

October 22, 2018

Mr. Donald Dahl
USEPA REGION 1 - New England
5 Post Office Square
Mail Code: OEP05-2
Boston, MA 02109-3912

RE: Amended Notice of Intent (NOI) for the proposed installation of a meteorological buoy (Met Buoy)

Dear Mr. Dahl

This Notice of Intent (NOI), as required by the Outer Continental Shelf Regulations in 40 Code of Federal Regulations (CFR) 55.4, is prepared for the proposed installation and operation of a meteorological buoy (Met Buoy) for the purposes of gathering meteorological data to support development of offshore wind projects in Renewable Energy Lease Number OCS-A 0486.

In accordance with 40 CFR 55.4, the NOI is being submitted to the Administrator through the United States Environmental Protection Agency (EPA) Regional Office, with copies to the air pollution control agencies of the Nearest Onshore Area (NOA) and onshore areas adjacent to the NOA.

Should you have any questions regarding this NOI, please contact me at 401-648-2644 or swilson@dwwind.com

Sincerely,



Stephanie Wilson
Director Permitting and Environmental Affairs

Attachment

cc: Marc Wolman – MassDEP, via email
Thomas Cushing – MassDEP, via email
Ron Gagnon – RIDEM, via email

NOTICE OF INTENT - AMENDED METEOROLOGICAL BUOY INSTALLATION Deepwater Wind New England, LLC.

Introduction

Deepwater Wind New England, LLC (Deepwater Wind) has prepared this Amended Notice of Intent (NOI), as required by the Outer Continental Shelf (OCS) Regulations in 40 Code of Federal Regulations (CFR) § 55.4, for the proposed installation and operation of a meteorological buoy (Met Buoy) for the purposes of gathering meteorological data to support development of offshore wind projects in Renewable Energy Lease Number OCS-A 0486 (as amended). An OCS source, as defined under 40 CFR § 55.2, is “any equipment, activity, or facility which: (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.); and (3) is located on the OCS or in or on waters above the OCS.” The proposed Met Buoy is powered by a rechargeable battery pack, that can be charged by an onboard wind turbine and/or, solar panels with an optional back-up engine generator. When powered by the wind turbine and/or solar panels, there is no potential to emit pollutants and the Met Buoy would not qualify as an OCS source under 40 CFR § 55.2. Deepwater Wind is applying for an OCS air permit to have the option to use the back-up generator to charge the rechargeable battery pack. When the back-up generator option is available, the Met Buoy has the potential to emit pollutants and thus qualifies as an OCS source, under 40 CFR § 55.2. Deepwater Wind may deploy the Met Buoy without the back-up generator option before an OCS air permit is issued. Deepwater Wind would not use the back-up generator option until an OCS air permit is issued.

The original NOI submitted in February 16, 2018, classified the Met Buoy as an “exploratory source” which is defined in 40 CFR § 55.2 as “any OCS source that is a temporary operation conducted for the sole purpose of gathering information”. Although the purpose of the Met Buoy is to gather information, the Met Buoy, as described in the Site Assessment Plan (SAP) approved by Bureau of Ocean and Energy Management (BOEM), could be deployed for up to 6 years; which does not meet the definition of temporary, per 1978 new source review rulemaking notice (43 FR 26388).

In accordance with 40 CFR § 55.4 (titled “*Requirements to submit a Notice of Intent*”), this NOI is being submitted to the Administrator through the United States Environmental Protection Agency (EPA) Regional Office, with copies to the air pollution control agencies of the Nearest Onshore Area (NOA) and onshore areas adjacent to the NOA. The Met Buoy installation area is located approximately 17 miles (27 kilometers) from Block Island, Rhode Island and approximately 23 miles (38 kilometers) from Nomans Land Island, Massachusetts. Although the NOA for the Met Buoy is Rhode Island, Deepwater Wind New England, LLC (Deepwater Wind) requests that the Administrator designate Massachusetts as the Corresponding Onshore Area (COA), pursuant to 40 CFR § 55.5, for the following reasons:

- The prevailing wind direction on an annual basis is generally from Rhode Island and towards Massachusetts. An assessment of the prevailing wind currents in the region indicates that air emissions from installation and operation of the meteorological data buoy on the OCS, will more likely occur in waters offshore of Massachusetts than those offshore of Rhode Island (NOAA National Climate Data Center, 2018¹).

¹ NOAA National Climatic Data Center 2018. Quonset State Airport – Wind Speed Direction. 2013-2017 Climate Data Online <https://www.ncdc.noaa.gov/cgi-bin/cdo/cdoprod.pl> Accessed August 23, 2018..

- Massachusetts air regulations are generally stricter than Rhode Island regulations, particularly concerning NOx, which is the pollutant of greatest concern.

This NOI includes all the required components of a NOI as listed in 40 CFR § 55.4(b)(1-10).

