

# Site Assessment Plan for the Atlantic Shores Offshore Wind Project

Prepared for:



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**APPENDICES**

- Appendix A Permits and Consultations
- Appendix B Equipment Specifications (*Contains Privileged or Confidential Information - Provided Under Separate Cover*)
- Appendix C Marine Archaeological Resource Assessment Report in Support of the Atlantic Shores Offshore Wind Project (*Contains Privileged or Confidential Information - Provided Under Separate Cover*)
- Appendix D Vessel Specifications
- Appendix E Geophysical and Geohazard Report of Site Assessment Plan (Metocean LiDAR Buoy Placement)
- Appendix F Air Emissions Analysis

## ACRONYMS AND ABBREVIATIONS

APD	area of potential disturbance
Atlantic Shores	Atlantic Shores Offshore Wind, LLC
BMP	best management practice
BOEM	Bureau of Ocean Energy Management
BSEE	Bureau of Safety and Environmental Enforcement
CO	carbon monoxide
CVA	Certified Verification Agent
CFR	Code of Federal Regulations
DoD	Department of Defense
ESA	Endangered Species Act of 1973
EPA	U.S. Environmental Protection Agency
EFH	essential fish habitat
FLiDAR	floating light detection and ranging
GHG	greenhouse gas
HAP	hazardous air pollutant
HSE	health, safety, and environmental
HRG	High Resolution Geophysical
Installation Areas	Official Protraction Diagram Wilmington NJ18-02, Blocks 6489, 6786, 6787, 6879, and 6887
Lease	Commercial Lease of Submerged Lands for Renewable Energy Development on the Outer Continental Shelf (OCS-A 0499)
LiDAR	light detection and ranging
MAG/TVG	magnetometer/traverse gradiometer
MLLW	mean lower low water
Metocean Buoys	Two SEAWATCH™ Wind LiDAR Buoys
Mid-Atlantic EA	Commercial Wind Lease Issuance and Site Assessment Activities on the Atlantic Outer Continental Shelf Offshore New Jersey, Delaware, Maryland, and Virginia Final Environmental Assessment
MMPA	Marine Mammal Protection Act of 1972
nT	nanotesla
NAAQS	National Ambient Air Quality Standard

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NMFS	National Oceanic and Atmospheric Administration, National Marine Fisheries Service
NO <sub>x</sub>	nitrogen oxides
NTL	Notice to Lessees and Operators
PM <sub>2.5</sub>	particulate matter less than 2.5 microns in diameter
PM <sub>10</sub>	particulate matter less than 10 microns in diameter
PATON	Private Aids to Navigation
SSS	Side Scan Sonar
SAP	Site Assessment Plan
SO <sub>2</sub>	sulfur dioxide
SBP	sub-bottom profiler
USCG	United States Coast Guard
USFF	United States Fleet Forces
VOC	volatile organic compounds
WEA	Wind Energy Area



## 1. INTRODUCTION

Atlantic Shores Offshore Wind, LLC (Atlantic Shores), a joint venture between EDF Renewables North America and Shell New Energies US LLC, has prepared this Site Assessment Plan (SAP) in support of the installation and operation of two floating light detection and ranging (FLiDAR) buoys to be located within Official Protraction Diagram Wilmington NJ18-02, Blocks 6489, 6786, 6787, 6879, and 6887 (Installation Areas; see Figure 1-1). Atlantic Shores has selected the Fugro SEAWATCH™ Wind light detection and ranging (LiDAR) buoy (the Metocean Buoy) as the proposed meteorological and metocean data collection technology. The Installation Areas are contained within the Lease Area<sup>1</sup> as defined under the Commercial Lease of Submerged Lands for Renewable Energy Development on the Outer Continental Shelf (OCS-A 0499) (Lease) (Figure 1-1).

The Lease was issued to US Wind, Inc. on February 4, 2016, with an effective date of March 1, 2016. On March 17, 2016, US Wind, Inc. requested a 12-month extension of the Preliminary Term of the Lease from the Bureau of Ocean Energy Management (BOEM), which was approved on June 10, 2016, extending the Preliminary Term from March 1, 2017 to March 1, 2018. On January 29, 2018, US Wind submitted a second request to extend the Preliminary Term of the Lease, which was approved on February 14, 2018, extending the Preliminary Term from March 1, 2018 to March 1, 2019. In November 2019, US Wind, Inc. and Atlantic Shores entered into discussions regarding the purchase and sale of the Lease by Atlantic Shores, which was anticipated to be consummated immediately after the BOEM approved the assignment of the Lease to a qualified affiliate of Atlantic Shores, EDF Renewables Development, Inc. Due to the limited amount of time available between the acquisition of the Lease and the end of the Preliminary Term, US Wind, Inc. and EDF Renewables Development, Inc. jointly submitted a third request to BOEM for a 12-month extension of the Preliminary Term of the Lease on November 16, 2018, which was approved on January 30, 2019, extending the Preliminary Term from March 1, 2019 to March 1, 2020. BOEM subsequently approved the assignment of the Lease to EDF Renewables Development, Inc. on December 4, 2018. The Lease was further assigned by EDF Renewables Development, Inc. to Atlantic Shores on August 13, 2019.

This SAP has been prepared in accordance with 30 Code of Federal Regulations (CFR) §§ 585.105, 606, 610, and 611 (see Table 1-1), the *Guidelines for Information Requirements for a Renewable Energy SAP* issued by BOEM in June 2019 (BOEM 2019), the *Commercial Wind Lease Issuance and Site Assessment Activities on the Atlantic Outer Continental Shelf Offshore New Jersey, Delaware, Maryland, and Virginia Final Environmental Assessment* (“Mid-Atlantic EA”; BOEM 2012), and the stipulations of the Lease (see Section 2-2).

Atlantic Shores obtained the required permits and approvals from the U.S. Army Corps of Engineers (USACE), U.S. Coast Guard (USCG), and U.S. Environmental Protection Agency (USEPA) necessary to support the installation and operation of the Metocean Buoys (Table 1-2 includes a description of each permit and copies of the authorizations are included in Appendix A). All installation, operation, and decommissioning activities will be conducted in compliance with SAP approval conditions, as well as the requirements stipulated in each of the issued permits.

The Metocean Buoys described in this SAP will collect wind resource and metocean data to support development of Atlantic Shores’ portfolio of offshore wind projects that will be located within the Lease Area. The deployment strategy for the Metocean Buoys at each of the identified Installation Areas is detailed in Section 3.2.

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<sup>1</sup> The Lease Area is defined by *Addendum A of BOEM Lease No. OCS-A 0499, Section II. Description of the Lease Area*. The total acreage of the Lease Area is approximately 183,353 acres. The Lease Area is depicted in its entirety in Figure 1-1 of this SAP.

