Errata for the
SouthCoast Wind
Final Environmental Impact Statement

December 16, 2024

Bureau of Ocean Energy Management

Office of Renewable Energy Programs

Errata Overview

The following errata to the SouthCoast Wind Final Environmental Impact Statement (FEIS) represent corrections related to technical errors, omissions, or clarifications.

1. FEIS, Locations of "BC-48"

There are 4 locations (pages ES-11, 2-3, 2-21, and I-43) that incorrectly label one of the turbines being removed under Alternative D. The corrected sections with redline edits now read:

- Executive Summary, ES-11
  - Under Alternative D, six WTGs (AZ-47, BA-47, BB-47, BC-47, BF~~C~~-48, and BF-49) in the northeastern portion of the Lease Area would be eliminated to reduce potential impacts on foraging habitat and potential displacement of wildlife from this habitat adjacent to Nantucket Shoals.
- Chapter 2, Page 2-3, Table 2-1

Alternative	Description
Alternative D – Nantucket Shoals (Preferred Alternative)	Under Alternative D, the construction, operations and maintenance, and eventual decommissioning of the Project on the OCS offshore Massachusetts would occur within the range of the design parameters outlined in the SouthCoast Wind COP, subject to applicable mitigation measures. However, six WTGs (AZ-47, BA-47, BB-47, BC-47, BF~~C~~-48, and BF-49) would be eliminated in the northeastern portion of the Lease Area to reduce potential impacts on foraging habitat and potential displacement of wildlife from this habitat adjacent to Nantucket Shoals

- Chapter 2, Page 2-21, Section 2.1.4
  - Under Alternative D, six WTGs (AZ-47, BA-47, BB-47, BC-47, BF~~C~~-48, and BF-49) in the northeastern portion of the Lease Area would be eliminated to reduce potential impacts on foraging habitat and potential displacement of wildlife from this habitat adjacent to Nantucket Shoals (Figure 2-7).

- Appendix I, Page I-43, Table I-10

Alternative	Description
Alternative D – Nantucket Shoals (Preferred Alternative)	Under Alternative D, the construction, operations and maintenance, and eventual decommissioning of the Project on the OCS offshore Massachusetts would occur within the range of the design parameters outlined in the SouthCoast Wind COP, subject to applicable mitigation measures. However, six WTGs (AZ-47, BA-47, BB-47, BC-47, BFC-48, and BF-49) would be eliminated in the northeastern portion of the Lease Area to reduce potential impacts on foraging habitat and potential displacement of wildlife from this habitat adjacent to Nantucket Shoals

2. FEIS, Executive Summary, ES-14, ES-15, and ES-18

In the Executive Summary, ES-2 Table, there is a misplaced "c" footnote next to NARWs under cumulative impacts, columns Alternative B through F. Additionally, the inclusion of footnote "e" does not provide any additional information and was determined to be unnecessary. The corrected table with redline edits now reads:

3.5.6 Marine Mammals						
Direct and Indirect Impacts (without baseline) [c]	None	Moderate adverse for NARW	Moderate adverse for NARW	Moderate adverse for NARW	Moderate adverse for NARW	Moderate adverse for NARW
		Moderate adverse for other mysticetes, odontocetes, and pinnipeds	Moderate adverse for other mysticetes, odontocetes, and pinnipeds	Moderate adverse for other mysticetes, odontocetes, and pinnipeds	Moderate adverse for other mysticetes, odontocetes, and pinnipeds	Moderate adverse for other mysticetes, odontocetes, and pinnipeds
Alternative Impacts [a]	Major adverse for NARW ~~[e]~~	Major adverse for NARW ~~[e]~~	Major adverse for NARW ~~[e]~~	Major adverse for NARW ~~[e]~~	Major adverse for NARW ~~[e]~~	Major adverse for NARW ~~[e]~~
	Moderate adverse for other mysticetes, odontocetes, and pinnipeds; minor beneficial for odontocetes and pinnipeds	Moderate adverse for other mysticetes, odontocetes, and pinnipeds; minor beneficial for odontocetes and pinnipeds	Moderate adverse for other mysticetes, odontocetes, and pinnipeds; minor beneficial for odontocetes and pinnipeds	Moderate adverse for other mysticetes, odontocetes, and pinnipeds; minor beneficial for odontocetes and pinnipeds	Moderate adverse for other mysticetes, odontocetes, and pinnipeds; minor beneficial for odontocetes and pinnipeds	Moderate adverse for other mysticetes, odontocetes, and pinnipeds
Cumulative Impacts [b]	Major adverse for NARW	Major adverse for NARW ~~[e]~~	Major adverse for NARW ~~[e]~~	Major adverse for NARW ~~[e]~~	Major adverse for NARW ~~[e]~~	Major adverse for NARW ~~[e]~~
	Moderate adverse for other mysticetes, odontocetes, and pinnipeds; minor beneficial for odontocetes and pinnipeds	Moderate adverse for other mysticetes, odontocetes, and pinnipeds; minor beneficial for odontocetes and pinnipeds	Moderate adverse for other mysticetes, odontocetes, and pinnipeds	Moderate adverse for other mysticetes, odontocetes, and pinnipeds; minor beneficial for odontocetes and pinnipeds	Moderate adverse for other mysticetes, odontocetes, and pinnipeds	Moderate adverse for other mysticetes, odontocetes, and pinnipeds

Impact rating colors are as follows: orange = major; yellow = moderate; green = minor. All impact levels are assumed to be adverse unless otherwise specified as beneficial. Where impacts are presented as multiple levels, the color representing the most adverse level of impact has been applied.

[a] Alternative impacts are inclusive of baseline conditions and impacts from ongoing activities for each resource as described in their respective sections in Chapter 3, *Affected Environment and Environmental Consequences*.

[b] Cumulative impacts represent alternative impacts (with the baseline) plus other foreseeable impacts.

[c] Direct and Indirect Impacts (without baseline) (i.e., alternative impacts without the baseline) were included at NMFS' request to support ~~determinations~~ their decision under the Marine Mammal Protection Act.

[d] Impacts are the same under Alternatives C1 and C2 and Alternatives E1, E2, and E3 unless otherwise noted in the table.

~~[e] Impacts were assessed as major for the No Action Alternative and Proposed Action scenarios for North Atlantic right whale (NARW) because impacts on individual NARWs could have severe population-level effects and compromise the viability of the species due to their low population numbers and continued state of decline.~~

3. FEIS, Locations of "Appendix O"

There are 13 locations that incorrectly refer to "Appendix F" instead of "Appendix O". The corrected sections with redline edits now read:

- Section 3.4.1, Page 3.4.1-1
    - The reader is referred to Appendix O~~F~~, *Assessment of Resources with Moderate (or Lower) Impacts*, for a discussion of current conditions and potential impacts on air quality from implementation of the No Action Alternative, the Proposed Action, and other action alternatives.
- Section 3.4.2, Page 3.4.2-1
    - The reader is referred to Appendix O~~F~~, *Assessment of Resources with Moderate (or Lower) Impacts*, for a discussion of current conditions and potential impacts on water quality from implementation of the No Action Alternative, the Proposed Action, and other action alternatives.
- Section 3.5.1, Page 3.5.1-1
    - The reader is referred to Appendix O~~F~~, *Assessment of Resources with Moderate (or Lower) Impacts*, for a discussion of current conditions and potential impacts on bats from implementation of the No Action Alternative, the Proposed Action, and other action alternatives.
- Section 3.5.2, Page 3.5.2-1
    - The reader is referred to Appendix O~~F~~, *Assessment of Resources with Moderate (or Lower) Impacts*, for a discussion of current conditions and potential impacts on benthic resources from implementation of the No Action Alternative, the Proposed Action, and other action alternatives.
- Section 3.5.3, Page 3.5.3-1
    - The reader is referred to Appendix O~~F~~, *Assessment of Resources with Moderate (or Lower) Impacts*, for a discussion of current conditions and potential impacts on birds from implementation of the No Action Alternative, the Proposed Action, and other action alternatives.
- Section 3.5.4, Page 3.5.4-1
    - The reader is referred to Appendix O~~F~~, *Assessment of Resources with Moderate (or Lower) Impacts*, for a discussion of current conditions and potential impacts on coastal habitat and fauna from implementation of the No Action Alternative, the Proposed Action, and other action alternatives.

- Section 3.5.5, Page 3.5.5-1
    - The reader is referred to Appendix O~~F~~, *Assessment of Resources with Moderate (or Lower) Impacts*, for a discussion of current conditions and potential impacts on finfish, invertebrates, and essential fish habitat from implementation of the No Action Alternative, the Proposed Action, and other action alternatives.
- Section 3.5.7, Page 3.5.7-1
    - The reader is referred to Appendix O~~F~~, *Assessment of Resources with Moderate (or Lower) Impacts*, for a discussion of current conditions and potential impacts on sea turtles from implementation of the No Action Alternative, the Proposed Action, and other action alternatives.
- Section 3.5.8, Page 3.5.8-1
    - The reader is referred to Appendix O~~F~~, *Assessment of Resources with Moderate (or Lower) Impacts*, for a discussion of current conditions and potential impacts on wetlands from implementation of the No Action Alternative, the Proposed Action, and other action alternatives.
- Section 3.6.3, Page 3.6.3-1
    - The reader is referred to Appendix O~~F~~, *Assessment of Resources with Moderate (or Lower) Impacts*, for a discussion of current conditions and potential impacts on demographics, employment, and economics from implementation of the No Action Alternative, the Proposed Action, and other action alternatives.
- Section 3.6.5, Page 3.6.5-1
    - The reader is referred to Appendix O~~F~~, *Assessment of Resources with Moderate (or Lower) Impacts*, for a discussion of current conditions and potential impacts on land use and coastal infrastructure from implementation of the No Action Alternative, the Proposed Action, and other action alternatives.
- Section 3.6.6, Page 3.6.6-1
    - The reader is referred to Appendix O~~F~~, *Assessment of Resources with Moderate (or Lower) Impacts*, for a discussion of current conditions and potential impacts on navigation and vessel traffic from implementation of the No Action Alternative, the Proposed Action, and other action alternatives.

- Section 3.6.8, Page 3.6.8-1
  - The reader is referred to Appendix O~~F~~, *Assessment of Resources with Moderate (or Lower) Impacts*, for a discussion of current conditions and potential impacts on recreation and tourism from implementation of the No Action Alternative, the Proposed Action, and other action alternatives.

4. FEIS, Chapter 3, Page 3.5.6-96

Section 3.5.6 includes a narrower description of the effects from the NMFS Letter of Authorization and omitted updates on species impacts based on SouthCoast's updates due to release of NMFS' Updated Technical Guidance. The corrected section with redline edits now reads:

Although the likelihood of exposure leading to PTS would be greatly reduced, through mitigation, some PTS of fin whales, humpback whales, and minke whales may occur.~~ would be authorized under the Letter of Agreement (LOA) issued under the MMPA.~~

As the shutdown zones and clearance zones would cover the majority of the largest PTS zones modeled for each species group, PTS exposures and the effects of noise exposure from Project pile driving leading to auditory injury are considered moderate for mysticetes (fin whales, humpback whales, and minke whales), odontocetes (harbor porpoises), and pinnipeds (harbor seals and gray seals).

5. FEIS Chapter 3, Page 3.5.6-111

The FEIS incorrectly summarized that impacts to all marine mammals from UXO detonation would be minor. The corrected section with redline edits now reads:

Along with the low number of potential UXOs (conservatively up to 10) identified in the Project area and the implementation of mitigation and monitoring measures, ~~potential Level A harassment~~ PTS associated with the UXO detonations would be considered ~~extremely~~ unlikely to occur for mysticetes and most odontocetes but may occur for harbor porpoises and seals.

Therefore, impacts to mysticetes (including NARW) and odontocetes (other than harbor porpoise), ~~and pinnipeds~~ from UXO detonations under the Proposed Action are expected to be minor with no expected impacts on marine mammal stocks or populations. Impacts on harbor porpoise and seals from UXO detonations are expected to be moderate due to the potential for PTS; however, no population level impacts are expected to occur.

6. FEIS, Chapter 3, Page 3.5.6-116

Section 3.5.6 does not include the abbreviation for the Letter of Authorization. The corrected section with redline edits now reads:

The Project-specific Letter of Authorization (LOA) would also include mitigation measures to minimize vessel strike risk for marine mammals. The measures proposed for the ~~Letter of Authorization~~LOA include minimum separation distances and a 10-knot vessel speed restriction.

7. FEIS, Chapter 3, Page 3.5.6-118

The FEIS incorrectly summarized the exposure analysis contained within the noise-related exposure estimate tables. The corrected section with redline edits now reads:

~~All o~~Other sources of noise leading to PTS or behavioral disturbance (i.e. G&G surveys, cable laying, and dredging~~, UXO detonation~~) were found to be discountable, insignificant, or have no effect on fin whales, sei whales, NARWs, or sperm whales. UXO detonation could cause TTS (and related behavioral disturbance) to several species of marine mammals, including blue fin, sei, and NARWs.

8. FEIS Chapter 3, Page 3.5.6-118

- The FEIS incorrectly indicated that the Proposed Action likely would not adversely affect blue whales and sperm whales. The corrected section with redline edits now reads:
  - Proposed Action likely would not adversely affect the ~~blue whale, sperm whale, or~~ West Indian manatee given that their rarity means effects on this~~ese~~ species would be extremely unlikely to occur. Blue whales, f~~F~~in whales, sei whales, sperm whales, and NARWs, on the other hand, are likely to occur in the Project area and would be subject to effects associated with the Proposed Action, including effects of noise (including, but not limited to pile driving and UXO detonation), vessel traffic, habitat disturbance/modifications, repair and maintenance activities, and unexpected/unanticipated events and other effects. Noise associated with the Proposed Action has the potential to result in injury or behavioral effects in these species. ~~While mitigation measures reduce the risk of auditory injury to discountable levels~~ F~~f~~or baleen whales ~~(~~and sperm whales~~ had no exposures)~~, exposure to noise from pile driving and UXO detonation exceeding ~~behavioral~~ harassment thresholds may occur and cause adverse effects. However, mitigation measures are expected to reduce the risk of auditory injury and behavioral disturbance. ~~All other sources of noise leading to PTS or behavioral disturbance (G&G surveys, cable laying, dredging, UXO detonation) were found to be discountable, insignificant, or have no effect on fin whales, sei whales, NARWs, or sperm whales.~~

- Section 3.5.6 incorrectly described the impact level for a group of impact producing factors. The corrected section with redline edits now reads:
  - Habitat disturbance or modification could result in increased entanglement risk in recreational fishing gear, turbidity and stratification effects, species avoidance or displacement, behavioral disruption, or EMF effects. Together, in combination with the effects from noise, moderate adverse effects on ESA-listed species are expected to occur. ~~However, such effects are expected to be insignificant or discountable as they would be short-term, localized, and unlikely to occur, or would not be measurable or measurably change risk.~~ Other effects (i.e., shifts or displacement of other ocean users) could result in displacement of fishing activity outside the Lease Area and may result in increased entanglement risk for ESA-listed marine mammals if shifts to fixed gear from mobile gear were to occur. However, such a gear shift is not expected, and effects of displacement would be insignificant.

