

EXHIBIT D  
Air Permit,  
OCS-EPA-R2  
NJ 02



**U.S. Environmental Protection Agency  
Region 2**

**OUTER CONTINENTAL SHELF AIR PERMIT**

Issued to

**Atlantic Shores Offshore Wind Project 1, LLC**

For the

**Atlantic Shores Project 1 and Project 2**

EPA Permit Number: OCS-EPA-R2 NJ 02

Issue Date: 09/30/2024

Effective Date: 10/30/2024.

In accordance with the provisions of section 328 of the Clean Air Act, 42 U.S.C. § 7627, and the implementing Outer Continental Shelf ("OCS") air regulations at title 40 of the Code of Federal Regulations ("C.F.R."), Part 55, the United States Environmental Protection Agency, Region 2 Office ("EPA") is issuing an OCS air quality permit to:

Atlantic Shores Offshore Wind Project 1, LLC  
1 Dock 72 Way, Floor 7  
Brooklyn, NY 11205

Atlantic Shores Offshore Wind Project 1, LLC is hereby authorized to construct and operate two offshore wind farms located on the OCS within the lease area OCS-A 0499, about 7.6 nautical miles (8.7 statute miles) from the New Jersey shoreline. The construction and operation of the two wind farms shall be subject to the attached permit conditions and permit limitations.

 Digitally signed by RICHARD  
RUV0  
Date: 2024.09.29 15:14:13 -04'00'

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Richard Ruvo, Director  
Air and Radiation Division

09/29/2024

Date

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## I. DEFINITIONS

*12-Month Rolling Total Emissions* means the facility-wide total emissions for a 12-month period, recalculated for each calendar month, which includes that month and the 11 months prior. The Permittee will calculate and record the 12-Month Rolling Total Emissions of each relevant air pollutant by adding the *Daily Emissions* for each emission source for each month, and then adding the *Daily Emissions* for that month to the tons of that air pollutant from the previous 11 consecutive months to get the 12-month rolling total tons for that air pollutant.

*Category 1* means relating to a marine engine with specific engine displacement below 7.0 liters per cylinder.<sup>1</sup>

*Category 2* means relating to a marine engine with a specific engine displacement at or above 7.0 liters per cylinder but less than 30.0 liters per cylinder.

*Category 3* means relating to a reciprocating marine engine with a specific engine displacement at or above 30.0 liters per cylinder.

*Commence construction* refers to commencing construction within the Wind Development Area. This is the date on which the owner or operator has all necessary preconstruction approvals or permits and has either:

- (1) Begun, or caused to begin, a continuous program of actual construction, to be completed within a reasonable time as determined by EPA; or
- (2) Entered into binding agreement or contractual obligation, which cannot be cancelled or modified without substantial loss to the owner or operator, to undertake a program of actual construction to be completed within a reasonable time as determined by EPA.

*Construction and Commissioning Phase*, or *C&C*, begins on the *C&C Start Date* and ends for Project 1 or Project 2 when the last wind turbine generator (“WTG”) of Project 1 or Project 2, respectively, to be constructed begins producing commercial power.

*Construction and Commissioning Phase Start Date*, or *C&C Start Date*, is the first day any vessel, equipment, or activity, that meets the definition of an OCS source, operates, occurs, or exists in the Wind Development Area.

*Daily Emissions* means the facility-wide emissions of a given pollutant in a day from all emission sources at the OCS Facility and emissions from vessels servicing or associated with the OCS Facility while enroute to or from the OCS Facility when within 25 nautical miles (“nm”) of the OCS Facility.

*Day* means a calendar day, including weekends and federal/state holidays.

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<sup>1</sup>Category 1, Category 2, and Category 3 for marine engines are defined at 40 C.F.R. § 1042.901 (“Definitions”).

*Foreign-flagged vessel* means a vessel of foreign registry, or a vessel operated under the authority of a country other than the United States.

*Marine engine*<sup>2</sup> means a nonroad engine 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. There are two kinds of marine engines:

- (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.

*OCS Facility* means the entire wind development area once the first OCS source is established in the Wind Development Area. The first OCS source is established once any equipment or activity that meets the definition of an OCS source is located within the Wind Development Area.

*OCS Lease Area* means the area within the designated Renewable Energy Lease Area OCS-A 0499, awarded by the Bureau of Ocean Energy Management (“BOEM”) and located about 7.6 nautical miles (8.7 statute miles) off the coast of New Jersey. The boundaries of the lease area are those defined by the BOEM lease.

*OCS Source* is defined as set forth in 40 C.F.R. § 55.2.

*OCS Source Vessel*, or a *Vessel that is an OCS Source*, is any vessel that:

- (1) Emits or has the potential to emit any air pollutant;
- (2) Is regulated or authorized under the Outer Continental Shelf Lands Act (“OCSLA”) (43 U.S.C. §1331 *et seq.*);
- (3) Is located on the OCS or in or on waters above the OCS; and
- (4) Is 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 is physically attached to an OCS source, in which case only the stationary source aspects of the vessels will be regulated.

*Operation and Maintenance Phase*, or *O&M*, is the period that begins on the operation and maintenance phase start date.

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<sup>2</sup>Marine engine is defined at 40 C.F.R. § 1042.901.

*Operation and Maintenance Phase Start Date*, or *O&M Phase Start Date*, is the first day the Atlantic Shores project produces commercial power.

*Permittee* includes Atlantic Shores Offshore Wind Project 1, LLC; its successor(s) that operate 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 operation.

*State-of-the-Art* or *SOTA* refers to the requirement from the Air Pollution Control Act of New Jersey which mandates that new or modified “significant sources” which emit air pollutants incorporate “advances in the art of air pollution control” as described in N.J.A.C. 7:27-8.12. Per N.J.A.C. 7:27-8.12, SOTA is equivalent to BACT or LAER, Maximum Achievable Control Technology (MACT), or New Source Performance Standards (NSPS) for sources and pollutants subject to any of those standards or requirements; for other sources and/or pollutants, SOTA may be compliance with a SOTA Manual, a general permit, or case-by-case SOTA.

*Tier 1* means relating to the Tier 1 emission standards, as shown in Appendix I to 40 C.F.R. Part 1042.

*Tier 2* means relating to the Tier 2 emission standards, as shown in 40 C.F.R. § 1042.104 and Appendix I to 40 C.F.R. Part 1042.

*Tier 3* means relating to the Tier 3 emission standards, as shown in 40 C.F.R. § 1042.101 and § 1042.104.

*Tier 4* means relating to the Tier 4 emission standards, as shown in 40 C.F.R. § 1042.101.

*Ultra-low sulfur diesel (ULSD)* means diesel fuel that is certified to meet the standards in 40 C.F.R. § 1090.305.

*U.S.-flagged vessel* means a vessel of U.S. registry, or a vessel operated under the authority of the United States.

*Wind Development Area (“WDA”)* is the designated Renewable Energy Lease Area OCS-A 0499, awarded by BOEM, located on the OCS. The project lease area is approximately 102,124 acres. Project 1 is located in the western portion of the WDA, and Project 2 is located in the eastern portion of the WDA, with an Overlap Area that could be used by either Project 1 or Project 2. At its closest point the WDA is approximately 7.6 nautical miles (8.7 statute miles) from the New Jersey shoreline. Note that the term WDA is used before an individual OCS source is established. Once the first OCS source is established in the WDA, the entire WDA is considered the OCS Facility.

## II. PROJECT DESCRIPTION

Atlantic Shores Offshore Wind Project 1, LLC (“Atlantic Shores” or “Permittee”), along with its affiliate, Atlantic Shores Offshore Wind Project 2, LLC (“Atlantic Shores Project 2 Company”), proposes to construct (install) and operate two offshore wind farms totaling approximately 2,840 megawatts (“MW”) in the designated Renewable Energy Lease Area OCS-A 0499 awarded by BOEM. The Lease Area covers approximately 102,124 acres located approximately 7.6 nautical miles (8.7 statute miles) from the New Jersey shoreline. Atlantic Shores and its affiliate, Atlantic Shores Project 2 Company, propose to develop the OCS lease area into two wind farms, known as Atlantic Shores Project 1 (“ASP1”) (1,510 MW) and Atlantic Shores Project 2 (“ASP2”) (target capacity of 1,327 MW), collectively referred to as the OCS Facility.

The final design of the OCS Facility has not been completed yet. The main project components that are subject to the OCS air permit terms and conditions will encompass:

- (1) up to 200 wind turbine generators (“WTGs”) with either monopile or piled jacket foundations. The WTGs use the energy of the wind, a source of renewable energy, and convert it to electricity;
- (2) up to 8 small, 5 medium or 4 large offshore substations (“OSSs”) with jacket foundations that will have permanent diesel generator engines (collectively up to eight 500 kW generators, depending on the final OSS design);
- (3) all infrastructure, including up to 547 miles of High-Voltage Alternating Current (“HVAC”) inter-array cables that will connect the WTGs and OSSs; up to 37 miles of HVAC inter-link cables that may be used to connect the OSSs to each other;
- (4) One permanent meteorological (“met”) tower used during both the construction and commissioning (“C&C”) phase and the operations and maintenance (“O&M”) phase and up to four temporary meteorological and oceanographic (“metocean”) buoys to monitor weather and sea state conditions within the OCS Facility during the C&C phase;
- (5) marine vessels with marine engines that will be used to construct and maintain the project components; and
- (6) portable diesel generator engines that will be temporarily located on the WTGs and OSSs platforms at times during the project’s C&C phase, and most of which subsequently will be used as permanent diesel generators located on the OSSs during the project’s O&M phase.

For OCS air permitting purposes, the project is divided into two phases, a Construction and Commissioning Phase and an Operations and Maintenance Phase. The C&C Phase is estimated to last about two years, and the O&M Phase will last for the duration of the project’s operational life. The project’s anticipated operational life is 30 years. There will also be a decommissioning phase at the end of the project’s anticipated operational life, which would involve the use of various marine vessels and construction equipment to remove the project’s structures from the OCS. This permit does not authorize the permittee to commence any such decommissioning activities, which may be subject to a separate preconstruction review process.

This OCS air permit covers emissions from the activities and emission sources that will occur within the BOEM Lease Area OCS-A 0499, as well as emissions from marine vessels while en route to and from the OCS location of the project when within 25 nautical miles of the OCS Lease Area's boundary, as described in the permit application.

Air pollutant emissions generated by the project include nitrogen oxides (NO<sub>x</sub>), carbon monoxide (CO), sulfur dioxide (SO<sub>2</sub>), particulate matter (PM), particulate matter with an aerodynamic diameter less than or equal to 10 microns (PM<sub>10</sub>), particulate matter with an aerodynamic diameter less than or equal to 2.5 microns (PM<sub>2.5</sub>), volatile organic compounds (VOC), greenhouse gas (GHG), and hazardous air pollutants (HAPs). These air pollutants are mainly associated with the combustion of diesel fuel in (1) marine engines, including main or propulsion marine engines and auxiliary marine engines on marine vessels that will be used at various times during C&C and O&M to construct and maintain the project. Some of the auxiliary marine engines will be powering specific equipment such as pile driving hammers and air compressors; (2) non-marine engines, including portable diesel generator engines used on a temporary basis during commissioning of each OSS or WTG, most of which will then become permanent diesel generator engines installed on and used on the OSSs during O&M. These permanent diesel engines will each be limited to 500 hours of operation per year. Other emission sources include (1) Sulfur hexafluoride (SF<sub>6</sub>) insulated electrical switchgears installed in the WTGs' foundations and OSSs' topsides, which will emit fugitive SF<sub>6</sub> emissions (a GHG pollutant) due to possible equipment leakage; (2) Ultra Low Sulfur Diesel ("ULSD") storage tanks that will be located on a temporary basis on the OSS platforms during C&C, and on a permanent basis on the OSSs during O&M, and which will emit fugitive VOC emissions; and (3) touch-up painting activities and cleaning of WTG and OSS mechanical components during C&C and O&M, which will also emit fugitive VOC emissions.

### **III. EMISSION SOURCES LISTS AND DESCRIPTIONS USED TO DETERMINE POTENTIAL TO EMIT OF THE OCS FACILITY**

#### **A. Representative Marine Vessels and Associated Main and Auxiliary Marine Engines During C&C**

The following Table 1A is a list of representative marine vessels and their marine engines that the Permittee has anticipated using during C&C. Emissions from these vessels and their engines while at the OCS source, and while en route to or from the source when within 25 nm of the source, must be included in the OCS Facility's potential to emit emissions.

The Permittee has not yet contracted the specific vessels it will use for the project; Atlantic Shores states that it is not possible for them to know the exact vessel that will be used until a short time before construction begins. Therefore, the table below lists marine vessels (and their marine engines) that are the types of vessels that the Permittee anticipates using. Atlantic Shores may end up using vessels and associated marine engines similar to but different from those listed, and those engines will be subject to the terms and conditions of this permit.

Some of the vessels listed in Table 1A are anticipated to meet the definition of "OCS source" in 40 C.F.R. § 55.2; other vessels are not. As shown below in Table 1A, the Permittee identified

three jack-up vessels that have the potential to become OCS sources during C&C; these vessels will be used for the WTG installation activities. The marine engines (Categories 1, 2, or 3) of those 3 OCS source vessels are subject to BACT and LAER air pollution control permitting requirements, as well as NSPS requirements such as those at 40 C.F.R. Part 60, Subpart III. In addition, during C&C some of the marine engines onboard the jack-up vessels are expected to emit certain pollutants over the SOTA thresholds, such as NO<sub>x</sub>, CO, TSP, PM<sub>10</sub>, and PM<sub>2.5</sub>, and thus will be subject to the relevant New Jersey SOTA requirements under N.J.A.C. 7:27-8.12.<sup>3</sup> Each jack-up vessel type listed in Table 1A may be a “U.S.-flagged vessel” or a “Foreign-flagged vessel,” as these terms are defined in the permit. For OCS source vessels, the Permittee states that although it uses representative vessels in its application, it will meet applicable air pollution control technology requirements by using vessels with the highest-tiered engines that are available at the time of deployment. However, the vessels deployed are primarily dependent on the vessels contracted. Sections IV.A.1.e and X.8.c below outline requirements to ensure that OCS source vessels deployed are those with the highest-tiered engines available at the time the vessels were contracted.

The main (or propulsion) and auxiliary marine engines listed below will be Category 1, Category 2, or Category 3 marine engines, as those terms are defined in this permit. All of the marine engines are compression ignition (“CI”) internal combustion engines (“ICE”) that will use ULSD with 15 ppm sulfur or less, or diesel fuel with a maximum sulfur content of 1,000 ppm for a small number of vessels with marine engines where the use of ULSD is not possible.

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<sup>3</sup> As explained in the definition section, SOTA refers to New Jersey’s Air Pollution Control Act requirements, which mandate that new or modified “significant sources” which emit air pollutants incorporate “advances in the art of air pollution control” if a given pollutant’s emissions are higher than certain SOTA thresholds as described in N.J.A.C. 7:27-8.12. The applicable SOTA thresholds for NO<sub>x</sub>, CO, TSP, PM<sub>10</sub>, and PM<sub>2.5</sub> can be found in Appendix 1, Table A of N.J.A.C. Subchapter 8.

**Table 1A – Representative Types of Marine Vessels, and Associated Main and Auxiliary Marine Engines, to be Used During C&C, as Described by Atlantic Shores, for Each of the Following Activities.**

<b>Representative Vessel Type for WTG and OSS Foundation Installation (for both ASP1 and ASP2<sup>a</sup>)</b>	<b>Activity/Vessel Description</b>	<b>Identified in Application as OCS Source? (Y/N)<sup>b</sup></b>	<b>Marine Engines (per each vessel): Type (Main or Auxiliary), Number &amp; Maximum Engine Power (in kilowatts (kW)/engine)</b>
Heavy Lift Vessel (HLV)	Medium HLV	N	Main engines (4): 3,840 Main engines (2): 4,800 Auxiliary engine (1): 1,110
Tug	Bubble Curtain Support Vessel	N	Main engines (2): 5,530
Barge 1	Barge	N	Auxiliary engine (1): 50
Barge 2	Barge	N	Auxiliary engine (1): 50
US Towing Tug 1	US Towing Tug	N	Main engines (2): 2,525 Auxiliary engines (3): 79
US Towing Tug 2	US Towing Tug	N	Main engines (2): 2,525 Auxiliary engines (3): 79
Crew Transfer Vessel	Crew Transfer/Protected Species Observer (PSO)/Noise Monitoring Vessel	N	Main engines (4): 522 Auxiliary engines (2): 27
Bubble Curtain Power <sup>c</sup>	Air Compressor	N	Auxiliary engines (20): 399
Hydraulic Hammer Power <sup>c</sup>	Hydraulic Hammer Engine	N	Auxiliary engines (3): 597
Heavy Lift Vessel (HLV)	Large HLV	N	Main engines (11): 4,182 Auxiliary engine (1): 5,833
Tug	Bubble Curtain Support Vessel	N	Main engines (2): 5,530
Barge	Transport Barge 1	N	Auxiliary engine (1): 50
Barge	Transport Barge 2	N	Auxiliary engine (1): 50

<sup>a</sup> ASP1 and ASP2 will each use the same set of vessels.

<sup>b</sup> This column indicates whether the applicant represented that the vessel would be an OCS source.

<sup>c</sup> This is not a vessel type. This is an engine that can be located on any of the vessel types or a barge with no propulsion engine. Atlantic Shores has expressed it does not expect to locate this engine on an OCS source vessel, but note that the OCS source status of the actual vessel on which the engine is located may impact the requirements applicable to this engine.