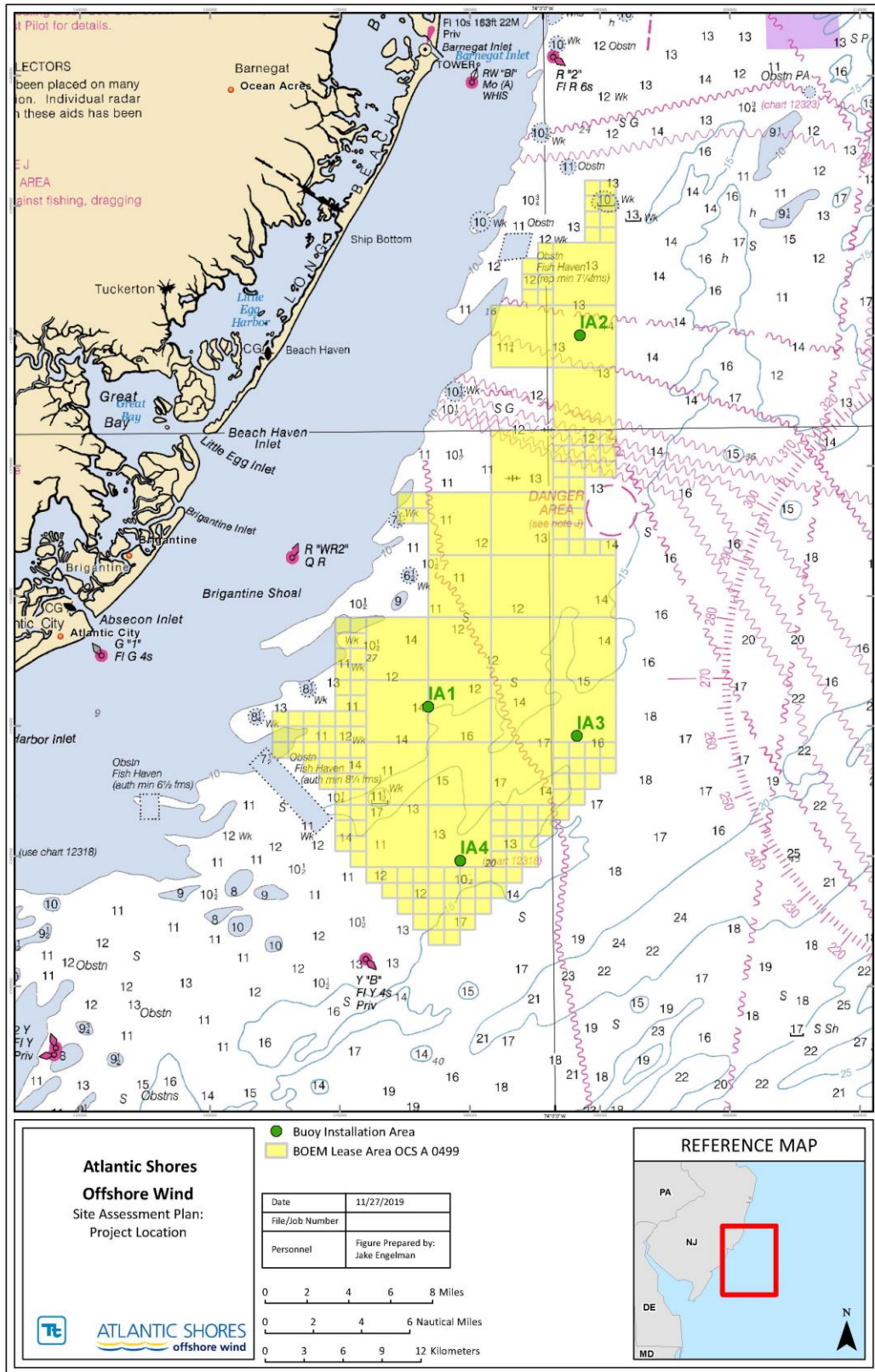


Figure 1-1 Site Assessment Plan Buoy Installation Areas

**Table 1-1 Site Assessment Plan Requirements for Commercial Leases Pursuant to §§ 585.105(a), 606(a), 610(a) and (b), and 611(a) and (b)**

Requirement	Compliance Statement
<b>§ 585.105(a)</b>	
1) The design of the environmental monitoring buoy and conduct of planned activities ensures safety and will not cause undue harm or damage to natural resources and will take measures to prevent unauthorized discharge of pollutants into the offshore environment.	Atlantic Shores will comply with this requirement, as evidenced in this SAP.
<b>§ 585.606(a)</b>	
1) The Project will conform to all applicable laws, regulations, and lease provisions.	Atlantic Shores will comply with this requirement. See Table 1-2, Table 1-3, Table 2-1, Table 2-2, and Appendix A.
2) The Project will be safe.	Atlantic Shores will comply with this requirement. Specifically, see Section 4.7.
3) The Project will not unreasonably interfere with other uses of the Outer Continental Shelf (OCS), including national security or defense.	Atlantic Shores will comply with this requirement. See Table 2-2 for specific activities to ensure compliance.
4) The Project will not cause undue harm or damage to natural resources; life; property; the marine, coastal, or human environment; or historical or archeological resources.	See Section 7.0 for an analysis of site characteristics and for avoidance and mitigation measures.
5) The Project will use best available and safest technology.	Atlantic Shores will comply with this requirement. See Section 3.1 and Appendix B for a description and technical specifications on the Metocean Buoys, including Fugro's Draft Mooring Design Dynamic and Fatigue Report provided with Appendix B.
6) The Project will use best management practices.	Atlantic Shores will comply with this requirement. Best management practices are described in Table 1-3, Sections 4.0, 5.0, 6.0, and 7.0.
7) The Project will use properly trained personnel.	Atlantic Shores will ensure that all personnel meet the project partners' technical as well as health, safety, and environmental (HSE standards for the work being conducted.
<b>§ 585.610(a)</b>	
1) Contact Information	Jennifer Daniels (781) 964-4293 Jennifer.daniels@atlanticshoreswind.com 1 Beacon Street, Boston MA 02108
2) Site assessment concept	Meteorological and oceanographic data collection using two SEAWATCH™ Wind LiDAR Buoys
3) Designation of operator	Not applicable. See Section 1.1.
4) Commercial lease stipulations and compliance	See Table 2-2.
5) A location plat	See Figure 1-1.
6) General structural and project design, fabrication and installation information	See Sections 3.0, 4.0, and 5.0.
7) Deployment activities	See Section 4.0.
8) Measures for avoiding, minimizing, reducing, eliminating, and monitoring environmental impacts	This SAP has been prepared in accordance with the Commercial Wind Lease Issuance and Site Assessment Activities on the Atlantic Outer Continental Shelf Offshore New Jersey, Delaware, Maryland, and Virginia Final Environmental Assessment (Mid-Atlantic EA; BOEM 2012), and Stipulations in Commercial Lease OCS-A 0499. Specific efforts to avoid, minimize, reduce, eliminate, or monitor environmental impacts can be found in Sections 4.0 and 7.0. Conformance with the Mid-Atlantic EA is detailed in Section 2.
9) Certified Verification Agent nomination	Not applicable. See Section 1.2.
10) Reference information	See Section 8.0.
11) Decommissioning and site clearance procedures	See Section 6.0
12) Air quality information	See Section 7.8

**Table 1-1 Site Assessment Plan Requirements for Commercial Leases Pursuant to §§ 585.105(a), 606(a), 610(a) and (b), and 611(a) and (b)**

