# Outer Continental Shelf Air Permit OCS-R1-04
# U.S. Environmental Protection Agency
# Region 1

Outer Continental Shelf Air Permit: South Fork Wind, LLC

130 MW Windfarm

Offshore Renewable Wind Energy Project

EPA Permit Number OCS-R1-04

Pursuant to the provisions of Section 328 of the Clean Air Act (CAA) and the Code of Federal Regulations (C.F.R.) Title 40, Part 55, the United States Environmental Protection Agency - Region 1 (EPA) is issuing an Outer Continental Shelf (OCS) air quality permit to South Fork Wind, LLC (SFW). SFW proposes to install and operate a 130 MW windfarm in the Rhode Island-Massachusetts Wind Energy Area. The location of the Rhode Island-Massachusetts Wind Energy Area comprises two original larger lease areas OCS-A-0486 and OCS-A-0487. A portion in the northern lease area of OCS-A-0486 (now OCS-A-0517) will be where the South Fork Wind Farm is located.

The construction and operation of the windfarm is subject to the attached permit conditions and permit limitations. This permit is effective on February 20, 2021 unless review is requested on the permit in accordance with 40 C.F.R. § 124.19 and shall remain in effect until it is surrendered to EPA.

This permit does not relieve SFW from the obligation to comply with applicable state and federal air pollution control rules and regulations.

DEBORAH SZARO

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Deborah A. Szaro
Acting Regional Administrator

Date of Signature: January 18, 2022

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## Acronyms and Abbreviations

| | |
|---|---|
| BACT | Best Available Control Technology |
| BOEM | Bureau of Ocean Energy Management |
| CAA | Clean Air Act |
| CERC | Continuous Emission Reduction Credit |
| C.F.R. | Code of Federal Regulations |
| CO | Carbon Monoxide |
| $CO_2$ | Carbon Dioxide |
| eGRID | Environmental Protection Agency's Emissions & Generation Resource Integrated Database |
| EPA | United States Environmental Protection Agency |
| g/hp-hr | Grams per horsepower-hour |
| g/kw-hr | Grams per kilowatt-hour |
| HC | Hydrocarbon |
| IMO | International Maritime Organization |
| kW | Kilowatt |
| kW/l | Kilowatt/liter |
| LAER | Lowest Achievable Emission Rate |
| l/cyl | Liter/Cylinder |
| MassDEP | Massachusetts Department of Environmental Protection |
| NMHC | Non-methane hydrocarbons |
| NNSR | Nonattainment New Source Review |
| $NO_2$ | Nitrogen Dioxide |
| NOx | Nitrogen Oxides |
| OCS | Outer Continental Shelf |
| OSS | Offshore Substation |
| PM | Particulate Matter |
| $PM_{10}$ | Particulate Matter with an aerodynamic diameter less than or equal to 10 microns |
| $PM_{2.5}$ | Particulate Matter with an aerodynamic diameter less than or equal to 2.5 microns |
| PSD | Prevention of Significant Deterioration |
| PTE | Potential to emit |
| $SO_2$ | Sulfur Dioxide |
| THC | Total hydrocarbon |
| TPY | Tons per year |
| ULSD | Ultra low sulfur diesel |
| SFW | South Fork Wind, LLC |
| VOC | Volatile Organic Compounds |
| WA | Work Area |
| WTGs | Wind Turbine Generators |

# I. Description of Permitted Activities

South Fork Wind, LLC (SFW) plans to design, permit, construct, and operate a 130 MW offshore wind energy project in Bureau of Ocean Energy Management (BOEM) Lease Area OCS-A 0517 (the windfarm).

The construction of wind turbine generators (WTGs) and the offshore substation (OSS) will require the use of marine vessels to perform the construction and to transport material from the mainland to its location on the Outer Continental Shelf (OCS). SFW will also install an offshore electrical cable that will connect the OSS to an onshore substation in East Hampton, NY although this activity is not covered by this permit.

The operation of the windfarm will last approximately 30 years. During this phase, most activities will be related to scheduled and preventative maintenance. The permit also anticipates unscheduled corrective maintenance that may require the use of specialized vessels, such as jack-up vessels.

Criteria air pollutant emissions and their precursors generated from the construction and operation of the windfarm include nitrogen oxides (NOx), nitrogen dioxide ($NO_2$), carbon monoxide (CO), sulfur dioxide ($SO_2$), particulate matter with an aerodynamic diameter less than or equal to 10 microns ($PM_{10}$), particulate matter with an aerodynamic diameter less than or equal to 2.5 microns ($PM_{2.5}$), and volatile organic compounds (VOCs). These air pollutants are associated with the combustion of diesel fuel in (1) a vessel's propulsion and auxiliary engines and (2) the engine(s) located on a WTG or OSS. The windfarm's pollutant emitting activities in the Work Area (WA) are a single stationary source for permitting purposes.

The estimated potential to emit (PTE) of the WA includes 1) emissions from engines on any WTG or OSS, 2) emissions from all engines on vessels included in the definition of an OCS source and, 3) emissions from all engines on vessels servicing or associated with the WA when those vessels are at or are en route to and from the OCS source and within 25 miles of the OCS source. Based on the PTE, the project is a major source of air pollution, and thus is subject to Prevention of Significant Deterioration (PSD) and Nonattainment New Source Review (NNSR) permitting requirements. The project is also subject to the minor NSR requirements under 310 CMR 7.02 of the Commonwealth of Massachusetts air pollution regulations.