**Table 1A – Representative Types of Marine Vessels, and Associated Main and Auxiliary Marine Engines, to be Used During C&C, as Described by Atlantic Shores, for Each of the Following Activities. (Continued)**

<b>Representative Vessel Type for OSS Installation (for both ASP1 and ASP2<sup>a</sup>)</b>	<b>Activity/Vessel Description</b>	<b>Identified in Application as OCS Source? (Y/N)<sup>b</sup></b>	<b>Marine Engines (per each vessel): Type (Main or Auxiliary), Number &amp; Maximum Engine Power (in kW/engine)</b>
Barge	Transport Barge 3	N	Auxiliary engine (1): 50
Barge	Transport Barge 4	N	Auxiliary engine (1): 50
US Towing Tug	US Towing Tug 1	N	Main engines (2): 2,525 Auxiliary engines (3): 79
US Towing Tug	US Towing Tug 2	N	Main engines (2): 2,525 Auxiliary engines (3): 79
US Towing Tug	US Towing Tug 3	N	Main engines (2): 2,525 Auxiliary engines (3): 79
US Towing Tug	US Towing Tug 4	N	Main engines (2): 2,525 Auxiliary engines (3): 79
Crew Transfer Vessel	Crew Transfer Vessel	N	Main engines (4): 522 Auxiliary engines (2): 27
Bubble Curtain Power <sup>c</sup>	Air Compressor	N	Auxiliary engines (20): 399
Hydraulic Hammer Power <sup>c</sup>	Hydraulic Hammer Engine	N	Auxiliary engines (3): 597

<sup>a</sup> ASP1 and ASP2 will each use the same set of representative vessels.

<sup>b</sup> This column indicates whether the applicant represented that the vessel would be an OCS source.

<sup>c</sup> This is not a vessel type. This is an engine that can be located on any of the vessel types or a barge with no propulsion engine. Atlantic Shores has expressed it does not expect to locate this engine on an OCS source vessel, but note that the OCS source status of the actual vessel on which the engine is located may impact the requirements applicable to this engine.

**Table 1A – Representative Types of Marine Vessels, and Associated Main and Auxiliary Marine Engines, to be Used During C&C, as Described by Atlantic Shores, for Each of the Following Activities. (Continued)**

<b>Representative Vessel Type for Scour Protection (for both ASP1 and ASP2<sup>a</sup>)</b>	<b>Activity/Vessel Description</b>	<b>Identified in Application as OCS Source? (Y/N)<sup>b</sup></b>	<b>Marine Engines (per each vessel): Type (Main or Auxiliary), Number &amp; Maximum Engine Power (in kW/engine)</b>
Fall Pipe Vessel	Fall Pipe Vessel	N	Main engines (4): 3,350 Main engines (4): 2,000 Auxiliary engine (1): 2,950
US Dredger	US Dredger	N	Auxiliary engines (2): 641 Auxiliary engine (1): 954
<b>Representative Vessel Types for Inter Array Cable Installation (for both ASP1 and ASP2<sup>a</sup>)</b>	<b>Activity/Vessel Description</b>	<b>Identified in Application as OCS Source? (Y/N)<sup>b</sup></b>	<b>Marine Engines (per each vessel): Type (Main or Auxiliary), Number &amp; Maximum Engine Power (in kW/engine)</b>
Cable Installation Vessel	Cable Installation	N	Main engine (1): 7,280 Auxiliary engine (1): 220
Support Vessel/SOV	Cable Installation Support Activities	N	Main engines (4): 1,200 Auxiliary engine (1): 800
TSHD (Dredger)	Sand Wave Clearance	N	Main engines (2): 641 Auxiliary engine (1): 954
AHTS	Pre-Lay Grapnel Run AHTS 1	N	Main engines (2): 4,500 Auxiliary engines (2): 410
AHTS	Pre-Lay Grapnel Run AHTS 2	N	Main engines (2): 4,500 Auxiliary engines (2): 410
Rock Dumping Vessel (Fall Pipe Vessel)	Post-Install Rock Protection	N	Main engines (4): 3,350 Main engines (4): 2,000 Auxiliary engine (1): 2,950

<sup>a</sup> ASP1 and ASP2 will each use the same set of representative vessels.

<sup>b</sup> This column indicates whether the applicant represented that the vessel would be an OCS source.

**Table 1A – Representative Types of Marine Vessels, and Associated Main and Auxiliary Marine Engines, to be Used During C&C, as Described by Atlantic Shores, for Each of the Following Activities. (Continued)**

<b>Representative Vessel Types for WTG Installation (for both ASP1 and ASP2<sup>a</sup>)</b>	<b>Activity/Vessel Description</b>	<b>Identified in Application as OCS Source? (Y/N)<sup>b</sup></b>	<b>Marine Engines (per each vessel): Type (Main or Auxiliary), Number &amp; Maximum Engine Power (in kW/engine)</b>
Jack-Up Vessel	WTG/OSS Installation	Y	Main engines (4): 3,535, all Category 3. Main engines (3): 2,650, all Category 3. Auxiliary engine (1): 2,650, Category 3.
Jack-Up Vessel	US Jack Up Feeder 1	Y	Main engines (2): 2,500, all Category 3. Auxiliary engine (1): 2,500; engine is either Category 1 or 2.
Jack-Up Vessel	US Jack Up Feeder 2	Y	Main engines (2): 2,500, all Category 3. Auxiliary engine (1): 2,500; engine is either Category 1 or 2.
Crew Transfer Vessel	Crew Transfer	N	Main engines (4): 522 Auxiliary engines (2): 27
Service Operation Vessel (SOV)	WTG Commissioning SOV	N	Main engines (4): 1,200 Auxiliary engine (1): 800

<sup>a</sup> ASP1 and ASP2 will each use the same set of representative vessels.

<sup>b</sup> This column indicates whether the applicant represented that the vessel would be an OCS source.

**Table 1A – Representative Types of Marine Vessels, and Associated Main and Auxiliary Marine Engines, to be Used During C&C, as Described by Atlantic Shores, for Each of the Following Activities. (Continued)**

<b>Representative Vessel Type for Export Cable Installation (for both ASP1 and ASP2<sup>a</sup>)</b>	<b>Activity/Vessel Description</b>	<b>Identified in Application as OCS Source? (Y/N)<sup>b</sup></b>	<b>Marine Engines (per each vessel): Type (Main or Auxiliary), Number &amp; Maximum Engine Power (in kW/engine)</b>
Export Cable Installation Vessel 1	Cable Installation	N	Main engines (2): 2,560 Main engines (2): 1,913 Auxiliary engines (2): 1,400
Export Cable Installation Vessel 2	Cable Installation	N	Main engines (2): 2,560 Main engines (2): 1,913 Auxiliary engines (2): 1,400
Support and Jointing Vessel	Support and Jointing	N	Main engines (2): 2,350 Main engine (1): 1,786 Auxiliary engines (2): 994
Dredger	Trailing Suction Hopper Dredge (TSHD)	N	Main engines (2): 641 Auxiliary engine (1): 954
Tug	Anchor Handling Tug Supply (AHTS)	N	Main engines (2): 4,500 Auxiliary engines (2): 410
Rock Dumping Vessel (Fall Pipe Vessel)	Post-Install Rock Protection	N	Main engines (4): 3,350 Main engines (4): 2,000 Auxiliary engine (1): 2,950
<b>Representative Vessel Types for Fuel Bunkering (for both ASP1 and ASP2<sup>a</sup>)</b>	<b>Activity/Vessel Description</b>	<b>Identified in Application as OCS Source? (Y/N)<sup>^</sup></b>	<b>Marine Engines (per each vessel): Type (Main or Auxiliary), Number &amp; Maximum Engine Power (in kW/engine)</b>
Tug	Towing Tug	N	Main engines (2): 2,525 Auxiliary engines (3): 79
Barge	Barge	N	Auxiliary engine (1): 50
Motion Compensation <sup>c</sup>	Motion Compensation	N	Auxiliary engine (1): 500

<sup>a</sup> ASP1 and ASP2 will each use the same set of representative vessels.

<sup>b</sup> This column indicates whether the applicant represented that the vessel would be an OCS source.

<sup>c</sup> This is not a vessel type. This is an engine that can be located on any of the vessel types or a barge with no propulsion engine. Atlantic Shores has expressed it does not expect to locate this engine on an OCS source vessel, but note that the OCS source status of the actual vessel on which the engine is located may impact the requirements applicable to this engine.

### **B. Representative Marine Vessels, and Associated Main and Auxiliary Marine Engines, to be Used During O&M**

The following Table 1B is a list of the marine vessels and their marine engines that are representative of the types to be used during O&M. The Permittee has not yet contracted any of these vessels; Atlantic Shores states that it is not possible for them to know at this time the exact vessel that will be used. Therefore, Atlantic Shores may end up using vessels and associated marine engines similar to but different from those listed below, and those engines will be subject to the terms and conditions of this permit.

Table 1B provides information related to the different types of representative vessels Atlantic Shores expects to use for O&M. Some of the vessels listed in Table 1B are anticipated to meet the definition of “OCS source” in 40 C.F.R. § 55.2; other vessels are not. As shown in Table 1B below, the Permittee identified four jack-up vessels that have the potential to become OCS sources during O&M; three vessels will be used for WTG Heavy Logistics activities and one additional vessel will be used for OSS major repairs. The marine engines of those four OCS source vessels are subject to BACT and LAER air pollution control permitting requirements. In addition, some of the marine engines onboard some of the jack-up vessels are expected to emit NO<sub>x</sub> over the SOTA threshold during O&M. Each jack-up vessel type listed in Table 1B may be a “U.S.-flagged vessel” or a “Foreign-flagged vessel,” as these terms are defined in the permit.

The main (or propulsion) and auxiliary marine engines listed in Table 1B below will be Category 1, Category 2, or Category 3 marine engines, as those terms are defined in this permit. All of the marine engines are CI ICE that will use ULSD with 15 ppm sulfur or less, or diesel fuel with a maximum sulfur content of 1,000 ppm for a small number of vessels with marine engines where the use of ULSD is not possible. For OCS source vessels, the Permittee states that although it uses representative vessels in its application, it will meet applicable control technology requirements by using vessels with the highest-tiered engines that are available at the time of deployment. Note that the vessels deployed are primarily dependent on the vessels contracted. Sections IV.A.1.e and X.8.c below outline requirements to ensure that OCS source vessels deployed are those with the highest-tiered engines available at the time the vessels are contracted.

**Table 1B – Representative types of marine vessels, and associated main and auxiliary marine engines, to be used during O&M**

<b>Representative Vessel Type for WTG and BOP Crew Logistics (for ASP1 and ASP2<sup>d</sup>)</b>	<b>Number of Vessels of this Type</b>	<b>Identified in Application as OCS Source? (Y/N)<sup>b</sup></b>	<b>Marine Vessel Engines (per each vessel): Type (Main or Auxiliary), Number &amp; Maximum Engine Power (in kW/engine)</b>
Service Operations Vessel	1	N	Main engines (4): 1200 Auxiliary engine (1): 800
Crew Transfer Vessels – All Year Campaign	4	N	Main engines (4): 522 Auxiliary engines (2): 27
Crew Transfer Vessels – Summer Campaign Only	6	N	Main engines (4): 522 Auxiliary engines (2): 27
<b>Representative Vessel Type for WTG Heavy Logistics/Jack Up (for ASP1 and ASP2<sup>d</sup>)</b>	<b>Number of Vessels of this Type</b>	<b>Identified in Application as OCS Source? (Y/N)<sup>b</sup></b>	<b>Marine Vessel Engines (per each vessel): Type (Main or Auxiliary), Number &amp; Maximum Engine Power (in kW/engine)</b>
US Feeder/Jack-Up Vessel (all engines are Category 3)	1	Y	Main engines (5): 4,000 Auxiliary engine (1): 4,000
US Feeder/Jack-Up Vessel (all engines are Category 3)	1	Y	Main engines (2): 2,350 Auxiliary engines (2): 1,000
European (Foreign-Flagged) Jack-Up Vessel (all engines are Category 3)	1	Y	Main engines (5): 4,000 Auxiliary engine (1): 4,000
<b>Representative Vessel Type for Repairs to the Inter-Array and Export Cables (for ASP1 and ASP2<sup>d</sup>)</b>	<b>Number of Vessels of this Type</b>	<b>Identified in Application as OCS Source? (Y/N)<sup>b</sup></b>	<b>Marine Vessel Engines (per each vessel): Type (Main or Auxiliary), Number &amp; Maximum Engine Power (in kW/engine)</b>
Inter-Array Cable Lay Vessel	1	N	Main engine (1): 7,280 Auxiliary engine (1): 220
Export Cable Lay Vessel	1	N	Main engine (1): 7,280 Auxiliary engine (1): 220
<b>Representative Vessel Type for Surveys to the Inter-Array and Export Cables (for ASP1 and ASP2<sup>d</sup>)</b>	<b>Number of Vessels of this Type</b>	<b>Identified in Application as OCS Source? (Y/N)<sup>b</sup></b>	<b>Marine Vessel Engines (per each vessel): Type (Main or Auxiliary), Number &amp; Maximum Engine Power (in kW/engine)</b>
Inter-Array Cable Survey Vessel	1	N	Main engines (2): 1,900 Auxiliary engines (2): 99
Export Cable Survey Vessel	1	N	Main engines (2): 1,900 Auxiliary engines (2): 99

<sup>b</sup> This column indicates whether the applicant represented that the vessel would be an OCS source.

<sup>d</sup> These vessels may serve one or both of ASP1 and ASP2 on a given trip.

**Table 1B – Representative types of marine vessels, and associated main and auxiliary marine engines, to be used during O&M (Continued)**

<b>Representative Vessel Type for Surveys to Foundation Below Water Inspection (for ASP1 and ASP2<sup>d</sup>)</b>	<b>Number of Vessels of this Type</b>	<b>Identified in Application as OCS Source? (Y/N)<sup>b</sup></b>	<b>Marine Vessel Engines (per each vessel): Type (Main or Auxiliary), Number &amp; Maximum Engine Power (in kW/engine)</b>
Subsea Inspection Survey Vessel	1	N	Main engines (2): 1,900 Auxiliary engines (2): 99
<b>Other Representative Vessels</b>	<b>Number of Vessels of this Type</b>	<b>Identified in Application as OCS Source? (Y/N)<sup>b</sup></b>	<b>Marine Vessel Engines (per each vessel): Type (Main or Auxiliary), Number &amp; Maximum Engine Power (in kW/engine)</b>
Crew Transfer Vessel for Environmental Monitoring	1	N	Main engines (4): 522 Auxiliary engines (2): 27
Service Operation Vessel for Retrofit Campaign	1	N	Main engines (4): 2,306 Auxiliary engines (4): 2,000
OSS Major Repair Jack-Up Vessel (all engines are Category 3)	1	Y	Main engines (5): 4,000 Auxiliary engine (1): 4,000

<sup>b</sup> This column indicates whether the applicant represented that the vessel would be an OCS source.

<sup>d</sup> These vessels may serve one or both of ASP1 and ASP2 on a given trip.

**C. Non-Marine Engines – Portable Diesel Generator Engines Used During C&C**

The following Table 2A is a list of representative non-marine portable diesel generator engines that will each be temporarily located on various OSSs or WTG platforms to provide power for commissioning of the OSSs/WTGs during C&C. The engine data (maximum engine power) included in the table below were presented by the Permittee as representative, as the exact engine specifications are not known at this time. Thus, Atlantic Shores may end up using similar engines with different maximum engine power than those listed below, and those engines will be subject to the terms and conditions of this permit. All of these non-marine engines will be Tier 4 engines under 40 C.F.R. Part 1039. The engines in Table 2A are CI ICE and will use ULSD with 15 ppm sulfur or less as fuel:

**Table 2A – Non-Marine Engines – Portable Diesel Generator Engines Used During C&C**

Activity	Engine Description	Number of Engines	Maximum Engine Power (kW)
OSS Commissioning Generators	OSS Commissioning Generators (non-marine engines, Tier 4)	8	500
WTG Commissioning Generator	WTG Commissioning Generators (non-marine engine, Tier 4)	1	240

**D. Non-Marine Engines – Permanent Diesel Generator Engines Used During O&M**

The following Table 2B is a list of representative non-marine permanent diesel generator engines that will be non-emergency engines located on a permanent basis on the OSSs and the applicant represents that they will be used intermittently for storm protection in the event of a longer-term power grid outage. These engines are the same 500 kW engines (up to eight) that are listed above in Table 2A as “OSS Commissioning Generators” during the C&C phase. Note that, just as emissions from these generators count towards the project’s potential to emit when they are used during C&C, all emissions from these generators also count in determining compliance with the Facility Potential to Emit Limits and the OCS Facility Limits on Daily Emissions during O&M. All of these non-marine engines will be Tier 4 engines under 40 C.F.R. Part 1039. The engines in Table 2B are CI ICE and will use ULSD with 15 ppm sulfur or less as fuel:

**Table 2B - Non-Marine Engines – Permanent Diesel Generator Engines Used During O&M**

Engine Description	Number of Generators	Maximum Engine Power (kW)
OSS Permanent Diesel Generator Engines for 4, 5, or 10 OSSs	Up to 8	500 kW

**E. SF<sub>6</sub>-Insulated Electrical Switchgears and G3-Insulated Bus Ducts**

Table 3 lists representative equipment which will be used during O&M that will contain SF<sub>6</sub>, and which are collectively referred to in this permit as “SF<sub>6</sub>-insulated electrical switchgears.” This includes SF<sub>6</sub>-insulated electrical equipment, namely switches (or circuit breakers) that will be installed on the WTGs and OSSs for both ASP1 and ASP2. “SF<sub>6</sub>-insulated electrical switchgears” also includes an SF<sub>6</sub>-containing gas-insulated bus duct (“gas-insulated bus duct”) that will be located on level 3 of each OSS. The gas-insulated bus duct is a metal pipe with an internal bus consisting of a copper bar encapsulated in an aluminum enclosure containing SF<sub>6</sub> for proper insulation.