General Company Information [40 CFR 55.4(b)(1)]

Company Name and Address:

Deepwater Wind New England, LLC
56 Exchange Terrace, Suite 300
Providence, RI 02903

Permitting Contact:

Aileen Kenney
Deepwater Wind, LLC
56 Exchange Terrace, Suite 300
Providence, RI 02903
401-648-0607
akenney@dwwind.com

Facility description in terms of the proposed process and products, including identification by Standard Industrial Classification Code [40 CFR 55.4(b)(2)]

On September 12, 2013, the Department of Interior's Bureau of Ocean Energy Management (BOEM) and Deepwater Wind executed two commercial leases on the outer continental shelf (OCS) in federal waters off the coast of Rhode Island and Massachusetts (Renewable Energy Lease Numbers OCS-A 0486 [North Lease Area] and OCS-A 0487 [South Lease Area]) for the purpose of the siting and development of offshore wind energy. Both Lease Areas are located within the area designated by BOEM as the Rhode Island-Massachusetts (RI-MA) Wind Energy Area (WEA).

Deepwater Wind has selected AXYS Technologies Inc. to deploy its AXYS Floating Light Detection and Ranging 6M buoy (FLiDAR 6M), a state-of-the-art Met Buoy, that incorporates the best available technology. The Met Buoy will consist of instrumentation systems and supporting systems atop a floating moored buoy platform as shown in Figure 1. The floating platform consists of the AXYS Navy Oceanographic Meteorological Automated Device (NOMAD) hull, mooring chain, and clump weight anchor. The hull would be moored to the seabed using a steel chain attached to one or two concrete clump weight anchors as shown in Figure 2.

A single or dual light detection and ranging (LIDAR) instrumentation package will be installed atop the hull. The LIDAR unit is a wind profiling device capable of remotely collecting wind data at heights up to 656 feet (200 meters) above the platform level. Each LIDAR unit is approximately 3.3 feet (1 meter) in height. In addition to the LIDAR package, the Met Buoy instrumentation package consists of the following sensors:

- Wave sensor for measuring wave height, direction, and period;
- Acoustic doppler current profiler (ADCP) for measuring current speed and direction;
- Wind anemometer for measuring surface wind speed and direction;
- Air temperature and relative humidity measuring sensors;
- Barometric pressure sensor for measuring ambient air pressure; and
- Avian and bat monitor sensor.

The Met Buoy will be deployed in the North Lease Area in federal waters of the Atlantic Ocean within OCS Block 6965, AliquotM of the Official Protraction Diagram Providence NK19-07. The location of the Met Buoy will be at or about 41° 05' 16" N and 71° 13' 22" W (Figure 3). Water depth at the Met Buoy Installation Area is approximately 115 feet (35.1 meters). The Met Buoy installation area is located approximately 17 miles (27 kilometers) from Block Island, Rhode Island and approximately 23 miles (38 kilometers) from Nomans Land Island, Massachusetts (Figure 4). The Met Buoy will be installed, operated, and decommissioned by a vendor under contract to Deepwater Wind.

The Met Buoy will be powered by a rechargeable battery pack, that can be charged by an onboard wind turbine and/or, solar panels with an optional back-up engine generator. When available, the back-up generator option will be provided by an on-board 6-kilowatt ultra-low sulfur diesel-fired engine with associated 225-gallon fuel oil tank. The engine will be a Polar Power, Model 8080Y-2TNV70, or equivalent 6-kilowatt diesel direct current (DC) generator using a Tier 4 EPA-certified engine.

The buoy installation will be used to gather data for up to 6 years after which the Met Buoy will be decommissioned and removed. DWW proposes to have AXYS install the Met Buoy in 2018. Installation of the Met Buoy is planned over a 2- to 4-day installation period, barring weather delays, and will be staged out of Quonset, Rhode Island or a comparable existing port in the northeast.