# II. List of Air Emissions Sources

**Table 1 – List of Air Emissions Sources[1]**

| Emission Source | Purpose | Phase |
|---|---|---|
| Crew transfer vessels | Transport crew to the WA. Potential transport of marine mammal observers. Used to refuel diesel-fired engines located on WTGs and OSS. | Construction and Operational |

[1] *The list of emission sources in this table is provided for informational purposes only. Other vessels or equipment not listed in this table may be used by SFW and are subject to the terms and provisions of this permit.*

| Emission Source | Purpose | Phase |
|---|---|---|
| Heavy lift crane vessels | Lift, support, and orient the components of each WTG and OSS during installation. Used for foundation installation. | Construction |
| Cable installation vessels | Lay and bury transmission cables in the seafloor. | Construction |
| Scour protection installation vessels | Deposit a layer of stone around the WTG and OSS foundations to prevent the removal of sediment by hydrodynamic forces<br>May place cable protection over limited sections of the offshore cable system | Construction |
| Multipurpose offshore support vessels | Clear the seabed floor of debris prior to laying transmission cables | Construction |
| Tugboats | Transport equipment and barges to the OCS source | Construction and as needed Operational |
| Anchor handling tug supply vessels | Install underwater noise mitigation devices (e.g., bubble curtains). Support offshore export cable installation. | Construction |
| Jack-up vessels | Transport WTG components to the WA. Extend legs to the ocean floor to provide a safe, stable working platform used for offshore crew accommodation. | Construction and, as needed, Operational |
| Dredging vessels | Used in certain areas prior to cable laying to remove the upper portions of sand waves | Construction |
| Survey vessels | Used to perform geophysical and geotechnical surveys | Construction |
| Service operation vessels | Transport crew to the WA<br>Provide offshore living accommodation and workspace | Construction and, as needed, Operational |
| Ocean-Going Heavy Transport Vessels (HTV) | Ocean-going vessels that may transport components (e.g., monopiles) directly to the Work area. | Construction |
| Wind Turbine Generator | Generate electricity from wind. Each WTG may have an additional diesel-fired engine. | Construction and Operational |
| Offshore Substation | Serve as the common interconnection point for the WTGs. The WTG will interconnect with an OSS via a submarine cable system. | Construction and Operational |

## III. Definitions

1. *Air Pollutant* shall have the same meaning as that term has within 40 C.F.R. part 55.

2. *Category 1 Engine* means

    a. For engines regulated under 40 C.F.R. Part 1042 (Tiers 3 and 4), a marine engine with specific engine displacement below 7.0 liters per cylinder; or

    b. For engines regulated under 40 C.F.R. Part 1042 – Appendix I (Tiers 1 and 2), a marine engine with a rated power greater than or equal to 37 kilowatts and a specific engine displacement less than 5.0 liters per cylinder.

3. *Category 2 Engine* means

    a. For engines regulated under 40 C.F.R. Part 1042 (Tiers 3 and 4), a marine engine with a specific engine displacement at or above 7.0 liters per cylinder but less than 30.0 liters per cylinder; or

    b. For engines regulated under 40 C.F.R. Part 1042 – Appendix I (Tiers 1 and 2), a marine engine with a specific engine displacement greater than or equal to 5.0 liters per cylinder but less than 30 liters per cylinder.

4. *Category 3 Engine* means a marine engine with a specific engine displacement greater than or equal to 30 liters per cylinder.

5. *Commence* means, that an owner or operator has undertaken a continuous program of construction or modification or that an owner or operator has entered into a contractual obligation to undertake and complete, within a reasonable time, a continuous program of construction or modification.

6. *Construction Phase* begins when the first OCS source is established in the WA and ends when the commissioning activities are completed. Commissioning is completed the day before SFW identifies in its notice to BOEM, pursuant to 30 C.F.R. § 585.636, that SFW will commence commercial operations.

7. *Construction Start Date* is the first day any equipment or activity, that meets the definition of an OCS source, operates, occurs, or exists in the WA. The EPA expects that the first OCS source will be a jack-up vessel.

8. *Continuous Emission Reduction Credit* (CERC) is equivalent to 1 ton per year of a pollutant, such as NOx. Under 310 CMR 7.00, Appendix B, a CERC is equivalent to a rate-based emission reduction credit (ERC).

9. *Domestic Flagged Vessel* means a vessel operated under the authority of the United States.

10. *Emission Unit* means any part of an OCS source vessel or OCS source, including but not limited to, engines, that emit or would have the potential to emit any air pollutant.

11. *Engine* shall include gasoline-fired spark ignition internal combustion engines, diesel-fired compression ignition internal combustion engines, marine engines, and diesel-fired generating sets.

12. *Feeder Jack-up Vessel* means a vessel that includes legs and a lifting system that enables the vessel to lower its legs into the seabed and elevate its hull to provide a stable work deck and meets the definition of a "Secondary Crew Transfer Vessel" or "Supply Vessel."

13. *Foreign Flagged Vessel* means a vessel of foreign registry or a vessel operated under the authority of a country other than the United States.

14. *Jack-up Vessel* means a vessel (whether self-propelled or not) that includes legs and a lifting system that enables the vessel to lower its legs into the seabed and elevate its hull to provide a stable work deck.

15. *Main WTG Installation vessel* is one of the two main jack-up foreign flagged vessels that will install the WTGs; domestically flagged vessels of the size and capabilities required for WTG installation do not exist. These vessels are not crew and supply vessels.

16. *Marine Diesel and Marine Residual Fuel* means Marine diesel with a sulfur content of 1,000 parts per million (ppm) by weight or less.

17. *Marine Engine* means a nonroad engine produced for any purpose that is installed or intended to be installed on a marine vessel. This includes a portable auxiliary marine engine only if its fueling, cooling, or exhaust system is an integral part of the vessel. A fueling system is considered integral to the vessel only if one or more essential elements are permanently affixed to the vessel.

    (1) Propulsion marine engine means a marine engine that moves a vessel through the water or directs the vessel's movement.

    (2) Auxiliary marine engine means a marine engine not used for propulsion.

18. *No. 1 of the [Ringelmann] Chart* has the same meaning as 20 % opacity.

19. *No. 2 of the [Ringelmann] Chart* has the same meaning as 40 % opacity.

20. *Ocean-going Vessel* means a commercial, government, or military vessel meeting any one of the following criteria:

    a. a vessel greater than or equal to 400 feet in length overall (LOA) as defined in 50 C.F.R. § 679.2, as adopted June 19, 1996;

b. a vessel greater than or equal to 10,000 gross tons (GT ITC) per the convention measurement (international system) as defined in 46 C.F.R. 69.51-.61, as adopted September 12, 1989; or

c. a vessel propelled by a marine compression-ignition engine with a per-cylinder displacement of greater than or equal to 30 liters.