According to Atlantic Shores, the SF<sub>6</sub> in the SF<sub>6</sub>-insulated switches and the SF<sub>6</sub> gas-insulated bus ducts will be in sealed systems. However, due to possible equipment leakage, the SF<sub>6</sub>-insulated electrical switchgears will be fugitive emission sources of SF<sub>6</sub>, a greenhouse gas. SF<sub>6</sub> emissions will also occur during refilling events at the OCS Facility during the operational life of the project.

Table 3 also lists G3-insulated bus ducts located on level 1 of each OSS for use related to the inter-array cables. G3 is an SF<sub>6</sub>-free gas mixture with a far lower global warming potential than SF<sub>6</sub>.

**Table 3 – G3- and SF6-Insulated Electrical Switchgears – During O&M**

WTGs and OSSs	Switchgear kV Range
WTG switches located in the entrance platform or tower bottom platform of each WTG	ASP1 ~ 108 switches and ASP2 ~ 92 switches. All switches rated at 72.5 kilovolts (“kV”).
OSS switches and G3 gas-insulated bus duct located on the level 1 of each OSS	ASP2 OSS: switchgears, from 66 kV, 72.5 kV, and 145 kV (145 kV if higher current rating is required).
OSS and SF <sub>6</sub> gas-insulated bus duct located on level 3 of each OSS	ASP1 OSS: switchgears from 145 kV and greater than 275 kV. ASP2 OSS: switchgears from 400 kV and 420 kV.

**F. ULSD Storage Tanks During C&C**

The following Table 4 is a list of ULSD storage tanks that will be located on a temporary basis on OSSs’ platforms during C&C. These storage tanks will be emission sources of fugitive VOC emissions:

**Table 4 – Representative Temporary ULSD Storage Tanks – During C&C**

OSS	Number of Storage Tanks	Storage Tank Volume (Gallons/each tank)
Storage tanks on each OSS platform	Up to 8 (1 tank for each engine on an OSS) <sup>°</sup>	8,500 gallons per tank

<sup>°</sup> As discussed above, Atlantic Shores expects to have 4, 5, or 8 OSSs, and to have up to 8 engines on OSSs.

### G. ULSD Storage Tanks During O&M

The following Table 5 is a list of ULSD storage tanks that will be located during O&M on a permanent basis on the OSSs' platforms. These storage tanks will be emissions sources of fugitive VOC emissions:

**Table 5 – Representative Permanent ULSD Storage Tanks - During O&M**

OSS	Number of Storage Tanks	Storage Tank Volume (Gallons/each tank)
Storage tanks on each OSS platform	Up to 8 (1 tank for each engine on an OSS) <sup>e</sup>	8,500 gallons per tank

<sup>e</sup> As discussed above, Atlantic Shores expects to have 4, 5, or 8 OSSs, and to have up to 8 engines on OSSs.

### H. Painting and Cleaning Activities

The permittee will conduct touch-up painting of the WTGs' and OSSs' components and will use small amounts of various solvents for cleaning mechanical components on the WTGs and OSSs at the project location during C&C. Atlantic Shores will also conduct, periodically, small amounts of repainting and/or touch-up painting of the WTGs and OSSs and will use small amounts of various solvents for periodic cleaning of mechanical components of the WTGs and OSSs during O&M. Painting and cleaning activities will constitute emission sources of fugitive VOC emissions.

## IV. EMISSION LIMITS AND COMPLIANCE REQUIREMENTS

### A. Marine Engines

#### 1. General Requirement

- a. During C&C, the three representative jack-up vessels identified in Table 1A to this permit, which will be used for installation activities related to the WTGs and/or OSSs and their foundations, shall be the sole marine vessels authorized by this permit to operate as OCS source vessels, as the term is defined in this permit.
- b. During O&M, the three representative jack-up vessels which will be used for WTGs Heavy Logistics activities and one additional representative jack-up vessel that will be used for OSS major repair, which are identified in Table 1B to this permit, shall be the sole marine vessels authorized by this permit to operate as OCS source vessels, as the term is defined in this permit.
- c. Section IV.A of this permit establishes emission limits for certain pollutants for the main and/or auxiliary marine engines of the three representative jack-up vessels that will be OCS sources during C&C and of the four representative jack-up vessels that will be OCS sources during O&M to meet 40 C.F.R. Part 60, Subpart IIII (“Standards of Performance for Stationary Compression Ignition Internal Combustion Engines”) (“NSPS IIII”), BACT, LAER, and SOTA requirements, as applicable.
- d. Notwithstanding paragraphs (a), (b), and (c) above, this permit does not prohibit the Permittee from deploying actual marine engines or marine vessels that are different from the representative OCS source vessels and/or marine engines listed in this permit, if those actual marine vessels or marine engines will be used in lieu of the representative OCS source marine vessels or marine engines listed in this permit, and for the same functions as the representative vessels or engines that they replace, and the actual vessels or marine engines meet all applicable NSPS IIII requirements, BACT and LAER requirements, SOTA requirements, and any other requirements in this permit that apply to the representative vessels or engines that they replace.

Each jack-up vessel deployed by the Permittee shall be the vessel with the highest-tiered engines (“highest-tier vessel”) that was available at the time the vessel was hired for the specific work required in the timeframe required. The Permittee may only hire and deploy an available vessel with the next highest-tier engines, if the Permittee documents the basis for its conclusion that the highest-tier vessel, and any other higher-tiered vessels, are not available. [40 C.F.R. § 52.21; N.J.A.C. 7:27-18.3(b)(1)]

- e. Each PM<sub>10</sub> and PM<sub>2.5</sub> (g/kW-hr) BACT emission limit specified in this permit for marine engines includes both filterable and condensable fractions of PM.
- #### 2. Category 1 Marine Engines of the Jack-Up OCS Source Vessels Used During C&C

**a. NSPS IIII Emission Standards (Category 1 Marine Engines During C&C)**

The Permittee shall comply with the NSPS IIII emission standards by ensuring that each Category 1 marine engine of each jack-up vessel used during C&C, identified in Table 1A of this permit, while the vessel is an OCS source, is certified to the emission standards in 40 C.F.R. Part 1042<sup>4</sup> applicable to the actual engine’s specifications. Such emission standards shall be no less stringent than the Tier 2 emission standards at 40 C.F.R. Part 1042, Appendix I, Table 2. The Tier 2 emission standards require at a minimum compliance with the following:

<b>Engine size displacement (“disp.”) liters/cylinder</b>	<b>Maximum Engine Power</b>	<b>NO<sub>x</sub>+ THC* (g/kW-hr)</b>	<b>CO (g/kW-hr)</b>	<b>PM (g/kW-hr)</b>
disp. < 0.9	≥ 37 kW	7.5	5.0	0.40
0.9 ≤ disp. < 5.0	≥ 37 kW	7.2	5.0	0.30

\*THC means total hydrocarbons.

[40 C.F.R. §§ 60.4204(b), 60.4201, 40 C.F.R. § 1042.101, 40 C.F.R. Part 1042, Appendix I]

**b. BACT/LAER Emission Limits (Category 1 Marine Engines During C&C)**

In order to comply with BACT and LAER requirements, the Permittee shall ensure that each Category 1 marine engine of each jack-up vessel used during C&C, identified in Table 1A of this permit, while the vessel is an OCS source, meets the BACT and LAER emission limits in the table below, as well as the NSPS IIII emission standards applicable to each of the jack-up vessel’s actual engines.<sup>5</sup> [40 C.F.R. § 52.21, N.J.A.C. 7:27-18.3(b)(1)]

<sup>4</sup> These requirements will be the Tier 2 requirements found at 40 C.F.R. Part 1042, Appendix I, Table 2 (“Primary Tier 2 Emissions Standards for Commercial and Recreational Marine Engines at or Above 37 kW (g/kW-hr)”), the Tier 3 requirements found at 40 C.F.R. § 1042.101 (“Exhaust emission standards for Category 1 and Category 2 engines.”), or the Tier 4 requirements also found at 40 C.F.R. § 1042.101, as applicable. For example, an actual model year 2014 or later engine with a maximum engine power greater than 2000 kW would be required to meet the Tier 4 emission standards in 40 C.F.R. § 1042.101.

<sup>5</sup> If the applicable NSPS IIII requirements provide a NO<sub>x</sub>+ NMHC into one emission limit, then a NO<sub>x</sub> limit should be derived by multiplying that emission limit by 0.95 NO<sub>x</sub> and the NMHC should be derived by multiplying that emission limit by 0.05. If the applicable NSPS IIII requirements provide a NO<sub>x</sub> + HC limit, then a NO<sub>x</sub> limit should be derived by using the following emission factors: NMHC= 0.984 x THC, THC = 1.02 x NMHC, VOC =1.053 x THC, THC = 0.95 x VOC, VOC = 1.07 x NMHC, and NMHC = 0.052 x NO<sub>x</sub>, as applicable. See <https://19january2017snapshot.epa.gov/www3/otaq/models/nonrdmdl/nonrdmdl2005/420r05015.pdf> and [https://www.baaqmd.gov/~media/files/engineering/policy\\_and\\_procedures/engines/emissionfactorsfordieselenines.pdf?la=en](https://www.baaqmd.gov/~media/files/engineering/policy_and_procedures/engines/emissionfactorsfordieselenines.pdf?la=en). The PM<sub>10</sub> emission limit is equal to the NSPS IIII PM emission limit. The PM<sub>2.5</sub> emission limit should be derived by multiplying the PM<sub>10</sub> emission limit by 0.97.

Engine size displacement (“disp.”) liters/cylinder	Maximum Engine Power	NO <sub>x</sub> (g/kW-hr)	VOC (g/kW-hr)	CO (g/kW-hr)	PM (g/kW-hr)	PM <sub>10</sub> (g/kW-hr)	PM <sub>2.5</sub> (g/kW-hr)
disp. < 0.9	≥ 37 kW	7.12	0.40	5.0	0.40	0.40	0.39
0.9 ≤ disp. < 5.0	≥ 37 kW	6.83	0.39	5.0	0.30	0.30	0.29

**c. SOTA Emission Limits (Category 1 Marine Engines During C&C)**

For any Category 1 marine engine of each jack-up vessel used during C&C, identified in Table 1A of this permit, that has the potential to emit 5 tons per year or more of NO<sub>x</sub>, CO, TSP<sup>6</sup>, PM<sub>10</sub>, or PM<sub>2.5</sub>, the BACT/LAER emission limit for that pollutant in the table above is also an emission limit for purposes of SOTA; furthermore, no engine will exceed the 5 tons per year SOTA threshold for any SOTA pollutant other than NO<sub>x</sub>, CO, TSP, PM<sub>10</sub>, or PM<sub>2.5</sub>. [N.J.A.C. 7:27-8.12]

**3. Category 2 Marine Engines of the Jack-Up OCS Source Vessels Used During C&C.**

**a. NSPS IIII Emission Standards (Category 2 Marine Engines During C&C)**

The Permittee shall comply with the NSPS IIII emission standards by ensuring that each Category 2 marine engine of each jack-up vessel used during C&C, identified in Table 1A of this permit, while the vessel is an OCS source, is certified to the emission standards in 40 C.F.R. Part 1042<sup>7</sup> applicable to the actual engine’s specifications. Such emission standards shall be no less stringent than the Tier 2 emission standards at 40 C.F.R. Part 1042, Appendix I, Table 2. The Tier 2 emission standards require at a minimum compliance with the following:

- NO<sub>x</sub> + THC: 11 g/kW-hr
- CO: 5 g/kW-hr
- PM: 0.50 g/kW-hr

[40 C.F.R. §§ 60.4204 (b), 60.4201, 40 C.F.R. § 1042.101, 40 C.F.R. Part 1042, Appendix I]

**b. BACT/LAER Emission Limits (Category 2 Marine Engines During C&C)**

<sup>6</sup> For TSP, the BACT/LAER limits for PM and PM<sub>10</sub> are the relevant SOTA limits for TSP.

<sup>7</sup> These requirements will be the Tier 2, Tier 3, or Tier 4 requirements found at 40 C.F.R. Part 1042. See footnote 4 above for more information.

In order to comply with BACT and LAER requirements, the Permittee shall ensure that each Category 2 marine engine of each jack-up vessel used during C&C, identified in Table 1A of this permit, while the vessel is an OCS source, meets the BACT and LAER emission limits below, as well as the NSPS IIII emission standards applicable to each of the jack-up vessel's actual engines.<sup>8</sup> [40 C.F.R. § 52.21, N.J.A.C. 7:27-18.3(b)(1)]

- NO<sub>x</sub>: 10.44 g/kW-hr
- VOC: 0.59 g/kW-hr
- CO: 5 g/kW-hr
- PM: 0.50 g/kW-hr
- PM<sub>10</sub>: 0.50 g/kW-hr
- PM<sub>2.5</sub>: 0.48 g/kW-hr

**c. SOTA Emission Limits (Category 2 Marine Engines During C&C)**

For any Category 2 marine engine of each jack-up vessel used during C&C, identified in Table 1A of this permit, that has the potential to emit 5 tons per year or more of NO<sub>x</sub>, CO, TSP<sup>9</sup>, PM<sub>10</sub>, or PM<sub>2.5</sub>, the BACT/LAER emission limit for that pollutant listed above is also an emission limit for purposes of SOTA; furthermore, no engine will exceed the 5 tons per year SOTA threshold for any SOTA pollutant other than NO<sub>x</sub>, CO, TSP, PM<sub>10</sub>, or PM<sub>2.5</sub>. [N.J.A.C. 7:27-8.12]

**4. Category 3 Marine Engines of the Jack-Up OCS Source Vessels Used During C&C**

**a. NSPS IIII Emission Standards (Category 3 Main (or Propulsion) Engines During C&C)**

The Permittee shall comply with the NSPS IIII emission standards by ensuring that each Category 3 main (or propulsion) marine engine of each jack-up vessel used during C&C, identified in Table 1A of this permit, while the vessel is an OCS source, meets the relevant NSPS IIII emission standards applicable to the actual engine's specifications. Such emission standards shall be no less stringent than emission standards below: [40 C.F.R. §§ 60.4204(c)(3) & (4)]

- NO<sub>x</sub>: 10.03 g/kW-hr
- PM: 0.15 g/kW-hr<sup>10</sup>

**b. NSPS IIII Emission Standards (Category 3 Auxiliary Engines During C&C)**

The Permittee shall comply with the NSPS IIII emission standards by ensuring that each Category 3 auxiliary marine engine of each jack-up vessel used during C&C, identified in Table 1A of this permit, while the vessel is an OCS source, meets the relevant NSPS IIII emission

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<sup>8</sup> If the applicable NSPS IIII requirements provide a NO<sub>x</sub> + THC limit, then the NO<sub>x</sub> limit should be derived as specified in footnote 5 above. If the applicable NSPS IIII requirements provide a HC limit, then a VOC limit should be derived by multiplying the HC limit by 1.053. The PM<sub>10</sub> emission limit is equal to the NSPS IIII PM emission limit. The PM<sub>2.5</sub> emission limit should be derived by multiplying the PM<sub>10</sub> emission limit by 0.97.

<sup>9</sup> For TSP, the BACT/LAER limits for PM and PM<sub>10</sub> are the relevant SOTA limits for TSP.

<sup>10</sup> NSPS IIII emission standards for PM include only filterable PM.

standards applicable to the actual engine's specifications. Such emission standards shall be no less stringent than the emission standards below: [40 C.F.R. §§ 60.4204(c)(3) & (4)]

- NO<sub>x</sub>: 11.55 g/kW-hr
- PM: 0.15 g/kW-hr

**c. BACT/LAER Emission Limits (Category 3 Main (or Propulsion) Engines during C&C)**

In order to comply with BACT and LAER requirements, the Permittee shall ensure that each Category 3 main (or propulsion) marine engine of each jack-up vessel used during C&C, identified in Table 1A of this permit, while the vessel is an OCS source, meets the BACT and LAER emission limits below. The Permittee shall also ensure that each such engine meets the NSPS IIII emission standard applicable to each of the jack-up vessel's actual engines and the Tier standard in 40 C.F.R. Part 1042 (no less stringent than Tier 2) applicable to the actual engine.<sup>11</sup> [40 C.F.R. § 52.21, N.J.A.C. 7:27-18.3(b)(1)]

- NO<sub>x</sub>: 10.03 g/kW-hr
- VOC: 2.10 g/kW-hr
- CO: 5 g/kW-hr
- PM: 0.15 g/kW-hr
- PM<sub>10</sub>: 0.18 g/kW-hr
- PM<sub>2.5</sub>: 0.17 g/kW-hr

**d. BACT/LAER Emission Limits (Category 3 Auxiliary Engines During C&C)**

In order to comply with BACT and LAER requirements, the Permittee shall ensure that each Category 3 auxiliary marine engine of each jack-up vessel used during C&C, identified in Table 1A of this permit, while the vessel is an OCS source, meets the BACT and LAER emission limits below. The Permittee shall also ensure that each such engine meets the NSPS IIII emission standard applicable to each of the jack-up vessel's actual engines and the Tier standard in 40 C.F.R. Part 1042 (no less stringent than Tier 2) applicable to the actual engine.<sup>12</sup> [40 C.F.R. § 52.21, N.J.A.C. 7:27-18.3(b)(1)]

- NO<sub>x</sub>: 11.55 g/kW-hr
- VOC: 2.10 g/kW-hr
- CO: 5 g/kW-hr

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<sup>11</sup> The VOC emission limit shall be derived from the relevant Tier standard by multiplying the HC emission standard in Part 1042 by 1.053. The PM<sub>10</sub> emission limit shall be derived from the NSPS IIII PM emission standard by adding the condensible fraction using the approach in EPA's AP-42 ("Compilation of Air Emissions Factors from Stationary Sources"), Section 3.4, Table 3.4.2. The PM<sub>2.5</sub> emission limit shall be derived by multiplying the PM<sub>10</sub> emission limit by 0.92.