Requirement	Compliance Statement
13) A listing of all federal, state, and local authorizations or approvals required to conduct site assessment activities on your lease	See Table 1-2
14) A list of agencies and persons with whom you have communicated, or with whom you will communicate, regarding potential impacts associated with your proposed activities	See Appendix A
15) Financial assurance information	Activities and facilities proposed herein will be covered by an appropriate bond or other approved security.
<b>§ 585.610(b)</b>	
<i>Geotechnical</i>	
(i) A description of all relevant seabed and engineering data and information to allow for the design of the foundation for that facility	Section 7.1
<i>Shallow Hazards</i>	
(i) Shallow faults;	Section 7.1
(ii) Gas seeps or shallow gas;	Section 7.1
(iii) Slump blocks or slump sediments;	Section 7.1
(iv) Hydrates; or	Section 7.1
(v) Ice scour of seabed sediments.	Section 7.1
<i>Archaeological Resources</i>	
(i) A description of the results and data from the archaeological survey;	Section 7.1, Appendix C
(ii) A description of the historic and prehistoric archaeological resources, as required by the National Historic Preservation Act of 1966 (NHPA), as amended.	Section 7.1, Appendix C
<i>Geological Survey</i>	
(i) Seismic activity at your proposed site;	Section 7.1
(ii) Fault zones;	Section 7.1
(iii) The possibility and effects of seabed subsidence; and	Section 7.1
(iv) The extent and geometry of faulting attenuation effects of geologic conditions near your site.	Section 7.1
<i>Biological</i>	
(i) Live bottoms	Section 7.1
(ii) Hard bottoms	Section 7.1
(iii) Topographic features; and	Section 7.1
(iv) Surveys of other marine resources such as fish populations (including migratory populations), marine mammals, sea turtles, and sea birds.	Section 7.1
<b>§ 585.611(a) and (b) Requirements</b>	
Hazard information	Section 7.1
Water quality	Section 7.7
<i>Biological resources</i>	
(i) Benthic communities	Section 7.3
(ii) Marine mammals	Section 7.5
(iii) Sea turtles	Section 7.5
(iv) Coastal and marine birds	Section 4.5
(v) Fish and shellfish	Section 7.4
(vi) plankton and seagrasses, and	Section 7.3
(vii) plant life	Section 7.3

**Table 1-1 Site Assessment Plan Requirements for Commercial Leases Pursuant to §§ 585.105(a), 606(a), 610(a) and (b), and 611(a) and (b)**

Requirement	Compliance Statement
Threatened or endangered species	Section 7.4
Sensitive biological resources or habitats	Section 7.3
Archaeological resources	Section 7.1, Appendix C
Socioeconomic resources	Section 7.9
Coastal and marine uses	Section 7.9
Consistency Certification	Table 1-2
Other Resources, conditions, and activities	Not Applicable

**Table 1-2 Permit Matrix**

Permitting Agency	Applicable Permit or Approval	Statutory Basis	Regulations	Applicant Requirements
National Oceanic and Atmospheric Administration (NOAA), National Marine Fisheries Service (NMFS)	Endangered Species Act (ESA) Section 7 Consultation	16 United States Code (U.S.C.) 1536	50 CFR 402	These consultations were completed prior to the issuance of the Lease. However, pursuant to its obligations under Section 7 of the ESA, BOEM is required to consult with NMFS prior to approval of any site assessment activities that may affect ESA-listed species that occur within the Lease Area.
	Magnuson-Stevens Fishery Conservation and Management Act Section 305(b) Consultation	16 U.S.C. 1801	50 CFR 600	No action required. BOEM will consult with NMFS to complete the essential fish habitat assessment and determination based on details provided herein.
	Incidental Take Authorization	Marine Mammal Protection Act of 1972 (MMPA) 16 U.S.C. 1361 <i>et seq.</i>	16 U.S.C. §§ 1361 <i>et seq.</i>	No action required. As detailed in Sections 4.0, 5.0, and 6.0, installation, operation, and decommissioning of the Metocean Buoys will not result in the harassment of marine mammals protected under the MMPA. In addition, as demonstrated in Section 2.2, Atlantic Shores will comply with Lease stipulations. The Lease stipulations are based on the Mandatory Project Design Criteria included in Appendix B of the Mid-Atlantic EA (BOEM 2012) which are consistent with the Incidental Take Statement of the NMFS Biological Opinion issued on July 19, 2013.
U.S. Army Corps of Engineers, Philadelphia District	Nationwide Permit 5 – Scientific Measurement Devices	Clean Water Act 33 U.S.C. 134	33 CFR 320 <i>et seq.</i>	Atlantic Shores filed a pre-construction notification on October 29, 2019 with the Philadelphia District to document eligibility under and conformance with the regional and general conditions applicable to Nationwide Permit (NWP) #5. This was approved on November 8, 2019. A copy of the permit is provided in Appendix A.
United States Coast Guard (USCG)	Approval for Private Aids to Navigation, Local Notice to Mariners	14 U.S.C. 81	33 CFR Part 66	Atlantic Shores submitted an application to the USCG for a Private Aids to Navigation (PATON) for the installation and operation of the Metocean Buoys on November 1, 2019. The PATON was approved on November 25, 2019. A copy of the PATON is provided in Appendix A.
U.S. Department of Interior, BOEM	National Historic Preservation Act (NHPA) Section 106 Consultation	NHPA 16 U.S.C. 470	36 CFR Part 60, Part 800	No action required. BOEM has executed a Programmatic Agreement that establishes procedures for consultations for site assessment activities in the New Jersey Wind Energy Area (WEA) and under NHPA stipulations for the identification and protection of cultural resources are included in the Lease.
U.S. Fish and Wildlife Service	Endangered Species Act Section 7 Consultation	16 U.S.C. 1536	50 CFR 402	No action required. These consultations were completed prior to the issuance of the Lease.

**Table 1-2 Permit Matrix**

Permitting Agency	Applicable Permit or Approval	Statutory Basis	Regulations	Applicant Requirements
U.S. Environmental Protection Agency, Region 2	OCS Air Permit	Clean Air Act (42 U.S.C. § 7401)	40 CFR § 55.2	Confirmation received from the U.S. Environmental Protection Agency (EPA), Region 2 on October 31, 2019 that due to no OCS sources for the Metocean Buoys and deployment activities, no OCS permit would be necessary. See Appendix A.
New Jersey Department of Environmental Protection and State of New York Department of State	Coastal Management Program Consistency Certification	Coastal Zone Management Act of 1972 (16 U.S.C. 1451 <i>et seq.</i> )	15 CFR 930 Subpart C	No action required. A Consistency Determination for SAP activities within the New Jersey WEA was issued in 2011. See Appendix A.

### 1.1 Authorized Representative and Designated Operator

As the lease holder, Atlantic Shores, by default, is also the lease operator. Atlantic Shores proposes to have Fugro serve as the contracted operator for the Metocean Buoys. The contact information for Fugro's Authorized Representative is as follows:

<b>Name of Authorized Representative</b>	Ben Williams
<b>Title</b>	Metocean Director
<b>Phone Number</b>	T +1 713 346 3606 M +1 713 206 9891
<b>Email</b>	bwilliams@fugro.com
<b>Address</b>	6100 Hillcroft Avenue, Houston, TX 77081

### 1.2 Certified Verification Agent Waiver Request

Pursuant to 30 CFR § 585.610(a)(9), BOEM may require a Certified Verification Agent (CVA) to certify to BOEM that the Metocean Buoys are designed to withstand the environmental and functional load conditions for the intended life of the Metocean Buoys in the Installation Areas. Atlantic Shores requests a waiver of the CVA requirement per 30 CFR § 585.705(c) because the selected Metocean Buoys are a commercially available technology that have been successfully tested and validated in close cooperation with DNV GL, who is a CVA. A Measurements Engineer from Fugro will also inspect the equipment prior to installation, witness the installation, and prepare an installation report as described in Section 4.0.