9. FEIS, Chapter 3, Pages 3.5.6-122 and 3.5.6-125

Section 3.5.6 incorrectly summarized impact determinations for individual IPFs and did not include the explanation as to why there would be moderate impacts to marine mammals and NARWs. The corrected sections with redline now read:

- Page 3.5.6-122
  - Therefore, direct and indirect impacts from construction, O&M, and decommissioning under Alternatives C and F would be moderate adverse for mysticetes (including NARW), odontocetes and pinnipeds~~ primarily due to noise exposure. Adverse effects from all other IPFs are expected to be negligible for mysticetes (including NARWs), odontocetes and pinnipeds~~. The moderate impact level for marine mammals other than NARW is primarily driven by the potential for auditory impacts, which could be permanent (i.e., PTS) for some mysticetes (humpback, fin and minke whales), odontocetes (harbor porpoise), and seals. It is expected that mitigation measures would minimize noise exposure such that any PTS of NARWs (and some other marine mammal species) would be avoided. However, moderate adverse impacts on NARWs could result from the Proposed Action due to the potential exposure of several individuals leading to temporary behavioral disturbance in potentially important seasonal foraging habitats along with other IPFs such as the presence of structures, as described above. Impacts on individual marine mammals or their habitat are not anticipated to lead to population-level effects.

- Page 3.5.6-125
  - The impacts of Alternative D alone would not be sufficiently reduced from the impacts of the Proposed Action alone to warrant a lower impact determination. Therefore, the direct and indirect impacts of construction, installation, O&M, and decommissioning of Alternative D would be moderate adverse for mysticetes (including NARW), odontocetes, and pinnipeds. The moderate impact level for marine mammals other than NARW is primarily driven by the potential for auditory impacts, which could be permanent (i.e., PTS) for some mysticetes (humpback, fin and minke whales), odontocetes (harbor porpoise), and seals. It is expected that mitigation measures would minimize noise exposure such that any PTS of NARWs (and some other marine mammal species) would be avoided. However, moderate adverse impacts on NARWs could result from the Proposed Action due to the potential exposure of several individuals leading to temporary behavioral disturbance in potentially important seasonal foraging habitats along with other IPFs such as the presence of structures, as described above. Impacts on individual marine mammals or their habitat are not anticipated to lead to population-level effects.

10. FEIS, Appendix F, Pages F-24 and F-25, Table A and Table B

SouthCoast discovered that there was an error in calculating the acreages of cable protection for the proposed Brayton Point route. SouthCoast has provided the estimated amount of cable protection per cable bundle is 56 acres, and 112 acres total for the proposed two cable bundles. However, when Appendix F's Table A was developed, 56 acres was multiplied by six, the number of individual cables, rather than by the number of cable bundles. As such, in Appendix F, Table A, for all variations of the Proposed Action, the acreage of cable protection for the entire route should read 112 instead of 336. Further, SouthCoast has determined that within the territorial seas ("state waters") up to 30 acres of cable protection would be required. As such, in Appendix F, Table A, for all variations of the Proposed Action, the acreage of cable protection in territorial seas should read 30, not 280. SouthCoast has also reevaluated the estimated acreage of cable protection that would be required for Alternatives C-1 and C-2 within territorial seas ("state waters"). In Appendix F, Table A, for all variations of Alternative C-1, the acreage of cable protection within state waters should read 17 acres, not 112. In Appendix F, Table B, for all variations of Alternative C-2, the acreage of cable protection within state waters should read 13 acres, not 112. The corrected tables with redline edits now read:

Table A

	No Action	Proposed Action with Route Option 1 over Aquidneck Island and Western Landfall	Proposed Action with Route Option 2 over Aquidneck Island and Western Landfall	Proposed Action with Route Option 2B over Aquidneck Island and Western Landfall	Proposed Action with Route Option 3 over Aquidneck Island and Western Landfall	Proposed Action with Route Option 1 over Aquidneck Island and Eastern Landfall	Proposed Action with Route Option 2 over Aquidneck Island and Eastern Landfall	Proposed Action with Route Option 2B over Aquidneck Island and Eastern Landfall	Proposed Action with Route Option 3 over Aquidneck Island and Eastern Landfall	Fisheries Habitat Impact Minimization Alternative C1 western with Route Option 1 over Aquidneck Island and Western Landfall	Fisheries Habitat Impact Minimization Alternative C1 western with Route Option 2 over Aquidneck Island and Western Landfall	Fisheries Habitat Impact Minimization Alternative C1 western with Route Option 2b over Aquidneck Island and Western Landfall	Fisheries Habitat Impact Minimization Alternative C1 western with Route Option 3 over Aquidneck Island and Western Landfall	Fisheries Habitat Impact Minimization Alternative C1 western with Route Option 1 over Aquidneck Island and Eastern Landfall
Linear Feet of Cable (LF, entire route)	0	496,139	494,774	495,531	496,438	499,503	498,142	498,899	499,781	501,984	499,339	505,640	506,407	505,400
Linear Feet of Cable (LF, state waters)	0	127,953	125,395	128,220	125,829	131,270	128,921	128,788	128,879	143,068	134,452	146,724	132,335	146,568
Dredge Material (acres, entire route)	0 CY	0 CY	0 CY	0 CY	0 CY	0 CY	0 CY	0 CY	0 CY	0 CY	0 CY	0 CY	0 CY	0 CY
Dredge Material (acres, state waters)	0 CY	0 CY	0 CY	0 CY	0 CY	0 CY	0 CY	0 CY	0 CY	0 CY	0 CY	0 CY	0 CY	0 CY
Cable Protection (acres, entire route)	0	112~~336~~	112~~336~~	112~~336~~	112~~336~~	112~~336~~	112~~336~~	112~~336~~	112~~336~~	99~~336~~	99~~336~~	99~~336~~	99~~336~~	99~~336~~
Cable Protection (acres, state waters)	0	30~~280~~	30~~280~~	30~~280~~	30~~280~~	30~~280~~	30~~280~~	30~~280~~	30~~280~~	17~~112~~	17~~112~~	17~~112~~	17~~112~~	17~~112~~
Amount of Fill Material (CY, entire route)	0	29,321,984	29,213,758	29,197,962	29,193,216	29,328,740	29,207,275	29,218,016	29,213,140	27,752,770	27,570,888	23,566,352	27,661,570	27,761,272
Amount of Fill Material (CY, state waters)	0	2,368,701	2,260,651	2,258,509	2,253,756	2,033,771	1,947,705	2,264,491	2,259,855	802,174	619,291	705,874	684,861	685,439
Seabed Preparation (CY, entire route)	0	1,630,856	1,630,856	1,630,856	1,630,856	1,630,856	1,630,856	1,630,856	1,630,856	1,168,561	1,168,561	1,168,561	1,168,561	1,168,561
Seabed Preparation (CY, state waters	0	512,471	512,471	512,471	512,471	512,471	512,471	512,471	512,471	206,404 Cy	206,404 Cy	205,404	206,404 Cy	206,404
Temporary Stream Crossings (acres)	0	0.04	0.08	0.08	0.08	0.04	0.08	0.08	0.08	0.18	0.22	0.22	0.22	0.18
Temporary Wetlands Impacts (acres)	0	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.497	0.497	0.497	0.497	0.497
Impacts to Other SAS (Eelgrass, Mudflat) (acres)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other Resource Concerns	0	0	0	0	0	0	0	0	0	Middletown Cemetery, Middletown Historical Society Property	Middletown Cemetery, Middletown Historical Society Property	Middletown Cemetery, Middletown Historical Society Property	Middletown Cemetery, Middletown Historical Society Property	Middletown Cemetery, Middletown Historical Society Property
										Sachuest Point Nat'l Wildlife Refuge	Sachuest Point Nat'l Wildlife Refuge	Sachuest Point Nat'l Wildlife Refuge	Sachuest Point Nat'l Wildlife Refuge	Sachuest Point Nat'l Wildlife Refuge

Table B

	Fisheries Habitat Impact Minimization Alternative C1 western with Route Option 2B over Aquidneck Island and Eastern Landfall	Fisheries Habitat Impact Minimization Alternative C1 western with Route Option 2A over Aquidneck Island and Eastern Landfall	Fisheries Habitat Impact Minimization Alternative C1 western with Route Option 3 over Aquidneck Island and Eastern Landfall	Fisheries Habitat Impact Minimization Alternative C1 eastern with Route Option 1 over Aquidneck Island and Western Landfall	Fisheries Habitat Impact Minimization Alternative C1 eastern with Route Option 2B over Aquidneck Island and Western Landfall	Fisheries Habitat Impact Minimization Alternative C1 eastern with Route Option 2A over Aquidneck Island and Western Landfall	Fisheries Habitat Impact Minimization Alternative C1 eastern with Route Option 3 over Aquidneck Island and Western Landfall	Fisheries Habitat Impact Minimization Alternative C1 eastern with Route Option 1 over Aquidneck Island and Eastern Landfall	Fisheries Habitat Impact Minimization Alternative C1 eastern with Route Option 2B over Aquidneck Island and Eastern Landfall	Fisheries Habitat Impact Minimization Alternative C1 eastern with Route Option 2A over Aquidneck Island and Eastern Landfall	Habitat Minimization Alternative C1 eastern with Route Option 3 over Aquidneck Island and Eastern Landfall	Fisheries Habitat Impact Minimization Alternative C2 and Western Landfall	Fisheries Habitat Impact Minimization Alternative C2 and Eastern Landfall
Linear Feet of Cable (LF, entire route) [a,b]	502,684	501,985	509,802	503,089	500,357	501,037	501,992	506,550	501,926	504,459	505,400	509,440	510,807
Linear Feet of Cable (LF, state waters) [a,b]	73,178	87,910	77,906	74,026	71,785	70,935	70,808	77,409	73,435	75,136	68,458	59,621.29	60,909.21
Dredge Material (acres, entire route)	0	0	0	0	0	0	0	0	0	0	0	0	0
Dredge Material (acres, state waters)	0	0	0	0	0	0	0	0	0	0	0	0	0
Cable Protection(acres, entire route)	99~~336~~	99~~336~~	99~~336~~	99~~336~~	99~~336~~	99~~336~~	99~~336~~	99~~336~~	99~~336~~	99~~336~~	99~~336~~	95~~336~~	95~~336~~
Cable Protection (acres, state waters)	17~~112~~	17~~112~~	17~~112~~	17~~112~~	17~~112~~	17~~112~~	17~~112~~	17~~112~~	17~~112~~	17~~112~~	17~~112~~	13~~112~~	13~~112~~
Amount of Fill Material (CY, entire route) [c]	5,136,699	5,135,346	5,444,812	5,398,002	5,166,913	5,146,347	5,200,112	5,191,491	5,193,557	5,192,889	5,188,224	5,487,134	5,489,922
Amount of Fill Material (CY, state waters) [c]	179,533	178,222	165,546	163,908	160,916	159,231	159,150	164.447	162,009	165,095	159, 663	150,982	160,136
Temporary Stream Crossings (acres)	0.22	0.22	0.22	0.13	0.17	0.17	0.17	0.13	0.17	0.17	0.17	0.41	0.41
Temporary Wetlands Impacts (acres)	0.497	0.497	0.497	0.492	0.492	0.492	0.492	0.492	0.492	0.492	0.492	0.12	0.12
Impacts to Other SAS (Eelgrass, Mudflat) (acres)	0	0	0	0	0	0	0	0	0	0	0	0	0
Other Resource Concerns	Middletown Cemetery, Middletown Historical Society Property	Middletown Cemetery, Middletown Historical Society Property	Middletown Cemetery, Middletown Historical Society Property	Norman Bird Sanctuary	Norman Bird Sanctuary	Norman Bird Sanctuary	Norman Bird Sanctuary	Norman Bird Sanctuary	Norman Bird Sanctuary	Norman Bird Sanctuary	Norman Bird Sanctuary	Federal Navigation Project	Federal Navigation Project
	Sachuest Point Nat'l Wildlife Refuge	Sachuest Point Nat'l Wildlife Refuge	Sachuest Point Nat'l Wildlife Refuge	Sachuest Point Nat'l Wildlife Refuge	Sachuest Point Nat'l Wildlife Refuge	Sachuest Point Nat'l Wildlife Refuge	Sachuest Point Nat'l Wildlife Refuge	Sachuest Point Nat'l Wildlife Refuge	Sachuest Point Nat'l Wildlife Refuge	Sachuest Point Nat'l Wildlife Refuge	Sachuest Point Nat'l Wildlife	Nature Conversancy Pocasset Ridge Conservation Area	Nature Conversancy Pocasset Ridge Conservation Area
												Audubon Emilie Ruecker Wildlife Sanctuary	Audubon Emilie Ruecker Wildlife Sanctuary

11. FEIS, Appendix G, Page G-77

Mitigation Measures NAV-3, Mariner Communication and Outreach Plan was incorrectly included in Table G-3. Additional Mitigation and Monitoring Measures. Elements of this mitigation measure are duplicative of BOEM's anticipated conditions of COP approval for the lessee to develop and maintain a project website; provide regular construction status, installation schedule, and maintenance schedule updates; provide copies of complaints and correspondence on a monthly basis; and, attend meetings when requested to provide briefings on the status of construction and operations, and on any problems or issues encountered with respect to navigation safety.

The corrected Table G-3 with redline edit now reads:

#	Proposed Project Phase [a]	Mitigation & Monitoring Measures	Description	Resource Area Mitigated	Anticipated Enforcing Agency
~~NAV-3~~	~~Pre-C, C, O&M, D~~	~~Mariner Communication and Outreach Plan~~	~~SouthCoast Wind will develop and implement a Mariner Communication and Outreach Plan that covers all project phases from pre-construction to decommissioning and that facilitates coordination with all mariners, including the commercial shipping industry, commercial and for-hire fishing industries, and other recreational users. The Mariner Communication and Outreach Plan will include the following components:~~ ~~a. During Project design, coordinating in-water construction activities to avoid and minimize disruptions;~~ ~~b. At least 90 days prior to commencing in-water construction activities in any construction season, consultation with stakeholders on an approximate schedule of activities and existing uses within the Project area. Make good faith efforts to accommodate those existing uses. The results of these good faith consultations can be summarized in a report and submitted to the federal agency(ies) prior to the start of each construction season;~~ ~~c. Following COP approval, notice of proposed changes which have the potential to impact fishing or maritime resources or activities;~~ ~~d. Notices to commence construction activities, conduct maintenance activities, and commence decommissioning;~~ ~~e. Status reports during construction with specific information on construction activities and locations for upcoming activities in the next 1–2 weeks;~~ ~~f. Post-construction notice of: (i) all cable protection measure locations (including protection type and charted location); (ii) any areas where the identified burial depth is less than target burial depth; and (iii) other obstructions to navigation created by the Project; and~~ ~~Post all notices described above to the Project website with information on how to opt-in for alerts.~~	~~Navigation~~	~~BOEM, BSEE~~

12. FEIS, Appendix N, Pages N-118

Section N.4.1.2, Table N.4.1-2 misspells the word quality. The corrected Table N.4.1-2 with redline edits now reads:

Comment No.	Comment	Response
BOEM-2023-011-0056-0020	The DEIS (Page: 153 Table 3.4.2-9. Results from thermal plume modeling conducted for Mayflower Wind HVDC OSP) states that four thermal plume scenarios were modeled to provide the expected maximum extent of the plume (maximum tidal velocities) and maximum concentrations of the plume (minimum tidal velocities). Recommended Action: We recommend that the FEIS explain the greater dilutions at edge of the near-field region (NFR) under the low velocity ambient conditions presented in the Table. Also the FEIS should explain the greater distance to edge of NFR under low velocity ambient conditions presented in the Table.	Section 3.4.2, Water Quallity, of the Final EIS has been updated to reflect the revised NPDES permit application results and provide explanation of dilution ratios at the edge of the near-field region and distance to the edge of the nearfield region under minimum current conditions

13. **FEIS, Appendix O**

Appendix O, page O-i refers to Section 3.4.2 Water Quality in its Table of Contents, however, this section is missing from Appendix O. Section 3.4.2 Water Quality has been provided in Attachment 1 of this errata.