<sup>12</sup> The VOC emission limit shall be derived from the relevant Tier standard by multiplying the HC emission standard in Part 1042 by 1.053. The PM<sub>10</sub> emission limit shall be derived from the NSPS IIII PM emission standard by adding the condensible fraction using the approach in EPA's AP-42 ("Compilation of Air Emissions Factors from Stationary Sources"), Section 3.4, Table 3.4.2. The PM<sub>2.5</sub> emission limit shall be derived by multiplying the PM<sub>10</sub> emission limit by 0.92.

- PM: 0.15 g/kW-hr
- PM<sub>10</sub>: 0.18 g/kW-hr
- PM<sub>2.5</sub>: 0.17 g/kW-hr

**e. SOTA Emission Limits (Category 3 Marine Engines during C&C)**

For any Category 3 marine engine (main (or propulsion) engine or auxiliary engine) of each jack-up vessel used during C&C, identified in Table 1A of this permit, that has the potential to emit 5 tons per year or more of NO<sub>x</sub>, CO, TSP<sup>13</sup>, PM<sub>10</sub>, or PM<sub>2.5</sub>, the BACT/LAER emission limit for that pollutant listed above is also an emission limit for purposes of SOTA; furthermore, no engine will exceed the 5 tons per year SOTA threshold for any SOTA pollutant other than NO<sub>x</sub>, CO, TSP, PM<sub>10</sub>, or PM<sub>2.5</sub>. [N.J.A.C. 7:27-8.12]

**5. Category 3 Marine Engines of the Jack-Up OCS Source Vessels Used During O&M**

**a. NSPS IIII Emission Standards (Category 3 Main (or Propulsion) Engines During O&M)**

The Permittee shall comply with the NSPS IIII emission standards by ensuring that each Category 3 main (or propulsion) marine engine of each jack-up vessel used during O&M, identified in Table 1B of this permit, while the vessel is an OCS source, meets the relevant NSPS IIII emission standards applicable to the actual engine's specifications. Such emission standards shall be no less stringent than emission standards below: [40 C.F.R. §§ 60.4204(c)(3) & (4)]

- NO<sub>x</sub>: 10.03 g/kW-hr
- PM: 0.15 g/kW-hr

**b. NSPS IIII Emission Standards (Category 3 Auxiliary Engines During O&M)**

The Permittee shall comply with the NSPS IIII emission standards by ensuring that each Category 3 auxiliary marine engine of each jack-up vessel used during O&M, identified in Table 1B of this permit, while the vessel is an OCS source, meets the relevant NSPS IIII emission standards applicable to the actual engine's specifications. Such emission standards shall be no less stringent than the emission standards below: [40 C.F.R. §§ 60.4204(c)(3) & (4)]

- NO<sub>x</sub>: 11.55 g/kW-hr
- PM: 0.15 g/kW-hr

**c. BACT/LAER Emission Limits (Category 3 Main (or Propulsion) Engines During O&M)**

In order to comply with BACT and LAER requirements, the Permittee shall ensure that each Category 3 main (or propulsion) marine engine of each jack-up vessel used during O&M, identified in Table 1B of this permit, while the vessel is an OCS source, meets the BACT and LAER emission limits below. The Permittee shall also ensure that each such engine meets the NSPS IIII emission standard applicable to each of the jack-up vessel's actual engines and the

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<sup>13</sup> For TSP, the BACT/LAER limits for PM and PM<sub>10</sub> are the relevant SOTA limits for TSP.

Tier standard in 40 C.F.R. Part 1042 (no less stringent than Tier 2) applicable to the actual engine.<sup>14</sup> [40 C.F.R. § 52.21, N.J.A.C. 7:27-18.3(b)(1)]

- NO<sub>x</sub>: 10.03 g/kW-hr
- VOC: 2.10 g/kW-hr
- CO: 5 g/kW-hr
- PM: 0.15 g/kW-hr
- PM<sub>10</sub>: 0.18 g/kW-hr
- PM<sub>2.5</sub>: 0.17 g/kW-hr

**d. BACT/LAER Emission Limits (Category 3 Auxiliary Engines During O&M)**

In order to comply with BACT and LAER requirements, the Permittee shall ensure that each Category 3 auxiliary marine engine of each jack-up vessel used during O&M, identified in Table 1B of this permit, while the vessel is an OCS source, meets the BACT and LAER emission limits below. The Permittee shall also ensure that each such engine meets the NSPS IIII emission standard applicable to each of the jack-up vessel's actual engines and the Tier standard in 40 C.F.R. Part 1042 (no less stringent than Tier 2) applicable to the actual engine.<sup>15</sup> [40 C.F.R. § 52.21, N.J.A.C. 7:27-18.3(b)(1)]

- NO<sub>x</sub>: 11.55 g/kW-hr
- VOC: 2.10 g/kW-hr
- CO: 5 g/kW-hr
- PM: 0.15 g/kW-hr
- PM<sub>10</sub>: 0.18 g/kW-hr
- PM<sub>2.5</sub>: 0.17 g/kW-hr

**e. SOTA Emission Limits (Category 3 Marine Engines during O&M)**

For any Category 3 marine engine (main (or propulsion) engine or auxiliary engine) of each jack-up vessel used during O&M, identified in Table 1B of this permit, that has the potential to emit 5 tons per year or more of NO<sub>x</sub>, CO, TSP<sup>16</sup>, PM<sub>10</sub>, or PM<sub>2.5</sub>, the BACT/LAER emission limit for that pollutant listed above is also an emission limit for purposes of SOTA; furthermore, no engine will exceed the 5 tons per year SOTA threshold for any SOTA pollutant other than NO<sub>x</sub>, CO, TSP, PM<sub>10</sub>, or PM<sub>2.5</sub>. [N.J.A.C. 7:27-8.12]

**6. GHG BACT Emission Limits for Marine Engines on Jack-Up Vessels**

<sup>14</sup> The VOC emission limit shall be derived from the relevant Tier standard by multiplying the HC emission standard in Part 1042 by 1.053. The PM<sub>10</sub> emission limit shall be derived from the NSPS IIII PM emission standard by adding the condensable fraction using the approach in EPA's AP-42 ("Compilation of Air Emissions Factors from Stationary Sources"), Section 3.4, Table 3.4.2. The PM<sub>2.5</sub> emission limit shall be derived by multiplying the PM<sub>10</sub> emission limit by 0.92.

<sup>15</sup> The VOC emission limit shall be derived from the relevant Tier standard by multiplying the HC emission standard in Part 1042 by 1.053. The PM<sub>10</sub> emission limit shall be derived from the NSPS IIII PM emission standard by adding the condensable fraction using the approach in EPA's AP-42 ("Compilation of Air Emissions Factors from Stationary Sources"), Section 3.4, Table 3.4.2. The PM<sub>2.5</sub> emission limit shall be derived by multiplying the PM<sub>10</sub> emission limit by 0.92.

<sup>16</sup> For TSP, the BACT/LAER limits for PM and PM<sub>10</sub> are the relevant SOTA limits for TSP.

- a. The combined carbon dioxide equivalent (“CO<sub>2</sub>e”) emissions from all marine engines onboard jack-up vessels, while the vessels are OCS sources, used for WTG and/or OSS installation during C&C, which are listed in Table 1A of this permit, shall not exceed 71,046 tons per year (“tpy”) on a 12-month rolling total. [40 C.F.R. § 52.21]
- b. The combined CO<sub>2</sub>e emissions from all the marine engines onboard jack-up vessels, while the vessels are OCS sources, used for WTG and/or OSS repair/maintenance during O&M, which are listed in Table 1B of this permit, shall not exceed 10,735 tpy on a 12-month rolling total. [40 C.F.R. § 52.21]
- c. CO<sub>2</sub>e or carbon dioxide equivalent tpy limits represent the sum of the following GHG pollutants: carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), and nitrous oxide (N<sub>2</sub>O), all converted to CO<sub>2</sub>e. [40 C.F.R. § 52.21]
- d. Compliance with each of the above BACT CO<sub>2</sub>e tpy emission limits shall be verified by calculations, as specified in Section IV.C of this permit. [40 C.F.R. § 55.8]

#### 7. Compliance Requirements for Marine Engines

- a. The Permittee shall ensure compliance with the NSPS IIII emission standards (g/kW-hr) specified in this permit for Category 1 and 2 marine engines by ensuring that each engine has an EPA-issued certificate of conformity<sup>17</sup> to the corresponding Tier emission standard (g/kW-hr) of 40 C.F.R. Part 1042. [40 C.F.R. § 60.4211(c)]
- b. The Permittee shall determine compliance with the NSPS IIII NO<sub>x</sub> and PM emission standards specified in this permit for Category 3 marine engines as follows:
  - 1) Conducting an initial performance test to demonstrate initial compliance with the emission standards, and annual performance tests thereafter, in accordance with 40 C.F.R. §§ 60.4211(d)(1) and (d)(3). This compliance requirement shall apply unless and until such time as the Permittee requests a waiver for performance test requirements pursuant to 40 C.F.R. § 60.8(b)(4) and EPA grants such a request. [40 C.F.R. §§ 60.4211(d)(1) and (d)(3)]
  - 2) Establishing operating parameters to be monitored continuously to ensure that the engines continue to meet the emission standards according to the provisions specified in § 60.4211(d)(2). [40 C.F.R. § 60.4211(d)(2)]
- c. The Permittee shall comply with all applicable NSPS IIII emission standards and other

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<sup>17</sup> See 40 C.F.R. § 1042.901 (“*Certification* means relating to the process of obtaining a certificate of conformity for an engine family that complies with the emission standards and requirements in [Part 1042].”).

applicable requirements for its marine engines on the jack-up vessels, except to the extent EPA has granted a request for exemption from such requirements under 40 C.F.R. § 55.7. [40 C.F.R. §§ 55.7 & 55.13(c)]

- d. The Permittee shall ensure compliance with the above BACT, LAER, and SOTA requirements established in this permit for each marine engine as follows: [40 C.F.R. § 52.21, N.J.A.C. 7:27-18.3(b)(1), 40 C.F.R. § 55.8, N.J.A.C. 7:27-8.12]
- 1) Ensure compliance with the NSPS IIII emission standards specified in this permit;
  - 2) Ensure that each Category 3 marine engine has an EPA-issued certificate of conformity to at least Tier 2 emission standards in 40 C.F.R. Part 1042;
  - 3) Ensure compliance with the diesel fuel sulfur content requirements specified at Section VIII of this permit; and
  - 4) Ensure compliance with the good combustion practices requirements specified at Section IX.C of this permit.

## B. Non-Marine Engines

### 1. Non-Marine Engines including the Portable Diesel Generator Engines<sup>18</sup> During C&C and Permanent Diesel Generator Engines during O&M

- a. The Permittee shall comply with the NSPS IIII emission standards by ensuring that each non-marine diesel generator engine used during C&C and/or O&M, listed in Tables 2A and 2B of this permit, is certified to meet the following Tier 4 emission standards from 40 C.F.R. § 1039.101(b), Table 1 (“Tier 4 Exhaust Emission Standards After the 2014 Model Year, g/kW-hr”) that apply to each engine based on its maximum engine power (kW):

Maximum Engine Power	NO <sub>x</sub> + NMHC (g/kW-hr)	NO <sub>x</sub> (g/kW-hr)	NMHC (g/kW-hr)	CO (g/kW-hr)	PM (g/kW-hr)
130 ≤ kW ≤ 560	-	0.40	0.19	3.5	0.02

[40 C.F.R. §§ 60.4204(b), 60.4201(a), and 1039.101(b)]

- b. The BACT and LAER emission limits below shall apply to the non-marine diesel generator engines used during C&C and/or O&M and listed in Tables 2A and 2B of this permit.

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<sup>18</sup> The Portable Diesel Generator Engines used during C&C are composed of 1) eight portable diesel generator engines that are initially being used as OSS Commissioning Generators during C&C and then subsequently being used as the Permanent Diesel Generator Engines during O&M, and 2) one portable WTG Commissioning Generator used only during C&C.

Maximum Engine Power	NO <sub>x</sub> (g/kW-hr)	VOC (g/kW-hr)	CO (g/kW-hr)	PM (g/kW-hr)	PM <sub>10</sub> * (g/kW-hr)	PM <sub>2.5</sub> * (g/kW-hr)
130 ≤ kW ≤ 560	0.40	0.20	3.5	0.02	0.02	0.02

\*The PM<sub>10</sub> and PM<sub>2.5</sub> (g/kW-hr) emission limits includes both filterable and condensable fractions of PM.

[40 C.F.R. § 52.21, N.J.A.C. 7:27-18.3(b)(1), N.J.A.C. 7:27-8.12]

- c. The Permittee shall comply with the particles<sup>19</sup> emission standard in N.J.A.C. 7:27-4.2 by ensuring that each permanent non-marine diesel generator engine used during O&M, listed in Table 2B of this permit, does not exceed the applicable maximum allowable particles emission rate set forth in the Table in N.J.A.C. 7:27-4.2(a). The applicable particles emission rate will depend on the final heat input rate of all fuel burning equipment discharging through a single stack. For a heat input rate between any two consecutive rates shown on the table, the maximum allowable particles emission rate shall be determined by interpolation. Compliance shall be ensured by using engines certified to meet the Tier 4 emission standard (which include PM standards) set forth at 40 C.F.R. § 1039.101(b), Table 1, specified in Section B.1.a in this permit, and employing operating practices and other requirements specified elsewhere in this permit. [N.J.A.C. 7:27-4.2(a)]

2. GHG BACT Emission Limit for the Portable Diesel Generator Engines During C&C and Permanent Diesel Generator Engines During O&M

- a. The combined CO<sub>2</sub>e emissions from all portable diesel generator engines used during C&C (both the WTG Commissioning Generator and the OSS Commissioning Generators), which are listed in Table 2A of this permit, shall not exceed 1,709 tpy on a 12-month rolling total. [40 C.F.R. § 52.21]
- b. The combined CO<sub>2</sub>e emissions from all permanent diesel generator engines on OSS platforms during O&M, which are listed in Table 2B of this permit, shall not exceed 1,228 tpy on a 12-month rolling total. [40 C.F.R. § 52.21]
- c. CO<sub>2</sub>e or carbon dioxide equivalent tpy limits represent the sum of the following GHG pollutants: CO<sub>2</sub>, CH<sub>4</sub>, and N<sub>2</sub>O, all converted to CO<sub>2</sub>e.
- d. Compliance with each of the above BACT CO<sub>2</sub>e tpy emission limits shall be verified by calculations, as specified in Section IV.C of this permit. [40 C.F.R. § 55.8]

3. Compliance Requirements for the Portable Diesel Generator Engines During C&C and Permanent Diesel Generator Engines During O&M

- a. The Permittee shall ensure compliance with the NSPS IIII emission standards (g/kW-hr) specified in this permit for each non-marine engine, by ensuring that each engine has an

<sup>19</sup> Under N.J.A.C 7:27-4.1 (“Definitions”), “‘Particles’ means any material, except uncombined water, which exists as liquid particles or solid particles at standard conditions.”

EPA-issued certificate of conformity to the applicable Tier 4 emission standards in 40 C.F.R. § 1039. [40 C.F.R. § 60.4211(c)]

- b. The Permittee shall ensure compliance with the BACT and LAER, requirements established in this permit for each non-marine engine as follows:
  - 1) Ensure compliance with the NSPS IIII emission standards specified in this permit;
  - 2) Ensure compliance with the diesel fuel sulfur content requirements specified at Section VIII of this permit; and
  - 3) Ensure compliance with the good combustion practices requirements specified at Section IX.C of this permit.