21. *OCS Source* has the same meaning as set forth in 40 C.F.R. § 55.2.

22. *OCS Source Vessel* is any vessel that:

a. Emits or has the potential to emit any air pollutant;

b. Is regulated or authorized under the Outer Continental Shelf Lands Act ("OCSLA") (43 U.S.C. §1331 et seq.); and

c. Is located on the OCS or in or on waters above the OCS.

d. Additionally, an OCS Source Vessel must be permanently or temporarily attached to the seabed and erected thereon and used for the purpose of exploring, developing or producing resources therefrom, within the meaning of section 4(a)(1) of OCSLA (43 U.S.C. § 1331 et seq.) or physically attached to an OCS facility, in which case only the stationary source aspects of the vessels will be regulated.

23. *Operational Phase* is the period of normal operations which begins on the operational phase start date.

24. *Operational Phase Start Date* is the date SFW identifies in its notice to BOEM, pursuant to 30 C.F.R. § 585.636, that the windfarm will commence commercial operations.

25. *The Permittee* includes South Fork Wind, LLC; its successor(s) in operating the permitted project; its contractors; and any agents or parties acting on its behalf that conduct activities regulated by this permit, including but not limited to vessel, barge, and equipment operators; and any operator.

26. *Primary Crew Transfer Vessel* means the one crew transport vessel that will be needed on an almost daily basis during both the construction and operational phases.

27. *Responsible Official* means a president, secretary, treasurer, or vice-president of the Permittee in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the Permittee, or a duly authorized representative of such person if the representative is responsible for the overall operation of one or more manufacturing, production, or operating facilities applying for or subject to a permit and either:

a. The facilities employ more than 250 persons or have gross annual sales or expenditures exceeding $25 million (in second quarter 1980 dollars); or

b. The delegation of authority to such representatives is approved in advance by the EPA;

28. *Secondary Crew Transfer Vessels* are all self-propelled vessels that are not Ocean-going Vessels and are used for carrying personnel to and from off-shore and in-harbor locations (including, but not limited to, off-shore work platforms, construction sites, and other vessels) from the staging area to the WA and that are not the primary crew transfer vessel.

29. *Smoke* means the visible aerosol, which may contain fly ash, resulting from combustion of materials but does not mean condensed water vapor.

30. *Supply Vessel* means a self-propelled vessel used for carrying supplies to and from off-shore and in-harbor locations (including, but not limited to, off-shore work platforms, construction sites, and other vessels) from the staging area to the WA and is included in the definition of an OCS source and is not an *Ocean-going Vessel*.

31. *Ultra-low sulfur diesel (ULSD)* means transportation diesel or biodiesel (containing no more than 20% non-fossil fuel) with a sulfur content of 15 ppm by weight or less.

32. *Vessel* means:

a. self-propelled vessels; and

b. barges or other non-self-propelled vessels that must be towed by another vessel. It includes vessels with or without systems that attach, either permanently or temporarily to the seabed.

33. *Vessel's starting location* means the geographic location where a vessel originates prior to being considered in transit to the work area. The vessel's starting location is used, in part, to calculate total emissions associated with the use of that vessel.

34. *Work Area* is the work area within BOEM Lease Area OCS-A 0517, located on the OCS.

## IV. Emission Limits

### A. All Engines and Emission Units on OCS Sources

1. The Permittee shall not cause, suffer, allow, or permit the emission of smoke from any Engine or Emission Unit which has a shade, density, or appearance equal to or greater than No. 1 of the [Ringelmann] Chart for a period, or aggregate period of time in excess of six minutes during any one hour, provided that at no time during the said six minutes shall the shade, density, or appearance be equal to or greater than No. 2 of the

[Ringelmann] Chart. [310 CMR 7.06(1)(a), 40 C.F.R. part 60 subpart IIII, 40 C.F.R. part 89, 40 C.F.R. part 1039] [2]

2. The Permittee shall not cause, suffer, allow or permit the operation of any Engine or Emission Unit to emit any contaminant(s), exclusive of uncombined water or smoke subject to Condition IV.A.1 above, that exceed 20% opacity for a period or aggregate period of time in excess of two minutes during any one hour provided that, at no time during the said two minutes shall the opacity exceed 40%. [310 CMR 7.06(1)(b)]

## B. Diesel-fired Engines on Wind Turbine Generators and Offshore Substation

1. The Permittee shall only burn ULSD in all engine(s) on WTGs and the OSS. [310 CMR 7.05(1)(a)1.]

2. The Permittee shall install and operate only engines that are certified by the manufacturer to meet or emit less than the Tier 4 emission standards set forth at 40 C.F.R. § 1039.101(b) for new compression-ignition engines. The emission limits for NOx, NMHC, CO and PM, will depend on the engine's maximum engine power (in kW). For the engines proposed for installation on the WTGs and OSS, the emission limits for engines rated $130 \leq kW \leq 560$ are:

    a. NOx = 0.40 grams/kilowatt-hour (g/kW-hr);

    b. NMHC = 0.19 g/kW-hr;

    c. CO = 3.5 g/kW-hr;

    d. PM = 0.02 g/kW-hr.

    [PSD Best Available Control Technology (BACT), NNSR Lowest Achievable Emission Rate (LAER), 40 C.F.R. § 60.4201, 40 C.F.R. § 1039.101][3]

3. Engines shall be limited to operating up to 200 hours a year per engine at each WTG or OSS location. [PSD]

## C. Engines While Vessels Are Operating as OCS Sources

The following terms and conditions contained within this subsection shall apply to all operating engines on a vessel while that vessel meets the definition of an OCS source vessel.