Attachment 1

3.4 Physical Resources

3.4.2 Water Quality

This section discusses potential impacts on water quality from the proposed Project, alternatives, and ongoing and planned activities in the water quality geographic analysis area. The water quality geographic analysis area, as shown on Figure 3.4.2-1, includes coastal waters within a 10-mile (16-kilometer) buffer around the Offshore Project area and a 15.5-mile (25-kilometer) buffer around the ports that may be used by the Project. In addition, the geographic analysis area includes an onshore component that includes any sub-watershed that is intersected by the Onshore Project area. The offshore geographic analysis area accounts for some transport of water masses due to ocean currents. The onshore geographic analysis area was chosen to capture the extent of the natural network of waterbodies that could be affected by construction and operation activities of the proposed Project.

3.4.2.1 Description of the Affected Environment

Surface waters in the geographic analysis area include: (1) coastal onshore waterbodies that generally include freshwater ponds, streams, and rivers; and (2) coastal marine waters that generally include saline and tidal/estuarine waters, such as Nantucket Sound, Rhode Island Sound, Mount Hope Bay, Sakonnet River and the Atlantic Ocean. Surface waters within most of the geographic analysis area and all of the Onshore Project areas are coastal marine waters.

The following key parameters characterize water quality. Some of these parameters are accepted proxies for ecosystem health (e.g., dissolved oxygen [DO], nutrient levels), while others delineate coastal onshore waters from coastal marine waters (e.g., temperature, salinity):

- **Nutrients:** Key ocean nutrients include nitrogen and phosphorous. Photosynthetic marine organisms need nutrients to thrive (with nitrogen being the primary limiting nutrient), but excess nutrients can cause problematic algal blooms. Algal blooms can significantly lower DO concentration, and toxic algal blooms can contaminate human food sources. Both natural and human-derived sources of pollutants contribute to nutrient excess.
- **Dissolved oxygen:** The amount of DO in water determines the amount of oxygen that is available for aquatic life to use. Temperature strongly influences DO content, which is further influenced by local biological processes. For a marine system to maintain a healthy environment, DO concentrations should be above 5 mg/L; lower levels may affect sensitive organisms (USEPA 2000).
- **Chlorophyll a:** Chlorophyll *a* is a measure of how much photosynthetic life is present. Chlorophyll *a* levels are sensitive to changes in other water parameters, making it a good indicator of ecosystem health. USEPA considers estuarine and marine levels of chlorophyll *a* under 5 micrograms per liter (µg/L) to be good, 5 to 20 µg/L to be fair, and over 20 µg/L to be poor (USEPA 2015).
- **Salinity***:* Salinity, or salt concentration, also affects species distribution. In general, seasonal variation in the region is smaller than year-to-year variation and less predictable than temperature changes (Kaplan 2011).

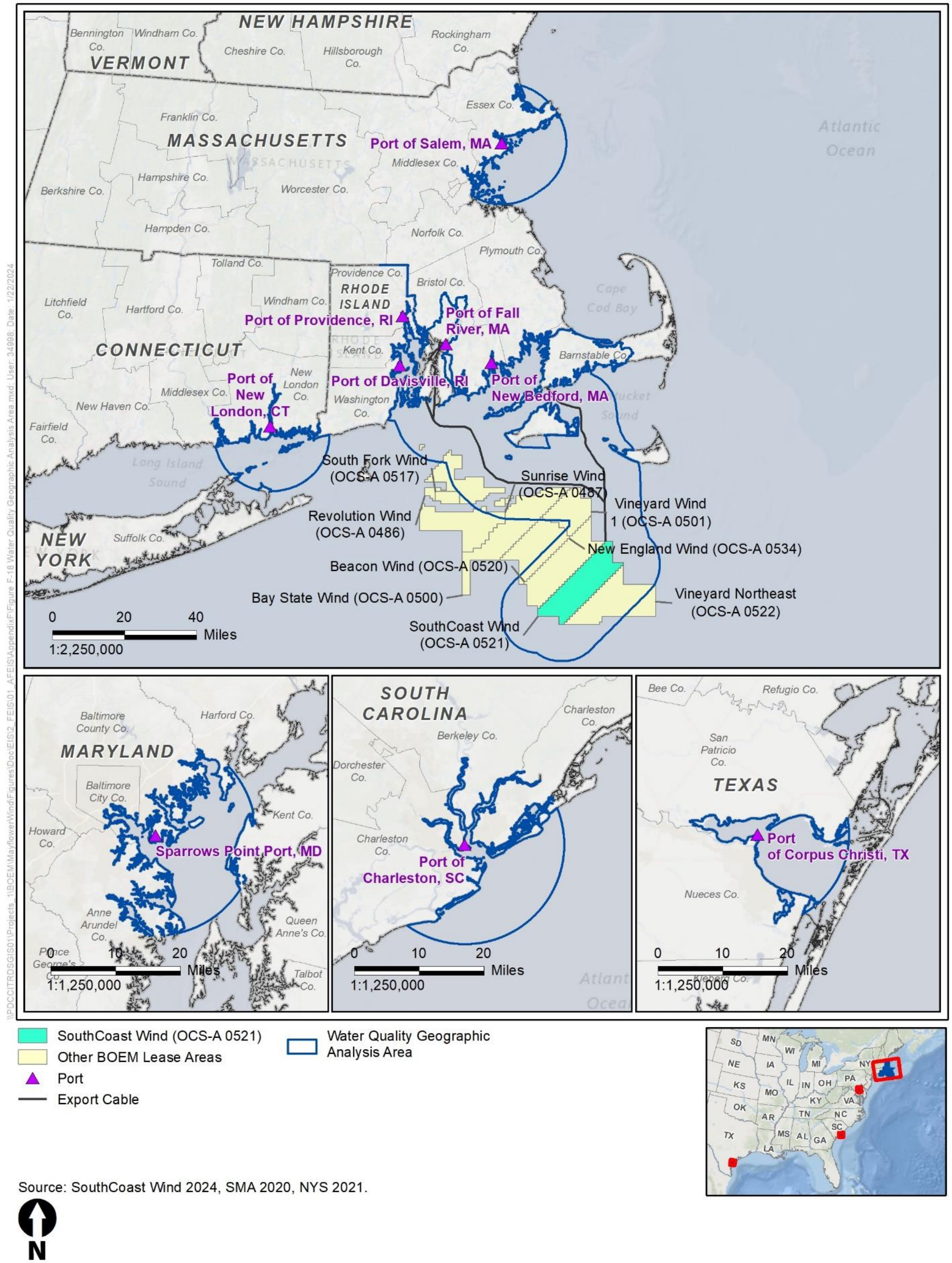

Figure 3.4.2-1. Water Quality geographic analysis area

- **Water temperature**: Water temperature heavily affects species distribution in the ocean. Large-scale changes to water temperature may affect seasonal phytoplankton blooms.
- **Turbidity:** Turbidity is a measure of water clarity, which is typically expressed as a concentration of total suspended solids (TSS) in the water column but can also be expressed as nephelometric turbidity units (NTU). Turbid water lets less light reach the seafloor, which may be detrimental to photosynthetic marine life (CCS 2017). In estuaries, a turbidity level of 0 to 10 NTUs is healthy while a turbidity level over 15 NTUs is detrimental (NOAA 2018). Marine waters generally have less turbidity than estuaries.

States also assess a variety of other water quality parameters as part of state requirements to evaluate and list state waters as impaired under CWA Section 303(d) requirements. Other water quality parameters assessed typically include, but are not limited to, concentrations of metals, pathogens, bacteria, pesticides, biotoxins, PCBs, and other chemicals. If a surface water is considered non-attaining under the assessment, this means a designated beneficial use (e.g., recreation, fish consumption) is impaired by an exceedance of one or more water quality parameters.

Water Quality Geographic Analysis Area: Coastal Marine Waters

This section presents water quality data for federal waters, mostly associated with the Lease Area, and offshore waters for the ECCs. Energy will be transmitted from up to five OSPs to landfall sites utilizing up to two ECCs that include one preferred route to Brayton Point, Massachusetts (Brayton Point ECC) and one variant route to Falmouth, Massachusetts (Falmouth ECC).[1] The Falmouth ECC state waters include Nantucket Sound, which is located between the south coast of Massachusetts and the Islands of Martha's Vineyard and Nantucket. The Brayton Point ECC state waters include the Sakonnet River, located east of Narragansett Bay in Rhode Island which connects Mount Hope Bay to the Rhode Island Sound. Mount Hope Bay is located between both Massachusetts and Rhode Island and is in the vicinity of the proposed export cable landfall locations at Brayton Point. Water quality of coastal marine waters in the geographic analysis area are summarized below, with more detailed water quality information included in COP Appendix H (SouthCoast Wind 2024).

Federal Waters in the Geographic Analysis Area: Water quality data collected by the Northeast Fisheries Science Center (NEFSC) from 1963 to 2019 show that yearly surface water temperature averages ranged from approximately 41.4°F (5.2°C) to 61.7°F (16.5°C), while bottom water temperatures ranged from approximately 44.4°F (6.9°C) to 54.9°F (12.7°C). Salinity averages remained fairly stable; ranging only from approximately 32.7 practical salinity units (psu) to 32.9 psu at the surface and from approximately 33.3 to 33.5 psu near the bottom (COP Appendix H; SouthCoast Wind 2024).

Long-term water temperature data are also available from the NOAA National Data Buoy Center (NDBC) for two buoys located in federal waters in the general vicinity of the Offshore Project area. Station 44020 is located in Nantucket Sound at a water depth of 46.9 feet (14.3 meters) near the Falmouth ECC.

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[1] As described in Chapter 2, Section 2.1.2, *Alternative B – Proposed Action,* Brayton Point is the preferred ECC for both Project 1 and Project 2, and Falmouth is the variant ECC for Project 2, which would be used if SouthCoast Wind is prevented from using Brayton Point for Project 2.

Station 44097 is located near Block Island at a water depth of 158 feet (48.2 meters) near the Brayton Point ECC and the Lease Area. Data from 2009 through 2019 from the NDBC show that annual temperatures near the Falmouth ECC ranged from 39.0 F (3.9°C) to 69.6°F (20.9°C), while temperatures ranged from 45.7°F (7.6°C) to 67.3°F (19.6°C) near the Brayton Point ECC and Lease Area (COP Appendix H; SouthCoast Wind 2024).

Falmouth ECC State Waters in the Geographic Analysis Area: The Center for Coastal Studies (CCS) began monitoring the water quality of the coastal waters of Cape Cod in 2006, and its program includes the only water quality monitoring that is regularly conducted in Nantucket Sound. Four sampling locations within Nantucket Sound are located in the general vicinity of the Falmouth ECC. Data collected from these stations are available from 2010 to 2016. Four sampling locations within Nantucket Sound are in the general vicinity of the Falmouth ECC. Data collected from these stations are available from 2010 to 2016. Three sampling stations are in coastal areas in the vicinity of the export cable landfall location in Falmouth. Data collected from these stations are available from 2014 to 2016 (CCS 2020). A sampling station at Oyster Pond-Falmouth is located near the alternate landfall locations. Table 3.4.2-1 and Table 3.4.2-2 present the seasonal results for the Nantucket Sound and coastal sampling stations, respectively. Winter sampling data were not available. Average seasonal results are summarized for water temperature, salinity, dissolved oxygen, chlorophyll *a*, turbidity, total nitrogen, and total phosphorus.

Table 3.4.2-1. Mean and standard deviation for water quality parameters measured in Nantucket Sound by CCS (2010–2016)

Season	Water Temperature (°C)	Salinity (psu)	DO (mg/L)	Chlorophyll *a* (µg/L)	Turbidity (NTU)	Total Nitrogen (µm)	Total Phosphorus (µm)
Spring (n=27)	12.9 ± 2.3	32.1 ± 0.25	9.8 ± 1.1	1.2 ± 0.53	0.47 ± 0.31	10.1 ± 3.5	0.61 ± 0.27
Summer (n=142)	20.5 ± 2.4	31.5 ± 1.4	7.6 ± 0.75	1.9 ± 0.83	0.59 ± 0.46	11.7 ± 4.8	0.71 ± 0.31
Fall (n=83)	18.2 ± 3.0	31.9 ± 0.25	7.7 ± 0.58	2.2 ± 1.1	0.51 ± 0.37	10.4 ± 3.1	0.76 ± 0.22

Source: COP Appendix H; SouthCoast Wind 2024.
Results show mean ± 1 standard deviation; n= number of samples (not all samples were analyzed for all parameters).
Spring = March to May; Summer = June to August; Fall = September to November.
n = number of samples (not all samples were analyzed for all parameters).

Table 3.4.2-2. Mean and standard deviation for water quality parameters measured in coastal locations near Falmouth Cable Landfall(s) by CCS (2014–2016)

Season	Water Temperature (°C)	Salinity (psu)	DO (mg/L)	Chlorophyll *a* (µg/L)	Turbidity (NTU)	Total Nitrogen (µm)	Total Phosphorus (µm)
Spring (n=10)	18.4 ± 1.3	21.1 ± 13.3	7.0 ± 1.3	5.4± 2.2	2.2± 1.1	Not sampled	Not sampled
Summer (n=62)	24.1 ± 2.5	21.2 ± 12.6	6.7 ± 1.8	10.0 ± 6.3	2.3 ± 1.5	35.0 ± 12.5	1.4 ± 0.58
Fall (n=33)	19.2 ± 4.1	21.8 ± 12.6	7.2 ± 2.0	13.0 ± 12.8	2.8 ± 3.0	42.3 ± 21.5	1.4 ± 0.82

Source: COP Appendix H; SouthCoast Wind 2024.
Results show mean ± 1 standard deviation; n= number of samples (not all samples were analyzed for all parameters).
Spring = March to May; Summer = June to August; Fall = September to November.
n= number of samples (not all samples were analyzed for all parameters).