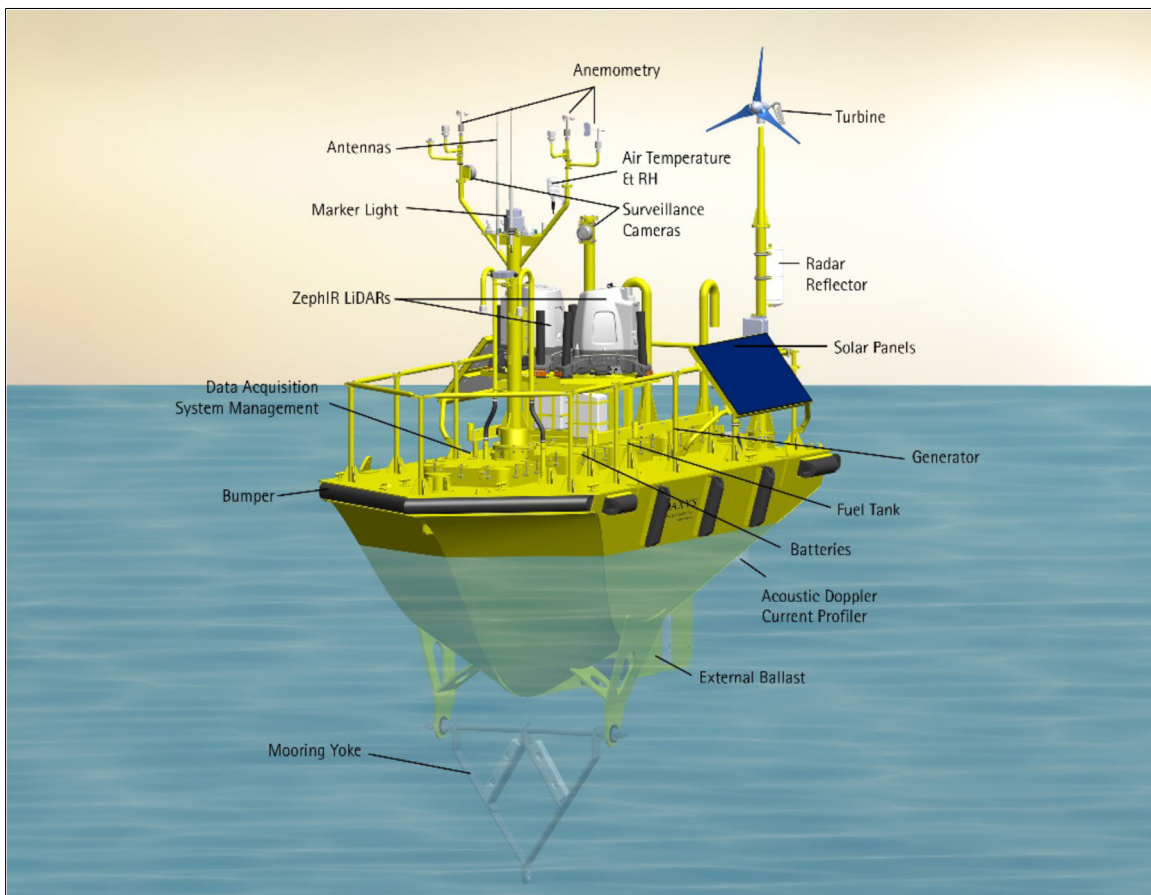


Figure 1: AXYS FLiDAR 6M™ Meteorological Buoy Proposed for Deepwater Wind

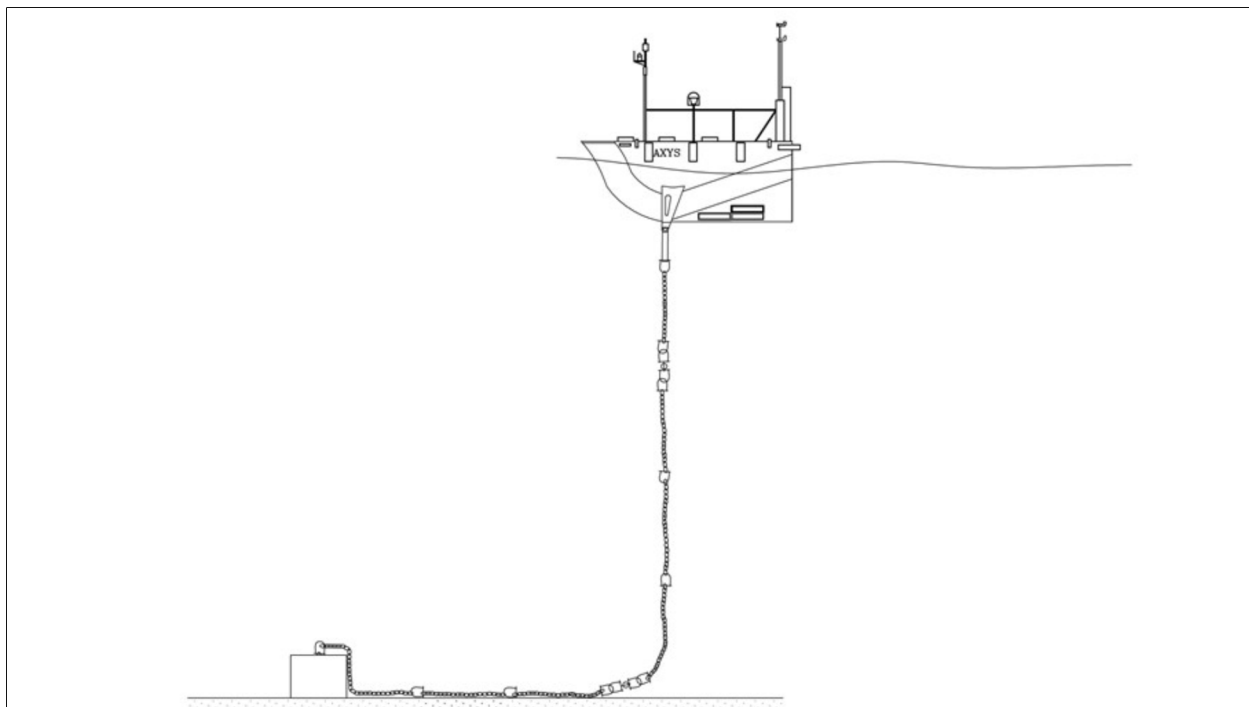


Figure 2: Mooring Arrangement for the Deepwater Wind Met Buoy

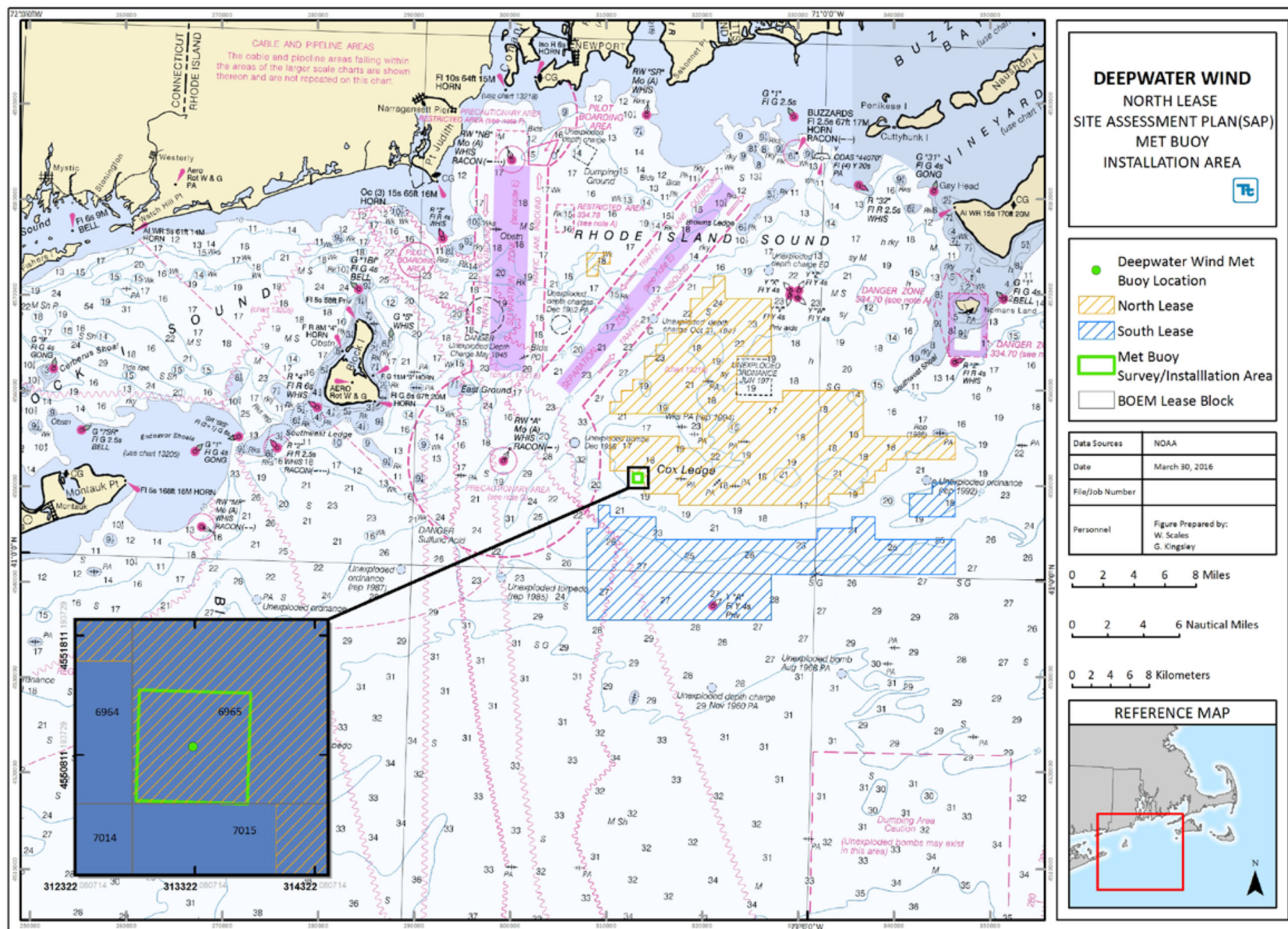


Figure 3: Installation Location of Met Buoy

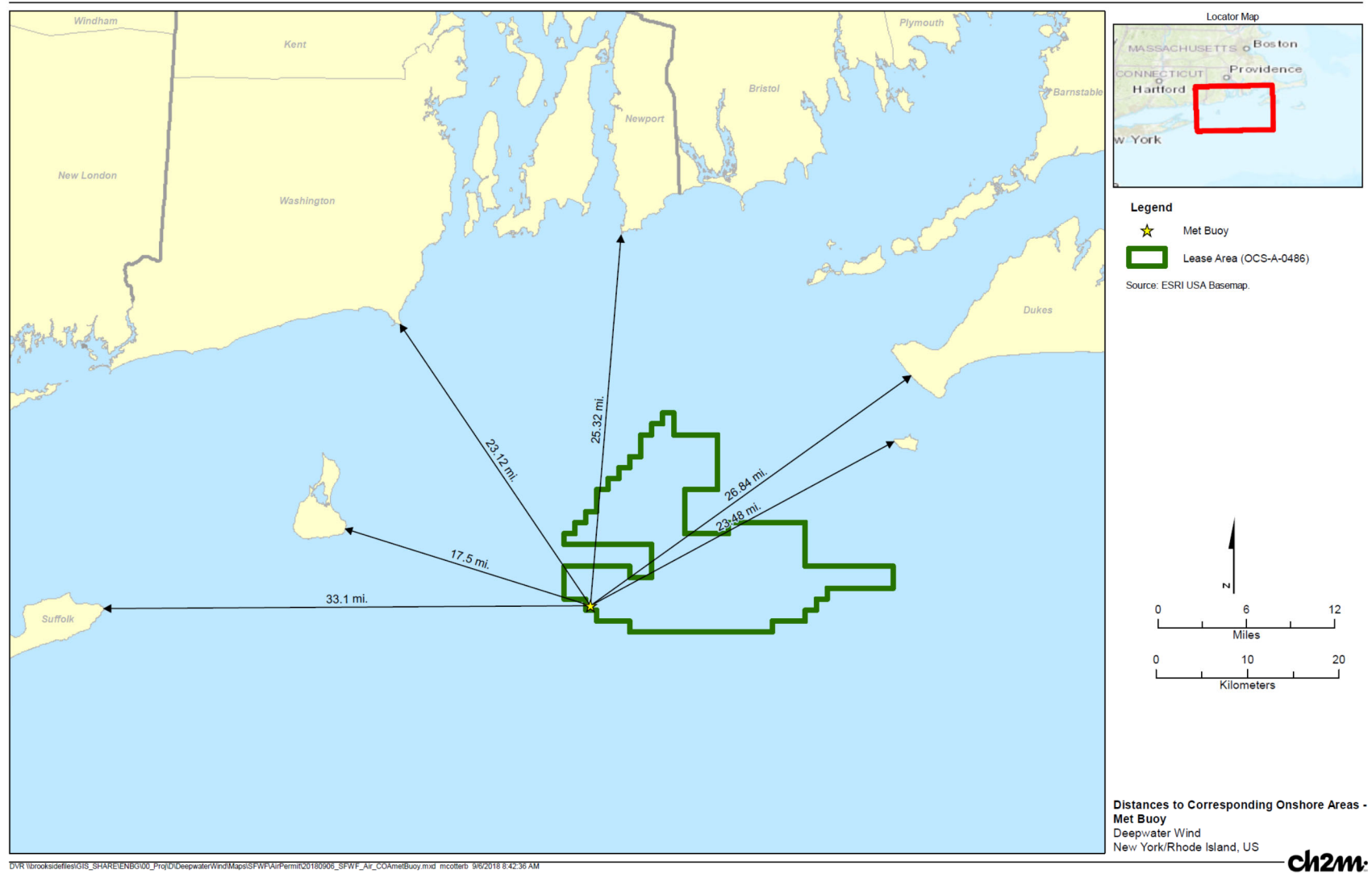


Figure 4: Distance to Corresponding Onshore Areas

Standard Industrial Classification (SIC) Code:

The Standard Industrial Classification (SIC) code for the Met Buoy data gathering is 871199 – “Engineering Service, nec (not elsewhere classified)”.

Estimate of the proposed project’s potential emissions of any air pollution, expressed in total tons per year and in such other terms as may be necessary to determine the applicability of requirements of this part. Potential emissions for the project must include all vessel emissions associated with the proposed project in accordance with the definition of potential emissions in 55.2. [40 CFR 55.4(b)(3)]:

The potential emission of air pollutants will occur during:

- Deployment of the Met Buoy (tug boat and work boat)
- Operation of back-up engine for the Met Buoy if the solar panels and battery fail
- Planned on-site maintenance (work boat)
- Decommissioning of the Met Buoy (tug boat and work boat)

It is anticipated that the installation and decommissioning of the Met Buoy would each be completed over a period of approximately 2 to 4 days for a total of 4 to 8 days. To be conservative, DWW completed air emission calculations based on 10 days for installation and an additional 10 days for decommissioning for a total of 20 days. This contingency covers the potential for weather and other unforeseen events that, although unlikely, could occur. For planned on-site maintenance, DWW has assumed eight round trips per year of a work boat during the 6-year operational period for a total of 48 round trips during the operations phase. A summary of the air potential emission estimates is presented in Table 1, and the detailed emission calculations and assumptions are presented in Appendix A.

Table 1. Met Buoy Installation, Operation and Decommissioning Emissions (tons/year)

| Activity | VOC | NO _x | CO | PM/PM ₁₀ | PM _{2.5} | SO ₂ | HAPs | CO _{2e} |
|---|------|-----------------|------|---------------------|-------------------|-----------------|------|------------------|
| Installation Activities | 0.31 | 6.09 | 3.07 | 0.37 | 0.36 | 0.0042 | 0.06 | 441.1 |
| Operation & Maintenance Activities | 0.03 | 0.32 | 0.20 | 0.01 | 0.01 | 0.0002 | 0.00 | 24.6 |
| Decommissioning Activities | 0.30 | 6.09 | 3.06 | 0.37 | 0.36 | 0.0041 | 0.06 | 441.1 |
| Maximum Annual Emissions ¹ | 0.33 | 6.42 | 3.27 | 0.38 | 0.37 | 0.0045 | 0.06 | 465.7 |
| Note: 1. The estimate of maximum annual emissions assumes that the annual operation and maintenance activities and either the installation or decommissioning activities occur in the same year. | | | | | | | | |

Even using very conservative assumptions, the emissions from the installation, operation, and decommissioning of the Met Buoy are all under major source permitting thresholds in Massachusetts.