### 1.3 Best Management Practices

Atlantic Shores will use its internal project execution structure to manage activities described in the SAP. As stated in Section 4.7, SAP activities will be supported by a Health, Safety, and Environmental (HSE) Plan, which can be submitted, upon request, to BOEM prior to deployment of the Metocean Buoys.

In addition, Atlantic Shores will use many of the best management practices (BMPs) identified in Attachment B of the *Guidelines for Information Requirements for a Renewable Energy Site Assessment Plan* (BOEM 2019) and *Establishment of an OCS Alternative Energy and Alternate Use Program*, Record of Decision, December 2007 (BOEM 2007). See Table 1-3 for a summary of these BMPs (numbering in Table 1-3 corresponds to the format of the noted SAP Guidelines).

**Table 1-3 Best Management Practices**

Best Management Practices	Location in SAP Document
1. Minimize the area disturbed by preconstruction site monitoring and testing activities and installations	Section 3.3
2. Contact and consult with the appropriate affected Federal, state, and local agencies early in the planning process	Table 2-2 and Section 4.1
5. Conduct seafloor surveys in the early phases of a project to ensure that the alternative energy project is sited appropriately to avoid or minimize potential impacts associated with seafloor instability and other hazards	Section 3.3
7. Avoid locating facilities near known sensitive seafloor habitats, such as coral reefs, hard-bottom areas, and chemosynthetic communities	Section 7.3
8. Avoid anchoring on sensitive seafloor habitats	Section 7.3
9. Reduce scouring action by ocean currents around foundations and to seafloor topography by taking all reasonable measures and employing periodic routine inspections to ensure structural integrity	Section 5.2
10. Avoid the use of explosives when feasible to minimize impacts to fish and other benthic organisms	No explosives will be used for activities proposed in the SAP.
13, 14, 15, 16, and 20 related to minimizing/avoiding vessel impacts to marine mammals and sea turtles.	Section 4.4
17. Conduct pre-siting surveys (may use existing data) to identify important, sensitive, and unique marine habitats in the vicinity of the project and design the project to avoid, minimize, or otherwise mitigate adverse impacts to these habitats	Section 7.0
18. Minimize construction activities in areas containing anadromous fish during migration periods	Section 7.4
19. Minimize seafloor disturbance during construction and installation of the facility and associated infrastructure	Section 4.1
25. Take measures to reduce perching opportunities	Section 7.6
26. Comply with Federal Aviation Administration and USCG requirements for lighting while using lighting technology (e.g., low-intensity strobe lights) that minimizes impacts to avian species	Table 1-2 and Section 7.6
28 and 29. Work cooperatively with commercial/recreational fishing entities and interests to ensure that the construction and operation of a project will minimize potential conflicts with commercial and recreational fishing interests. Review planned activities with potentially affected fishing organizations and port authorities to prevent unreasonable fishing gear conflicts. Minimize conflict with commercial fishing activity and gear by notifying registered fishermen of the location and time frame of the project construction activities well in advance of mobilization with updates throughout the construction period	Section 7.9
30. Use practices and operating procedures that reduce the likelihood of vessel accidents and fuel spills	Section 4.0
31. Avoid or minimize impacts to the commercial fishing industry by marking applicable structures (e.g., wind turbines, wave generation structures) with USCG-approved measures (such as lighting) to ensure safe vessel operation	Table 1-2 and Section 7.9
32. Avoid hard-bottom habitats, including seagrass communities and kelp beds, where practicable, and restore any damage to these communities	Section 7.3
44. Prepare waste management plans, hazardous material plans, and oil spill prevention plans, as appropriate, for the facility	Based on guidance provided by BOEM in October 2017, prior to commencing installation of the Metocean Buoys, Atlantic Shores would submit an Oil Spill Response Measures for review and approval to the Oil Spill Response Division of the Bureau of Safety and Environmental Enforcement (BSEE), if necessary. No diesel generator(s) will be affixed to the Metocean Buoys.

## 2. CONFORMITY WITH PRIOR BOEM ACTIONS REGARDING SAP ACTIVITIES

### 2.1 Mid-Atlantic Environmental Assessment

On January 20, 2012, BOEM issued a Finding of No Significant Impact based on a comprehensive environmental assessment. *The Commercial Wind Lease Issuance and Site Assessment Activities on the Atlantic Outer Continental Shelf (OCS) Offshore New Jersey, Delaware, Maryland, and Virginia Final Environmental Assessment* (BOEM 2012) analyzed the foreseeable consequences associated with issuing commercial leases within the identified WEAs on the OCS offshore New Jersey, Delaware, Maryland, and Virginia. The New Jersey WEA is inclusive of the Lease Area (Figure 1-1) well as the installation areas of Metocean Buoys. The Metocean Buoys and proposed activities described herein are consistent with Sections 3.1.3.3 and 3.1.3.4 of the Mid-Atlantic EA. Table 2-1 below provides a comparison of the information assessed in the Mid-Atlantic EA and the relevant detail proposed by Atlantic Shores herein.

**Table 2-1 Comparison of Mid-Atlantic EA and SAP Elements**

Project Component	Assessed in EA	Proposed in SAP	Summary
# of Buoys	Maximum 2 buoys per lease area and an additional small tethered buoy	2 SEAWATCH™ Wind LIDAR buoys	The number of buoys proposed in this SAP are consistent with what was assessed in the EA.
Meteorological Buoy Specifications	100-foot-long spar buoy, weighing 15 tons, just over 6 feet diameter	20 feet overall height, 9.2 feet diameter, and 3,748 pounds	The Metocean Buoys proposed in this SAP are smaller and weigh less than what was assessed in the EA. The direct consequence is a reduction in the anchor requirement and subsequent footprint, and heavy mooring chain in dynamic contact with the seabed.
Meteorological Buoy Hull Type	Navy Oceanographic Meteorological Automated Device	SEAWATCH™ Wavescan platform	Atlantic Shores is proposing to use a hull type that is consistent with what was assessed in the EA.
Meteorological Buoy Height above ocean surface	30 to 40 feet (9 to 12 meters)	11.5 feet (FLiDAR)	The Metocean Buoys proposed in this SAP are less than half the height that what was assessed in the EA.
Meteorological Buoy Mooring Design	All chain mooring, 2.7-4.5 ton anchor, 36 square feet resting on sea floor, anchor sweep 8.75 acres	All chain mooring, 3.3-ton large link steel chain weight, and 44- to 88-pound acoustic modem bottom weights, anchor sweep of up to 3.1 acres (inclusive of acoustic modem clump weight footprint and galvanized chain on the seabed).	The weight and area of anchor resting on the sea floor is generally consistent with what was assessed in the EA. However, the anchor sweep of the mooring design proposed by Atlantic Shores is less than half the size of what was assessed in the EA.
Data Transmission	Transmit operational status and data to receiver on shore	Transmit operational status and data to shore via a two-way communication link	The data transmission protocols proposed by Atlantic Shores are consistent with what was assessed in the EA.
Maintenance	Monthly or quarterly	Every 6 to 9 months	The maintenance schedule proposed in this SAP is less frequent than what was proposed in the EA, which is expected to result in lower impacts through reduced disturbance to marine life and other maritime users.