The condition of coastal water was assessed by USEPA in the 2010 National Coastal Condition Assessment (NCCA) (USEPA 2015). Water quality data from the 2010 NCCA are available for eight stations within Nantucket Sound. Parameters measured in this assessment included chlorophyll *a*, dissolved inorganic nitrogen, dissolved inorganic phosphorus, DO at the bottom of the water column, and light transmissivity. Water quality results for the Nantucket Sound data set are summarized in Table 3.4.2-3. These water quality parameters were used to determine a water quality index (WQI) for each sample characterized as Good, Fair, or Poor. As summarized in Table 3.4.2-4, in Nantucket Sound, 88 percent of the samples (seven of eight) received a WQI of Good and the remaining sample was Fair.

Table 3.4.2-3. Mean and standard deviation for water quality parameters in Nantucket Sound measured in the 2010 NCCA

Season	Chlorophyll *a* (µg/L)	Dissolved Inorganic Nitrogen (mg/L)	Dissolved Inorganic Phosphorus (mg/L)	DO (mg/L)	Light Transmissivity (% at 1 m depth)
Nantucket Sound (n=8)	18.4 ± 1.3	21.1 ± 13.3	7.0 ± 1.3	5.4± 2.2	2.2± 1.1

Source: COP Appendix H; SouthCoast Wind 2024.
Results show mean ± 1 standard deviation; n= number of samples (not all samples were analyzed for all parameters).

Table 3.4.2-4. Summary of surface water parameter scores and WQI for the Nantucket Sound

Parameter	Good	Fair	Poor	No Data
Chlorophyll *a*	88%	12%	0%	0%
Dissolved inorganic nitrogen	100%	0%	0%	0%
Dissolved inorganic phosphorus	0%	100%	0%	0%
Dissolved oxygen	88%	12%	0%	0%
Light transmissivity	75%	0%	0%	25%
Overall WQI	88%	12%	0%	0%

Source: COP Appendix H; SouthCoast Wind 2024.
Results show percent of samples within each category for individual parameters and overall WQI.

Brayton Point ECC State Waters: Data was collected by the United States Geological Survey at a buoy monitoring station in the Sakonnet River near Gould Island, Rhode Island. The Sakonnet River remains saline throughout the year due to tidal influence. Reaching peak temperatures in the summer months, the river also reaches its lowest DO (Table 3.4.2-5). Seasonal algal growth, seen as increased Chlorophyll *a*, as well as low DO levels have raised concern for the ecological health of the river. The primary causes of the observed water-quality impairments are the inputs of nutrients from wastewater management and stormwater runoff from the surrounding developed area (COP Appendix H; SouthCoast Wind 2024).

Table 3.4.2-5. Mean and standard deviation for water quality parameters measured from the USGS Sakonnet River Station Buoy near Gould Island, Rhode Island (2018–2019)

Season	Water Temperature (°C)	Salinity (psu)	DO (mg/L)	Chlorophyll *a* (µg/L)	Turbidity (NTU)	Total Nitrogen (µm)	Total Phosphorus (µm)
Spring (n=2)	12.6 ± 0.2	28 ± 0.0	7.3 ± 0.4	NA	1.2± 0.0	0.21 ± 0.03	0.04 ±0.01
Summer (n=28)	22.3 ± 2.7	30.3 ± 0.8	6.1 ± 0.9	6.3 ± 4.6	2.4 ± 0.8	0.28 ± 0.07	0.07 ± 0.02
Fall (n=20)	17.7 ± 4.7	29.8 ± 1.2	7.0 ± 1.0	3.0 ± 1.4	2.5 ± 0.6	0.33 ± 0.08	0.08 ± 0.01

Source: COP Appendix H; SouthCoast Wind 2024.
Results show mean ± 1 standard deviation; n = number of samples (not all samples were analyzed for all parameters).
Values for turbidity and salinity were only measured in 2018.
Spring = March to May; Summer = June to August; Fall = September to November.

The Massachusetts Department of Environmental Protection (MassDEP) operates two fixed-location buoys at the mouths of the Cole and Taunton Rivers to monitor water quality in Mount Hope Bay seasonally from May to November. The monitoring is part of the Narragansett Bay Fixed-Site Monitoring Network (NBFSMN) and provides data in the Massachusetts portion of Mount Hope Bay. Data collected from these stations are available for the 2017 and 2018 seasons as shown in Table 3.4.2-6 (COP Appendix H; SouthCoast Wind 2024).

Table 3.4.2-6. Mean and standard deviation for water quality parameters measured in Mount Hope Bay by NBFSMN (2017–2018)

Year	Site	Water Temperature (°C)	Salinity (psu)	DO (mg/L)	Chlorophyll *a* (RFU)	Nitrate-N (mg/:)
2017	Taunton Buoy	20.3 ± 3.2	27.4 ± 1.2	7.4 ± 1.3	2.5 ± 2.2	0.12 ± 0.06
	Cole Buoy	20.5 ± 3.3	27.9 ± 1.9	7.9 ± 1.3	4.3 ± 3.7	0.13 ± 0.06
2018	Taunton Buoy	21.3 ± 4.3	27.2 ± 2.6	7.1 ± 1.2	2.7 ± 2.2	0.18 ± 0.08
	Cole Buoy	21.4 ± 4.4	27.5 ± 2.1	7.5 ± 1.2	2.7 ± 2.0	0.16 ± 0.06

Source: COP Appendix H; SouthCoast Wind 2024.
Results show mean ± 1 standard deviation.

A buoy located near the proposed Brayton Point landfall site(s) and the Brayton Point ECC is located in Mount Hope Bay. Table 3.4.2-7 summarizes the temperature data between 2011 and 2020 (COP Appendix H; SouthCoast Wind 2024).

Table 3.4.2-7. Mean and standard deviation for seasonal water temperature data from NOAA NDBC for Mount Hope Bay (2011–2020)

Season	Number of Samples	Water Temp (°C)
Spring	210,308	9.4 ± 4.2
Summer	207,469	22.7 ± 2.8
Fall	207,819	16.5 ± 4.8
Winter	209,750	4.5 ±2.5

Source: COP Appendix H; SouthCoast Wind 2024.
Results show mean ± 1 standard deviation.
Spring = March to May; Summer = June to August; Fall = September to November, Winter = December to February.

303(d) Listed Impaired Waters: Assessment units listed as 303(d) impaired in the water quality geographic analysis area include, but are not limited to, Buzzards Bay, Outer New Bedford Harbor, New Bedford Inner Harbor, Mount Hope Bay, Upper Narragansett, Providence River, Newport Harbor/Coddington Cove, Bear Creek, Middle Harbor, and associated tidal tributaries. These waters are non-attaining for fish consumption, ecological or recreational use, with causes including metals other than mercury, nutrients, oil and grease, trash, pathogens, total toxins, oxygen depletion, and PCBs (USEPA 2020).

Water Quality Specific to Proposed Ports

SouthCoast Wind is considering multiple ports for construction including New Bedford, Fall River, and Salem, Massachusetts; Davisville and Providence, Rhode Island; New London, Connecticut; Sparrows Point, Maryland; Charleston, South Carolina; and Corpus Christi, Texas as well as some international ports. O&M vessel trips would originate primarily from the ports of New Bedford and Fall River, Massachusetts; New London, Connecticut; or Providence, Rhode Island with the potential for occasional repair and supply delivery trips originating from ports in Davisville and Providence, Rhode Island; Salem, Massachusetts; Sparrows Point, Maryland; and Charleston, South Carolina..

USEPA (2012) assessed water quality conditions along the coasts of the United States and developed a WQI (good, fair, or poor) that evaluated five water quality parameters: nitrogen, phosphorus, chlorophyl *a*, water clarity (TSS or turbidity), and DO. The overall water quality condition of the Northeast Coast, which includes the proposed ports in Connecticut, Maryland, Massachusetts, and Rhode Island, is considered fair, with 9 percent of the coastal area rated poor and 53 percent rated fair. Phosphorus, chlorophyll *a*, DO, and water clarity ratings are all considered fair, while nitrogen rating is considered good (USEPA 2012). The overall water quality condition of the Southeast Coast, which includes the proposed port in South Carolina, is considered fair, with 13 percent of the coastal area rated poor and 64 percent of the area rated fair. Ratings for phosphorus, chlorophyll *a*, and DO are all considered fair, and the rating for nitrogen is considered good. Water clarity has a poor rating. The Gulf Coast, which includes the proposed port in Texas, has an overall water quality rating of fair, with 10 percent of the coastal area being rated poor and 53 percent of the area rated fair. Water quality ratings for nitrogen and DO are considered good, while ratings for phosphorus, chlorophyll *a*, and water clarity are considered fair.

303(d) Listed Impaired Waters: Assessment units listed as 303(d) impaired in the water quality geographic analysis area relative to proposed ports in Connecticut, Maryland, Massachusetts, and Rhode Island include, but are not limited to, Salem Harbor, Plum Island Sound, New Bedford Inner Harbor, Mount Hope Bay, Bear Creek, Middle Harbor, LIS EB Midshore – Stonington, LIS EB Shore – Wequetequock Cove, Stonington, LIS EB Inner – Pawcatuck River (02), Stonington, LIS EB Inner – Inner Wequetequock Cove, Stonington, Tidal Pawcatuck River, Thames River (Mouth), New London, LIS EB Inner – Thames River (middle), Ledyard and associated tidal tributaries. Impaired assessment units in the water quality geographic analysis area relative to proposed ports in South Carolina and Texas include, but are not limited to, Gulf of Mexico, Corpus Christi Inner Harbor, Laguna Madre, and Oso Bay. These waters are non-attaining for fish consumption, ecological, or recreational use, with causes including algal growth, unknown impaired biota, pathogens, and oxygen depletion (USEPA 2020).

Water Quality Geographic Analysis Area: Coastal Onshore Waters

As previously stated, surface waters within most of the geographic analysis area and all of the Onshore Project areas are coastal marine waters. The Falmouth underground export cable and transmission routes pass several small coastal ponds between the preferred and alternate export cable landfall locations and the onshore substation sites. The onshore export cable and alternate underground transmission routes do not cross any mapped rivers, streams, vernal pools, or waterbodies, but do pass within 0.6 mile (1 kilometer) of Cape Cod Canal, Great Pond, Grews Pond, and Long Pond. The underground onshore export cable routes between the preferred and alternate landfall locations and the onshore substation sites pass through residential areas containing small coastal ponds including Salt Pond, Sols Pond, Jones Pond, Grews Pond, Siders Pond, Shivericks Pond, an unnamed pond north of Shivericks Pond, Nyes Pond, and Morse Pond. The Falmouth onshore export cables do not cross any streams designated as impaired. One impaired waterbody, Little Pond, is adjacent to a Falmouth onshore export cable segment. The Little Pond assessment unit is non-supporting for ecological use and fish consumption caused by pathogens, and unknown causes.

The Brayton Point export cable corridor crosses over Aquidneck Island in route to the Brayton Point landfall locations. As the export cable crosses over Aquidneck Island it passes through residential and recreational areas. There are several freshwater streams and ponds present in the vicinity of the onshore export cable route options, including Founders Brook, which is listed as impaired. Founders Brook is non-supporting for recreational use due to pathogens. Numerous estuaries are also within the vicinity of the onshore export cable routes, including Old Orchard Cove, Long Neck Cove, and Mount Hope Bay. The assessment units listed as impaired within the geographic analysis area of the Brayton Point onshore cable routes include the Sakonnet River and Mount Hope Bay. The Sakonnet River assessment unit is non-attaining for fish consumption use caused by pathogens and unknown causes. The Mount Hope Bay assessment unit is non-attaining for ecological use and fish consumption use caused by nutrients, oxygen depletion, pathogens, and unknown causes.

Groundwater Quality

Several drinking water protection areas occur in the vicinity of the Falmouth transmission line and underground cable routes. These include multiple Zone I and Zone II Wellhead Protection areas, as well as surface water supply protection areas primarily surrounding Long Pond (COP Appendix H, Section 3.4.4.1, Figure 3-6; SouthCoast Wind 2024). The USGS has investigated groundwater and surface water resources on Cape Cod for over 50 years. Groundwater is the sole source of drinking water and a major source of freshwater for domestic, industrial, and agricultural uses on the Cape. Groundwater discharged from aquifers also supports freshwater pond and stream ecosystems and coastal wetlands. In most areas, groundwater in the sand and gravel aquifers is shallow and susceptible to contamination from anthropogenic sources and saltwater intrusion. USGS activities include long-term monitoring of groundwater and pond levels and field research on groundwater contamination and plumes associated with Joint Base Cape Cod (JBCC), located north of the Falmouth Onshore Project area. Groundwater quality data in the vicinity of the Falmouth Onshore Project area were not identified (SouthCoast Wind 2024).

The Rhode Island Department of Environmental Management (RIDEM) classifies the groundwater quality of the area surrounding the Brayton Point onshore export cable route options over Aquidneck Island as Class GA, which includes groundwater resources that are known or presumed to be suitable for drinking water use without treatment. However, the Aquidneck Island area is not considered a priority area (GAA classification), and approximately 70 percent of the state of Rhode Island overlies groundwater classified as GA. There are no drinking water protection areas (e.g., public wells, well head protection areas, drinking water reservoir watersheds) along the Brayton Point ECC. This includes the overland portion on Aquidneck Island (COP Appendix H, Section 3.4.4.1, Figure 3-6; SouthCoast Wind 2024). Brayton Point is home to considerable past and former industrial use, and there has been past contamination identified in the groundwater. Even though there are no drinking water aquifers identified at the landing sites, data provided in the *2019 Annual Groundwater Monitoring and Corrective Action Report and Final Closure Report - Brayton Point CCR Basins A, B, and C* suggests that groundwater will be less than 6 feet (1.8 meters) below the ground surface at the landing sites (GEI Consultants 2019).

3.4.2.2 Impact Level Definitions for Water Quality

Definitions of potential impact levels are provided in Table 3.4.2-8. There are no beneficial impacts on water quality.

Table 3.4.2-8. Impact level definitions for water quality

Impact Level	Impact Type	Definition
Negligible	Adverse	Changes would be undetectable.
Minor	Adverse	Changes would be detectable but would not result in degradation of water quality in exceedance of water quality standards.
Moderate	Adverse	Changes would be detectable and would result in localized, short-term degradation of water quality in exceedance of water quality standards.
Major	Adverse	Changes would be detectable and would result in extensive, long-term degradation of water quality in exceedance of water quality standards.

3.4.2.3 Impacts of Alternative A – No Action on Water Quality

When analyzing the impacts of the No Action Alternative on water quality, BOEM considered the impacts of ongoing activities, including ongoing non-offshore wind and ongoing offshore wind activities on the baseline conditions for water quality. The cumulative impacts of the No Action Alternative considered the impacts of the No Action Alternative in combination with other planned non-offshore wind and offshore wind activities, as described in Appendix D, *Planned Activities Scenario*.