1. The Permittee while owning, operating, or having control of a seagoing vessel shall not

[2] The citations in brackets represent the authority for the permit provisions described immediately beforehand.
[3] The authority for provisions citing PSD, PSD BACT, and NNSR LAER originates from case-by-case analyses required by 40 C.F.R. § 52.21 (PSD) and 310 CMR 7.00, Appendix A (NNSR). A detailed discussion of these provisions can be found in the June 24, 2021 Fact Sheet for EPA Draft Permit Number OCS-R1-04.

cause, suffer, allow, or permit, aboard said vessel, tube blowing or soot removal activities that cause or contribute to a condition of air pollution. [310 CMR 7.11(4)]

2. The Permittee shall only burn ULSD, Marine Distillate, or Marine Residual fuels when operating any diesel-fired emission unit. [310 CMR 7.05(1)(a)3 and 40 C.F.R. § 80.510(k)]

3. The Permittee shall ensure that all category 1 and 2 engines on all domestic and foreign flagged feeder jack-up vessels, domestic and foreign flagged supply vessels, and secondary crew transfer vessels, while those vessels are operating as an OCS source, meet the Tier 4 engine emission limits in 40 C.F.R. § 1042.101, except if one of the conditions in subparagraph 3.a. or 3.b below is met, in which case the Permittee may use an engine meeting the emissions limits for the next lower Tier (i.e., Tier 3). Similarly, in the event that one of the conditions in subparagraph 3.a or 3.b below is met regarding the use of an engine meeting Tier 3 emissions limits, the Permittee may use an engine meeting the Tier 2 emission limits in 40 C.F.R. § 1042 – Appendix I in lieu of an engine meeting Tier 3 emission limits. All engines operating on domestic and foreign flagged feeder jack-up vessels, domestic and foreign flagged supply vessels, and secondary crew transfer vessels while those vessels meet the definition of an OCS source, shall meet the emission limits for a Tier 3 or 4 engine in 40 C.F.R. §1042.101 or 40 C.F.R. § 1042 – Appendix I for a Tier 2 engine, whichever is applicable. In order to use a lesser Tier engine, as described above, one of the following conditions must be met:

   a. A vessel with a higher Tier engine (i.e., Tier 4) is not available within two hours of when the vessel must be deployed;

   b. The total emissions associated with the use of a vessel with the higher Tier engine(s) would be greater than the total emissions associated with the use of the vessel with the next lower Tier engine(s). For purposes of this subparagraph, when determining the total emissions associated with the use of a vessel with a particular engine, the Permittee may include the emissions of the vessel that would occur when the vessel would be in transit to the OCS source from the vessel's starting location.

[PSD BACT, NNSR LAER, and 40 C.F.R. § 60.4201]

4. The Permittee shall ensure that all category 1 and 2 engines for domestic flagged vessels operating as an OCS source that do not meet the definitions for any type of feeder jack-up vessel, supply vessel, or primary or secondary crew transfer vessel, are certified to meet the Tier 4 engine standards in 40 C.F.R. § 1042.101, except if one of the conditions in subparagraph 4.a. or 4.b., below, is met, in which case the Permittee may use the next lower Tier engine (i.e., Tier 3). Similarly, in the event that one of the conditions in subparagraph 4.a or 4.b., below, is met regarding the use of a Tier 3 engine, the Permittee may use a Tier 2 engine in lieu of a Tier 3 engine. In the event that one of the conditions in subparagraph 4.a or 4.b is met regarding the use of a Tier 2 engine, the Permittee may use a Tier 1 engine in lieu of a Tier 2 engine. All engines operating on any vessel that is not a jack-up vessel, supply vessel, or primary or secondary crew transfer vessel while

that vessel meets the definition of an OCS source, shall be certified as meeting the emission limits for a Tier 3 or 4 engine in 40 C.F.R. § 1042.101 or Tier 1 or 2, and 40 C.F.R. part 1042 – Appendix I, depending upon whichever Tier the engine is certified to meet. In order to use a lesser Tier engine, as described above, one of the following conditions must be met:

a. A vessel with a higher Tier engine is not available within two hours of when the vessel must be deployed;

b. The total emissions associated with the use of a vessel with the higher Tier engine(s) would be greater than the total emissions associated with the use of the vessel with the next lower Tier engine(s). For purposes of this subparagraph, when determining the total emissions associated with the use of a vessel with a particular engine, the Permittee may include the emissions of the vessel that would occur when the vessel would be going to the WA from the vessel's starting location.

[PSD BACT, NNSR LAER, and 40 C.F.R. § 60.4201]

5. The Permittee shall ensure that all engines on all foreign flagged vessels not regulated by permit condition IV.C.3, and all Category 3 engines on domestic flagged vessels, while those vessels are operating as an OCS source, are certified to meet either the MARPOL Annex VI (Annex VI) Tier III NOx limits, in the case of a foreign flagged vessel, or EPA's Tier 3 engine standards, in the case of a US flagged vessel, in Table 2 of this permit, except if one of the conditions in subparagraph 5.a or 5.b below is met, in which case the Permittee may use the next lower Tier engine (i.e., Annex VI Tier II or EPA Tier 2). Similarly, in the event that one of the conditions in subparagraph 5.a or 5.b below is met regarding the use of an Annex VI Tier II or EPA Tier 2 engine, the Permittee may use an Annex VI Tier I or EPA Tier 1 engine in lieu of an Annex VI Tier II or EPA Tier 2 engine. All engines operating on a foreign vessel while that vessel meets the definition of an OCS source, shall be certified as meeting the relevant NOx emission limits for Annex VI in Table 2, depending upon whichever Annex VI Tier the engine is certified to meet. In order to use a lesser Annex VI or EPA Tier engine, as described above, one of the following conditions must be met:

   a. A vessel with a higher Annex VI or EPA Tier engine is not available within two hours of when the vessel must be deployed;

   b. The total emissions associated with the use of a vessel with the higher Annex VI or EPA Tier engine(s) would be greater than the total emissions associated with the use of the vessel with the next lower Annex VI or EPA Tier engine(s). For purposes of this subparagraph, when determining the total emissions associated with the use of a vessel with a particular engine, the Permittee may include the emissions of the vessel that would occur when the vessel would be going to the WA from the vessel's starting location;

   c. For category 3 engines on domestically flagged vessels, with a model year of

2011 or later, those engines must comply with an HC emission limit of 2 g/kW-hr and a CO emission limit of 5 g/kW-hr. [40 C.F.R. § 1042.104(a)]