**Table 2-1 Comparison of Mid-Atlantic EA and SAP Elements**

Project Component	Assessed in EA	Proposed in SAP	Summary
Installation and decommissioning process	Carried or towed by vessel, lower or place buoy over final location, drop mooring anchor, decommissioning is reverse of installation	Towed by vessel, deploy mooring system and lower anchor over final location, decommissioning is reverse of installation except buoy will be placed on deck of the vessel rather than towed back to shore	The installation and decommissioning processes proposed by Atlantic Shores are consistent with what was assessed in the EA.
Installation and decommissioning timeframe	Installation 1 day per buoy, Decommissioning 1 day per buoy	Installation up to 2 days for the Metocean Buoys, decommissioning up to 2 days for the Metocean Buoys.	The installation and decommissioning timeframes proposed by Atlantic Shores are consistent with what was assessed in the EA.
Power supply	Solar, wind, backup diesel generator	Solar panels (4 at 45 watts each) and back-up lead batteries (4) and lithium batteries (4) and 4 EFOY Pro fuel cells ( <a href="http://www.efoy-pro.com">www.efoy-pro.com</a> )	The power supply proposed by Atlantic Shores are consistent with what was assessed in the EA, with the exception of the backup diesel generator, which has been replaced with fuel cells to reduce emissions.

## 2.2 Lease OCS-A 0499

BOEM identified mitigation measures in the Mid-Atlantic EA (BOEM 2012) for buoy installation, operation, and decommissioning. The measures were developed by BOEM in consultation with other federal and state agencies to reduce or eliminate the potential environmental risks to, or conflicts with, individual environmental and socioeconomic resources upon issuance of a commercial lease for site assessment and characterization activities. BOEM has issued the mitigation measures for Atlantic Shores' lease-specific site characterization activities and site assessment activities in the Lease Area based upon these measures. Atlantic Shores will implement these Lease-specific measures as described in more detail in Table 2-2 below.

**Table 2-2 Conformance with the Commercial Renewable Energy Lease Number OCS-A 0499 Stipulations**

Addendum "C" Stipulation	Description	SAP Document
<b>3 National Security and Military Operations</b>		
3.2.4 Lessee Point-of-Contact for Evacuation/Suspension Notifications	The Lessee must inform the Lessor of the persons/offices to be notified to implement the terms of 3.2.2 and 3.2.3.	Jennifer Daniels, Development Director Atlantic Shores Offshore Wind, LLC (781) 964-4293 Jennifer.daniels@atlanticshoreswind.com 1 Beacon Street, Boston MA 02108
3.2.5 Coordination with Command Headquarters	The Lessee must establish and maintain early contact and coordination with the appropriate command headquarters (see Contact Information for Reporting Requirements Sheet), in order to avoid or minimize the potential to conflict with and minimize the potential effects of conflicts with military operations.	Atlantic Shores will establish contact with the United States Fleet Forces N46 at 1562 Mitscher Avenue, Suite 250, in Norfolk, Virginia ([757] 836-6206), as provided in the Commercial Lease.

**Table 2-2 Conformance with the Commercial Renewable Energy Lease Number OCS-A 0499 Stipulations**

Addendum "C" Stipulation	Description	SAP Document
3.3 Electromagnetic Emissions	Prior to entry into any designated defense operating area, warning area, or water test area for the purpose of commencing survey activities undertaken to support SAP or Construction and Operations Plan (COP) submittal, the Lessee must enter into an agreement with the commander of the appropriate command headquarters to coordinate the electromagnetic emissions associated with such survey activities. The Lessee must ensure that all electromagnetic emissions associated with such survey activities are controlled as directed by the commander of the appropriate command headquarters.	Atlantic Shores will provide the frequencies the Metocean Buoys will use to transmit data to confirm electromagnetic emissions from the SAP activities will not conflict with military operations.
<b>4 Standard Operating Conditions</b>		
4.1.1 Briefing	Prior to the start of operations, the Lessee must hold a briefing to establish responsibilities of each involved party, define the chains of command, discuss communication procedures, provide an overview of monitoring procedures, and review operational procedures. This briefing must include all relevant personnel, crew members and protected species observers (PSO). New personnel must be briefed as they join the work in progress.	See Section 4.3, Pre-Installation Briefing.
4.1.2	The Lessee must ensure that all vessel operators and crew members, including PSOs, are familiar with, and understand, the requirements specified in Addendum C.	See Section 4.3, Pre-Installation Briefing.
4.1.3	The Lessee must ensure that a copy of the standard operating conditions (Addendum C) is made available on every project-related vessel.	See Section 4.3, Pre-Installation Briefing.
4.1.4 Marine Trash and Debris Prevention	The Lessee must ensure that vessel operators, employees, and contractors actively engaged in activity in support of plan (i.e., SAP and COP) submittal are briefed on marine trash and debris awareness and elimination, as described in the BSEE Notice to Lessees and Operators (NTL) No. 2012-G01 ("Marine Trash and Debris Awareness and Elimination") or any NTL that supersedes this NTL, except that the Lessor will not require the Lessee, vessel operators, employees, and contractors to undergo formal training or post placards. The Lessee must ensure that these vessel operator employees and contractors are made aware of the environmental and socioeconomic impacts associated with marine trash and debris and their responsibilities for ensuring that trash and debris are not intentionally or accidentally discharged into the marine environment. The above-referenced NTL provides information the Lessee may use for this awareness briefing.	Atlantic Shores will comply with NTL 2015-G03 which has superseded NTL 2012-G01, except that formal training will not be conducted and placards will not be posted. Vessel Operators, employees, and contractors will be briefed prior to boarding the vessel.
4.2.1 Vessel Strike Avoidance Measures	The Lessee must ensure that all vessels conducting activities in support of plan submittal comply with the vessel-strike avoidance measures specified in stipulations 4.2.1 through 4.2.9.1, except under extraordinary circumstances when complying with these requirements would put the safety of the vessel or crew at risk.	See Section 4.4, Protected Species Avoidance
4.3.6 No Impact without Approval	The Lessee must not knowingly impact a potential archaeological resource without the Lessor's prior approval.	See Section 7.2 and Appendix C. Marine Archaeological Resource Assessment Report
4.3.7 Post-Review Discovery Clauses	If the Lessee, while conducting site characterization activities in support of plan submittal, discovers a potential archaeological resource, such as the presence of a shipwreck (e.g., a sonar image or visual confirmation of an iron, steel, or wooden hull, wooden timbers, anchors, concentrations of historic objects, piles of ballast rock), prehistoric artifacts, or relict landforms within the project area, the Lessee must:	Appendix C. Marine Archaeological Resource Assessment Report
4.3.7.1	Immediately halt seafloor/bottom-disturbing activities within the area of discovery;	Appendix C. Marine Archaeological Resource Assessment Report
4.3.7.2	Notify the Lessor within 24 hours of discovery;	Appendix C. Marine Archaeological Resource Assessment Report