Impacts of the No Action Alternative

Under the No Action Alternative, baseline conditions for water quality described in Section 3.4.2.1, *Description of the Affected Environment and Future Baseline Conditions*, would continue to follow current regional trends and respond to IPFs introduced by other ongoing non-offshore wind and offshore wind activities. Ongoing activities within the geographic analysis area that contribute to impacts on water quality generally relate to or include terrestrial runoff, ground disturbance (e.g., construction) and erosion, terrestrial point and non-point source discharges, and atmospheric deposition. The deposition of contaminated runoff into surface waters and groundwater can result in exceedances of water quality standards that can affect the beneficial uses of the water (e.g., drinking water, aquatic life, recreation). While water quality impacts may be temporary and localized (e.g., construction), and state and federal statutes, regulations and permitting requirements (e.g., Clean Water Act Section 402) avoid or minimize these impacts, issues with water quality can still persist.

Ongoing offshore wind activities in the geographic analysis area that contribute to impacts on water quality include ongoing construction of the Vineyard Wind 1 project (62 WTGs and 1 OSP) in OCS-A 0501, the South Fork project (12 WTGs and 1 OSP) in OCS-A 0517, and the Revolution Wind project (65 WTGs and two OSPs) in OCS-A 0486. Ongoing construction of these projects would affect water quality through the primary IPFs of accidental releases, anchoring, new cable emplacement and maintenance, port utilization, presence of structures, discharges/intakes, and land disturbance. Ongoing construction of the Vineyard Wind 1, South Fork, and Revolution Wind projects would have the same type of impacts on water quality that are described in *Cumulative Impacts of the No Action Alternative* for ongoing and planned offshore wind activities, but the impacts would be of lower intensity.

Cumulative Impacts of the No Action Alternative

The cumulative impact analysis for the No Action Alternative considers the impacts of the No Action Alternative in combination with other planned non-offshore wind activities and planned offshore wind activities (without the Proposed Action).

Other planned non-offshore wind activities that affect the water quality include onshore development activities (including urbanization, forestry practices, municipal waste discharges, and agriculture), marine transportation-related discharges, dredging and port improvement projects; commercial fishing, military use, new submarine cables and pipelines, and climate change (see Appendix D, *Planned Activities Scenario,* Section D.2 for a description of planned activities). Water quality impacts from these activities, especially from dredging and harbor, port, and terminal operations, are expected to be localized and temporary to permanent, depending on the nature of the activities and associated IPFs. Similar to ongoing activities, the deposition of contaminated runoff into surface waters and groundwater can result in exceedances of water quality standards that can affect the beneficial uses of the water (e.g., drinking water, aquatic life, recreation). State and federal water quality protection requirements and permitting would result in avoiding and minimizing these impacts.

The following sections summarize the potential impacts of ongoing and planned offshore wind activities in the geographic analysis area on water quality during construction, O&M, and decommissioning of the projects. The water quality geographic analysis area overlaps with most, but not all, of the Vineyard Wind Northeast (OCS-A 0522) and the Beacon Wind 1 (OCS-A 0520) lease areas. The geographic analysis area also has some overlap with the remainder of the lease areas in the Massachusetts/Rhode Island region. BOEM conservatively assumed in its analysis of water quality impacts that all 1,048 WTGs estimated for the Massachusetts/Rhode Island region lease areas would be sited within the water quality geographic analysis area. BOEM anticipates that there would be some construction overlap for offshore project components of these lease areas (Appendix D, Table D3-1).

BOEM expects offshore wind activities to affect water quality through the following primary IPFs.

Accidental releases: Other offshore wind activities could expose surface waters to contaminants (such as fuel, solid waste, or chemicals, solvents, oils, or grease from equipment) in the event of a spill or release during routine vessel use. Offshore wind projects would result in a small incremental increase in vessel traffic, with a short-term peak during construction. Vessel activity associated with construction is expected to occur regularly in the Massachusetts and Rhode Island lease areas beginning in 2023 and continuing through 2030 and then lessen to near-baseline levels during operational activities. Increased vessel traffic would be localized near affected ports and offshore construction areas. Increased vessel traffic in the region associated with offshore wind construction could increase the probability of collisions and allisions, which could result in oil or chemical spills.

Based on the estimated construction schedules (Appendix D, Table D-2), offshore wind projects could occur with some overlapping construction schedules between 2023 and 2030. This EIS estimates that up to approximately 1,833,481 gallons (8,335,170 liters) of coolants, 6,835,448 gallons (31,073,946 liters) of oils, and 1,729,064 gallons (7,860,324 liters) of diesel fuel could be stored within WTG foundations and the OSPs in the water quality geographic analysis area. Other chemicals, including grease, paints, and sulfur hexafluoride, would also be used at the offshore wind projects, and black and gray water may be stored in sump tanks on facilities. BOEM has conducted extensive modeling to determine the likelihood and effects of a chemical spill at offshore wind facilities at three locations along the Atlantic Coast, including an area near the proposed Project area (Rhode Island-Massachusetts Wind Energy Area [WEA]) (Bejarano et al. 2013). Results of the model indicated a catastrophic, or maximum-case scenario, release of 129,000 gallons (488,318 liters) of oil mixture has a “Very Low” probability of occurring, meaning it could occur one time in 1,000 or more years. In other words, the likelihood of a given spill resulting in a release of the total container volume (such as from a WTG, OSP, or vessel) is low. The modeling effort also revealed the most likely type of spill (i.e., non-routine event) to occur is from the WTGs at a volume of 90 to 440 gallons (341 to 1,666 liters), at a rate of one time in 1 to 5 years, or a diesel fuel spill of up to 2,000 gallons (7,571 liters) at a rate of one time in 20 years. The likelihood of a spill occurring from multiple WTGs and OSPs at the same time is very low and, therefore, the potential impacts from a spill larger than 2,000 gallons (7,571 liters) are largely discountable. The modeling effort was conducted based on information collected from multiple companies and projects and would therefore apply to the other projects in the water quality geographic analysis area. For the purposes of this discussion, small-volume spills equate to the most likely spill volume between 90 and 440 gallons (341 to 1,666 liters) of oil mixture or up to 2,000 gallons (7,571 liters) of diesel fuel, while large-volume spills are defined as a catastrophic release of 129,000 gallons (488,318 liters) of material, based on modeling conducted by Bejarano et al. (2013). Small-volume spills could occur during maintenance or transfer of fluids, while low-probability small- or large-volume spills could occur due to vessel collisions, allisions with the WTGs/OSPs, or incidents such as toppling during a storm or earthquake.

All offshore wind projects would be required to comply with regulatory requirements related to the prevention and control of accidental spills administered by USCG and BSEE. OSRPs are required for each project and would provide for rapid spill response, cleanup, and other measures that would help to minimize potential impacts on affected resources from spills. Vessels would also have their own onboard containment measures that would further reduce the impact of an allision. A release during construction or operation would generally be localized and short term and result in little change to water quality. In the unlikely event an allision or collision involving project vessels or components resulted in a large spill, impacts on water quality would be adverse and short term to long term, depending on the type and volume of material released and the specific conditions (e.g., depth, currents, weather conditions) at the location of the spill.

Accidental releases of trash and debris would be infrequent and negligible because operators would comply with federal and international requirements for management of shipboard trash. All vessels would also need to comply with the USCG ballast water management requirements outlined in 33 CFR 151 and 46 CFR 162; allowed vessel discharges such as bilge and ballast water would be restricted to uncontaminated or properly treated liquids.

In summary, there is potential for moderate water quality impacts due to a maximum scenario accidental release, but due to the very low likelihood of a maximum scenario release occurring and the expected size of the most likely spill to be small and of low frequency, the overall impact of accidental releases is anticipated to be short term, localized, and minor, resulting in little change to water quality. As such, accidental releases from offshore wind development in the water quality geographic analysis area would not be expected to contribute appreciably to overall impacts on water quality.

Anchoring: Offshore wind activities would contribute to changes in offshore water quality from resuspension and deposition of sediments from anchoring during construction, installation, maintenance, and decommissioning of offshore components. BOEM estimates that approximately 2,134 acres (864 hectares) of seabed could be affected by anchoring in the water quality geographic analysis area. Disturbances to the seabed during anchoring would temporarily increase suspended sediment and turbidity levels in and immediately adjacent to the anchorage area. The intensity and extent of the additional sediment suspension effects would be less than that of new cable emplacement (see new cable emplacement and maintenance IPF discussion below) and would therefore be unlikely to have an incremental impact beyond the immediate vicinity. If more than one project is being constructed during the same period, the impacts would be greater than for one project, and multiple areas would experience water quality impacts from anchoring but, due to the localized area for sediment plumes, the impacts would likely not overlap each other geographically. The overall impact of increased sediment and turbidity from vessel anchoring is anticipated to be adverse, localized, and short term, resulting in a minor impact on ambient water quality. Anchoring would not be expected to appreciably contribute to overall impacts on water quality.

New cable emplacement and maintenance: Emplacement of submarine cables would result in increased suspended sediments and turbidity. As described under the *Anchoring* IPF, these activities would contribute to changes in offshore water quality from the resuspension and deposition of sediment. Sediment dispersion modeling conducted for two other offshore wind projects (the Vineyard Wind 1 Project in Massachusetts and the Block Island Wind Farm in Rhode Island) were reviewed and evaluated, and general sediment conditions and hydrodynamics are similar to those in the Project area (COP Appendices F1 and F3 for detailed descriptions; SouthCoast Wind 2024). The sediments within each project area were predominantly sands and current velocities were within similar ranges, indicating that the results of each modeling effort would be expected to be representative of the Project site. Turbidity concentrations greater than 10 mg/L would be short in duration up to 6 hours and limited to within approximately 164 to 656 feet (50 to 200 meters) of the trench in the offshore area. BOEM anticipates that offshore wind projects would use dredging only when necessary and rely on other cable laying methods for reduced impacts (such as jet plow or mechanical plow) where feasible. Due to the localized areas of disturbances and range of variability within the water column, the overall impacts of increased sediments and turbidity from cable emplacement and maintenance are anticipated to be localized, short term, and adverse, resulting in a minor impact on ambient water quality. If multiple projects are being constructed at the same time, the impacts would be greater than those identified for one project and would likely not overlap each other geographically due to the localized natures of the plumes. New cable emplacement and maintenance activities would not be expected to appreciably contribute to overall impacts on water quality.

Port utilization: Offshore wind development would use nearby ports and could also require port expansion or modification, resulting in increased vessel traffic or increased suspension and turbidity from any in-water work. These activities could also increase the risk of accidental spills or discharge. However, these actions would be localized, and port improvements would comply with all applicable permit requirements to minimize, reduce, or avoid impacts on water quality. As a result, port utilization impacts on water quality would be minor and not be expected to appreciably contribute to overall impacts on water quality.

Presence of structures: Reasonably foreseeable offshore wind projects are estimated to result in approximately 920 structures by 2030 in the water quality geographic analysis area (Appendix D, Table D3-1). These structures could disturb up to 1,247 acres (505 hectares) of seabed in the water quality geographic analysis area from foundation and scour protection installation and disrupt bottom current patterns, leading to increased movement, suspension, and deposition of sediments. Scouring, which could lead to impacts on water quality through the formation of sediment plumes (Harris et al. 2011), would generally occur in shallow areas with tidally dominated currents.

Offshore wind facilities have the potential to impact atmospheric and oceanographic processes through the presence of structures and the extraction of energy from the wind. There has been extensive research into characterizing and modeling atmospheric wakes created by wind turbines in order to design the layout of wind facilities and hydrodynamic wake/turbulence related to predicting seabed scour but relatively few studies have analyzed the hydrodynamic wakes coupled with the interaction of atmospheric wakes with the sea surface. Further, even fewer studies have analyzed wakes and their impact on regional scale oceanographic processes and potential secondary changes to primary production and ecosystems. Studies thus far in this topic have focused on ocean modeling rather than field measurement campaigns.

The general understanding of offshore wind–related impacts on hydrodynamics is derived primarily from European based studies. A synthesis of European studies by van Berkel et al. (2020) summarized the potential effects of wind turbines on hydrodynamics, the wind field, and fisheries. Local to a wind facility, the range of potential impacts include increased turbulence downstream, remobilization of sediments, reduced flow inside wind farms, downstream changes in stratification, redistribution of water temperature, and changes in nutrient upwelling and primary productivity. Human-made structures, especially tall vertical structures such as foundations, alter local water flow at a fine scale by potentially reducing wind-driven mixing of surface waters or increasing vertical mixing as water flows around the structure (Carpenter et al. 2016; Cazenave et al. 2016; Segtnan and Christakos 2015). When water flows around the structure, turbulence is introduced that influences local current speed and direction. Turbulent wakes have been observed and modeled at the kilometer scale (Cazenave et al. 2016; Vanhellemont and Ruddick 2014). While impacts on current speed and direction decrease rapidly around monopiles, there is a potential for hydrodynamic effects out to a kilometer from a monopile (Li et al. 2014). Direct observations of the influence of a monopile extended to at least 984 feet (300 meters); however, changes were indistinguishable from natural variability in a subsequent year (Schultze et al. 2020). The range of observed changes in current speed and direction 984 to 3,281 feet (300 to 1,000 meters) from a monopile is likely related to local conditions, wind farm scale, and sensitivity of the analysis. In strongly stratified locations, the mixing seen at monopiles is often masked by processes forcing toward stratification (Schultze et al. 2020), but the introduction of nutrients from depth into the surface mixed layer can lead to a local increase in primary production (Floeter et al. 2017; refer to Section 3.5.5, *Finfish, Invertebrates, and Essential Fish Habitat*, Section 3.5.6, *Marine Mammals*, and Section 3.5.7, *Sea Turtles*, regarding hydrodynamic and atmospheric wake effects on primary production).

Atmospheric wakes brought about by WTG structures may also result in impacts on the forces driving the mixing of surface waters. A modeling study of atmospheric wake effects by Daewel et al. (2022) showed that extremely large clusters of offshore wind turbines in the North Sea provoke large scale changes in annual primary productivity due to changes in stratification. Christiansen et al. (2022) determined that wake-induced anomalies in wind speed caused by North Sea wind farms could lead to a decrease in the shear-driven forcing at the sea surface boundary, which affects ocean stratification over several tens of kilometers around the wind farms. Water column impacts heavily depend on foundation type and oceanographic conditions (e.g., currents, well-mixed to stratified waters, and depth). Many of the modeling studies conducted to date note uncertainty in whether impacts observed in the models would be distinguishable relative to natural variability in oceanographic conditions (Schultze et al. 2020; Christiansen et al. 2022; Floeter et al. 2022; NASEM 2023). A recent National Academy of Sciences panel convened to assess potential impacts from offshore windfarms in the Nantucket Shoals region on marine hydrodynamics. The panel noted that “the paucity of observations and uncertainty of the modeled hydrodynamic effects make it difficult to assess the ecological impacts of offshore wind farms, particularly considering the scale of both natural and human-caused variability in the Nantucket Shoals region....” (NASEM 2024). While oceanographic and hydrodynamic conditions resulting from the presence of offshore structures are not fully understood at this time, the range of the wake effect may extend from a few hundred meters (Li et al. 2014; Schultze et al. 2020) to tens of kilometers (Dorrell et al. 2022, Christiansen et al. 2022) and is likely to vary both seasonally and regionally.