**Table 2 – NOx Emission Limits**

| Annex VI/EPA Tier | Ship constructed after | Total weighted cycle NOx emission limit (g/kWh) n = engine's rated speed (rpm) | | |
|---|---|---|---|---|
| | | n is less than 130 rpm | n is 130 or more but less than 2,000 rpm | n is 2,000 rpm or more |
| I / 1 | 1 January 2000[a] | 17.0 | $45 \cdot n^{(-0.2)}$ e.g., 720 rpm = 12.1 | 9.8 |
| II / 2 | 1 January 2011 | 14.4 | $44 \cdot n^{(-0.23)}$ e.g., 720 rpm = 9.7 | 7.7 |
| III / 3 | 1 January 2016 | 3.4 | $9 \cdot n^{(-0.2)}$ e.g., 720 rpm = 2.4 | 2.0[b] |

a: The EPA Tier 1 NOx emission limits for Category 3 engines on U.S. vessels apply beginning model year 2004; however, the Annex VI Tier I standards apply to engines installed on U.S. vessels beginning 1 January 2000 if that U.S. vessel operates internationally.

b: The total weighted cycle NOx emission limit for engines meeting the Tier III Annex VI standard is 1.96 when the engine speed equals or exceeds 2,000 rpm.

[PSD BACT, NNSR LAER, 40 C.F.R. § 60.4201, and 40 C.F.R. § 1043]

6. The Permittee shall ensure that all engines on all foreign flagged vessels, and category 3 engines on domestically flagged vessels, with a model year before 2011, while those vessels are operating as an OCS source, use good combustion practices based on the most recent manufacturer's specifications issued for these engines at the time that these engines are operating under this permit. [PSD BACT and NNSR LAER]

7. The Permittee shall ensure that all engines on vessels not included in condition IV.C.6, while those vessels are operating as an OCS source, use good combustion practices based on the most recent manufacturer's specifications issued for these engines at the time that these engines are operating under this permit. [PSD BACT and NNSR LAER]

8. The Primary Crew Transfer Vessel, while operating as an OCS source, shall have all engine(s) certified as meeting the highest Tier engine for engines in 40 C.F.R. §1042.101. Tier 4 emission standards apply to engine(s) at or above 600 kW, and Tier 3 emission standards apply to engine(s) below 600 kW. These emission standards apply during the construction and operational phases of the WA. If after the Primary Crew Transfer Vessel is deployed and it is necessary to deploy additional Crew Transfer Vessels to the WA, those additional Crew Transfer Vessels shall meet the requirements of subparagraph 3 above. [PSD BACT, NNSR LAER, and 40 C.F.R. § 60.4201]

9. The Permittee will only use, as applicable, adhesive, sealant, adhesive primer, or sealant primer that meet the VOC content requirements of 310 CMR 7.18(30). [310 CMR 7.18(30)]

## V. NNSR Offsets

1. The Permittee shall obtain a minimum of 25 tons per year of NOx Continuous Emission Reduction Credits (CERCs) prior to the beginning of the Operational Phase. The Permittee shall obtain the CERCs from one of the following:

    a. Rate-based emission reduction credits certified under the Massachusetts trading bank regulations codified at 310 CMR 7.00, Appendix B;

    b. The Permittee may enter into a third-party agreement that requires the third-party to create CERCs. Such an agreement must be federally enforceable prior to the Permittee using said CERCs;

    c. A facility that has ceased operations and had its CAA permits revoked or rescinded and has not had the resulting emissions reductions certified under the Massachusetts trading bank regulations under 310 CMR 7,00, Appendix B. CERCs based on a facility shutdown are required to be memorialized in a document from the Commonwealth of Massachusetts to ensure the CERCs from such a shutdown are fully in compliance with the CAA and have not been relied on by Massachusetts to meet other CAA requirements.

[NNSR and 310 CMR 7.00, Appendix B]

## VI. Operating Requirements and Work Practices

A. Diesel-fired Engines on WTGs and OSS

1. For non-emergency engines located on WTGs during the construction phase and the non-emergency engine located on the OSS during the construction and operational phase, the Permittee must install, operate, and maintain all engines to achieve the emissions standards at 40 C.F.R. § 60.4204(b) over the entire life of the engine. [40 C.F.R. §60.4206]

2. For emergency engines located on WTGs during the operational phase, the Permittee must install, operate, and maintain all engines to achieve the emissions standards at 40 C.F.R. § 60.4205(b) over the entire life of the engine. [40 C.F.R. §60.4206]

3. The Permittee shall ensure that the diesel fuel purchased for and used in each engine meets the following per-gallon standards:

    a. Sulfur content of 15 ppm by weight maximum; and

    b. Cetane index or aromatic content as follows:

        i. A minimum cetane index of 40; or

ii. A maximum aromatic content of 35 volume percent.

[310 CMR 7.05, 40 C.F.R. § 60.4207(b) and 40 C.F.R. § 80.510(b)]

4. The Permittee shall install and operate all engines that are certified by the manufacturer to meet or surpass the emission standards in 40 C.F.R. § 60.4204(b) or § 60.4205(b) as specified in this permit; [40 C.F.R. § 60.4211(c)]

5. The Permittee shall meet the following requirements:

   a. The Permittee shall install, operate and maintain all engines and control devices according to the manufacturer's emission-related written instructions; [40 C.F.R. § 60.4211(a)(1)]

   b. The Permittee shall only change emission-related settings on the engines that are permitted by the manufacturer; [40 C.F.R. § 60.4211(a)(2)]

   c. The Permittee shall install and operate the engines configured according to the manufacturer's emission-related specifications; [40 C.F.R. § 60.4211(c)]

B. Engines While Vessels are Operating as OCS Sources

The following term and condition contained within this subsection shall apply to all operating emission units on a vessel while that vessel meets the definition of an OCS source vessel.

1. All OCS vessel engines must comply with the operating and work practice standards, as applicable, specified in 40 C.F.R. part 60, subpart IIII and 40 C.F.R. part 63, subpart ZZZZ.