Description of all emissions points including associated vessels. [40 CFR § 55.4(b)(4)]:

AXYS will employ a qualified marine contractor to transport and deploy the Met Buoy under the management and direction of AXYS. The marine contractor is expected to use the vessel types described in Table 2 for installation and decommissioning and for Met Buoy maintenance.

Table 2. Air Emissions Points Associated with Met Buoy

| Emission Point | Description | Use Period |
|-----------------------|---|---------------------------------|
| Work Vessel | Flat-topped barge or comparable work vessel with sufficient deck space to store and secure clump weight, mooring chain, hull, and all miscellaneous monitoring equipment to be installed on the Met Buoy. May use anchors or dynamic positioning for station keeping. | Installation Decommissioning |
| Handling Tug | Ocean-going tug for moving the work barge, anchor handling, and installation support. | Installation Decommissioning |
| Crew Boat | 30-person crew boat to bring personnel to the work vessel twice per day as needed. | Installation Decommissioning |
| Work Vessel | Planned onsite maintenance would be scheduled twice per year and would be completed by comparable or smaller vessels as the installation vessel. Planned maintenance activities would include replacement of consumables, service of sensors, data retrieval, and checking the mooring configuration. | Operations |
| Back-up Engine | A 6-kilowatt ultra-low sulfur diesel (ULSD) fired emergency engine will be used for battery back-up if the wind turbine and solar panels fail to sufficiently charge the Met Buoy battery. | Operation |

Estimate of quantity and type of fuels and raw materials to be used. [40 CFR § 55.4(b)(5)]:

Estimate of quantities of fuels used in vessels for construction:

- Approximately 38,708 gallons of fuel will be used in the work vessels and tug during each of installation and decommissioning.
- Approximately 1,900 gallons of fuel will be used in the work vessel each year for maintenance of the Met Buoy.

Estimate of quantity of fuel used for emergency generator:

- Approximately 260 gals of ULSD will be used in the emergency generator each year (conservatively based on 500 hours per year of operation).

No other raw materials other than fuels will be used for the Met Buoy installation, maintenance or decommissioning.

Description of proposed air pollution control equipment [40 CFR § 55.4(b)(6)]:

There is no air pollution control equipment proposed for this project. The back-up engine will be an EPA Tier 4-classified engine designed to meet all applicable air pollution control and applicable engine emissions regulations.

Proposed limitations on source operations or any work practice standards affecting emissions [40 CFR § 55.4(b)(7)]:

Though the potential emissions are estimated based on 8,760 hours per year of operation as a worst-case basis, it is estimated that the back-up generator will only be used about 1 percent of the hours in a year, or 88 hours per year. Work practice standards that will be employed during the installation, maintenance, or decommissioning of the Met Buoy include minimizing the idling of the engines of the boats. The back-up generator on the buoy will use ULSD to minimize sulfur and particulate emissions.

Other information affecting emissions, including, where applicable, information related to stack parameters (including height, diameter, and plume temperature), flow rates, and equipment and facility dimensions [40 CFR § 55.4(b)(8)]:

There are no “stacks” associated with the emission points, rather the emission points consist of vessel engine exhausts and exhaust from the back-up generator.

Such other information as maybe necessary to determine the applicability of onshore requirements [40 CFR § 55.4(b)(9)]:

DWW will provide additional information as requested by the EPA.

Such other information as maybe necessary to determine the source’s impacts in onshore areas [40 CFR § 55.4(b)(10)]:

DWW will provide additional information as requested by the EPA.

Appendix A

Detailed Emission Calculations and Assumptions

Appendix A

NOTICE OF INTENT - METEOROLOGICAL BUOY INSTALLATION

Deepwater Wind New England, LLC.

Emission factors form ICF International report to the US EPA "Current Methodologies in Preparing Mobile Source Port-Related Emissions Inventories", April 2009

| | | CO2 | CH4 | N2O | CO | NOX | PM10 | PM2.5 | SO2 | VOC | | CO2 | CH4 | N2O | CO | NOX | PM10 | PM2.5 | SO2 | VOC | HAPs |
|--|---------|--------|------|------|------|-------|------|-------|------|------|-----------|-----|-------|-------|-------|------|------|-------|-------|-------|-------|
| Category 2 engines | g/kW-hr | 690.00 | 0.09 | 0.02 | 5.00 | 9.80 | 0.72 | 0.70 | 1.30 | 0.50 | (g/hp-hr) | 515 | 0.067 | 0.015 | 3.730 | 7.3 | 0.46 | 0.45 | 0.005 | 0.373 | |
| Category 1 engines<1000 kW | g/kW-hr | 690.00 | 0.09 | 0.02 | 5.00 | 9.80 | 0.30 | 0.29 | 1.30 | 0.27 | (g/hp-hr) | 515 | 0.067 | 0.015 | 3.730 | 7.3 | 0.19 | 0.19 | 0.005 | 0.201 | |
| Category 3 engines (MSD using MDO) (>30L/cyl.) | g/kW-hr | 646.00 | 0.00 | 0.03 | 1.10 | 13.20 | 0.19 | 0.17 | 0.40 | 0.50 | (g/hp-hr) | 482 | 0.003 | 0.023 | 0.821 | 9.8 | 0.14 | 0.13 | 0.298 | 0.373 | |
| All Categories aux. engines (MSD using MDO) | g/kW-hr | 690.71 | 0.00 | 0.03 | 1.10 | 13.90 | 0.18 | 0.17 | 0.42 | 0.40 | (g/hp-hr) | 515 | 0.003 | 0.023 | 0.821 | 10.4 | 0.13 | 0.13 | 0.313 | 0.298 | |
| Non-road Cane | g/kW-hr | | | | | | | | | | (g/hp-hr) | 530 | 0.03 | 0.013 | 0.75 | 4.34 | 0.13 | 0.13 | 0.005 | 0.31 | 0.020 |