Results from a recent Johnson et al. (2021) hydrodynamic model of four different WTG build-out scenarios of the offshore Rhode Island and Massachusetts lease areas found that offshore wind projects have the potential to alter local and regional physical oceanic processes (e.g., currents, temperature stratification) via their influence on currents from WTG foundations and by extracting energy from the wind. The results of the hydrodynamic model study show that introduction of the offshore wind structures into the offshore WEA modifies the oceanic responses of current magnitude, temperature, and wave heights by (1) reducing the current magnitude through added flow resistance, (2) influencing the temperature stratification by introducing additional mixing, and (3) reducing current magnitude and wave height by extracting of energy from the wind by the offshore wind turbines. Alterations in currents and mixing would affect water quality parameters such as temperature, DO, and salinity, but would vary seasonally and regionally. WTGs and the OSPs associated with reasonably foreseeable offshore wind projects would be placed in average water depths of 100 to 200 feet (30 to 60 meters) where current speeds are relatively low, and offshore cables would be buried where possible. Cable armoring would be used where burial is not possible, such as in hard-bottomed areas. BOEM anticipates that developers would implement BMPs to minimize seabed disturbance from foundations, scour, and cable installation. Adverse impacts on offshore water quality would be localized, short term, and minor. Presence of structures would not be expected to appreciably contribute to overall impacts on water quality.

The exposure of offshore wind structures, which are mainly made of steel, to the marine environment can result in corrosion without protective measures. Corrosion is a general problem for offshore infrastructures and corrosion protection systems are necessary to maintain their structural integrity. Protective measures for corrosion (e.g., coatings, cathodic protection systems) are often in direct contact with seawater and have different potentials for emissions, e.g., galvanic anodes emitting metals, such as aluminum, zinc, and indium, and organic coatings releasing organic compounds due to weathering and leaching. The current understanding of chemical emissions for offshore wind structures is that emissions appear to be low, suggesting a low environmental impact, especially if compared to other offshore activities, but these emissions may become more relevant for the marine environment with increased numbers of offshore wind projects and a better understanding of the potential long-term effects of corrosion protection systems (Kirchgeorg et al. 2018). Based on the current understanding of offshore wind structure corrosion effects on water quality, BOEM anticipates the potential impact to be minor.

Discharges/intakes: Other offshore wind projects would result in a small incremental increase in vessel traffic, with a short-term peak during construction. Vessel activity associated with offshore wind project construction is expected to occur regularly in the Massachusetts and Rhode Island lease areas beginning in 2023 and continuing through 2030, and then lessen to near-baseline levels during operation. Increased vessel traffic would be localized near affected ports and offshore construction areas. Offshore wind development would result in an increase in regulated discharges from vessels, particularly during construction and decommissioning, but the events would be staggered over time and localized. Offshore permitted discharges would include uncontaminated bilge water and treated liquid wastes. BOEM assumes that all vessels operating in the same area will comply with federal and state regulations on effluent discharge. All offshore wind projects would be required to comply with regulatory requirements related to the prevention and control of discharges and of nonindigenous species. All vessels would need to comply with the USCG ballast water management requirements outlined in 33 CFR Part 151 and 46 CFR Part 162. Furthermore, each project’s vessels would need to meet USCG bilge water regulations outlined in 33 CFR Part 151, and allowable vessel discharges such as bilge and ballast water would be restricted to uncontaminated or properly treated liquids. Therefore, due to the minimal amount of allowable discharges from vessels associated with offshore wind projects, BOEM expects impacts on water quality resulting from vessel discharges to be minimal and to not exceed background levels over time.

The WTGs and OSPs would continuously release chlorine and other waste heat during operation due to the heat transfer that occurs when seawater is used to cool the equipment that converts HVAC electricity to HVDC electricity. However, during normal operating conditions, the discharged chemicals and waste heat will have minimal impact on water quality if discharge concentrations meet the water quality-based limits of SouthCoast Wind’s NPDES permit. In the event of a spill related to an allision or other unexpected or low-probability event, impacts on water quality from chemical discharges from the WTGs or OSPs during operation would be temporary. During decommissioning, all offshore wind structures would be drained of fluid chemicals via vessel, dismantled, and removed. BOEM does not anticipate any discharge of fluid chemicals in the ocean during the decommissioning of offshore wind structures. As such, BOEM anticipates decommissioning to have temporary impacts on water quality, with a return to baseline conditions.

Other offshore wind projects in the geographic analysis area may use HVDC substations that would convert AC to DC before transmission to onshore project components. As described in a recent white paper produced by BOEM (Middleton and Barnhart 2022), these HVDC systems are cooled by an open-loop system that intakes cool sea water and discharges warmer water back into the ocean. Chemicals such as bleach (sodium hypochlorite) would be used in order to prevent growth in the system and keep pipes clean. The warm water discharged is generally considered to have a minimal effect as it will be absorbed by the surrounding water and returned to ambient temperatures. Even though localized effects on water quality due to discharge of warmer water that contain bleach could take place in the area immediately surrounding the outlet pipe, they are expected to be minimal due to the much larger mass of the surrounding ocean if the facility meets the water quality-based discharge limits of SouthCoast Wind's NPDES permit. Potential impacts on water quality to surrounding sea water would require permits through the USEPA National Pollutant Discharge Elimination System (NPDES) (Middleton and Barnhart 2022).

Due to the staggered increase in vessels from various projects; the current regulatory requirements administered by USEPA, USACE, USCG, and BSEE; and the restricted allowable discharges, the overall impact of discharges from vessels is anticipated to be localized and short term. Based on the above, BOEM anticipates discharges to have a minor impact on water quality, as the level of impact in the water quality geographic analysis area from offshore wind development would be similar to existing conditions and would not be expected to appreciably contribute to overall impacts on water quality.

Land disturbance: Other offshore wind development could include onshore components that would lead to increased potential for water quality impacts resulting from accidental fuel spills or sedimentation during the construction and installation of onshore components (e.g., equipment, substation). Construction and installation of onshore components near waterbodies may involve ground disturbance, which could lead to unvegetated or otherwise unstable soils. Precipitation events could potentially erode the soils, resulting in sedimentation of nearby surface waters and subsequent increased turbidity. It is assumed that an SWPPP and erosion and sedimentation controls would likely be implemented during the construction period to minimize impacts, resulting in infrequent and temporary erosion and sedimentation events.

In addition, onshore construction and installation activities would involve the use of fuel and lubricating and hydraulic oils. Use of heavy equipment onshore could result in potential spills during active use or refueling activities. It is assumed that a Spill Prevention, Control, and Countermeasure (SPCC) plan would be prepared for each project in accordance with applicable regulatory requirements and would outline spill prevention plans and measures to contain and clean up spills if they were to occur. Additional mitigation and minimization measures (such as refueling away from wetlands, waterbodies, or known private or community potable wells) would be in place to decrease impacts on water quality. Impacts on water quality would be limited to periods of onshore construction and periodic maintenance over the life of each project.

Overall, the impacts from onshore activities that occur near waterbodies could result in temporary introduction of sediments or pollutants into coastal waters in small amounts where erosion and sediment controls fail. Land disturbance for offshore wind developments that are at a distance from waterbodies and that implement erosion and sediment control measures would be less likely to affect water quality. In addition, the impacts would be localized to areas where onshore components were being built near waterbodies. While it is possible that multiple projects could be under construction at the same time, the likelihood that construction of the onshore components overlaps in time or space is minimal, and the total amount of erosion that occurs and impacts on water quality at any one given time could be minimal. Land disturbance from offshore wind development is anticipated to be localized, short term, and minor, and would not be expected to appreciably contribute to overall impacts on water quality.

Conclusions

Impacts of the No Action Alternative: Under the No Action Alternative, water quality would continue to follow current regional trends and be affected by ongoing activities. BOEM expects ongoing non-offshore wind and offshore wind activities to have temporary impacts on water quality primarily through accidental releases and sediment suspension related to vessel traffic, port utilization, presence of structures, discharges, and land disturbance. BOEM anticipates that the impacts of ongoing activities, including construction of the Vineyard Wind 1 and South Fork projects, ongoing vessel traffic, military use, commercial activities, recreational activities, and land disturbance, would be **minor adverse**.

Cumulative Impacts of the No Action Alternative: Under the No Action Alternative, existing environmental trends and ongoing activities would continue to affect water quality in the geographic analysis area. Planned non-offshore wind activities, including new submarine cables and pipelines, onshore development, marine surveys, and port improvements, would incrementally contribute to cumulative impacts on water quality. Similarly, planned offshore wind projects would also contribute to water quality impacts from sediment resuspension during construction and decommissioning, both from regular cable laying and from prelaying; vessel discharges; sediment contamination; discharges from the WTGs and OSP during operation; sediment plumes due to scour; and erosion and sedimentation from onshore construction. Construction and decommissioning activities associated with planned offshore wind activities would lead to increases in sediment suspension and turbidity in the offshore lease areas during the first 7 years of construction of projects and in the latter part of the 30-year life spans of offshore wind projects due to decommissioning activities. However, sediment suspension and turbidity increases would be temporary and localized, and BOEM anticipates the impact to be minor. BOEM has considered the possibility of impacts resulting from accidental releases; a moderate impact could occur if there was a large-volume, catastrophic release. However, the probability of catastrophic release occurring is very low and the expected size of the most likely spill would be very small and of low frequency. Therefore, the cumulative impacts of the No Action Alternative on water quality from ongoing and planned activities would be **minor** because any potential detectable impacts are not anticipated to exceed water quality standards.

3.4.2.4 Relevant Design Parameters and Potential Variances in Impacts

This EIS analyzes the maximum-case scenario; any potential variances in the proposed Project build-out as defined in the PDE would result in impacts similar to or less than those described in the sections below. The following proposed Project design parameters (Appendix C, *Project Design Envelope and Maximum-Case Scenario*) would influence the magnitude of the impacts on water quality.

- The amount of vessel use during installation, operations, and decommissioning.
- The number of WTGs and OSPs and the amount of cable laid determines the area of seafloor and volume of sediment disturbed by installation.
- Installation methods chosen and the duration of installation.
- Proximity to sensitive water sources and mitigation measures used for onshore proposed Project activities.
- In the event of a non-routine event such as a spill, the quantity and type of oil, lubricants, or other chemicals contained in the WTGs, vessels, and other proposed Project equipment.

Variability of the proposed Project design as a result of the PDE includes the exact number of WTGs and OSPs (determining the total area of foundation footprints); the number of monopile, piled-jacket, or suction-bucket foundations; the total length of interarray cable; the total area of scour protection needed; and the number, type, and frequency of vessels used in each phase of the proposed Project. Changes in the design may affect the magnitude (number of structures and vessels), location (WTG and other Project element layouts), and mechanism (installation method, non-routine event) of water quality impacts.

SouthCoast Wind has committed to measures to minimize impacts on water quality. See COP Volume 2, Table 16.1 for a complete list of avoidance, minimization, and mitigation measures (AMMs) proposed for use during construction, O&M, and decommissioning of the Project (SouthCoast Wind 2024).

3.4.2.5 Impacts of Alternative B – Proposed Action on Water Quality

The Proposed Action would contribute to impacts through all the IPFs named in Section 3.4.2.3, *Offshore Wind Activities (without Proposed Action)*. The most impactful IPFs would likely include new cable emplacement and maintenance that could cause noticeable temporary impacts during construction through increased suspended sediments and turbidity, the presence of structures that could result in alteration of local water currents and lead to the formation of sediment plumes, and discharges that could result in localized turbidity increases during discharges or bottom disturbance during dredged material disposal.

Accidental releases: Similar to offshore wind projects without the Proposed Action, chemicals (e.g., coolants, oils, diesel fuel, other chemicals) would be used and stored in facilities and black and gray water may be stored in sump tanks on facilities. The Proposed Action would have a maximum of 75,000 gallons (283,905 liters) of coolants, 1,188,650 (4,499,527 liters) of oils and lubricants, and

332,300 gallons (1,257,891 liters) of diesel stored within WTG foundations and OSPs (COP Volume 1, Section 3.3.17, Table 3-26; SouthCoast Wind 2024). As discussed previously, the risk of a spill from any single offshore structure would be low, and any effects would likely be localized. A reduction in the number of WTGs required due to increased capacity would result in a smaller total amount of materials being stored offshore. Modeling conducted for an area near the proposed Project area (Rhode Island-Massachusetts WEA) indicates that the most likely type of spill (i.e., non-routine event) to occur during the life of a project is 90 to 440 gallons (341 to 1,666 liters), which would have brief, localized impacts on water quality (Bejarano et al. 2013). One difference between the Proposed Action and the Rhode Island-Massachusetts WEA is that there would be more WTGs under the Proposed Action (147 instead of 130 that were modeled), which would lead to a slight increased likelihood of spill events compared to the Bejarano et al. model (Bejarano et al. 2013). There is potential for moderate water quality impacts due to a maximum-case scenario accidental release, but due to the very low likelihood of a maximum-case scenario release occurring and the expected size of the most likely spill to be small and of low frequency, the overall impact is anticipated to be short term, localized, and minor, resulting in little change to water quality.

Increased vessel traffic in the region associated with the Proposed Action could increase the probability of collisions and allisions, which could possibly result in oil or chemical spills. However, collisions and allisions are anticipated to be unlikely based on the following factors that would be considered for the proposed Project: USCG requirement for lighting on vessels, NOAA vessel speed restrictions, the proposed spacing of WTGs and OSP, the lighting and marking plan that would be implemented, and the inclusion of proposed Project components on navigation charts. SouthCoast Wind would implement its OSRP (COP Appendix AA; SouthCoast Wind 2024), which would provide for rapid spill response, cleanup, and other measures to minimize any potential impact on affected resources from spills and accidental releases, including spills resulting from catastrophic events. In the unlikely event an allision or collision involving vessels or components associated with the Proposed Action resulted in a large spill, impacts from the Proposed Action alone on water quality would be short term to long term depending on the type and volume of material released and the specific conditions (e.g., depth, currents, weather conditions) at the location of the spill. In addition, SouthCoast Wind has committed to developing a Project-specific SPCC plan in the SWPPP to prevent accidental releases of oils and other hazardous materials to the extent practical (COP Volume 2, Table 16-1; SouthCoast Wind 2024). With implementation of this measure, risk of fuel spills and leaks from vessels would be minimized and any impact would be considered minor.

Onshore construction activities would require heavy equipment use or HDD activities, and potential spills could occur as a result of an inadvertent release from the machinery or during refueling activities. In addition, all wastes generated onshore would comply with applicable federal regulations, including the Resource Conservation and Recovery Act and the Department of Transportation Hazardous Material regulations. Therefore, BOEM anticipates the Proposed Action would result in minor, temporary, and long-term impacts on water quality as a result of releases from heavy equipment during construction and other cable installation activities.

SouthCoast Wind anticipates the Port of New Bedford's MCT as the primary port to be used for Project activities. The New Bedford MCT has been expanded to accommodate offshore wind projects. Further investments in port upgrades and general infrastructure improvements at the New Bedford MCT site and/or other ports in the region are expected in the future. SouthCoast Wind would also use the ports of Fall River and Salem, Massachusetts; Davisville and Providence, Rhode Island; and New London, Connecticut; a small number of vessel trips may also originate from the ports of Sparrows Point, Maryland; Charleston, South Carolina; and Corpus Christi, Texas. BOEM anticipates that use of the port facilities would result in minor impacts on water quality because a potential release at the facility would likely be relatively small and would be cleaned up in accordance with federal and state regulations.