[40 C.F.R. part 60, subpart IIII and 40 C.F.R. part 63, subpart ZZZZ]

## VII. Testing Requirements

1. For each engine operating on the Main WTG Installation Vessel, the Permittee shall conduct a visible emission test for 30 consecutive minutes using the EPA test method 22 when the vessel is operating as an OCS source, once per operating day. If during the method 22 test visible emissions are observed for more than 3 consecutive minutes, within 14 calendar days the Permittee shall conduct a visible emission test using the EPA method 9. An operating day is defined as any calendar day in which the vessel operated as an OCS source. All visible emission tests for this specific permit condition shall be conducted in accordance with the EPA test requirements specified in 40 C.F.R. part 60, appendix A, methods 9 and 22.

2. The Permittee shall, upon request by the EPA, conduct emission test(s), including visible emissions, of any operating emission unit subject to an emission limit in Section IV of this permit, including any engine on any vessel while that vessel is an OCS source. The

Permittee shall perform the tests using the procedures and reference in 40 C.F.R. part 60, Appendix A, as applicable.

## VIII. Recordkeeping Requirements

The Permittee will maintain records of the following:

1. The date and time that a vessel becomes an OCS source during the construction and operational phases.

2. The date and time that a vessel ceases to be an OCS source during the construction and operational phases.

3. The make, model, maximum rated power output, cylinder size, and manufacturing date of each engine on each vessel operating as an OCS source during the construction phase, including if the vessel is a domestic or foreign-flagged vessel.

4. The make, model, maximum rated power output, cylinder size, and manufacturing date of each engine on each vessel included in the PTE during the operational phase, including if the vessel is a domestic or foreign-flagged vessel.

5. The make, model, maximum rated power output, cylinder size, and manufacturing date of each engine on each and every WTG and OSS.

6. Copies of certifications that demonstrate the Tier standard the engine was manufactured to meet for each engine on each vessel that meets the definition of an OCS source. The different Tier standards are found in 40 C.F.R. Parts 89, 1042 – Appendix I (formerly part 94), 1039, or 1042. For foreign flagged vessels the different Tier standards are found at Regulation 13 of MARPOL Annex VI.

7. For each engine on each vessel that is included in the PTE during the operational phase of the project, record daily, for each and every day, the:

    a. Total hours of operation when operating within 25 nautical miles of the OCS source;

    b. Engine speed rating, in rpms (if applicable in determining daily emissions);

    c. Emission factor associated with the engine certification, or the emission factor specified in permit condition VIII.9, as applicable, used in determining the daily emissions required of this permit; and

    d. Actual fuel usage data and manufacturing load and fuel consumption rate information, if engine load is determined by using the formula for determining a daily load factor in permit condition VIII.9.a.

8. Beginning on the "operational start date," as that phrase is defined in Section III of this permit, the Permittee shall start recording on a daily basis for each and every day, the total amount (in tons) of NOx emissions emitted from:

   a. engines on any WTG or OSS;

   b. all engines on vessels included in the definition of an OCS source: and

   c. all engines on vessels servicing or associated with the WA facility when those vessels are at the WA facility, or en route to or from the WA facility and are within 25 miles of the WA facility's centroid.

9. Daily emissions for vessels shall be calculated using the following formula:

$$E = kW * Hours * LF * EF * 1.10231E\text{-}6$$

Where:

- E = total emissions, tons
- kW = total engine size, kW
- Hours = hours for each engine
- LF = engine load factor
- EF = emission factor, g/kW-hr
- 1.10231E-6 = g to ton conversion factor

When determining the values for the above variables, the Permittee shall use the following:

a. The engine load factor should be calculated using actual fuel usage data, engine operating time, manufacturing load and fuel consumption rate information, and the following formula:

$$LF = V \div T \div Rmax$$

Where:

- LF = engine load factor
- V = volume fuel consumed during engine operation, gal
- T = engine operating time, hours
- Rmax = fuel consumption rate at maximum engine power, gal/hr

Alternatively, if actual fuel usage data is not available, the Permittee may use an engine load factor of 0.69.

b. For domestically flagged vessels, the emission factor shall be the NOx and HC emission rate for the Tier level the engine has been certified to meet. If the Tier level combines both NOx and either HC or THC into one emission limit, then that emission limit shall be multiplied by 0.976 for NOx. The emission rates are contained in 40 C.F.R. §§ 1042.101 or 1042 – Appendix I and vary depending on

the engine's Tier classification. For engines on domestically flagged vessels without a Tier certification the emission factors shall be the following:

i. For Category 1 engines 9.7 g/kW-hr for NOx.
ii. For Category 2 engines 16.5 g/kW-hr for NOx.
iii. For Category 3 engines 19.5 g/kW-hr for NOx.

c. For foreign flagged vessels, the emission factor for NOx shall be the emission rate for the Tier level engine in Table 2 of this permit. For category 3 engines and foreign flagged vessels without Annex VI certifications, the emission factor shall be 19.5 g/kW-hr for NOx.

10. The construction start date and the operational phase start date.

11. Each time the Permittee uses a vessel while operating as an OCS source with a lower Tier certified engine, record the condition the Permittee relied on to justify the use of a vessel with a lower Tier certified engine under Section IV.C.

12. For all engines operating on OCS sources (including vessels meeting the definition of an OCS source), the Permittee shall provide fuel supplier certifications, for each fuel delivery, documenting the following:

a. The name of the vessel;

b. The name of the fuel supplier;

c. The sulfur content of the fuel;

d. The method used to determine the sulfur content of the fuel;

e. The location of the fuel when the sample was drawn for analysis to determine the sulfur content of the fuel; specifically including whether the fuel was sampled as delivered to SFW or whether the sample was drawn from fuel in storage at the fuel supplier's or fuel refiner's facility or another location;

If the fuel was not sampled as delivered, a statement that the sampling was performed according to either the single tank composite sampling procedure or the all-levels sampling procedure in ASTM D4057-88, "Standard Practice for Manual Sampling of Petroleum and Petroleum Products" and that no additions have been made to the supplier's tank since sampling.