HAP emission factors for commercial marine vessels were determined using the methodology identified by US EPA for the latest (2011) National Emissions Inventory (NEI); i.e., they are calculated as percentages of the PM10, PM2.5, or VOC emissions from the CMVs.

The HAP emisson for nonroad engines were based on EPA's AP-42 Volume 1, Chapters 3.3 for small diesel engines. (see HAP emission factor summary pages)

Emission calculation:

Vessel Emissions (ton) = Engine Power Rating (kW) x Loading Factor x Activity Hours (hours) x Emission Factor (g/kW-hour) x (1 lb /454 g) x (1 ton / 2000 lb) x (# of Sources)

MET BUOY Installation, Maintenance and Decommissioning Vessel Emission Estimates

| Type of Equipment/Emission Source Description (list others as needed) | | Vessel Type in BOEM Tool for Emission factor selection | No. of engine | Engine Rating (hp) | Engine Rating (kW) | Fuel Type | Trips | Hrs/trip | Operating days | Operating Hours (hrs/day) | Total vessel Operating Hours (hrs) | Average Load (%) | fuel Usage (Gallons) | CO2 | CH4 | N2O | CO | NOX | PM10 | PM2.5 | SO2 | VOC | HAPs |
|--|------------------|--|---------------|--------------------|--------------------|-----------|-------|----------|----------------|---------------------------|------------------------------------|------------------|----------------------|--------|-------|-------|-------|-------|-------|-------|-------|-------|------|
| Tug Boat | main engine | construction | 1 | 4000 | 2982.8 | Diesel | 10 | 4 | 10 | 20 | 240 | 31% | 15003.6 | 168.86 | 0.022 | 0.005 | 1.224 | 2.398 | 0.152 | 0.147 | 0.002 | 0.122 | 0.03 |
| | auxiliary engine | construction | 1 | 100 | 74.57 | Diesel | 10 | 4 | 10 | 20 | 240 | 43% | 520.3 | 5.86 | 0.001 | 0.000 | 0.042 | 0.083 | 0.002 | 0.002 | 0.000 | 0.002 | 0.00 |
| Work boat | main engine | construction | 1 | 4000 | 2982.8 | Diesel | 10 | 4 | 10 | 20 | 240 | 43% | 20811.4 | 234.23 | 0.031 | 0.007 | 1.697 | 3.327 | 0.210 | 0.204 | 0.002 | 0.170 | 0.04 |
| | auxiliary engine | construction | 1 | 200 | 149.14 | Diesel | 10 | 4 | 10 | 20 | 240 | 43% | 1040.6 | 11.71 | 0.002 | 0.000 | 0.085 | 0.166 | 0.004 | 0.004 | 0.000 | 0.005 | 0.00 |
| | crane | construction | 1 | 250 | 186.425 | Diesel | 10 | 4 | 10 | 20 | 240 | 43% | 1331.7 | 15.07 | 0.001 | 0.000 | 0.021 | 0.123 | 0.004 | 0.004 | 0.000 | 0.009 | 0.00 |
| Work boat (maintenance) | main engine | Operation | 2 | 450 | 335.565 | Diesel | 8 | 4 | 8 | 8 | 96 | 43% | 1873 | 21.08 | 0.003 | 0.001 | 0.153 | 0.299 | 0.008 | 0.008 | 0.000 | 0.008 | 0.00 |
| | auxiliary engine | Operation | 1 | 13 | 9.6941 | Diesel | 8 | 4 | 8 | 8 | 96 | 43% | 27.1 | 0.30 | 0.000 | 0.000 | 0.002 | 0.004 | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |
| Tug Boat | main engine | Decommissioning | 1 | 4000 | 2982.8 | Diesel | 10 | 4 | 10 | 20 | 240 | 31% | 15003.6 | 168.86 | 0.022 | 0.005 | 1.224 | 2.398 | 0.152 | 0.147 | 0.002 | 0.122 | 0.03 |
| | auxiliary engine | Decommissioning | 1 | 100 | 74.57 | Diesel | 10 | 4 | 10 | 20 | 240 | 43% | 520.3 | 5.86 | 0.001 | 0.000 | 0.042 | 0.083 | 0.002 | 0.002 | 0.000 | 0.002 | 0.00 |
| Work boat | main engine | Decommissioning | 1 | 4000 | 2982.8 | Diesel | 10 | 4 | 10 | 20 | 240 | 43% | 20811.4 | 234.23 | 0.031 | 0.007 | 1.697 | 3.327 | 0.210 | 0.204 | 0.002 | 0.170 | 0.04 |
| | auxiliary engine | Decommissioning | 1 | 200 | 149.14 | Diesel | 10 | 4 | 10 | 20 | 240 | 43% | 1040.6 | 11.71 | 0.002 | 0.000 | 0.085 | 0.166 | 0.004 | 0.004 | 0.000 | 0.005 | 0.00 |
| | crane | Decommissioning | 1 | 250 | 186.425 | Diesel | 10 | 4 | 10 | 20 | 240 | 43% | 1331.7 | 15.07 | 0.001 | 0.000 | 0.021 | 0.123 | 0.004 | 0.004 | 0.000 | 0.009 | 0.00 |
| Total | | | | | | | | | | | | | 79,315.3 | 892.84 | 0.11 | 0.03 | 6.29 | 12.50 | 0.75 | 0.73 | 0.01 | 0.62 | 0.13 |
| Construction | | | | | | | | | | | | | 38,707.6 | | | | | | | | | | |
| Maintenance | | | | | | | | | | | | | 1,900.1 | | | | | | | | | | |
| Decommissioning | | | | | | | | | | | | | 38,707.6 | | | | | | | | | | |
| Installation and Decommissioning | | | | | | | | | | | | | 77,415.2 | | | | | | | | | | |