**Table 2-2 Conformance with the Commercial Renewable Energy Lease Number OCS-A 0499 Stipulations**

Addendum "C" Stipulation	Description	SAP Document
4.3.7.3	Notify the Lessor in writing via report to the Lessor within 72 hours of its discovery;	Appendix C. Marine Archaeological Resource Assessment Report
4.3.7.4	Keep the location of the discovery confidential and take no action that may adversely affect the archaeological resource until the Lessor conducts an evaluation and instructs the applicant on how to proceed; and,	Appendix C. Marine Archaeological Resource Assessment Report
4.3.7.5	Conduct any additional investigations as directed by the Lessor to determine if the resource is eligible for listing in the National Register of Historic Places (30 CFR 585.802(b)). The Lessor will direct the Lessee to conduct such investigations if: (1) the site has been impacted by the Lessee's project activities; or (2) impacts to the site or to the area of potential effect cannot be avoided. If investigations indicate that the resource is potentially eligible for listing in the National Register of Historic Places, the Lessor will tell the Lessee how to protect the resource or how to mitigate adverse effects to the site. If the Lessor incurs costs in protecting the resource, under Section 110(g) of the National Historic Preservation Act, the Lessor may charge the Lessee reasonable costs for carrying out preservation responsibilities under the OCS Lands Act (30 CFR 585.802(c-d)).	Appendix C. Marine Archaeological Resource Assessment Report
4.5.1. Reporting Injured or Dead Protected Species	The Lessee must ensure that sightings of any injured or dead protected species (e.g., marine mammals, sea turtles or sturgeon) are reported to the Lessor, NMFS and the NMFS Northeast Region's Stranding Hotline (866-755-6622 or current) within 24 hours of sighting, regardless of whether the injury or death is caused by a vessel. In addition, if the injury or death was caused by a collision with a project-related vessel, the Lessee must notify the Lessor of the strike within 24 hours. The Lessee must use the form provided in Appendix A to ADDENDUM "C" to report the sighting or incident. If the Lessee's activity is responsible for the injury or death, the Lessee must ensure that the vessel assists in any salvage effort as requested by NMFS.	See Section 4.4

### 3. PROJECT DESCRIPTION AND OBJECTIVES

#### 3.1 Project Description and Objectives

Atlantic Shores will collect and analyze meteorological data, inclusive of wind speed and direction at multiple heights, and information on other meteorological and oceanographic conditions as part of the site assessment activities of the Project within the Lease Area. As stated previously, Atlantic Shores has proposed that the collection of this data will be performed using two Fugro SEAWATCH™ Buoys. The proposed Metocean Buoys represent state-of-the-art equipment that incorporates the best available technologies, mooring components, and mooring designs to ensure reliable, quality data collection, robust mooring integrity, safety and minimal environmental impacts. Design drawings of the technology proposed are provided in Appendix B.

The SEAWATCH™ Buoys will consist of instrumentation and supporting systems atop a floating moored buoy platform (Figure 3-1). The SEAWATCH™ Buoy is built on the SEAWATCH™ Wavescan platform, a versatile instrumentation platform, designed to provide less drag and large buoyancy making it well suited for deep offshore locations or areas of strong current forces. The software includes the power management GENI™ controller and the ZephIR LiDAR. Each floating platform consists of a modular hull for easy transport and local assembly, an instrument container with processor and other electronics, power system (fuel cells and lead acid batteries), LiDAR, a met mast, a sensor carrier arm (located at the top of the met mast),

mooring chain, and chain weight anchor. The platform float with fenders has a diameter of 9.2 feet (2.8 meters). The unit is made out of a combination of polyethylene, aluminum and stainless-steel, measuring 20 feet (6.1 meters) in overall height, 9.2 feet (2.8 meters) in diameter, and a weight of 3,748 pounds (1,700 kilograms [kg]). The vertical profile of the SEAWATCH™ Buoy, including instrumentation, will be approximately 11.5 feet (3.5 meters) from the sea surface to the top of the hull mast. The submerged portion of the hull will measure approximately 8.5 feet (2.6 meters) below the sea surface from the water line to the bottom of the keel weight. The Metocean Buoys will be decommissioned at the end of the operational life as described in Section 6.0.



**Figure 3-1 SEAWATCH™ Wind LiDAR Buoy**

### 3.2 Site Location

The proposed Metocean Buoys will be deployed at up to four locations within the Lease Area. These sites are collectively referred to as the Installation Areas (Figure 1-1). For the purpose of the discussion in this SAP, the four Installation Areas where the Metocean Buoys are proposed to be located have been given unique identifiers (Table 3-1). One of the buoys (L1) will be deployed to Installation Area IA3 for approximately one year. LI will remain in position until the technology has gathered one-year of concurrent data with the second buoy (L2) (Table 3-2). The coordinates for the four locations are provided in Table 3-1 and depicted on Figure 1-1.

**Table 3-1 Location of the Metocean Buoys**

Buoy Installation Area (IA)	Latitude	Longitude	NAVD88 Water Depth	OCS Lease Block	Aliquot
IA1	39°18'34"N	74°6'33"W	25 Meters	6786, 6787	H, E
IA2	39°33'56"N	73°58'12"W	24 Meters	6489	F
IA3	39°17'17"N	73°58'37"W	32 Meters	6789	N
IA4	39°12'9"N	74°4'55"W	27 Meters	6887	O

**Table 3-2 Buoy Deployment Schedule**

Buoy Installation Area (IA)	2020				2021				2022				2022			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
IA3				L1	L1	L1	L1	L1								
IA1				L2	L2	L2	L2	L2	L2	L2	L2	L2	L2	L2	L2	
IA2								L1	L1	L1	L1	L1				
IA4												L1	L1	L1	L1	

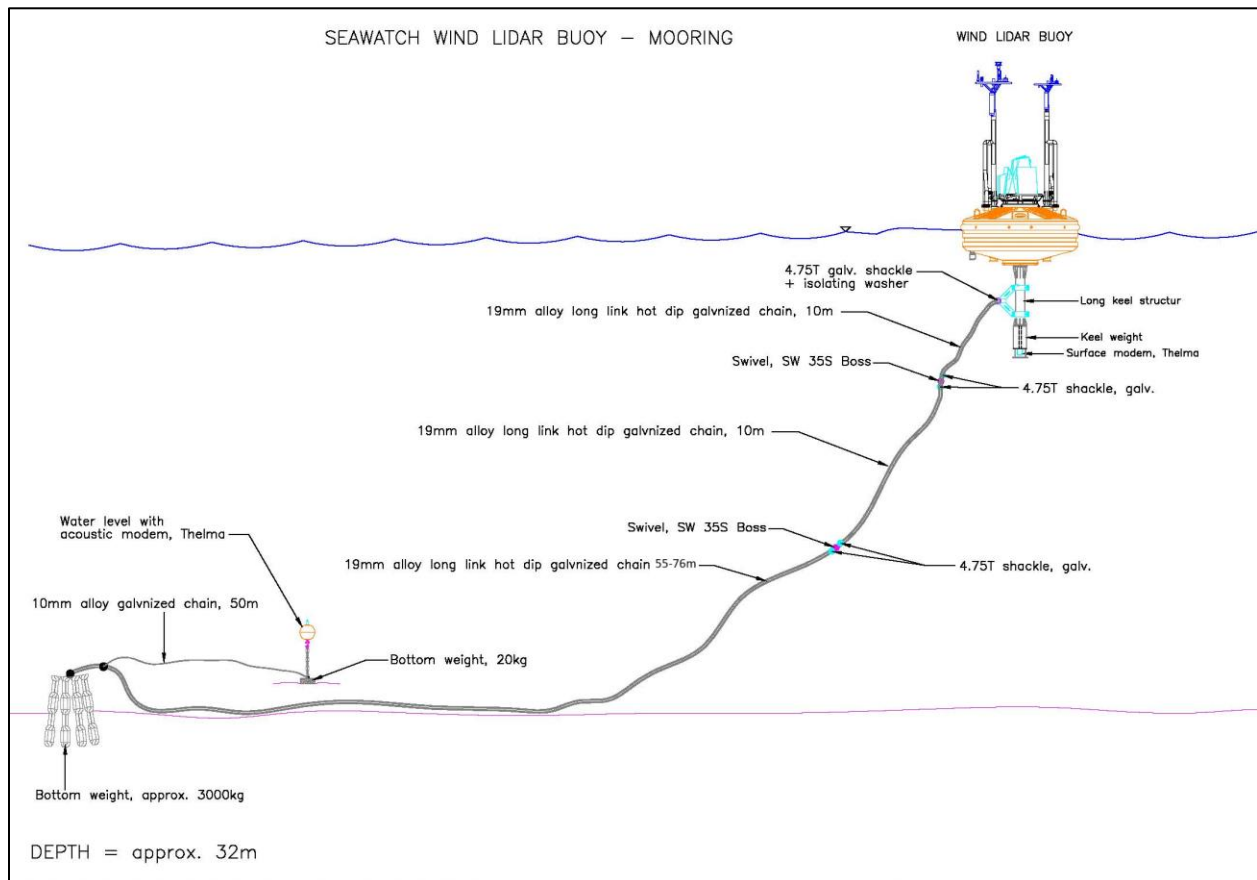
### 3.3 Mooring Designs, Power Supply, and Instrumentation