[40 C.F.R. § 52.21, N.J.A.C. 7:27-18.3(b)(1); 40 C.F.R. § 55.8, N.J.A.C. 7:27-8.12]

### **C. Marine and Non-Marine Engines GHG BACT Emission Limits - Calculation Methodology Requirements**

1. The Permittee shall use the following methodology in calculating the actual CO<sub>2</sub>e emissions from (1) marine engines of vessels while the vessels are OCS sources, for C&C and for O&M separately; and (2) non-marine engines, for C&C and for O&M, separately. The calculated actual emissions shall be used to verify compliance with the BACT CO<sub>2</sub>e emission limits (expressed in tons of CO<sub>2</sub>e on a 12-month rolling total basis) which are specified in this permit and are established for the following combinations of marine engines and non-marine engines:
  - a. Marine Engines Combinations:
    - 1) All marine engines of marine vessels used during C&C, while the vessels are OCS sources.
    - 2) All marine engines of marine vessels used during O&M, while the vessels are OCS sources.
  - b. Non-marine Engines Combinations:
    - 1) All portable diesel generator engines used during C&C.
    - 2) All permanent diesel generator engines on OSSs during O&M.
2. Emissions of CO<sub>2</sub>e from each relevant marine and non-marine engine shall be calculated daily using the formulas below. [40 C.F.R. § 52.21; 40 C.F.R. §§ 55.6 & 55.8]

*Formula 1 (for marine engines):*

$$E = kW * \text{Engine load factor (\%)} * \frac{\text{Hours}}{\text{day}} * \text{Emission Factor} \left( \frac{\text{g}}{\text{kW-hr}} \right) * 1.10231 * 10^{-6}$$

*Formula 2 (for non-marine engines):*

$$E = \frac{\text{MMBTU}}{\text{hr}} * \text{Engine load factor (\%)} * \frac{\text{Hours}}{\text{day}} * \text{Emission Factor} \left( \frac{\text{lb}}{\text{MMBTU}} \right) * 1/2000$$

Where:

- E = actual tons of CO<sub>2e</sub> emissions of each relevant engine per day, including emissions of CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O
  - kW = the maximum engine power (kW) of the relevant marine engine
  - MMBTU/hr = the maximum heat input rate (MMBTU/hr) of the relevant non-marine engine
  - Engine load factor (%) = the engine daily load factor for a given marine or non-marine engine calculated as follows:
  - For each marine engine of a marine vessel, the daily load factor (%) shall be calculated and recorded daily by dividing the actual daily fuel use rate (gallons/day, over a 24-hour period) of a specific vessel by the maximum daily fuel rate for the vessel (gallons/day, assuming all vessel engines operating at their maximum rated kW power for 24 hours/day). The calculated daily load factor (%) shall apply to each marine engine of that vessel. If the daily load factor is not calculated on a certain day, the Permittee shall assume 100% load for that day.
  - For each non-marine engine used to power OSSs and WTGs during C&C and each non-marine engine permanently located on the OSSs during O&M, the daily load factor (%) shall be calculated and recorded daily by dividing the actual daily fuel use rate (gallons/day, over a 24-hour period) of a specific engine by the maximum daily fuel rate for that engine (gallons/day, assuming engine operating at its maximum rated kW power for 24 hours/day). The calculated daily load factor (%) shall apply to each non-marine engine.
  - Hours/day = number of hours that (1) the relevant marine engine is in operation on a vessel that is an OCS source (*Formula 1*); or (2) the relevant non-marine engine is in operation (*Formula 2*). The hours/day should be monitored and recorded daily for each relevant engine.
  - Emission factor (g/kW-hr): The CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O emission factors (in g/kW-hr) for each marine engine should be equal to the emission factors provided in the April 2022 EPA Ports Emissions Inventory Guidance (2022 EPA guidance document).
  - For non-marine engines covered by this permit, the CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O emission factors (lb/MMBTU) used to calculate the engine's CO<sub>2e</sub> emissions may be based on Tables C-1 and C-2 of 40 C.F.R. Part 98.
  - $1.10231 * 10^{-6}$  = grams to tons conversion factor
  - 1/2,000 = lb to ton conversion factor
- a. The Permittee shall calculate the daily emissions in tons of each of CO<sub>2</sub>, CH<sub>4</sub>, and N<sub>2</sub>O emitted by each relevant marine engine using formula 1.
  - b. The Permittee shall calculate the tons of CO<sub>2e</sub> emitted by each relevant marine engine each calendar day based on the Global Warming Potentials (“GWP”) listed in Table A-1 to 40 C.F.R. Part 98, Subpart A.
  - c. The Permittee shall calculate the daily emissions in tons of each of CO<sub>2</sub>, CH<sub>4</sub>, and N<sub>2</sub>O emitted by each relevant non-marine engine using formula 2.

- d. The Permittee shall calculate the tons of CO<sub>2</sub>e emitted by each relevant non-marine engine each calendar day based on the Global Warming Potentials (“GWP”) listed in Table A-1 to 40 C.F.R. Part 98, Subpart A.
- e. At the end of each calendar day, the Permittee shall sum the tons of CO<sub>2</sub>e calculated for that day for all relevant marine engines or non-marine engines included in each combination (listed above) that is subject to a BACT emission limit for tons of CO<sub>2</sub>e and get the actual daily tons of CO<sub>2</sub>e for that particular combination of marine or non-marine engines.
- f. On a monthly basis, for each relevant combination of marine or non-marine engines, the Permittee shall calculate the tons of CO<sub>2</sub>e emitted that month by adding the CO<sub>2</sub>e daily emissions for that month. Then, the tons of monthly CO<sub>2</sub>e shall be added to the tons of CO<sub>2</sub>e from the previous 11 months to get the 12-month rolling total tons of CO<sub>2</sub>e. This calculated 12-month rolling total tons of CO<sub>2</sub>e shall be used to demonstrate compliance with the BACT emission limits expressed as tons of CO<sub>2</sub>e on a 12-month rolling total basis established in this permit for certain combinations of marine and non-marine engines.

**D. SF<sub>6</sub>-Insulated Electrical Switchgears (Switches and SF<sub>6</sub> Gas-Insulated Bus Ducts) on the WTGs and OSSs**

1. Emission Limits

- a. The annual CO<sub>2</sub>e emissions from all SF<sub>6</sub>-insulated electrical switchgears listed in Table 3, combined, during O&M shall not exceed the BACT CO<sub>2</sub>e emission limit of 3,519 tpy CO<sub>2</sub>e on a 12-month rolling total basis. [40 C.F.R. § 52.21]

2. Compliance Requirements Related to SF<sub>6</sub>-Insulated Electrical Switchgears

The Permittee shall comply with the requirements below for the SF<sub>6</sub>-insulated electrical switchgears listed in Table 3, and shall not install bus ducts containing SF<sub>6</sub> on level 1 of the OSSs. [40 C.F.R. § 52.21, 40 C.F.R. § 55.8]

- a. Compliance with the BACT CO<sub>2</sub>e tons per year limit for the SF<sub>6</sub>-insulated electrical switchgears shall be demonstrated via the following calculations:
  - 1) On a monthly basis, the Permittee shall calculate and record the tons of monthly CO<sub>2</sub>e emitted by the SF<sub>6</sub>-insulated electrical switchgears combined, by using mass balance and accounting for leakage periods and by converting the SF<sub>6</sub> emissions to CO<sub>2</sub>e based on the Global Warming Potentials (“GWP”) listed in Table A-1 to 40 C.F.R. Part 98, Subpart A.
  - 2) Then the tons of monthly CO<sub>2</sub>e shall be added to the tons of CO<sub>2</sub>e from the previous 11 months to get the 12-month rolling total tons of CO<sub>2</sub>e. This calculated 12-month rolling total tons of CO<sub>2</sub>e shall be used to demonstrate compliance with the BACT emission limits of CO<sub>2</sub>e on a 12-month rolling total basis established in this permit for the SF<sub>6</sub>-insulated electrical switchgears.

- b. The Permittee shall install and operate enclosed-pressure SF<sub>6</sub>-insulated electrical switchgears (switches and SF<sub>6</sub> gas-insulated bus ducts) that shall each have a manufacturer-guaranteed leak rate of 0.5% or less per year by weight of the SF<sub>6</sub> material stored in each of the electrical switchgears. This requirement applies to all switchgears installed on each of the wind turbines, each of the electrical switches that are installed on each of the offshore substations, and each of the SF<sub>6</sub> gas-insulated bus ducts.
- c. The Permittee shall install, operate, and maintain a SF<sub>6</sub> leak detection alarm system with low pressure alarms for SF<sub>6</sub> leak detection.
- d. Upon a detectable pressure drop that is 10 percent of the original pressure (accounting for ambient air conditions) for any switch or SF<sub>6</sub> gas-insulated bus duct, perform maintenance on an SF<sub>6</sub>-insulated electrical switchgear to fix seals as soon as practicable but no later than 5 days after the pressure drop is detected. If repair or replacement cannot occur within 5 days of the detected leak, then the Permittee shall divert power from the affected electrical switchgear(s) and isolate the leak until the repair or replacement can be performed. If repair or replacement cannot occur within 5 days of the detected leak because dangerous weather conditions prevent the repair within that period, then: 1) the Permittee shall fix seals at the soonest weather-permitting accessible day but no later than 14 days after the pressure drop is detected; and 2) if the repair cannot occur within 14 days of the detected leak then the Permittee shall divert power from the affected electrical switchgear(s) and isolate the leak until the repair or replacement can be performed. The Permittee shall document and maintain records of the equipment repaired or replaced, including but not limited to, the estimated time of leakage and volume of gas leaked during that time as well as records and documentation of any claim(s) that dangerous weather delayed repair or replacement. [40 C.F.R. § 52.21]
- e. If an event requires the removal of a switchgear, the damaged major components will be replaced with new components or repaired in accordance with Original Equipment Manufacturer (OEM) recommended procedures. For purposes of this requirement, an event means when any component of a switchgear is damaged and results in SF<sub>6</sub> leakage that cannot be repaired on site. The Permittee shall consider the technical and economic viability of installing SF<sub>6</sub>-free switchgears whenever an SF<sub>6</sub>-containing switchgear needs to be replaced with a new one and install the SF<sub>6</sub>-free switchgear, if deemed technically feasible. The Permittee shall keep a record of this decision and its basis for each replaced switchgear.
- f. The Permittee shall conduct periodic visual inspection of the SF<sub>6</sub>-insulated electrical switchgears as prescribed by the manufacturer(s).

g. The Permittee shall implement the following:

- 1) The manufacturer's prescribed routine and periodic inspection and maintenance program for each of the WTGs' and OSSs' SF<sub>6</sub>-insulated electrical switchgears and leak detection alarm systems.
- 2) The manufacturer's prescribed measures to minimize SF<sub>6</sub> emissions to the maximum extent possible, when low pressure alarms are triggered.
- 3) The manufacturer's prescribed procedures and measures to reduce SF<sub>6</sub> emissions during re-filling of the SF<sub>6</sub>-insulated electrical switchgears.
- 4) The manufacturer's recommended measures to minimize emissions associated with the storage of any SF<sub>6</sub> material at the project site.

## E. ULSD Storage Tanks

### 1. Emission Limits

- a. The following VOC LAER emission limit shall apply to the VOC fugitive emissions from all ULSD storage tanks, combined, listed in Table 4 of this permit, which will be located on a temporary basis on the OSSs' platforms during C&C: 0.15 tpy on a 12-month rolling total. [N.J.A.C. 7:27-18.3(b)(1)]
- b. The following VOC LAER emission limit shall apply to the VOC fugitive emissions from all ULSD storage tanks, combined, listed in Table 5 of this permit, which will be located on a permanent basis on the OSSs' platforms during O&M: 0.15 tpy on a 12-month rolling total. [N.J.A.C. 7:27-18.3(b)(1)]

### 2. Compliance Requirements for the ULSD Storage Tanks

- a. The Permittee shall ensure that all ULSD storage used during C&C and O&M are light color storage tanks. [N.J.A.C. 7:27-18.3(b)(1)]
- b. The Permittee shall implement the measures below. [N.J.A.C. 7:27-18.3(b)(1)]
  - 1) Good tank design;
  - 2) Good storage, operating, and maintenance procedures as indicated by the tank's manufacturer to prevent and minimize the emissions; and
  - 3) Submerged fill as the method of filling the storage tanks.
- c. Compliance with the VOC LAER emission limits for the ULSD storage tanks specified in Tables 4 and 5 of this permit shall be demonstrated by calculations as follows: [N.J.A.C. 7:27-18.3(b)(1), 40 C.F.R. § 55.8]

- 1) On a monthly basis, the Permittee shall calculate and record the tons of monthly VOC emitted by the storage tanks used during C&C or O&M, by using the EPA's TANKS emission estimation software, version 4.0.9d or newer.
  - 2) Then, the tons of monthly VOC shall be added to the tons of VOC from the previous 11 months to get the 12-month rolling total tons of VOC. The calculated 12-month rolling total tons of VOC shall be used to demonstrate compliance with the LAER VOC emission limits of tons on a 12-month rolling total basis, established in this permit for the ULSD storage tanks.
- d. During C&C and O&M, the Permittee is authorized to construct, install, and operate on the OSSs' platforms the number of storage tanks, and the associated volume in gallons for each tank, which are listed in Tables 4 and 5 of this permit. [40 C.F.R. § 55.6(a)(4)]
- e. The content of each storage tank shall be limited to ULSD with a sulfur content that shall not exceed 0.0015% by weight. [40 C.F.R. § 55.6(a)(4), 40 C.F.R. § 55.8]

## **F. Painting and Cleaning Activities**

### 1. Emission Limits

- a. The following VOC LAER emission limit shall apply to VOC fugitive emissions from all painting and cleaning activities during C&C: 0.75 tpy on a 12-month rolling total.
- b. The following VOC LAER emission limit shall apply to VOC fugitive emissions from all painting and cleaning activities during O&M: 0.75 tpy on a 12-month rolling total. [N.J.A.C. 7:27-18.3(b)(1)]

### 2. Compliance Requirements for the Painting and Cleaning Activities

- a. Compliance with the VOC LAER emission limits for the painting and cleaning activities for each of C&C and O&M shall be demonstrated by calculations as specified below. [N.J.A.C. 7:27-18.3(b)(1), 40 C.F.R. § 55.8]
  - 1) On a monthly basis, the Permittee shall calculate and record the tons of monthly VOC emitted by painting and cleaning activities, separately, for C&C and for O&M, using mass balance and the actual VOC content of each gallon of paint, solvent, and cleaner as applied or used.
  - 2) Then, the tons of monthly VOC shall be added to the tons of VOC from the previous 11 months to get the 12-month rolling total tons of VOC for C&C and for O&M, respectively. The actual tons of VOC shall be used to demonstrate compliance with the VOC LAER emission limits of tons on a 12-month rolling total basis established in this permit for the painting and cleaning activities.

b. The Permittee shall comply with the requirements below to minimize emissions:  
 [N.J.A.C. 7:27-18.3(b)(1), 40 C.F.R. § 55.8]

- 1) Use only low-VOC-containing paints and solvents;
- 2) Implement best management practices, whenever practical, to prevent the airborne particulate matter generated in the process of painting from drifting into the atmosphere; and
- 3) Ensure proper storage of all paints and solvents in non-leaking containers.
- 4) The Permittee shall not mix any paints with different VOC contents.

**G. Facility Potential to Emit Limits**

The Permittee shall comply with the below requirements. [N.J.A.C. 7:27-18.3(b)(1), 40 C.F.R. § 52.21, 40 C.F.R. § 55.8]

1. The Permittee shall comply with the following limits on the Potential to Emit (“PTE”) of the OCS Facility. Each of the tpy emission limits in Table 6 is based on a 12-month rolling total. The C&C emission limits in tpy listed in Table 6 represent the maximum emissions for each listed air pollutant that are estimated to occur in any one of the two years anticipated for C&C, and the O&M tpy listed in Table 6 represent the maximum emissions that are estimated to occur in any year of the 30 years of the anticipated commercial lifespan of the project. [N.J.A.C. 7:27-18.3(b)(1), 40 C.F.R. § 52.21)]

**Table 6 – OCS Facility Potential to Emit Limits (in tpy, on a 12-month rolling total basis)**

Project Phase	NO <sub>x</sub>	CO	VOC	PM	PM <sub>10</sub>	PM <sub>2.5</sub>	*SO <sub>2</sub>	GHGs (as CO <sub>2</sub> e)
C&C	1,645.1	446.2	33.8	51.4	51.4	49.8	4.1	119,097.6
O&M	408.1	96.0	7.0	13.2	13.2	12.8	1.2	30,386.4

\*While SO<sub>2</sub> emissions do not trigger PSD review, this maximum limit was incorporated into the air quality/AQRV analyses. Therefore, it is an enforceable limit.

2. The emission limits in tpy on the PTE of the OCS Facility for C&C and O&M in Table 6 represent the sum of each pollutant emitted from each type of emission sources specified below. [40 C.F.R. § 55.2]
  - a. Emissions from engines located on the WTGs and/or OSSs;
  - b. Emissions from marine engines while the vessels are OCS sources;
  - c. Emissions from marine engine while the vessels are at the OCS Facility, but are not OCS sources;
  - d. Emissions from marine engines of vessels servicing or associated with the OCS Facility while the vessels are en route to and from the OCS Facility and within 25 nm of the OCS

Lease Area boundaries, including those emissions that may occur within state waters (e.g., less than 3 nm from the New Jersey shoreline);

- e. Emissions from non-marine engines;
  - f. Emissions from SF<sub>6</sub>-insulated electrical switchgears on the WTGs and/or OSSs during O&M; and
  - g. Emissions from all other emission sources included in the permit, including but not limited to, fuel storage tanks at OSSs, emissions from painting and/or other maintenance, and all actual emissions from the permanent generators on the OSSs.
3. Emissions of NO<sub>x</sub>, CO, VOC, PM, PM<sub>10</sub>, PM<sub>2.5</sub>, SO<sub>2</sub> and CO<sub>2e</sub> from each marine and non-marine engine shall be calculated daily using the formulas below. [N.J.A.C. 7:27-18.3(b)(1), 40 C.F.R. § 52.21, 40 C.F.R. § 55.8, N.J.A.C. 7:27-22.19]

*Formula 1* (to be used for calculating emissions for each air pollutant emitted by a marine engine, and for each air pollutant other than CO<sub>2e</sub> emitted by a non-marine engine):

$$E = kW * \text{Engine load factor (\%)} * \frac{\text{Hours}}{\text{day}} * \text{Emission Factor} \left( \frac{\text{g}}{\text{kW-hr}} \right) * 1.10231 * 10^{-6}$$

*Formula 2* (to be used to calculate CO<sub>2e</sub> emissions from a non-marine engine):

$$E = \frac{\text{MMBTU}}{\text{hr}} * \text{Engine load factor (\%)} * \frac{\text{Hours}}{\text{day}} * \text{Emission Factor} \left( \frac{\text{lb}}{\text{MMBTU}} \right) * 1/2000$$

Where:

- E = actual emissions for a given engine in tons/day
- kW = the maximum engine power (kW) of the relevant marine or non-marine engine
- MMBTU/hr = the maximum heat input rate (MMBTU/hr) of the relevant non-marine engine
- Engine load factor (%) = the engine daily load factor for a given marine or non-marine engine calculated as follows:
  - For each marine engine of a marine vessel, the daily load factor (%) shall be calculated and recorded daily by dividing the actual daily fuel use rate (gallons/day, over a 24-hour period) of a specific vessel by the maximum daily fuel rate for the vessel (gallons/day, assuming all vessel engines operating at their maximum rated kW power for 24 hours/day). The calculated daily load factor (%) shall apply to each marine engine of that vessel.
  - If the daily load factor is not calculated on a certain day, the Permittee shall (1) assume 100% load for all marine engines of the marine vessel while the marine vessel is at the OCS Facility, regardless of whether the vessel is an OCS source; and (2) use the load factors from the application for all marine engines of marine vessels servicing or associated with the OCS Facility, while within 25 nm of the OCS Lease Area boundaries.