Appendix A
NOTICE OF INTENT - METEOROLOGICAL BUOY INSTALLATION
Deepwater Wind New England, LLC.

MET Buoy generator

Emission Factors - Non-road CI Engine (g/kW-hr)

| Emission Factors* Nonroad CI engine (g/kW-hr) | | | | | | | | | | |
|---|--------------|---------|-----------|-----|--------------|-----|-------|------|----------|-------------|
| Emission Factor ID | Engine Rated | | PM2.5 (as | | | | | | | Data Source |
| | Power (kW) | CO2* | CO | NOX | PM10 (as PM) | PM) | SO2** | VOC* | HAPs* | |
| Nonroad CI engine Tier 4 | < 8 kW | 699.504 | 8 | 7.5 | 0.4 | 0.4 | 0.006 | 1.50 | 2.71E-02 | (a) |

Note:

(a) EPA Federal Nonroad Compression-Ignition Engines: Exhaust Emission Standards (EPA-420-B-16-022, March 2016)

* Emission factor are from AP-42 section 3.3

* SO2 emission have been adjusted for the 15 ppmw sulfur content in ultra-low sulfur diesel fuel using the correction factors for ultra-low sulfur diesel as presented in Table 3-9 of the ICF Report. The emission factors for SO2 was multiplied by 0.005.

| AP-42 | CO2 | | SO2 | | VOC | | HAPs | | |
|-------------|------------|-----------|------------|-----------|------------|-----------|------------|-----------|-----------|
| | (lb/hp-hr) | (g/kW-hr) | (lb/hp-hr) | (g/kW-hr) | (lb/hp-hr) | (g/kW-hr) | (lb/hp-hr) | (g/kW-hr) | |
| Section 3.3 | 1.15 | 700 | 0.00205 | 1.25 | 0.00247 | 1.50 | 0.006370 | 0.0000446 | 0.0271242 |

HAP is the sum of available emissions factors for HAPs listed in Clean Air Act

$$\text{Emissions (ton)} = \text{Engine Power Rating (kW)} \times \text{Activity Hours (hours)} \times \text{Emission Factor (g/kW-hour)} \times (1 \text{ lb} / 454 \text{ g}) \times (1 \text{ ton} / 2000 \text{ lb}) \times (\# \text{ of Sources})$$

| | |
|-------------|------------|
| Fuel Usage: | 279 g/kWhr |
|-------------|------------|

Heat Input: 0.08 MMBtu/hr

Generator emissions

| Type of Equipment/Emission Source Description (list others as needed) | | No. of Each Type of Equipment | Engine Size on Equipment (specify units) | Equipment Size | | | Emission Factor used | Engine Use | Vent/Stack Height (feet) | Vent/Stack Diameter (inches) | Total Hours/Day Engine Use | Utilization Percentage (%) | Total Hours/Year Engine Use | Work Task | Fuel Usage (gal) | Load Factor | Emission (tons/year) | | | | | | | |
|---|--|-------------------------------|--|----------------|----|-----------|----------------------|------------|--------------------------|------------------------------|----------------------------|----------------------------|-----------------------------|-----------|------------------|-------------|----------------------|---------|---------|---------|---------|---------|---------|---------|
| | | | | HP | kW | Fuel Type | | | | | | | | | | | CO2 | CO | NOx | PM10 | PM2.5 | SO2 | VOC | HAP |
| Generator | | 1 | generator | | 6 | Diesel | Tier 4 Certified | | | | | | 500 | | 270 | 1 | 2.31323 | 0.02646 | 0.02480 | 0.00132 | 0.00132 | 0.00002 | 0.00496 | 0.00009 |