The location for the Installation Areas of the proposed Metocean Buoys as presented in Table 3-1 was based on a review of existing data, the most likely development scenarios for the Lease Area, and the best available technologies. The following sections provide detailed descriptions of the proposed Metocean Buoys as well as their associated mooring designs, power supply, and instrumentation.

BOEM and the Department of Defense (DoD) will be notified in the event that Atlantic Shores elects to add any new sensors or instrumentation to the Metocean Buoys.

#### 3.3.1 Mooring Design

The SEAWATCH™ Buoys will be attached to the seafloor by means of a mooring design which is comprised of a galvanized chain that connects the SEAWATCH™ Buoy to a large link steel chain weight on the seafloor. The large link steel chain weight is also connected to a water level with acoustic modem atop a bottom weight via a galvanized chain (Figure 3-2). The large link steel chain weight and bottom weight would weigh approximately 3.3 tons (3,000 kilograms) and 44 to 88 pounds (20 to 40 kilograms), respectively, and would sit on the seabed for a total area of up to 10 square feet (1.9 square meters). The chain would be attached to the base of the SEAWATCH™ Wavescan platform via the long keel structure. The link diameter in the chafe section of the mooring is 19 millimeters. This larger chain link diameter has been specifically selected based on the results of a Mooring Fatigue Analysis. The maximum area of the anchor chain sweep associated with the long-term operation of each SEAWATCH™ Buoy is anticipated to be approximately 3.1 acres (1.3 hectares) for the long link chain weight (based on anchor chain radii of approximately 207 feet [63 meters]). The 10-square-foot (1.9 square meters) bottom weight and sweep for the 164 feet (50 meters) chain associated with the acoustic modem will be fully contained within the sweep area defined above. Vertical penetration of the long link chain weight and bottom weight into the seabed is anticipated to be approximately 3.3 feet (1.0 meters) and horizontal impacts of the chain weight are anticipated to be approximately 0.1 acre (0.04 ha) of seafloor.



**Figure 3-2 SEAWATCH™ Mooring Maximum Design**

### 3.3.2 Power Supply

The SEAWATCH™ instrumentation will be powered by fuel cells of up to 25,926-amp hours which can operate individually or in pairs. The SEAWATCH™ instrumentation would be capable of operating at full capacity by each fuel cell for 70 days, for a total to 280 days of autonomy. Each fuel cell is connected to four 28-liter methanol cans (totaling 112 liters) and there is a solar panel on the lid of each fuel chamber. The four solar panels (45 watts each for a total capacity of 160 watts) charge the batteries, and the batteries power all of the sensors and equipment. The fuel cells power the batteries in the event of a technical problem with the solar panels, and/or during a prolonged period of no sun. A back-up power supply includes a lead-acid battery bank (Powersafe 12VF62) of up to 248-amp hours for such critical functions such as metocean system, communication and flash lamp in case of low energy level on main batteries.

### 3.3.3 Instrumentation Equipment

- A LiDAR instrumentation package, comprised of a ZephIR300M, will be installed atop the SEAWATCH™ Buoy. The ZephIR300M unit is a wind-profiling device capable of remotely measuring and collecting wind speeds and directions from 10 to 200+ meters. The SEAWATCH™ will also contain the following equipment: Wavesense 3 to measure wave height, period and direction;
- A Gill Ultrasonic single point wind sensor to measure speed and direction, wind gusts;

- A Vaisala HMP155 to measure air temperature and humidity;
- A Vaisala PTB330 to measure air pressure;
- A Nortek Aquadopp Profiler 400 kHz to measure current velocity and direction and water temperature;
- A Protec L3 measuring AIS AtoN;
- A Septentrio functioning as a dual GPS;
- A Thelma thermometer and pressure gauge functioning as a water level sensor; and
- A Seabird MicroCAT SBE 37-SMP to measure sea conductivity.

Table 3-3 provides a list of the parameters measured by the SEAWATCH™, the associated instrumentation, as well as the range and accuracy of the measurements.

**Table 3-3 Parameters Measured and Recorded by the SEAWATCH™**

Parameter	Instrumentation	Range
Measurement height (configurable)	ZephIR 300 LiDAR	10 m – 300 m
Probe length at 10 m	ZephIR 300 LiDAR	0.07 m
Probe length at 100 m	ZephIR 300 LiDAR	7.7 m
Number of simultaneous heights measured	ZephIR 300 LiDAR	Up to 10
Sampling rate	ZephIR 300 LiDAR	50 Hz
Average period (configurable)	ZephIR 300 LiDAR	1 second upwards
Scanning cone angle	ZephIR 300 LiDAR	30°
Wind Speed	ZephIR 300 LiDAR	<1 meter per second (m/s) to 70 m/s
Wind Direction	ZephIR 300 LiDAR	N/A

The SEAWATCH™ Buoy uses Fugro G-Link software for data acquisition and transfer which provides full onboard processing of all measured data and 4 gigabytes of data storage. The two-way communication link provides real-time data transfer and control, and provides flexibility to configure sensors and data collection parameters. The robust design of the module hull is reliable in all weather and temperature extremes.

Using the maintenance plan described in Section 5.2, equipment on the SEAWATCH™ will have a minimum two-year operational lifespan.

#### 4. DEPLOYMENT/INSTALLATION

Installation of the Metocean Buoys may take up to 2 days, barring weather delays. It is anticipated that the deployment activities will be staged out of the Miller's Launch in Staten Island, New York.

##### 4.1 Overview of Installation and Deployment Activities

Atlantic Shores will notify BOEM, United States Fleet Forces (USFF) N46, the USACE, Philadelphia District, and the USCG prior to mobilization to deploy the Metocean Buoys. Written notice via email will be provided to the appropriate contact at USFF Command prior to mobilization in order to avoid potential conflicts with

military operations. Atlantic Shores will update USFF Command on the installation schedule following approval of the SAP and detailed planning.