[310 CMR 7.05, 40 C.F.R. § 60.4207(b) and 40 C.F.R. § 80.510(b)]

13. For all applicable adhesives, sealants, adhesive primers, and sealant primers, the Permittee shall maintain records demonstrating compliance with 310 CMR 7.18(30), including, but not limited to, the following information:

a. a data sheet or materials list that provides the material name, product category according to 310 CMR 7.18(30)(c): Table 1, and Table 2, manufacturer identification, the VOC content of each product as supplied, and type of material application;

b. a list of each adhesive, sealant, adhesive primer, sealant primer, cleanup solvent, and surface preparation solvent in use and in storage;

c. a list of reducers, catalysts, or other components used and the as applied mix ratio;

d. the final VOC content of any adhesive, sealant, adhesive primer, or sealant primer as applied;

e. the VOC content and vapor pressure, of any cleanup solvents, surface preparation solvents, reducers and catalysts, and VOC-containing materials used in the preparation, application, rework, and cleaning processes related to use or application of any adhesive, sealant, adhesive primer, or sealant primer;

f. the monthly volume of each adhesive, sealant, adhesive primer, sealant primer, cleanup solvent, and surface preparation solvent used;

g. the monthly total facility-wide VOC emissions from all adhesives, sealants, adhesive primers, and sealant primers used or applied at any facility where a person is claiming an exemption pursuant to 310 CMR 7.18(30)(d)4.

[310 CMR 7.18(30)e]

14. The Permittee shall make all records required by this permit available to the EPA upon request. The records shall be kept for a minimum of five years and located at an onshore office.

15. The Permittee shall keep records of all required information necessary to submit annual Source Registration / Emissions Statements to MassDEP as required by Condition IX.8 of this permit. [310 CMR 7.12]

## IX. Reporting Requirements

1. The Permittee shall notify the EPA, in writing, at least 30 days, but no more than 90 days, prior to locating the first OCS source.

2. The Permittee shall notify the EPA, in writing, at least 30 days prior to installing and/or operating an Engine on each and every WTG and OSS. The notification shall include for each Engine the make, model, maximum rated power output, cylinder size, and manufacturing date.

3. When requested by the EPA, within 30 days or such other timeframe as agreed upon, the Permittee shall furnish any information related to the permit. If the Permittee becomes aware that relevant facts were not submitted or were incorrect in the permit application or in any report to the EPA, the Permittee shall, upon becoming aware of such facts or corrected information, promptly submit to the EPA such facts or corrected information.

4. Within 30 days or such other timeframe as agreed upon, the Permittee shall furnish to the EPA any information that the EPA may request in writing to determine whether cause exists for modifying, revoking, reissuing, or terminating the permit, or to determine compliance with the permit. Upon request, the Permittee shall also furnish to the EPA copies of records that are required to be maintained by this permit, including information claimed to be confidential. Information claimed to be confidential must be accompanied by a claim of confidentiality according to the provisions of 40 C.F.R. Part 2, subpart B.

5. The Permittee shall hold at its onshore office, all records required by the permit including, but not limited to, monitoring data and support information required by this permit, and records of all data used to complete the application for this permit. These materials shall be retained for at least five years from the date of the sample, measurement, or report unless otherwise specified.

6. The Permittee shall comply with the requirements specified in the following parts of the New Source Performance Standards, Subpart A (General Provisions): 40 C.F.R. §§ 60.1 through 60.6, 60.9, 60.10, 60.12, 60.14 through 60.17, and 60.19, as specified in Table 8 of 40 C.F.R. part 60, subpart IIII (Standards of Performance for Stationary Compression Ignition (CI) Internal Combustion Engines (ICE)). [40 C.F.R. § 60.4218]

7. The Permittee shall comply with the requirements specified in the following parts of the New Source Performance Standards, Subpart A (General Provisions): 40 C.F.R. §§ 60.1 through 60.6, 60.9, 60.10, 60.12, 60.14 through 60.17, and 60.19, as specified in Table 8 of 40 C.F.R. part 60, subpart JJJJ (Standards of Performance for Stationary Spark Ignition Internal Combustion Engines). [40 C.F.R. § 60.4246]

8. In accordance with 310 CMR 7.12, the Permittee shall report annually to the Massachusetts Department of Environmental Protection (MassDEP), all information as required by the Source Registration/Emission Statement Form. The Responsible Official for the Permittee shall sign and submit a Source Registration to the MassDEP every year by May 1st. The Permittee shall note therein any minor changes (under 310 CMR 7.02(2)(e), 7.03, 7.26, etc.), which did not require Plan Approval. [310 CMR 7.12]

9. The Permittee shall demonstrate that any NOx CERCs used for compliance are surplus, quantifiable, enforceable, and permanent. The Permittee shall submit the demonstration to the EPA prior to the Operational Phase Start Date. The demonstration shall include, at a minimum, 1) the source where the CERCs were generated; 2) the time period used to determine the CERCs; and 3) whether the CERCs have been adjusted to take into account the CAA and the Commonwealth's requirements in effect as of January 13, 2021 (the date SFW's application was deemed complete).

10. The Permittee shall submit annually by January 31, April 30, July 31, and October 31 for the previous three months respectively, a report to the EPA, including the following:

    a. Results of all visible emission tests performed in accordance with section VII of this permit.

    b. The daily NOx emissions determined by section VIII of this permit.

    c. The date of any deviation from a permit term or condition that occurred during the reporting period and the corrective actions taken to resolve the deviation.

    d. The date of return to compliance for any deviation that had occurred during the reporting period.

    e. A Corrective Action Plan, including the anticipated remedy, for all outstanding deviations at the time of reporting.

    f. Any additional information for determining the compliance status with the permit required by the EPA in writing prior to the start of the reporting period.

11. The Permittee shall promptly report to the EPA all instances of deviations from permit requirements by email, within three days of discovery of such deviation. The email address can be found in section XVI of this permit.

12. The Responsible Official shall certify, annually for the calendar year, that the facility is in compliance with the requirements of this permit. The report shall be postmarked or delivered by January 31st each year to the EPA. The report shall be submitted in compliance with the submission requirements below. The compliance certification and report shall describe:

    a. the terms and conditions of the permit that are the basis of the certification;

    b. the current compliance status and whether compliance was continuous or intermittent during the reporting period;

    c. the methods used for determining compliance, including a description of the monitoring, record keeping, and reporting requirements and test methods; and

    d. any additional information required by the EPA to determine the compliance status of the source.