- For each non-marine engine used to power OSSs and WTGs during C&C and the permanent non-marine engines on the OSSs during O&M, the daily load factor (%) shall be calculated and recorded daily by dividing the actual daily fuel use rate (gallons/day, over a 24-hour period) of a specific engine by the maximum daily fuel rate for that engine (gallons/day, assuming engine operating at its maximum rated kW power for 24 hours/day). The calculated daily load factor (%) shall apply to each non-marine engine.
- Hours/day = the number of hours the relevant marine or non-marine engine is in operation, which shall be monitored and recorded daily.
  - For each marine engine on a vessel, this includes the hours the engine is in operation when the vessel is either an OCS source or is not an OCS source but is at the OCS Facility or within 25 nm from the OCS Lease Area boundaries.
  - For each non-marine engine, this includes the hours each engine is in operation.
- Emission factor (g/kW-hr or lb/MMBTU):

The emission factor (in g/kW-hr) for marine engines located on vessels that are OCS sources:

- The NO<sub>x</sub>, CO, VOC, PM, PM<sub>10</sub>, PM<sub>2.5</sub> emission factors (in g/kW-hr) used in this formula shall be the BACT/LAER/SOTA NO<sub>x</sub>, CO, VOC, PM, PM<sub>10</sub>, PM<sub>2.5</sub>-specified in this permit. Alternatively, the Permittee may use lower NO<sub>x</sub>, CO, VOC, PM, PM<sub>10</sub>, and PM<sub>2.5</sub> emission factors (in g/kW-hr) that correspond to higher Tier marine engines emission standards if the Permittee actually uses higher Tier marine engines than those listed in this permit; in this case, the emission factors shall be derived from the Tier emission standards from the EPA-issued certificate of conformity for each applicable engine, the emission standards in 40 C.F.R. Part 60, Subpart IIII, the Tier Marine Standards at 40 C.F.R. Part 1042, the engine manufacturer specifications, or from site-specific testing.

If the engine emission standards are presented as NO<sub>x</sub> + hydrocarbon (HC), or NO<sub>x</sub> + NMHC, derive NO<sub>x</sub>, HC, and NMHC emission factors as specified in footnote 5 of this permit.

- For the NO<sub>x</sub> and PM emission factors (in g/kW-hr) for Category 3 marine engines subject to the NSPS IIII emission standards, the Permittee may alternatively choose to use the actual NO<sub>x</sub> and PM (g/kW-hr) values determined during the performance tests required in the permit.

- For the SO<sub>2</sub> emission factors (in g/kW-hr) for marine engines, the Permittee may choose to use an SO<sub>2</sub> emission factor based on the actual sulfur content of fuel used.

The emission factor (in g/kW-hr) for marine engines located on vessels that are not OCS sources, during the times the vessels are at the OCS Facility or traveling to and from the OCS Facility and within 25 nm of the OCS Lease Area boundaries:

- The NO<sub>x</sub>, CO, VOC, PM, PM<sub>10</sub>, and PM<sub>2.5</sub> emission factors (g/kW-hr) shall be determined based on the Tier emission standards for the actual Tier to which each marine engine that the Permittee uses is certified. For those air pollutants for which no Tier emission standards are available, the Permittee shall use emission factors (g/kW-hr) from the engine manufacturer specifications, or emission factors (g/kW-hr) derived from performance testing data conducted for similar engines.
- For Category 3 marine engines, the Permittee may use a lower SO<sub>2</sub> emission factor if the engine is using fuel with a lower sulfur content than the 1,000 ppm specified in this permit.
- For marine engines covered by this permit, the CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O emission factors (g/kW-hr) used to calculate the engine's CO<sub>2e</sub> emissions should be equal to the emission factors provided in the April 2022 EPA Ports Emissions Inventory Guidance (2022 EPA guidance document).
- PM<sub>10</sub> is assumed to be equal to PM, based on conservative engineering judgement. Per the 2022 EPA guidance document, for all marine vessels firing ULSD, PM<sub>2.5</sub> is assumed to be 97% of the PM<sub>10</sub> value for Categories 1 and 2 engines, and 92% of the PM<sub>10</sub> value for all Category 3 engines.

The emission factor (in g/kW-hr) for non-marine engines covered by this permit:

- The NO<sub>x</sub>, CO, VOC, PM, PM<sub>10</sub>, and PM<sub>2.5</sub> emission factors (g/kW-hr) shall be the BACT/LAER/SOTA NO<sub>x</sub>, CO, VOC, PM, PM<sub>10</sub>, PM<sub>2.5</sub>, emission limits (g/kW-hr) specified in this permit.
  - For the SO<sub>2</sub> emission factors (in g/kW-hr) for non-marine engines, the Permittee may choose to use an SO<sub>2</sub> emission factor based on the actual sulfur content of fuel used.
  - For non-marine engines covered by this permit, the CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O emission factors (lb/MMBTU) used to calculate the engine's CO<sub>2e</sub> emissions may be based on Tables C-1 and C-2 of 40 C.F.R. Part 98.
- $1.10231 * 10^{-6}$  = grams to tons conversion factor
  - 1/2,000 = lb to ton conversion factor

4. The Permittee shall calculate the daily emissions in tons of each air pollutant emitted by each relevant marine and non-marine engine, using either formula 1 or formula 2 for each calendar day, as appropriate.
5. On a monthly basis, the Permittee shall calculate and record the tons of each air pollutant emitted that month by all marine and non-marine engines by adding the daily emissions for each engine for that month. Then, the monthly emissions in tons for each air pollutant shall be added to the tons of the corresponding air pollutant from the previous 11 months to get the 12-month rolling total tons of each air pollutant.
  - a. To calculate the 12-month rolling total tons of CO<sub>2</sub>e, the Permittee shall add together the calculated 12-month rolling total tons of CO<sub>2</sub>e from the SF<sub>6</sub>-insulated electrical switchgears (required to be calculated in Section IV.D of this permit for O&M only) and the calculated “12-month rolling total actual CO<sub>2</sub>e emissions” from the marine and non-marine engines.
  - b. To calculate the 12-month rolling total tons of VOC, the Permittee shall add together the calculated 12-month rolling total tons of VOC from the ULSD Storage Tanks (required to be calculated in Section X.4 of this permit), the calculated 12-month rolling total tons of VOC emissions from the Painting and Cleaning Activities (required to be calculated in Section X.5 of this permit), and the calculated 12-month rolling total tons of VOC from the marine and non-marine engines.
6. The actual tons of NO<sub>x</sub>, CO, VOC, PM, PM<sub>10</sub>, PM<sub>2.5</sub>, SO<sub>2</sub>, and CO<sub>2</sub>e, calculated using the methods provided above for determining 12-month rolling total tons of pollutant, shall be used to demonstrate compliance with the PTE emission limits for the facility specified in Table 6 of this permit.

## **H. Emission Offsets**

1. The Permittee shall secure emission offsets for the O&M phase that meet all of the criteria established at N.J.A.C. 7:27-18.3(c), (d), (e), and (f), 18.5 and 18.8, as specified below.
  - a. 530.53 tpy of NO<sub>x</sub>, from the following sources:
    - 1) 126.4 tpy from Carneys Point, NJDEP Program Interest Number PI 65498, 500 Shell Road, Carneys Point, NJ 08069 (shutdown of emission sources)
    - 2) 404.13 tpy from Logan Generating Plant, NJDEP Program Interest number PI 55834, 76 RT 130, South Swedesboro, NJ 08085 (shutdown of emission sources)
  - b. 9.09 tpy of VOC, from the following source:
    - 1) Logan Generating Plant, NJDEP Program Interest number PI 55834, 76 RT 130, South Swedesboro, NJ 08085 (shutdown of emission sources)

**I. OCS Facility Limits on Daily Emissions**

1. The Permittee shall comply with the following limits on the OCS Facility’s daily emissions, expressed as tons per day (“tpd”) and included in Table 7. These limits are derived from the emissions modeled in the application and ensure compliance with the NAAQS and PSD increments. [40 C.F.R. § 52.21]

**Table 7 – OCS Facility Daily Emissions Limits (in tpd)**

Project Phase	NO <sub>x</sub>	CO	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>2</sub> *
C&C	17.14	5.50	0.55	0.53	0.05
O&M	5.46	1.27	0.17	0.28	0.01

\*While SO<sub>2</sub> emissions do not trigger PSD review and were not modeled, this maximum limit was incorporated in the air quality/AQRV analyses. Therefore, it is an enforceable limit.

2. Compliance with the C&C and O&M emission limits (in tpd) in Table 7 shall be determined by the sum of each pollutant emitted from each type of emission sources below. [40 C.F.R. § 55.2]
  - a. Emissions from engines located on the WTGs and/or OSSs;
  - b. Emissions from marine engines while the vessels are OCS sources;
  - c. Emissions from marine engines while the vessels are at the OCS Facility, but are not OCS sources;
  - d. Emissions from marine engines of vessels servicing or associated with the OCS Facility while the vessels are en route to and from the OCS Facility and within 25 nm of the OCS Lease Area boundaries, including those emissions that may occur within state waters (e.g., less than 3 nm from the New Jersey shoreline); and
  - e. Emissions from all non-marine engines.
3. Emissions of NO<sub>x</sub>, CO, PM<sub>10</sub>, PM<sub>2.5</sub>, and SO<sub>2</sub> from each marine and non-marine engine, for each air pollutant, shall be calculated daily using the formula below. [40 C.F.R. § 55.8, N.J.A.C. 7:27-22.19]

$$E = kW * \text{Engine load factor (\%)} * \frac{\text{Hours}}{\text{day}} * \text{Emission Factor} \left( \frac{\text{g}}{\text{kW-hr}} \right) * 1.10231 * 10^{-6}$$

Where:

- E = actual emissions for a given engine in tons/day
- kW = the maximum engine power (kW) of the relevant marine or non-marine engine
- Engine load factor (%) = the engine daily load factor for a given marine or non-marine engine, calculated as follows:
  - For each marine engine of a marine vessel, the load factor (%) shall be calculated and recorded daily by dividing the actual daily fuel use rate (gallons/day) (i.e., actual

- daily fuel use rate shall assume 24 hours/day) of a specific vessel by the maximum daily fuel rate for the vessel (gallons/day, assuming all vessel engines operating at their maximum rated kW power for 24 hours/day). The calculated daily load factor (%) shall apply to each marine engine of that vessel.
- If the daily load factor is not calculated on a certain day, the Permittee shall (1) assume 100% load for all marine engines of the marine vessel while the marine vessel is at the OCS Facility, regardless of whether the vessel is an OCS source; and (2) use the load factors from the application for all marine engines of marine vessels servicing or associated with the OCS Facility, while within 25 nm of the OCS Lease Area boundaries and keep a record of the day and why it was unable to determine the actual engine daily load factor for that particular day.
  - For each non-marine engine used to power OSSs and WTGs during C&C and the non-marine engines permanently located on the OSSs during O&M, the daily load factor (%) shall be calculated and recorded daily by dividing the actual daily fuel use rate (gallons/day) (i.e., actual daily fuel use rate shall assume 24 hours/day) of a specific engine by the maximum daily fuel rate for that engine (gallons/day, assuming engine operating at their maximum rated kW power for 24 hours/day). The calculated daily load factor (%) shall apply to each non-marine engine.
  - Hours/day = the number of hours the relevant marine or non-marine engine is in operation, which shall be monitored and recorded daily.
    - For each marine engine on a vessel, this includes the hours the engine is in operation when the vessel is either an OCS source or is not an OCS source but is at the OCS Facility or within 25 nm from the OCS Lease Area boundaries.
    - For each non-marine engine, this includes the hours each engine is in operation.
  - Emission factor (g/kW-hr):
    - The emission factor (in g/kW-hr) for marine engines located on vessels that are OCS sources:
      - The NO<sub>x</sub>, CO, VOC, PM, PM<sub>10</sub>, PM<sub>2.5</sub> emission factors (in g/kW-hr) used in this formula shall be the BACT/LAER/SOTA NO<sub>x</sub>, CO, VOC, PM, PM<sub>10</sub>, PM<sub>2.5</sub>-specified in this permit. Alternatively, the Permittee may use lower NO<sub>x</sub>, CO, VOC, PM, PM<sub>10</sub>, and PM<sub>2.5</sub> emission factors (in g/kW-hr) that correspond to higher Tier marine engines emission standards if the Permittee actually uses higher Tier marine engines than are those listed in this permit; in this case, the emission factors shall be derived from the Tier emission standards from EPA-issued certificate of conformity for each applicable engine containing the emission standards in 40 C.F.R. Part 60, Subpart III, Tier Marine Standards at 40 C.F.R. Part 1042, engine manufacturer specifications, or site-specific testing derived factors.

If the engine emission standards are presented as NO<sub>x</sub> + hydrocarbon (HC), or NO<sub>x</sub> + NMHC, derive NO<sub>x</sub>, HC, and NMHC emission factors as specified in footnote 5 of this permit.

- For the NO<sub>x</sub> emission factor (in g/kW-hr) for Category 3 marine engines subject to the NSPS IIII emission standards, the Permittee may alternatively choose to use the actual NO<sub>x</sub> (g/kW-hr) values determined during the performance tests required in the permit.
- For the SO<sub>2</sub> emission factors (in g/kW-hr) for Category 3 marine engines, the Permittee may alternatively choose to use an SO<sub>2</sub> emission factor based on the actual sulfur content of fuel used.
- The emission factor (in g/kW-hr) for marine engines located on vessels that are not OCS sources, during the times the vessels are at the OCS Facility or within 25 nm from the OCS Lease Area boundaries:

The NO<sub>x</sub>, CO, VOC, PM, PM<sub>10</sub>, and PM<sub>2.5</sub> emission factors (g/kW-hr) shall be determined based on the Tier emission standards for the actual Tier to which each marine engine that the Permittee uses is certified. For those air pollutants for which no Tier emission standards are available, the Permittee shall use emission factors (g/kW-hr) from the engine manufacturer specifications, or emission factors (g/kW-hr) derived from performance testing data conducted for similar engines.

- For marine engines covered by this permit, the CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O emission factors (g/kW-hr) used to calculate the engine's CO<sub>2</sub>e emissions should be equal to the emission factors provided in the April 2022 EPA Ports Emissions Inventory Guidance (2022 EPA guidance document).
- PM<sub>10</sub> is assumed to be equal to PM, based on conservative engineering judgement. Per the 2022 EPA guidance document, for all marine vessels firing ULSD, PM<sub>2.5</sub> is assumed to be 97% of the PM<sub>10</sub> value for Categories 1 and 2 engines, and 92% of the PM<sub>10</sub> value for all Category 3 engines.
- The emission factor (in g/kW-hr) for non-marine engines covered by this permit:
- The NO<sub>x</sub>, CO, VOC, PM, PM<sub>10</sub>, PM<sub>2.5</sub>, and emission factors (g/kW-hr) shall be the BACT/LAER/SOTA NO<sub>x</sub>, CO, VOC, PM, PM<sub>10</sub>, PM<sub>2.5</sub>, emission limits (g/kW-hr) specified in this permit.
- For the SO<sub>2</sub> emission factors (in g/kW-hr) for non-marine engines, the Permittee may choose to use an SO<sub>2</sub> emission factor based on the actual sulfur content of fuel used.
- For non-marine engines covered by this permit, the CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O emission factors (lb/MMBTU) used to calculate the engine's CO<sub>2</sub>e emissions may be based on

Tables C-1 and C-2 of 40 C.F.R. Part 98.

- $1.10231 * 10^{-6}$  = grams to tons conversion factor
  - $1/2,000$  = lb to ton conversion factor
4. The Permittee shall calculate the daily emissions in tons of each air pollutant emitted by each relevant marine and non-marine engine, each calendar day using the formula above.
  5. The sums of the actual tons of NO<sub>x</sub>, CO, PM<sub>10</sub>, PM<sub>2.5</sub>, and SO<sub>2</sub> emissions per day for each relevant marine and non-marine engine, calculated using the method provided above, shall be used to demonstrate compliance with the OCS Facility Daily Emissions Limits (in tpd) specified in Table 7 of this permit.