Anchoring: There would be increased vessel anchoring during the construction, installation, O&M, and decommissioning of offshore components of the Proposed Action. Anchoring would cause increased turbidity levels. Impacts on water quality from the Proposed Action alone due to anchoring would be localized, short term, and minor during construction and decommissioning. SouthCoast Wind anticipates daily averages of between 15 and 35 vessels depending upon the construction activities, with an expected maximum of 50 vessels in the Lease Area at one time. The number of vessels is anticipated to result in 441.8 acres (178.8 square kilometers) of impact from anchoring. Anchoring during operation would decrease due to fewer vessels required during operation, resulting in reduced impacts.

Cable emplacement and maintenance: The installation of array cables and offshore export cables would include site-preparation activities (e.g., sandwave clearance, boulder removal) and cable installation via jet plow, mechanical plow, or mechanical trenching, which can cause temporary increases in turbidity and sediment resuspension. Other projects using similar installation methods (e.g., jet plowing, pile driving) have been characterized as having minor impacts on water quality due to the short-term and localized nature of the disturbance (Latham et al. 2017). To evaluate the impacts of offshore export cable and interarray cable installation, a sediment transport model was developed to evaluate potential suspended sediment transport and deposition (COP Appendix F3; SouthCoast Wind 2024). Results of the sediment dispersion modeling indicated that the water column concentration (TSS) and the sediment deposition pattern and thickness were mostly influenced by 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) to the water column, specified the total amount of sediments resuspended. The response was short lived for all but the finest grade sediments such as silts and clays. The fine sediments settle more slowly than coarser sediments resulting in the suspended silt and clay sediments being 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 portions of 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 0.62 mile (1 kilometer). 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 resuspension. In regions with larger grain sizes, sediments dropped back to the sea floor more quickly, keeping concentrations low, and within a few meters of the trenching tool. The associated deposition footprint area was also small. Concentrations of 100 mg/L were predicted to be within 160 feet (50 meters) of the route centerline and decreased in less than 15 minutes. The sections of the offshore ECC segment that had higher amounts of fine sediments had higher transport of the model predicted TSS concentrations showing the 100 mg/L concentration extending to 984 feet (300 meters). The 100 mg/L TSS concentration level or greater covered a total of 6,070 acres (25 square kilometers) along the entire length of the Brayton Point ECC (COP Appendix F3; SouthCoast Wind 2024).

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 1-hour period, releasing 100 percent of the dredged material into the water column. The TSS concentrations exceeding 100 mg/L traveled a maximum distance of 0.2 mile (0.32 kilometer) and dissipated in a little over an hour at the Brayton Point site but were half that at the Aquidneck Island sites. The area coverage of the 100 mg/L or greater level was contained within an average of 12 acres (5 hectares).

The depositional footprint resulting from the cable installation occurred relatively locally along the majority of the ECC route where the mass settles out quickly. Deposition thicknesses of 0.04 inch (1 millimeter) and greater are mostly limited to a corridor with a maximum width of 100 to 115 feet (30 to 35 meters) around the cable centerline. In the areas where there are finer grain sediments, the 0.04-inch (1-millimeter) thickness contour distance can increase locally to 540 feet (165 meters) from the ECC indicative centerline. The sedimentation footprint for HDD sites was very small with a maximum coverage of the 0.04-inch (1-millimeter) thickness contour of only 1.2 acres (0.5 hectare), extending a maximum distance of 312 feet (95 meters) and 2.5 acres (1 hectare) for the 0.02-inch (0.5-millimeter) thickness contour, extending a maximum distance of 518 feet (158 meters) 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 0.04-inch (1-millimeter) and 0.02-inch (0.5-millimeter) thickness levels along the entire ECC route was 892 acres (361 hectares) and 1,312 acres (531 hectares), respectively.

These impacts on water quality for finer sediments are anticipated to be localized adjacent to the trench and temporary in nature. Therefore, given the known hydrodynamic conditions within the area of the Project and the expected BMPs associated with jet plowing technologies, no long-term impacts on water quality are anticipated following cable installation activities. BOEM anticipates the Proposed Action alone would have negligible, long-term impacts on water quality via this mechanism. Overall, impacts on water quality from the Proposed Action due to cable emplacement and resulting suspension of sediment and turbidity would be short term and minor.

Port utilization: The current bearing capacity of existing ports was considered suitable for WTGs, requiring no port modifications for supporting offshore wind energy development (DOE 2014). During construction, several ports may be used, including the ports of New Bedford, Fall River, and Salem, Massachusetts; Davisville and Providence, Rhode Island; New London, Connecticut; Sparrows Point, Maryland; Charleston, South Carolina; and Corpus Christi, Texas as well as some international ports. O&M vessel trips would originate primarily from the ports of New Bedford and Fall River, Massachusetts; New London, Connecticut, or Providence, Rhode Island with the potential for occasional repair and supply delivery trips originating from ports in Davisville and Providence, Rhode Island; Salem, Massachusetts; Sparrows Point, Maryland; and Charleston, South Carolina. The impacts on water quality could include accidental fuel spills or sedimentation during port use. The incremental increases in ship traffic at the ports would be small; multiple authorities regulate water quality impacts from these operations (BOEM 2019). Therefore, the impacts of the Proposed Action alone on water quality from port utilization would be negligible.

Presence of structures: Existing stationary facilities that present allision risks are limited in the open waters of the geographic analysis area. Dock facilities and other structures are concentrated along the coastline. The Proposed Action would add up to 147 WTGs, 5 OSPs, and related Project elements, which would increase seabed disturbance and potential water quality impacts. As described in Section 3.4.2.3, *Impacts of Alternative A – No Action on Water Quality*, offshore wind projects have the potential to alter local and regional physical oceanic processes (e.g., currents, temperature stratification) via their influence on currents from WTG foundations and by extracting energy from the wind.

Disturbances from offshore wind structures would be localized but, depending on the hydrologic conditions, have the potential to affect water quality through altering mixing patterns and the formation of sediment plumes. The alteration of mixing patterns can potentially cause lower oxygen levels which can produce harmful algal blooms. There has been no definitive correlation made between the construction of offshore wind facilities and decreases in oxygen levels or increases in harmful algal blooms. There is evidence that the decrease in oceanic oxygen levels and increase in harmful algal blooms is likely a result of ocean warming caused by climate change (Mahaffey et al. 2020; Dai et al. 2023). Harmful algal blooms occur due to diatoms that produce high concentrations of domoic acid. Sterling et al. (2022) suggests that a particularly toxic species of domoic acid producing diatom (*Pseudo-nitzschia australis*) occurring in the Narragansett Bay is not a resident species and likely introduced from offshore in 2016. The same study (Sterling et al. 2022) indicates that the likely introduction of *P. australis* may have been driven by climate change along the Northwest Atlantic Shelf.

The addition of scour protection would further minimize effects on local sediment transport. The impacts from the Proposed Action on water quality due to the presence of structures would be negligible to minor during construction, O&M, and conceptual decommissioning. In addition, as described in Section 3.4.2.3, the exposure of offshore wind structures to the marine environment can result in emissions of metals and organic compounds from corrosion protection systems. However, the current understanding of chemical emissions for offshore wind structures is that emissions appear to be low, suggesting a low environmental impact (Kirchgeorg et al. 2018). Leading edge erosion has been discovered to emit Bisphenol A (BPA) and per- and polyfluoroalkyl substances (PFAS) known as “forever chemicals” into the water, which can then contaminate the marine food chain. There are currently no studies available that identify the amounts of these chemicals that are emitted by turbine blade erosion.

USEPA is currently proposing and implementing actions related to PFAS better understand and reduce potential risks associated with these chemicals that will help to guide future regulations.

Discharges/intakes: During construction of the Proposed Action, vessel traffic would increase in and around the Wind Farm Area, leading to potential discharges of uncontaminated water and treated liquid wastes. Table 3-25 of the COP lists types of waste potentially produced by the Proposed Action (COP Volume 1, Section 3.3.16, Table 3-25; SouthCoast Wind 2024). SouthCoast Wind would only be allowed to discharge uncontaminated water (e.g., uncontaminated ballast water and uncontaminated water used for vessel air conditioning) or treated liquid wastes overboard (e.g., treated deck drainage and sumps). Other waste such as sewage and solid waste or chemicals, solvents, oils, and greases from equipment, vessels, or facilities would be stored and properly disposed of on land or incinerated offshore.

SouthCoast Wind expects substantially less vessel use during routine O&M than during construction. Vessel use would consist of scheduled inspection and maintenance activities, with corrective maintenance as needed. In a year, the Proposed Action would generate a maximum of 100 crew vessel trips, 1 jack-up vessel trip, 24 supply vessel trips, and 250 helicopter trips during O&M (COP Volume 1, Section 3.3.14.2, Table 3-23; SouthCoast Wind 2024). The proposed Project would require all vessels to comply with regulatory requirements related to the prevention and control of discharges, accidental spills, and nonindigenous species. All vessels would need to comply with waste and water management regulations described in Section 3.4.2.3, including USCG ballast water management requirements and USCG bilge water regulation. The bilge water from the proposed Project would either be retained onboard vessels in a holding tank and discharged to an onshore reception facility or treated onboard, after which the treated water could be discharged overboard. In addition, bilge water would not be allowed to be discharged into the sea unless the oil content of the bilge water without dilution is less than 15 parts per million (33 CFR Part 151.10). For vessels operating within 3 nautical miles (5.6 kilometers) from shore, bilge water regulations under USEPA's NPDES program apply to any of the proposed Project's vessels that are covered by a Vessel General Permit (those that are 79 feet [24 meters] or greater in length). Bilge discharges within 3 nautical miles (5.6 kilometers) from shore are subject to the rules in Section 2.2.2 of the Vessel General Permit and must occur in compliance with 40 CFR Parts 110, 116, and 117, and 33 CFR 151.10. With implementation of these AMMs and the described regulatory requirements, the temporary impact of routine vessel discharge is expected to be minor.

The WTGs and OSPs are generally self-contained and do not generate chemical discharges under normal operating conditions. In the event of a spill related to an allision or other unexpected or low-probability event, impacts on water quality from chemical discharges from the WTGs or OSPs during operation would be temporary. During decommissioning, SouthCoast Wind would drain all fluid chemicals from the WTGs and OSPs via vessel and dismantle and remove them. There would be no discharge of fluid chemicals in the ocean during the decommissioning of offshore wind structures. BOEM anticipates decommissioning to have temporary impacts on water quality, with a return to baseline conditions.

SouthCoast Wind has proposed the use of one or more HVDC converter platforms, which would require seawater to be pumped in to cool the electrical equipment and then discharged back into the ocean.

SouthCoast Wind developed an NPDES permit application for one offshore HVDC converter station in the Lease Area for Project 1 (see Appendix B, Figure B-2) (TetraTech and Normandeau Associates, Inc. 2023). Refer to Appendix B for the parameters of the HVDC converter OSP cooling water intake system (CWIS). If SouthCoast Wind uses HVDC technology for Project 2, there would likely be one additional HVDC converter OSP (for a total of two HVDC OSPs). The parameters and modeling results from the NPDES permit application for Project 1 are representative of a second HVDC converter OSP for Project 2 in the Lease Area. The only anticipated difference would be the location of the second HVDC converter OSP, which would be at a deeper position in the southern portion of the Lease Area. A separate NPDES permit application would need to be submitted to and approved by USEPA for any additional HVDC converter OSPs.

Based on the NPDES permit application, one HVDC converter station is expected to withdraw cooling water from the ocean at a rate of up to 9.9 million gallons per day and maintain an intake velocity of less than or equal to 0.5 feet per second to minimize impingement impacts.[2] SouthCoast Wind modeled thermal plumes from HVDC cooling water discharge to evaluate the spatial extent of the rise in temperatures of the receiving water in the vicinity of the discharge location based on the highest temperature differences between ambient (intake) and effluent (discharge) conditions in the fall (Scenario 1), winter (Scenario 2), spring (Scenario 3), and summer (Scenario 4) using a thermal mixing zone analysis in CORMIX v12.0GTD Advanced Tools (TetraTech and Normandeau Associates, Inc. 2023).

The following parameters were used to define the typical operating conditions based on the design intake flow (DIF) of 9.9 MGD.

- DIF = 1,560 m^3/h (9.9 MGD) during two-pump operations.
- Depth of discharge = 42.7 feet (13 meters) below the surface, 108.9 feet (33.2 meters) above the seafloor.
- Maximum discharge temperature = 86°F (30°C).

The plume dynamics were evaluated during four separate seasons to determine potential zones of initial dilution during those periods. According to the USEPA's Criterion Continuous Concentration for temperature-based water quality, the maximum acceptable increase in weekly average temperature resulting from artificial heat sources is 1.8°F (1°C) during all seasons of the year (USEPA 1986). Furthermore, the radius requirement for the 1.8°F (1°C) temperature increase caused by a discharge within the predicted zone of initial dilution should be less than 330 feet (101 meters) as described in the Ocean Discharge Criteria at CFR 125.121(c) (Tetra Tech and Normandeau Associates, Inc. 2023).

From four modeled maximum temperature delta scenarios (Table 3.4.2-9), the distance from the discharge point where the temperature delta reached 1°C (1.8°F) was 41.9 feet (12.8 meters) in the fall, 84.9 feet (25.9 meters) in the winter, 67.5 feet (20.6 meters) in the spring, and 46.6 feet (14.2 meters) in the summer. The effluent plume area was highest in the winter at 792.1 square feet (73.6 square

[2] USEPA considers intake velocities of 0.5 feet per second or less a suitable compliance option to minimize impingement impacts.

meters) and lowest in the fall at 407.0 square feet (37.8 square meters). These CORMIX results indicate that impacts on the ocean temperature are localized and minimal when the maximum temperature increases occur and that the water quality standard allowed for by the Ocean Discharge Criteria is expected to be met well within the 330-foot (100-meter) radius mixing zone for initial dilution of discharges (Tetra Tech and Normandeau Associates, Inc. 2023). Four scenarios were modeled to provide the expected maximum extent of the plume (maximum tidal velocities) and maximum concentrations of the plume (minimum tidal velocities). See Table 3.4.2-9 for results of plume modeling for each scenario.