[310 CMR 7.02(7)(c)]

13. Any document required to be submitted under this permit, or any other document requested by the EPA which is not specified in this permit shall be certified by a responsible official as to the truth, accuracy and completeness. Such certification shall be in compliance with 310 CMR 7.01(2) and contain the following language:

> "I certify that I have personally examined the foregoing and am familiar with the information contained in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including possible fines and imprisonment."

[310 CMR 7.01(2)(c)]

## X. General Conditions

The Permittee shall comply with the following general conditions:

1. Should there be any differences between the permit application and this permit, the permit shall govern.

2. The ability to operate and/or construct an OCS source under this permit shall become invalid if construction is not commenced within 18 months after the effective date of this permit, if construction is discontinued for a period of 18 months or more, or if construction is not completed within a reasonable time. The 18-month period may be extended upon a showing satisfactory to the EPA or the delegated agency that an extension is justified. Sources obtaining extensions are subject to all new or interim requirements and a reassessment of the applicable control technology when the extension is granted. This requirement shall not supersede a more stringent requirement under 40 C.F.R. §§ 55.13 or 55.14. [40 C.F.R. §55.6(b)(4), 40 C.F.R. § 52.21(q)(2)].

3. This permit may be suspended, modified, or revoked by the EPA if the EPA determines that any condition or part of this permit is being violated.

4. This permit may be modified or amended when in the opinion of the EPA such modification or amendment is necessary or appropriate to clarify the permit conditions, or after consideration of a written request by the Permittee to modify or amend the permit conditions. The filing of a request by the Permittee for a permit revision, revocation and reissuance, or termination, or of a notification of planned changes or anticipated noncompliance does not stay any OCS permit condition.

5. Pursuant to 310 CMR 7.01(3) and 7.02(3)(f) and 40 C.F.R. § 55.6(a)(4), the Permittee shall comply with all conditions contained in this permit. Should there be any differences between provisions contained in the General Conditions of this permit and any provisions contained elsewhere in this permit, the latter shall govern.

6. The Permittee shall notify all other owners and operators, contractors, and the subsequent owners and operators (if any) associated with emissions from the permitted activities, of the conditions of the permit. [40 C.F.R. § 55.6(a)(4)(iv)]

7. The Permittee shall comply with all applicable requirements of 40 C.F.R. part 55 and this permit. Failure to do so shall be considered a violation of section 111(e) of the CAA. All enforcement provisions of the CAA, including, but not limited to, the provisions of sections 113, 114, 120, 303 and 304 of the CAA, shall apply to the permitted activities. [40 §§ C.F.R. 55.8, 55.9(a) and (b)].

8. As provided in 40 C.F.R. § 55.9(c), if the Permittee is ordered to cease operation of any piece of equipment due to an enforcement action taken by EPA, the shutdown will be coordinated by the EPA with BOEM and the United States Coast Guard, to assure that the shutdown will proceed in a safe manner. No shutdown action will occur until after the EPA's consultation with these entities, but in no case, will initiation of the shutdown be delayed by more than 24 hours. [40 C.F.R. part 55]

9. All applicable permit fees as specified under 40 C.F.R. § 55.10 and 310 CMR 4.00, shall be submitted to the federal government according to the fee schedule in 310 CMR 4.00. [310 CMR 4.00]

10. If requested in writing by the EPA, the Permittee shall have up to 30 days to submit to the EPA, an Emission Reduction Plan that meets the requirements of 310 CMR 8.00. [310 CMR 8.08]

11. The Permittee shall construct and operate all equipment regulated herein in compliance with all other applicable provisions of federal and state air regulations. [40 C.F.R. § 55.6(a)(4)(iii)]

12. In the case of a safety issue, engine failure, or a storm at sea, that requires a vessel to attach temporarily to the seabed, the vessel will not be considered an OCS source as a result of that attachment. [40 C.F.R. § 55.2]

## XI. Right of Entry

The Permittee shall allow all authorized representatives of EPA, upon presentation of credentials, to enter upon or through any OCS source permitted by this permit and to enter upon or through any location where records required under this permit are maintained. The Permittee shall allow such authorized representatives:

1. At reasonable times, to access and copy any records that must be maintained under this permit;

2. To inspect any OCS source, equipment (including monitoring and air pollution control equipment), practices, or operations regulated or required under this permit; and

3. To monitor substances or parameters, and sample emissions, for purposes of assuring compliance with this permit.

[Section 114 of the Clean Air Act, 42 U.S.C. § 7414; 40 C.F.R. §§ 55.8(a), (b), and (d)].

## XII. Transfer of Ownership

In the event of any changes in control or ownership of the project, this permit shall be binding on all subsequent owners and operators. The Permittee shall notify the succeeding owner and operator of the existence of this permit and its conditions before such change if possible, but in no case later than 14 days after such change. Notification shall be sent by letter with a copy forwarded within 5 days to the EPA.

## XIII. Severability

The provisions of this permit are severable, and if any provision of the permit is held by a court or other tribunal of competent jurisdiction to be invalid or unenforceable, the remainder of this permit will not be affected thereby and shall remain in full force and effect.

## XIV. Credible Evidence

For the purpose of establishing whether or not the Permittee has violated or is in violation of any provision of this permit, the methods used in this permit shall be used, as applicable. However, nothing in this permit shall preclude the use, including the exclusive use, of any credible evidence or information, relevant to whether the Permittee would have been in compliance with applicable requirements if the appropriate performance or compliance test procedures or methods had been performed.

## XV. Permit Fees

1. The Permittee shall submit the permit application fee of $24,305 for a major comprehensive plan approval for the OCS permit.

2. The Permittee shall submit the application fee to the EPA within 60 days from receipt of written notice by the EPA of the fee amount due.

[310 CMR 4.10(2)(c)(4)]

## XVI. Agency Address

Subject to change, except for prompt reporting of permit deviations and fee payments, all correspondence required by this permit, including, but not limited to, all records, reports, or other information requested by EPA shall be forwarded to:

Air Compliance Clerk
U.S. EPA New England
5 Post Office Square
Mail Code: 04-2
Boston MA 02109-3912

Prompt reporting of permit deviations shall be sent electronically to the Air Compliance Clerk. At the time of permit issuance, the email address is schwartz.sandra@epa.gov.