## **V. SMOKE, ODORS, OPACITY LIMITATIONS AND MEASUREMENTS, AND CRANKCASE EMISSIONS**

1. The Permittee shall ensure that each marine engine of any jack-up vessel that is an OCS source, and each non-marine engine (portable diesel generator engines used during C&C, and permanent diesel generator engines on OSSs during O&M), shall not cause smoke the shade or appearance of which is darker than number 1 on the Ringlemann smoke chart or greater than 20 percent opacity, exclusive of visible condensed water vapor, to be emitted into the outdoor air from the combustion of fuel in any stationary internal combustion engine or any stationary turbine engine for a period of more than 10 consecutive seconds. [N.J.A.C. 7:27-3.5]
2. For each marine engine of any jack-up vessel that is an OCS source, the Permittee shall conduct a one-minute visible emissions survey of the engine's emission points, each day during C&C and O&M that the engine operates. The survey shall be conducted using EPA test Method 22, while the engine is operating. No more than four emission points shall be observed simultaneously.
  - a. For emission points where visible emissions are observed, the Permittee shall initiate corrective action within no more than eight hours of the initial observation, or within no more than 24 hours of the initial observation if limited remaining daylight hours prevent faster action.
  - b. If, after taking the corrective action, the visible emissions persist, the Permittee shall perform an EPA test Method 9 visual determination of opacity in accordance with 40 C.F.R. § 60, Appendix F, within 24 hours of the initial observation. [40 C.F.R. § 55.8]
3. The Permittee shall conduct, annually, an EPA test Method 9 visual determination of opacity in accordance with 40 C.F.R. Part 60, Appendix F for each permanent diesel generator engine on the OSSs during O&M. [40 C.F.R. § 55.8]

4. The Permittee shall, upon request of the EPA, conduct a Method 9 visual determination of opacity for any marine engine of a vessel that is not an OCS source, or any non-marine engine used during C&C or O&M. [40 C.F.R. § 55.8]
5. The Permittee shall ensure that each non-marine engine (portable diesel generator engines used during C&C and O&M, and permanent diesel generator engines on the OSSs during O&M) does not exceed the smoke opacity standards below. [40 C.F.R. §§ 60.4204(b), 60.4201(a), and 1039.105(b)]
  - a. 20 percent during the acceleration mode;
  - b. 15 percent during the lugging mode; and
  - c. 50 percent during the peaks in either the acceleration or lugging modes.
6. The Permittee shall not allow, or permit any air contaminant, including an air contaminant detectable by the sense of smell, to be present in the outdoor atmosphere in such quantity and duration which is, or tends to be, injurious to human health or welfare, animal or plant life or property, or would unreasonably interfere with the enjoyment of life or property. This shall not include an air contaminant which occurs only in areas over which the owner or operator has exclusive use or occupancy. In determining whether an odor unreasonably interferes with the enjoyment of life or property, EPA shall consider all of the relevant facts and circumstances, including, but not limited to, the character, severity, frequency, and duration of the odor, and the number of persons affected thereby. In considering these and other relevant facts and circumstances, no one factor shall be dispositive, but each shall be considered relevant in determining whether an odor interferes with the enjoyment of life or property, and, if so, whether such interference is unreasonable considering all of the circumstances. [N.J.A.C. 7:27-8.3(j), N.J.A.C. 7:27-5]
7. The Permittee shall ensure compliance with the following crankcase emissions provisions at 40 C.F.R. § 1039.115(a) for each non-marine engine (portable diesel generator engines used during C&C and O&M, and permanent diesel generator engines on the OSSs during O&M):
  - a. The crankcase emissions may not be discharged directly into the atmosphere from any engine throughout its useful life unless the crankcase emissions are added to the exhaust emissions (either physically or mathematically) during all emission testing. Crankcase emissions shall have the meaning defined at 40 C.F.R. § 1039.801: Crankcase emissions means any airborne substances emitted to the atmosphere from any part of the engine crankcase's ventilation or lubrication system. The crankcase is the housing for the crankshaft and other related parts. [40 C.F.R. §§ 60.4204(b), 60.4201(a), and 1039.115(a)]
8. The Permittee shall ensure compliance with the following crankcase emissions provisions at 40 C.F.R. § 1042.115(a) for each of the marine engines listed in the permit and subject to the Tier engine emission standards in 40 C.F.R. § 1042.101 or Appendix I to 40 C.F.R. Part 1042, while the vessels are OCS sources:

- a. The crankcase emissions may not be discharged directly into the atmosphere from any engine throughout its useful life unless the crankcase emissions are added to the exhaust emissions (either physically or mathematically) during all emission testing. Crankcase emissions shall have the meaning defined at 40 C.F.R. § 1042.901: Crankcase emissions means any airborne substances emitted to the atmosphere from any part of the engine crankcase's ventilation or lubrication system. The crankcase is the housing for the crankshaft and other related internal parts. [40 C.F.R. § 1042.115(a)]

**VI. 40 C.F.R. PART 60, SUBPART III – STANDARDS OF PERFORMANCE FOR STATIONARY COMPRESSION IGNITION INTERNAL COMBUSTION ENGINES (“NSPS III”) – OPERATING PRACTICES, COMPLIANCE AND MONITORING REQUIREMENTS AND OTHER REQUIREMENTS**

1. The Permittee shall ensure that the following are complied with for each marine engine used during C&C and O&M, and each non-marine engine (portable diesel generator engines used during C&C and O&M, and permanent diesel generator engines on OSSs during O&M) for which this permit requires compliance with NSPS III emission standards:
  - a. Operate and maintain each engine and control device according to the manufacturer's emission-related written instructions. [40 C.F.R. § 60.4211(a)(1)]
  - b. Only change those emissions-related settings that are permitted by the manufacturer. [40 C.F.R. § 60.4211(a)(2)]
  - c. Meet the applicable requirements of 40 C.F.R. Part 1068. [40 C.F.R. § 60.4211(a)(3)]
  - d. Operate and maintain each engine to achieve the emissions standards at 40 C.F.R. § 60.4204, which are specified in this permit, over the entire life of the engines. [40 C.F.R. § 60.4206]
  - e. For each engine, the diesel particulate filter (if the engine is equipped with one) must be installed with a backpressure monitor that notifies the owner or operator when the high backpressure limit of the engine is approached. [40 C.F.R. § 60.4209(b)]
2. The Permittee shall comply with all applicable requirements of the New Source Performance Standards provisions from 40 C.F.R. Part 60, Subpart A (General Provisions) that are specifically listed in Table 8 of 40 C.F.R. Part 60, Subpart III. [40 C.F.R. § 60.4218]
3. For the eight permanent diesel generator engines on the OSSs during O&M, the Permittee shall maintain (1) documentation supporting that the engines were installed and configured according to the manufacturer's specifications; and (2) records of the manufacturer's written instructions for the operation and maintenance of the engines. [40 C.F.R. § 52.21]

4. Any new, modified, or reconstructed CI ICE, as these terms are defined in NSPS IIII, that is listed in this permit at Section IV.A or IV.B shall comply with all applicable NSPS IIII requirements, except to the extent EPA has granted a request for exemption from such requirements under 40 C.F.R. § 55.7. [40 C.F.R. §§ 55.7 & 55.13(c)]
5. Except for marine engines that are covered by Section IV.A.1.c and d of this permit, prior to the use of any CI ICE marine engine of a vessel that is an OCS source which is not listed in Section IV.A of this permit:
  - a. The Permittee shall notify EPA immediately and shall submit to EPA an OCS air permit modification application; and
  - b. The Permittee shall not use the CI ICE marine engine unless and until EPA has issued the OCS air permit authorizing such use.
6. For any new, modified, or reconstructed CI ICE non-marine engine that is part of the OCS Facility, that is not listed in Section IV.B of this permit, and that is certified by EPA to less stringent emission standards than the Tier 4 emission standards in 40 C.F.R. § 1039.101(b), Table 1 (“Tier 4 Exhaust Emission Standards After the 2014 Model Year, g/kW-hr”):
  - a. The Permittee shall notify EPA immediately and shall submit to EPA an OCS air permit modification application; and
  - b. The Permittee shall not use the CI ICE non-marine engine unless and until EPA has issued the OCS air permit authorizing such use.
7. For any new, modified, or reconstructed CI ICE non-marine engine that is part of the OCS Facility, that is not listed in Section IV.B of this permit, that is certified by EPA to the Tier 4 emission standards in 40 C.F.R. § 1039.101(b), Table 1, and that is not subject to other regulatory requirements incorporated by reference into 40 C.F.R. Part 55 at the time:
  - a. The Permittee shall notify EPA immediately and shall submit to EPA an OCS air permit modification application together with a demonstration supporting that the non-marine engine (1) meets the Tier 4 emission standards in 40 C.F.R. § 1039.101(b), Table 1; and (2) is not subject to other regulatory requirements incorporated by reference into 40 C.F.R. Part 55 at the time, within 30 days of when the Permittee starts using that CI ICE non-marine engine; and
  - b. The Permittee may use the non-marine engine after submittal of the OCS air permit application, prior to EPA’s issuance of the OCS air permit modification authorizing the use of the CI ICE marine engine.

**VII. 40 C.F.R. PART 63, SUBPART ZZZZ – NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS FOR STATIONARY RECIPROCATING INTERNAL COMBUSTION ENGINES – COMPLIANCE REQUIREMENTS, MAINTENANCE**

## **AND MANAGEMENT PRACTICES, AND OTHER REQUIREMENTS**

1. For all of the Permittee's marine engines of vessels that are OCS sources, and non-marine engines, specified in this permit and that are required to comply with 40 C.F.R. Part 63, NESHAP ZZZZ (National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines ("RICE")) ("NESHAP ZZZZ"), the Permittee shall comply with the requirements of NESHAP ZZZZ by meeting the requirements of NSPS III. The Permittee shall not use engines subject to NESHAP ZZZZ that cannot comply by meeting the requirements of NSPS III. [40 C.F.R. § 63.6590(c)(1)]
2. The Permittee shall comply with all applicable requirements of the National Emission Standards for Hazardous Air Pollutants for Source Categories provisions at 40 C.F.R. Part 63, subpart A (General Provisions) that are specifically listed in Table 8 of NESHAP ZZZZ. [40 C.F.R. § 63.6665]

### **VIII. FUEL CONTENT REQUIREMENTS**

1. The Category 1 and Category 2 marine engines of all marine vessels (listed in Tables 1A and 1B), and all non-marine engines portable diesel generator engines used during C&C and all permanent diesel generator engines used during O&M (listed in Tables 2A and 2B) shall comply with the following fuel content requirements:
  - a. The Permittee shall ensure that the diesel fuel used in all of the above-listed engines meets the per-gallon standards below. [40 C.F.R. § 60.4207(b), 40 C.F.R. § 1090.305(a), 40 C.F.R. § 63.6604]
    - 1) Maximum sulfur content of 15 parts per million (ppm); and
    - 2) Cetane index or aromatic content as follows:
      - i. A minimum cetane index of 40; or
      - ii. A maximum aromatic content of 35 volume percent.
  - b. The Permittee shall ensure that sulfur content of the diesel fuel used in all of the above-listed engines is limited to 0.0015 percent by weight or less. [40 C.F.R. § 52.21]
2. Category 3 Marine Engines
  - a. The Permittee shall ensure that the diesel fuel used in the Category 3 marine engines of marine vessels meets a maximum per-gallon sulfur content of 1,000 ppm. [40 C.F.R. § 60.4207(d), 40 C.F.R. § 1090.325(b), 40 C.F.R. § 63.6604]
3. Compliance demonstration requirements

- a. Compliance with the above maximum sulfur content of fuel limit(s) of 15 ppm (or 0.0015 percent by weight) and 1,000 ppm shall be demonstrated by fuel supplier certifications for each fuel delivery. [40 C.F.R. § 55.8(a), 40 C.F.R. § 52.21]

## **IX. OPERATING LIMITATIONS, WORK PRACTICES, MONITORING, AND OTHER REQUIREMENTS**

### **A. Permanent Diesel Generator Engines**

1. The Permittee shall comply with the following for each of the permanent diesel generator engines on the OSSs during O&M. Each permanent diesel generator engine shall: [40 C.F.R. § 52.21, 40 C.F.R. § 55.6(a)(4)]
  - a. Have a maximum engine power of less than or equal to 500 kW.
  - b. Each engine shall be equipped with a non-resettable hour meter.
  - c. Each engine shall not exceed 500 hours of operation on a 12-month rolling total basis.

### **B. Marine Engines of Jack-Up Vessels, Used During C&C and O&M**

1. The NO<sub>x</sub> and PM performance tests required for each Category 3 marine engine on the jack-up vessels shall be conducted as specified in 40 C.F.R. § 60.4213. [40 C.F.R. §§ 60.4211(d)(1) & (3) and 60.4213]
2. The Permittee shall ensure that the performance tests are completed within 180 days after initial startup (1) for each of the jack-up vessels used during C&C, the initial “startup” is the first day the construction activities involve the use of the jack-up vessel; and (2) for each jack-up vessel used during O&M, the initial “startup” is the first day the jack-up vessel is used during O&M. Startup shall have the meaning provided at 40 C.F.R. § 60.2 (“Definitions”). [40 C.F.R. § 60.8(a)]
3. At least 60 days prior to each performance test, the Permittee shall submit to the EPA at the address indicated in Section XIV.15.c of this permit, for review and approval, a Quality Assurance Project Plan (an emission test protocol) detailing methods and procedures to be used during the performance testing. [40 C.F.R. § 55.8]
4. The Permittee shall submit the performance test report to the EPA within 60 days after the completion of each performance test. [40 C.F.R. § 55.8]

### **C. Good Combustion Practices**

1. The Permittee shall use good combustion practices based on the manufacturer’s specifications for all marine and non-marine engines of the Atlantic Shores project.

2. For the eight permanent diesel generators engines on the OSSs during O&M, the Permittee shall:
  - a. Develop and implement an enhanced monitoring and maintenance plan that will assure good combustion practices and combustion efficiency.
  - b. Submit the enhanced monitoring and maintenance plan to EPA along with the first annual compliance report required elsewhere in this permit at the address provided in this permit in Section XIV.15.c.  
[N.J.A.C. 7:27-22.19, 40 C.F.R. § 55.8]

#### **D. Other Requirements**

1. The Permittee shall monitor and record on a daily basis the hours each engine is in operation, for the following engines, when they are at the OCS Facility or within 25 nm of the OCS Lease Area boundaries: each marine engine of each marine vessel listed in Tables 1A and 1B of this permit; each marine engine listed in Table 1C of this permit; and each non-marine engine listed in Tables 2A, 2B and 2C of this permit. The hours of operation shall be recorded from a non-resettable hour-meter, or, if no such meter is available, by monitoring and maintaining records of the actual daily operating hours. [40 C.F.R. §§ 55.6(a)(4) and 55.8(a)]
2. The Permittee shall monitor and record on a daily basis the fuel use rate (gallons/day) for each marine vessel used that day.
3. The Permittee shall provide EPA with at least a 30-day prior notice of each NO<sub>x</sub> and PM performance test, annual visual determination of opacity, or any other performance test that may be required by EPA, to afford EPA the opportunity to have an observer present. If after the 30-day notice for a scheduled performance test or visual determination of opacity test, there is a delay (due to operational problems, etc.) in conducting that scheduled test, the Permittee shall notify EPA as soon as possible of any delay in the original test date, either by providing at least 7 days prior notice of the rescheduled date of the performance test, or by arranging a rescheduled date with the EPA by mutual agreement. [40 C.F.R. § 60.8(d), 40 C.F.R. § 55.8]

### **X. RECORDKEEPING REQUIREMENTS**

The Permittee shall comply with the below recordkeeping requirements. [40 C.F.R. § 55.8, unless otherwise specified below]

1. Jack-Up Vessels – Performance Tests
  - a. The Permittee shall maintain records of any NO<sub>x</sub> and PM emissions performance test reports required by this permit for Category 3 marine engines on jack-up vessels (used during C&C and O&M), which shall at a minimum include the date and the results of the test.

2. Portable Diesel Generator Engines on OSSs and WTGs (used during C&C) and Permanent Diesel Generator Engines on OSSs during O&M

The Permittee shall maintain the following records:

- a. For each of the above-listed engines that are equipped with a diesel particulate filter, the records of any corrective action taken after the backpressure monitor has notified the owner or operator that the high backpressure limit of the engine is approached. [40 C.F.R. § 60.4214(c)]
- b. For each of the permanent diesel generator engines on the OSSs during O&M, the records of:
  - 1) the enhanced monitoring and maintenance plan.
  - 2) Once per month, the total operating time of each generator from that generator's hour meter, as well as a calculation of the 12-month rolling total of hours operated for each generator.

3. SF<sub>6</sub>-Insulated Electrical Switchgears

The Permittee shall maintain the following records:

- a. Actual SF<sub>6</sub> emissions (in tons of CO<sub>2</sub>e) and the corresponding calculations required in Section IV.D of this permit for verifying compliance with the BACT CO<sub>2</sub>e emission limit.
- b. The date and time that any alarm is activated, the corrective action(s) taken to remedy the problem (and the amount of SF<sub>6</sub> added, or contained in any replacement equipment), the date of each such corrective action, and the date when the problem was resolved.
- c. Results of all routine and periodic inspections and, for inspections during which an issue was uncovered, records of any corrective action(s) taken to remedy the problem.
- d. Documentation supporting the manufacturer-guaranteed SF<sub>6</sub> leak rates specified in this permit.

4. ULSD Storage Tanks

The Permittee shall maintain the following records:

- a. Actual amount of ULSD stored in all storage tanks collectively, on a 12-month rolling total basis, during C&C and, separately, during O&M.

- b. Actual tons of VOC fugitive emissions, and the corresponding calculations required in Section IV.D of this permit to demonstrate compliance with the LAER VOC emission limit for ULSD storage tanks.

5. Painting and Cleaning Activities

The Permittee shall maintain the following records:

- a. Actual amount (in gallons) of each type of paint and/or solvent used on a 12-month rolling total basis.
- b. Data sheets or other materials that provide the name, VOC content, and density for each paint and/or solvent used.
- c. Actual tons of VOC fugitive emissions, and the corresponding calculations required in Section IV.F in this permit to demonstrate compliance with the LAER VOC emission limit for painting and cleaning activities.

6. Opacity

The Permittee shall maintain records of the results of all annual Method 9 visual determination of opacity tests required by this permit, and of any other Method 9 visual determination of opacity tests initiated by the Permittee after visible emissions are observed.