Table 3.4.2-9. CORMIX results for maximum temperature delta scenarios for a SouthCoast Wind HVDC OSP modeled in the Atlantic Ocean

Parameter	Scenario 1: Fall	Scenario 2: Winter	Scenario 3: Spring	Scenario 4: Summer
Maximum discharge temperature, °F (°C)	86 (30)			
Minimum ambient Atlantic Ocean temperature, lowest seasonal observed, °F (°C)	54.1 (12.3)	39.6 (4.2)	38.6 (3.7)	51.3 (10.7)
Maximum temperature delta, °F (°C)	31.9 (17.7)	46.4 (25.8)	47.4 (26.3)	34.7 (19.3)
Resulting Atlantic Ocean temperature at the edge of the plume, °F (°C)	55.9 (13.3)	41.4 (5.2)	40.4 (4.7)	53.1 (11.7)
Dilution ratio at the edge of the plume	17.8	25.8	26.3	19.7
Thermal plume length ft (m)	41.9 (12.8)	84.9 (25.9)	67.5 (20.6)	46.6 (14.2)
Thermal plume width, ft (m)	11.8 (3.6)	11.1 (3.4)	12.8 (3.9)	28.7 (8.7)
Plume area, ft^2 (m^2)	407.0 (37.8)	792.1 (73.6)	721.2 (67.0)	657.1 (61.0)

Source: Tetra Tech and Normandeau Associates, Inc. 2023; Appendix A

[a] Distance from the outfall, where the temperature delta reaches 1°C (1.8°F).
°C = degrees Celsius ; °F = degrees Fahrenheit; ft = feet; ft^2 = square feet; m = meters; m^2 = square meters

Considering the slight increases in water temperatures and small size of the thermal plume area, in the context of the overall size of the Lease Area (127,388 acres [51,552 hectares]), minimal impacts on water temperature are anticipated. Based on results of the thermal plume modeling, impacts from the discharge are expected to be localized and minimal, especially where the plume is controlled by discharge characteristics. Similar results would be anticipated if SouthCoast Wind selects additional HVDC converter OSP(s) for the southern portion of the Lease Area associated with Project 2. Because the impacts from each OSP would be localized and minimal, the combined impacts from thermal plume discharges from multiple HVDC converter OSPs under the Proposed Action are anticipated to be minor. Bleach (sodium hypochlorite) would be used to inhibit marine growth in the HVDC cooling equipment (COP Volume 1, Section 3.4.5; SouthCoast Wind 2024). A hypochlorite generator would produce the sodium hypochlorite by seawater electrolysis. These generators are designed to achieve a hypochlorite solution flow rate of sufficient concentration, corresponding with a 1 to 4 parts per million equivalent free chlorine concentration in the seawater intake lines. The residual free chlorine at the outlet would be negligible and would be oxidized in the water (TetraTech and Normandeau Associates, Inc. 2023). No chemicals are involved in the cleaning cycles of the HVDC converter.

The impact on water quality from the discharge of warm seawater with small concentrations of bleach would be negligible if discharge concentrations meet the water quality-based limits of SouthCoast Wind's NPDES permit. Impacts would be localized to the area immediately surrounding the outlet pipe.

Overall, the impacts on water quality from the Proposed Action would be short term and minor during construction and, to a lesser degree, during decommissioning. During operations, the number of vessels in use would decrease even more, resulting in fewer impacts.

Land disturbance: Construction and installation of onshore components (e.g., substations, cable installation) would disturb ground and lead to unvegetated or otherwise unstable soils until permanent stabilization is achieved. Onshore construction would disturb the ground with typical depths of up to 8 feet (2.4 meters) (e.g., trenching for onshore cable installation) but could be deeper depending on survey results and potential utility crossings, which could have potential to interact with groundwater if groundwater were shallow enough to interact with the disturbance. Any contaminants spilled during construction would be localized, contained, and cleaned up per permitting requirements and SouthCoast Wind's OSRP and, therefore, would not be anticipated to reach groundwater or have any effect on groundwater quality. The sites for the up to two converter stations at Brayton Point and one substation at Falmouth would require up to 20 acres (4 hectares) and 26 acres (10.5 hectares), respectively, to accommodate the area for the converter and substation equipment and buildings, energy storage, stormwater management, and landscaping. Total temporary and permanent disturbance associated with onshore components if Brayton Point is the POI for Project 1 and Project 2 is approximately 26 acres (10.5 hectares) (COP Volume 1, Table 3-39; SouthCoast Wind 2024). Total temporary and permanent disturbance associated with onshore components if Brayton Point is the POI for Project 1 and Falmouth is the POI for Project 2 is approximately 65 acres (26.5 hectares) (COP Volume 1, Table 3-39; SouthCoast Wind 2024). Precipitation events could potentially erode the soils and discharge sediment-laden runoff into nearby surface waters, leading to increased turbidity. SouthCoast Wind would implement erosion and sedimentation controls during the construction period. Construction would lead to an increased potential for water quality impacts resulting from accidental fuel spills or sedimentation in waterbodies. The incremental increases in land disturbance from the Proposed Action would be small, and AMMs, such as the use of an OSRP and SWPPP, would be implemented. As such, impacts from the Proposed Action on water quality from land disturbance would be negligible to minor.

Cumulative Impacts of the Proposed Action

The cumulative impacts of the Proposed Action considered the impacts of the Proposed Action in combination with other ongoing and planned non-offshore wind and offshore wind activities. Ongoing and planned non-offshore wind activities related to onshore development, terrestrial runoff and discharges, marine transportation-related discharges, dredging and port improvement projects, commercial fishing, military use, submarine cables and pipelines, atmospheric deposition, and climate change would contribute to impacts on water quality through the primary IPFs of accidental releases, anchoring, cable emplacement and maintenance, port utilization, presence of structures, discharges, and land disturbance. The construction, O&M, and decommissioning of both onshore and offshore infrastructure for offshore wind activities in the geographic analysis area would also contribute to water quality impacts associated with the same IPFs.

The Proposed Action would contribute to the combined accidental release impacts on water quality from ongoing and planned activities including offshore wind. Given the low probability of these spills occurring, BOEM does not expect ongoing and planned activities, including the Proposed Action, to appreciably contribute to impacts on water quality resulting from oil and chemical spills. The Proposed Action would contribute to the combined anchoring impacts on water quality from ongoing and planned activities including offshore wind. The contribution from the Proposed Action to increased sediment concentration and turbidity would be additive with the impact(s) of any and all other cable installation activities, including offshore wind activities, that occur within the water quality geographic analysis area and that would have overlapping timeframes during which sediment is suspended. Multiple offshore wind projects may overlap in cable installation activity in the geographic analysis area and contribute to these temporary impacts (refer to Appendix D for construction schedules of specific projects). The Proposed Action would contribute to the combined port utilization impact on water quality from ongoing and planned activities, which is anticipated to be minor due to the need for minimal port modifications or expansions and the small increase in ship traffic. The cumulative impacts of combined accidental releases, anchoring, and port utilization would likely be temporary (during construction), localized, and minor.

The presence of structures from the Proposed Action and other offshore wind projects would increase seabed disturbance and potential water quality impacts. In the water quality geographic analysis area, offshore wind activities including the Proposed Action would result in 2,994 acres (1,212 hectares) of impact from installation of foundations and scour protection, 13,720 acres (5,552 hectares) of impact from installation of offshore and interarray cables, and 1,401 acres (567 hectares) of impact from hard protection for offshore cables and interarray cables. Of these seabed disturbances, the Proposed Action would contribute 4,988 acres, or 28 percent. The impacts would be mostly localized and are not anticipated to degrade regional water quality. Cumulative impacts on water quality would likely be minor and constant over the lifespans of the reasonably foreseeable activities.

Impacts on water quality from the Proposed Action due to discharges would be additive with the impact(s) of any and all discharges, including those of other offshore wind activities that occur within the water quality geographic analysis area during the same timeframe. Vessel traffic (e.g., fisheries use, recreational use, shipping activities, military uses) in the region would overlap with vessel routes and port cities expected to be used for the Proposed Action, and vessel traffic would increase under the Proposed Action. Discharge events would mostly be staggered over time and localized, and all vessels would be required to comply with regulatory requirements related to prevention and control of discharges, accidental spills, and nonindigenous species administered by USEPA, USACE, USCG, and BSEE. Therefore, the cumulative impacts on water quality would likely be short term, localized, and minor primarily during construction and to a lesser extent during decommissioning and operations.

Cumulative impacts of land disturbance impacts on water quality would likely be localized, short term, and minor due to the low likelihood that construction of onshore components would overlap in time and space, and the minimal amount of expected discharge of sediment-laden runoff into nearby waterbodies.

Overall, the cumulative impact on water quality would likely be minor but could increase to moderate in the unlikely event of a large-volume, catastrophic release. In the context of reasonably foreseeable environmental trends, the Proposed Action could contribute a detectable increment to the cumulative impacts on water quality.

Conclusions

Impacts of the Proposed Action: BOEM anticipates the impacts on water quality resulting from the Proposed Action would be **minor adverse**. Impacts from routine activities including sediment resuspension during construction and decommissioning, both from regular cable laying and from prelaying, dredging, vessel discharges, sediment contamination, discharges from the WTGs or OSP during operation, sediment plumes due to scour, and erosion and sedimentation from onshore construction, would be negligible to minor. Impacts from non-routine activities, such as accidental releases, would be minor from small spills. While a larger spill could have moderate impacts on water quality, the likelihood of a spill this size is very unlikely. The impacts associated with the Proposed Action are likely to be temporary or small in proportion to the geographic analysis area, and the resource would recover completely after decommissioning.

Cumulative Impacts of the Proposed Action: BOEM anticipates that the cumulative impacts on water quality in the geographic analysis area would be **minor adverse**. BOEM has considered the possibility of a moderate impact resulting from accidental releases; this level of impact could occur if there was a large-volume, catastrophic release. While it is an impact that should be considered, it is unlikely to occur. In context of reasonably foreseeable environmental trends, the incremental impacts contributed by the Proposed Action to the cumulative impacts on water quality would be detectable should a large-volume, catastrophic release occur. The Proposed Action would contribute to the cumulative impact rating primarily through the increased turbidity and sedimentation due to anchoring and cable emplacement during construction, and alteration of water currents and increased sedimentation during operation due to the presence of structures.

3.4.2.6 Impacts of Alternatives C, D (Preferred Alternative), E, and F on Water Quality

Impacts of Alternatives C, D, E, and F: The impacts resulting from the installation of offshore wind infrastructure under Alternatives C, D, E, and F would be either the same or less than those described under the Proposed Action due to the same (Alternatives C and E) or reduced (Alternatives D and F) number of structures and offshore export cables in the Wind Farm Area. While Alternative F would still have the same number of overall offshore structures in the Lease Area, the reduced number of Falmouth export cables using HVDC technology would require the construction of an HDVC converter station OSP that may otherwise not be necessary under the Proposed Action. While the reduced number of structures and offshore export cables may slightly reduce localized water quality impacts during construction and operations, the difference in impacts compared to the Proposed Action would not be materially different. BOEM expects that the modifications to the Brayton Point export cable route under Alternative C-1 and Alternative C-2 would slightly reduce the potential for offshore water quality impacts because cable emplacement would be avoided in the Sakonnet River. Onshore, however, Alternative C-1 and Alternative C-2 would slightly increase the potential water quality impacts because of the longer onshore cable routes. Because the cables would be installed largely within existing road ROWs and mitigation measures, such as the use of an SPCC plan and SWPPP, would be implemented, Alternative C-1 and Alternative C-2 are not expected to significantly change the potential impacts on water quality. Similarly, reducing the number of Falmouth offshore export cables from five to three under Alternative F as compared to the Proposed Action is not expected to substantively change the potential impacts on water quality because cable emplacement would still result in short-term and localized sediment suspension. The addition of another HVDC converter station OSP under Alternative F for the Falmouth export cables for Project 2 (in addition to the HVDC OSP already proposed for Project 1 at Brayton Point) would increase impacts on water temperature during operations. As previously stated for the Proposed Action, the proposed HVDC converter OSP would use an open-loop cooling system that would cause a slight, localized increase in water temperature in the vicinity of the effluent diffuser. However, based on thermal plume modeling conducted for the Project, impacts on water quality from the effluent created by the HVDC structure are expected to be minimal, and a second OSP would not substantially change the overall impact rating given the small area that would be affected. In addition, the discharge of bleach from a second HVDC converter would have little effect on water quality around the discharge location due to the very low concentrations of bleach.

Under Alternative E-1, piled-jacket foundations are expected to have fewer sediment effects than monopiles due to lower scour potential and smaller wake effects. The GBS foundations proposed under Alternative E-3 and suction-bucket foundations proposed under Alternative E-2 may have larger sediment effects than monopiles and piled jackets (Alternative E-1) because of their larger scour potential (BOEM 2021). Overall, the GBS foundations proposed under Alternative E-3 would require larger disturbance footprints than the piled foundations and suction-bucket foundations under Alternative E-1 and Alternative E-2, potentially resulting in greater water quality impacts than the Proposed Action (which does not include GBS foundations).

Cumulative Impacts of Alternatives C, D, E, and F: In context of reasonably foreseeable environmental trends, cumulative impacts of Alternatives C, D, E, and F on water quality would be similar to those of the Proposed Action.

Conclusions

Impacts of Alternatives C, D, E, and F: The expected **minor adverse** impacts associated with the Proposed Action would not change substantially under Alternatives C, D, E, and F. The same construction and installation, O&M, and conceptual decommissioning activities would still occur, albeit at differing scales in some cases. Alternative C-1 and Alternative C-2 would result in similar, but not materially different, minor impacts on water quality in relation to sediment disturbance and turbidity and onshore ground disturbance. Alternative D may result in slightly less, but not materially different, minor impacts on water quality due to a reduced number of WTGs that would be constructed and maintained. Due to the size of the foundations, Alternative E-3 (GBS) and Alternative E-2 (suction-bucket) would result in slightly greater sediment effects than Alternative E-1 (piled) and the Proposed Action, although the overall magnitude of impacts would remain **minor adverse**. Alternative F would result in the same minor impacts on water quality from the modification to the Falmouth offshore export cables. The addition of an HVDC converter station OSP using an open-loop cooling system would cause a slight increase in impacts on water temperature but would not be substantially different from the Proposed Action.

Cumulative Impacts of Alternatives C, D, E, and F: In the context of reasonably foreseeable environmental trends, the cumulative impacts associated with Alternatives C, D, E, and F would be the same as the Proposed Action—**minor adverse**, but with a possibility of a moderate impact resulting from accidental releases; this level of impact could occur if there was a large-volume, catastrophic release. While it is an impact that should be considered, it is unlikely to occur.

3.4.2.7 Comparison of Alternatives

The minor impacts associated with the Proposed Action would be the same for Alternatives C, D, E, and F. Alternative C-1 and Alternative C-2 would result in similar, but not materially different, minor impacts on water quality in relation to sediment disturbance and turbidity and onshore ground disturbance. Alternative D may result in slightly less, but not materially different, minor impacts on water quality due to a reduced number of WTGs that would be constructed and maintained. Due to the size of the foundations, Alternative E-3 (GBS) and Alternative E-2 (suction-bucket) would result in slightly greater sediment effects than Alternative E-1 (piled) and the Proposed Action, although the overall magnitude of impacts would remain minor. Alternative F would result in the same minor impacts on water quality from the modification to the Falmouth offshore export cables. The addition of an HVDC converter station OSP using an open-loop cooling system would cause an increase in impacts on water temperature but would not change the impact magnitude.

3.4.2.8 Proposed Mitigation Measures

No measures to mitigate impacts on water quality have been proposed for analysis.