7. Sulfur Content in Fuel

The Permittee shall maintain records, for all fuel deliveries, of the fuel supplier certifications required by this permit to demonstrate compliance with the sulfur content in fuel limits specified in this permit.

8. Other Recordkeeping Requirements

The Permittee shall maintain records of the following:

- a. Construction and Commissioning Phase Start Date.
- b. Operations and Maintenance Phase Start Date.
- c. For each OCS source vessel deployed during C&C and/or O&M, the Permittee shall maintain a record of the alternate vessels that, during the time of contract development, were available for hire for the required work needed at the time needed, as well as the Tier levels for each vessel's engines. The alternate vessels available for hire shall be listed in ranking order from the one with the highest tiered-engines to the one with lowest tiered-engines. If the vessel with the highest tiered-engines from the list was the actual vessel hired and deployed, the record should state so. If the vessel with the highest tiered-engines from the list was not the actual vessel hired and deployed, the record

should document the reason(s) for the Permittee's selection of a vessel with lower-tiered engines.

- d. For each vessel that will be used for each of the C&C activities, which are detailed in Table 1A of this permit, and each vessel that will be used for each of the O&M activities, which are detailed in Table 1B: the vessel's owner (individual or company), vessel name, build year, nation of origin (US-flagged or foreign-flagged vessel), exact vessel function, and documentation specifically supporting whether (1) the vessel requires attachment to the seabed (either via anchors, spuds (type of jack-up vessel), or other type of attachment) while at the Atlantic Shores project site during the C&C or O&M activities; (2) the vessel could be maintained in a fixed position using only the vessel engines and without any attachment to the seabed during the C&C and O&M activities; or (3) the vessel would require attachment to other vessels, while those other vessels are OCS sources, or to the WTGs or OSSs structures during the C&C or O&M activities.
- e. For each marine engine of each vessel that will be used for each of the C&C and O&M activities, regardless of whether the vessel is considered an OCS source or not: the engine's category (1 through 3), type of marine engine (i.e., main (or propulsion) or auxiliary marine engine), maximum engine power (kW), make and model year, displacement in liters/cylinder, install date, maximum in-use engine speed in rotations per minute, type of fuel used and sulfur content for each fuel type, average loads, and the EPA certificate of conformity to a Tier engine rating or IAPP certificate, as applicable.
- f. For each non-marine engine that will be used for each of the C&C and O&M activities: maximum engine power (kW), model year, type of fuel used and sulfur content of fuel, and the EPA certificate of conformity to the Tier 4 emission standards in 40 C.F.R. § 1039.101(b).
- g. Daily records of the following:
  - 1) Number of hours that each marine engine of a marine vessel is operated, while the vessel is an OCS source.
  - 2) Number of hours that each marine engine of any vessel is operated both while the vessel is at the OCS Facility but not an OCS source, and when the vessel is within 25 nm of the OCS Lease Area boundaries of the project.
  - 3) Number of hours that each non-marine engine is operated.
  - 4) Daily marine engines load factors.
  - 5) Daily fuel use rate (gallons/day) for each marine vessel.
  - 6) All actual emissions (in tons/day), along with the supporting calculations, which are required to be calculated by this permit to demonstrate compliance with the limits on the modeled emission rates included in Table 7 of this permit.

- h. Monthly records of the following:
  - 1) Actual CO<sub>2</sub>e emissions from marine and non-marine engines subject to this permit's BACT CO<sub>2</sub>e emission limits, along with supporting calculations, to verify compliance with the BACT CO<sub>2</sub>e emission limits.
  - 2) Actual emissions of pollutants subject to the PTE limits in Table 6 of this permit, and supporting calculations, for all relevant emission sources, used to demonstrate compliance with those PTE limits.

## **XI. REPORTING REQUIREMENTS**

1. The Permittee shall notify EPA within 5 days of the C&C Phase Start Date.
2. The Permittee shall notify EPA within 5 days of the O&M Phase Start Date.
3. The Permittee shall submit an annual report including the information required in this Section XI or elsewhere in this permit. The Permittee shall submit the annual report to EPA by the following dates:
  - a. For those records created during C&C:
    - 1) The first report shall be submitted to EPA within 30 days of the end of the first 12 consecutive calendar months, starting with the month in which the C&C Phase Start Date occurs.
    - 2) Future reports shall be submitted to EPA within 30 days from the end of the subsequent 12 consecutive calendar months period.
  - b. For those records created during O&M:
    - 1) Each report shall cover a calendar year and shall be submitted by no later than April 15 of the following calendar year. The first report shall cover the calendar year in which the O&M Phase Start Date occurs, regardless of whether this is a whole or partial year.
  - c. If C&C and O&M activities overlap in time (for example, if ASP1 is in the O&M Phase and ASP2 is in the C&C Phase for a given reporting period), the Permittee shall submit separate annual reports covering those activities in the C&C Phase and those activities in the O&M Phase.
4. SF<sub>6</sub>-Insulated Electrical Switchgears

The Permittee shall include in the annual report submitted to EPA during O&M all records required at Sections X.3. of this permit related to SF<sub>6</sub>-insulated electrical switchgears.

5. Opacity

- a. The Permittee shall submit to EPA, within 30 days of the completion of each annual Method 9 visual determination of opacity test required by this permit, a copy of the results of the test. [N.J.A.C. 7:27-22.19, 40 C.F.R. § 55.8]
- b. The Permittee shall include in each annual report submitted to EPA during C&C or O&M a copy of the test results from any Method 9 visual determination of opacity tests conducted during the reporting period after visible emissions were observed.

6. The Permittee shall include in the annual reports submitted to EPA during C&C and O&M the following:

- a. All actual emissions (expressed in tons, for each 12-month rolling period falling in whole or in part within the reporting period) of each pollutant listed in Table 6 of this permit, along with the supporting calculations, to demonstrate compliance with the PTE limits specified in Table 6;
- b. All actual emissions (expressed in tons per day) for each pollutant listed in Table 7, along with supporting calculations, to demonstrate compliance with the limits on the modeled emission rates specified in Table 7 of this permit; and
- c. All records required at Sections X.8.c, d, e, and f of this permit.

7. Records and reports required by this permit shall contain the information below, where applicable. [40 C.F.R. § 52.21; 40 C.F.R. § 55.8]

- a. The date, source operation, and time of sampling or measurements;
- b. The date(s) analyses were performed;
- c. The company and the name of the person representing that company who was responsible for performing the sampling, measurements or analyses;
- d. The analytical techniques or methods used;
- e. The results of such analyses including quality assurance data where required;
- f. The operating conditions as existing at the time of sampling or measurement;
- g. Any deviation from permit requirements must be clearly identified in all records and reports;
- h. Copies of all reports required by this permit;
- i. Any other information required by EPA to interpret the monitoring data; and
- j. Reports must be certified by a responsible official, consistent with N.J.A.C. 7:27-1.39.

8. Compliance monitoring and recordkeeping shall be conducted according to the terms and conditions contained in this permit and shall follow all quality assurance requirements found in applicable regulations. Records of all monitoring data and support information must be retained for a period of at least 5 years from the date of the monitoring, sampling, measurement, report, or application. Support information includes all calibration and

maintenance records and all original strip-chart recordings for continuous monitoring instrumentation, and copies of all reports required by the permit. [40 C.F.R. § 55.8]

- a. In the case of any condition contained in this permit with a reporting requirement of “Upon request by the EPA,” the permittee shall include in the semiannual report a statement for each such condition that the monitoring or recordkeeping was performed as required or requested and a listing of all instances of deviations from these requirements.
- b. In the case of any emission testing performed during the previous six-month reporting period, due to either a request by the EPA or a regulatory requirement, the permittee shall include in the semiannual report a summary of the testing results and shall indicate whether or not the EPA has approved the results.
- c. All semiannual reports may be submitted electronically or physically. Electronic reports shall be submitted using the EPA’s Compliance and Emission Reporting Data Interface (CEDRI). If the Permittee elects to send physical copies instead, those copies shall be sent to the EPA at the mailing address provided in this permit.

## **XII. EMISSION STATEMENTS AND STATE SERVICE FEES**

The following emission statement requirements of N.J.A.C. 7:27-21, apply to the O&M Phase and its emission sources. The state service fees are from N.J.A.C. 7:27-8.6. [40 C.F.R. § 55.10(a)(1) and (2), N.J.A.C. 7:27-21, N.J.A.C. 7:27-8.6].

1. The Permittee shall submit to the EPA an annual emission statement of its actual O&M Phase emissions for each calendar year, consistent with the requirements of N.J.A.C. 7:27-21 (“Emission Statements”). This annual emission statement shall be submitted by no later than April 15 of the following calendar year. The first annual emission statement shall cover the calendar year in which the O&M Phase Start Date occurs, regardless of whether this is a whole or partial year. The annual emission statements shall be certified by a responsible official as provided at N.J.A.C. 7:27-21.5 and submitted electronically to [Buettner.Robert@epa.gov](mailto:Buettner.Robert@epa.gov), or another email address or addresses provided by EPA to the Permittee.
2. The Permittee shall retain and maintain a copy of each emission statement submitted to the EPA, and all records and other materials supporting how the information submitted in the emission statement was determined, including any calculations, data, measurements, and estimates used, for five years following the year in which the emission report is submitted. These records shall all be made available at the facility to the representatives of the EPA upon request during normal business hours. [N.J.A.C. 7:27-21.7]
3. The Permittee shall submit the applicable registration fee required under and calculated pursuant to N.J.A.C. 7:27-8.6 and 40 C.F.R. § 55.10(a)(2), to the address listed below with a copy of the amount submitted. [40 C.F.R. § 55.10(a)(2)]

4. Prior to issuance of this final permit, the Permittee shall submit the service fee payments and the required supporting documentation to the following address:

U.S. EPA  
OCFO/OC/ACAD/FCB  
Attn: Collections Team  
1300 Pennsylvania Ave NW  
Mail Code 2733R  
Washington, DC 20004

5. Each payment submittal shall include a cover letter containing the following supporting documentation with the payment:
  - a. Permittee's name.
  - b. Complete Permittee address, including city, state, zip code.
  - c. Name and phone number of permittee point of contact.
  - d. EPA Permit Number: OCS-EPA-R2 NJ 01.
  - e. EPA Contact: [Contact Name], Supervisor, Permitting Section, Air and Radiation Division. EPA will provide the Permittee with a Contact Name at least 6 months prior to the first payment deadline.
  - f. Reason for payment: "Miscellaneous Receipts Payment for OCS Air Permit Fee under 40 C.F.R. Part 55."
6. The Permittee shall send a photocopy of each fee payment check (or other confirmation of actual fee paid) and a copy of the supporting documentation to:

Supervisor  
Permitting Section, Air and Radiation Division  
U.S. EPA Region 2  
290 Broadway  
New York, NY 10007-1866

7. The Permittee shall retain and maintain a copy of all materials used to determine fee payments for at least five years following the year in which the fee payment is submitted.

### **XIII. TITLE V FACILITY PERMIT REQUIREMENTS**

Reserved.

### **XIV. GENERAL REQUIREMENTS**

1. Air Pollution Prohibited.  
No person shall cause, suffer, allow or permit to be emitted into the outdoor atmosphere substances in quantities which shall result in air pollution as defined in N.J.A.C. 7:27-5.1. [N.J.A.C. 7:27-5.2]

2. Open Burning of Refuse – Prohibitions.

- a. No person shall burn, cause, suffer, allow, or permit the disposal of rubbish, garbage, trade waste, buildings or structures by open burning. [N.J.A.C. 7:27-2.3(a)]

3. Permit Expiration.

- a. An approval to construct shall become invalid if the Permittee does not commence construction within 18 months after receipt of such approval, 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 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]
- b. Any OCS air permit to construct issued to a new OCS source or modification shall remain in effect until it expires under 40 C.F.R. § 55.6(b)(4), is rescinded under the applicable requirements incorporated in 40 C.F.R. §§ 55.13 and 55.14, or until the date EPA terminates this permit at the Permittee's request as specified by this permit. [40 C.F.R. § 55.6(b)(5)]

4. Enforcement.

The Permittee shall comply with all 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 OCS source and Permittee. [40 C.F.R. §§ 55.9(a) and (b)]

5. Safe Shutdown.

As provided in 40 C.F.R. § 55.9(c), if this facility is ordered to cease operation of any piece of equipment due to enforcement action taken by the EPA, the shutdown will be coordinated by the EPA with the Department of the Interior's Bureau of Ocean Energy Management 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. § 55.9(c)]

6. Construction and Operation.

- a. Any owner or operator who constructs or operates an OCS source not in accordance with the application submitted pursuant to this Part 55, or with any approval to construct or permit to operate, or any owner or operator of a source subject to the requirements of this part who commences construction after the effective date of this part without

applying for and receiving approval under this part, shall be in violation of this part. [40 C.F.R. § 55.6(a)(4)(i)]

- b. Receipt of an approval to construct or a permit to operate from the Administrator or delegated agency shall not relieve any owner or operator of the responsibility to comply fully with the applicable provisions of any other requirements under Federal law. [40 C.F.R. § 55.6(a)(4)(ii)]

7. Notification to Owners, Operators, and Contractors.

The Permittee shall notify all other owners or operators, contractors, and any subsequent owners or operators associated with the operation of this facility including emissions therefrom, of the terms and conditions of this permit. A copy of the notification letter shall be forwarded to the EPA Region 2 Office at the address specified in this permit. In the event of any changes in control or ownership of the project, this Permit shall be binding on all subsequent owners and operators. [40 C.F.R. § 55.6(a)(4)(i) & (iv)]

8. Monitoring and Compliance.

The Permittee shall, upon request by the EPA, conduct emissions test(s), including but not limited to testing for visible emissions, for any emission sources listed in this permit. [40 C.F.R. § 55.8, 42 U.S.C. § 7414]

9. Additional Emissions Tests.

For the purpose of ascertaining compliance or noncompliance with any air pollution control code, rule, or regulation, the EPA may require the person who owns such air contamination source to submit an acceptable report of measured emissions within a stated time. Such person shall bear the cost of measurement and preparing the report of measured emission. The Permittee shall comply with the acceptable procedures specified at N.J.A.C. 7:27-8.4(f) or other procedures specified in this permit or under federal law, as applicable. [N.J.A.C. 7:27-8.4(f), 40 C.F.R. § 55.8, 42 U.S.C. § 7414]

10. Credible Evidence.

For the purpose of establishing whether or not the Permittee is in compliance with any provision of this permit, the methods for compliance demonstration as specified 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, regarding whether the Permittee has violated or is in violation of any requirement or prohibition of this permit or of federal law, or relevant to whether the Permittee would have been in compliance with applicable requirements if the appropriate performance or compliance test or procedure had been performed. [CAA §§ 113(a) and (1), 40 C.F.R. §§ 60.11(g) and 61.12]

11. Permit Fees.

The Permittee shall comply with all permit fees requirements specified at 40 C.F.R. §§ 55.10(a)(1) and (2).

12. Right to Entry.

Pursuant to section 114 of the Clean Air Act, 42 U.S.C. § 7414, EPA-authorized personnel have the right to enter this facility and inspect for all purposes authorized under section 114 of the Act. The Permittee acknowledges that EPA-authorized personnel, upon the presentation of credentials, shall be permitted:

- a. To enter at any time upon the premises where the source is located or in which any records are required to be kept under the terms and conditions of this OCS Permit;
- b. At reasonable times to access and to copy any records required to be kept under the terms and conditions of this OCS Permit;
- c. To inspect any equipment, operation, or method required in this OCS Permit; and
- d. To sample emissions from the source relevant to this permit.

[40 C.F.R. §§ 55.8(a), (b) and (d), 42 U.S.C. 7414]

13. Certification Requirement.

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 truth, accuracy, and completeness. Such certifications shall state that based on information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate, and complete. [40 C.F.R. §§ 55.8(a) and (b)]

14. Recordkeeping Requirements.

- a. Notwithstanding any other term in this permit, in accepting this permit, the Permittee understands and agrees that all information relating to this permitted source may be used by the EPA as evidence in any enforcement case involving the permitted source arising under federal statutes, EPA rules, or rules enforceable by EPA.
- b. This permit or a copy thereof shall be kept at the office of Atlantic Shores Offshore Wind Project 1, LLC, which is located at the address specified on page 1 of this permit.
- c. The Permittee shall furnish all records required by this permit when requested by EPA.
- d. The Permittee shall hold at the office of Atlantic Shores Offshore Wind Project 1, LLC, which is located at the address specified on page 1 of this permit, all records required by the permit including, but not limited to, monitoring data and support information

required by the 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. Records of all data used to complete the permit application must be kept for five years from the date of the application, unless otherwise specified. Support information includes all calibration and maintenance records and all original strip-chart recordings for continuous monitoring instrumentation and copies of all reports required by the permit. [40 C.F.R. §§ 55.8(a) and (b)]

15. Report Submission.

- a. When requested by the EPA, the Permittee shall furnish any information required by law which is needed to determine compliance with 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 such facts or corrected information to the EPA. [40 C.F.R. §§ 55.8(a) and (b)]
- b. The Permittee shall furnish to the EPA, within a reasonable time, 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 kept pursuant to the terms of the 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. [40 C.F.R. §§ 55.8(a) and (b)]
- c. All notifications, reporting, performance tests protocols, or other communications related to this permit shall be submitted to:

Manager – Stationary Source Compliance Section  
Air Compliance Branch  
USEPA Region 2  
290 Broadway  
New York, NY 10007-1866

Supervisor – Permitting Section  
Air Programs Branch  
USEPA Region 2  
290 Broadway  
New York, NY 10007-1866