Atlantic Shores will notify mariners, fishermen, and other users of the area by submitting a request to the USCG for publication of a Local Notice to Mariners (LNM) 2 weeks prior to the start of the in-water work. This notice will include the contact names for the installation vessels, local fisheries liaison officer, channels of communication, and the duration of the work. Copies of all USCG communications will be provided to BOEM as required. Additionally, in accordance with standard maritime practices, the vessel captain(s) will broadcast via VHF radio on Marine Channel 16 notification to mariners of their position and limited mobility during installation activities. The USCG PATON for each of the Metocean Buoys has already been authorized (see Table 1-2).

Within 30 days of completing the installation of the Metocean Buoys, Atlantic Shores' contractor, Fugro, will prepare an Installation Report and provide a copy to BOEM to fulfill the requirements of 30 CFR § 585.615(a). This report will include a description of the equipment and the installation, including final coordinates of the installation site and photo documentation of the equipment deployed, the results of all commissioning tests, the plans and schedule for upcoming inspections and maintenance, and any noted problems or issues to be addressed. Additionally, Atlantic Shores shall notify the USCG immediately of the final position of the sinker.

Atlantic Shores will provide written notification to BOEM and DoD of any proposal to add new sensors to the Metocean Buoys. Atlantic Shores will include the technical specifications (manufacturer, model, spectrum requirements, etc.) for any proposed new sensors, specifically seismometers and hydrophones, in the notification. The notification will be provided to the contacts listed in the Lease, or updated contact information as provided by BOEM.

#### 4.1.1 SEAWATCH™ Deployment

One workboat (*Berto L Miller*) approximately 180 feet (55 meters) in length will be used for the deployment of the Metocean Buoys. Each SEAWATCH™ will be towed behind the workboat to its deployment location. The mooring systems will also be stored on the deck of a vessel during transit. The mooring systems for the Metocean Buoys, inclusive of chain weight, chains, water level with acoustic modem, ropes and lines, will be deployed from the work vessel by a winch and A-Frame.

On arrival to the deployment location, the SEAWATCH™ chain will be connected to the chain of the 6,614-pound (3,000-kilogram) clump weight. Once at deployment location, the vessel will be maneuvered against the current. The safety fence at the stern will then be removed. The towing ropes will be released from the buoy which will allow the buoy to float behind the vessel. The vessel will then drift away with the current letting the buoy pull out the mooring chain. Once all mooring parts are in the sea, the safety fence at the stern will be replaced. The ropes securing the 6,614-pound (3,000-kilogram) clump weight and the 44- to 88-pound (20- to 40-kilogram) modem weight will be disconnected. Once the vessel is at the target mooring position, the weights will be released and allowed to sink.

The second SEAWATCH™ will be deployed in the same manner at the second deployment location.

All personnel participating in the installation will attend a pre-installation briefing (see Section 4.3).

## 4.2 Vessels

Atlantic Shores will employ Fugro to transport and deploy the Metocean Buoys. Atlantic Shores anticipates that the deployment of the Metocean Buoys will require the support of one workboat, and currently proposes



to use the *Berto L Miller* or a similar vessel. The *Berto L Miller* is a supply vessel with twin Cat 3512 engines. The vessel measures 180 feet (55 meters) in length with a 44-foot (13.4-meter) beam and a maximum 12-foot (3.7-meter) draft. The maximum speed is 12 knots and cruising speed is 10 knots.

Depending on vessel availability at the time of installation, Atlantic Shores may alternately elect to use a tug and barge with crane and one support vessel. See Appendix D for vessel specifications.

### 4.3 Pre-Installation Briefing

Prior to the installation of the Metocean Buoys, all personnel will attend a pre-installation briefing as required by Lease Stipulation 4.1.1. The pre-installation briefing will include a Tool-Box Talk as well as an HSE and hazard identification presentations. The purpose of this briefing will be to review the HSE requirements and associated emergency response requirements for the proposed work, identify the responsibilities of each person, define the chains of command, discuss communication procedures, and provide an overview of planned installation activities. Additional topics for the briefing will include protected species avoidance, marine trash and debris awareness, and oil spill response procedures.

The Atlantic Shores on-site representative will have the authority to stop or delay any of the installation activities, if deemed necessary. If change in personnel is required during installation activities, the new personnel will be briefed as they join the work in progress.

### 4.4 Protected Species Avoidance

All whales, dolphins, and porpoises in the northeast region are federally protected by the MMPA. In addition, many large whales in the area, as well as sea turtles, are further protected under the ESA.

The Lease contains specific stipulations to minimize risk to marine species that must be followed. Deployment of the Metocean Buoys will not require pile driving; accordingly, mitigations to reduce adverse impacts on protected species from pile driving do not apply. The Lease stipulations summarized in Table 4-1 apply to activities associated with installation, operation, and decommissioning of the Metocean Buoys and must be adhered to.

**Table 4-1 Standard Operating Conditions in the Lease Area**

Addendum "C" Stipulation	Vessel Operations Conditions
<b>4.2 Vessel Strike Avoidance Measures</b>	
4.2.1	The Lessee must ensure that all vessels conducting activities in support of submittal comply with the vessel-strike avoidance measures specified in stipulations 4.2.1 through 4.2.9.1, except under extraordinary circumstances when complying with these requirements would put the safety of the vessel or crew at risk.
4.2.2	The Lessee must ensure that vessel operators and crews maintain a vigilant watch for cetaceans, pinnipeds, and sea turtles and slow down or stop their vessel to avoid striking these protected species.
4.2.3	The Lessee must ensure that all vessel operators comply with 10 knot (18.5 kilometer per hour [km/hr]) speed restrictions in any Dynamic Management Area (DMA).
4.2.4	The Lessee must ensure that vessels 65 feet in length or greater, operating from November 1 through July 31, operate at speeds of 10 knots (18.5 km/hr) or less.
4.2.5	The Lessee must ensure that all vessel operators reduce vessel speed to 10 knots or less when mother/calf pairs, pods, or large assemblages of non-delphinoid cetaceans are observed near an underway vessel.
<b>4.2.6 North Atlantic Right Whales</b>	
4.2.6.1	The Lessee must ensure all vessels maintain a separation distance of 500 meters (1,640 feet) or greater from any sighted North Atlantic right whale.

**Table 4-1 Standard Operating Conditions in the Lease Area**

Addendum "C" Stipulation	Vessel Operations Conditions
4.2.6.2	The Lessee must ensure that avoidance measures are taken if a vessel comes within 500 meters (1,640 feet) of any North Atlantic right whale:
4.2.6.2.1	If underway, vessels must steer a course away from any sighted North Atlantic right whale at 10 knots (18.5 km/h) or less until the 500 meters (1,640 feet) minimum separation distance has been established (except as provided in 4.2.6.2.2).
4.2.6.2.2	If a North Atlantic right whale is sighted in a vessel's path, or within 100 meters (328 feet) to an underway vessel, the underway vessel must reduce speed and shift the engine to neutral. The lessee must not engage engines until the North Atlantic right whale has moved outside the vessel's path and beyond 100 meters (328 feet), at which point the Lessee must comply with 4.2.6.2.1.
4.2.6.2.3	If a vessel is stationary, the vessel must not engage engines until the North Atlantic right whale has moved beyond 100 meters (328 feet), at which point the Lessee must comply with 4.2.6.2.1.
<b>4.2.7 Non-Delphinoid Cetaceans other than the North Atlantic Right Whale.</b>	
4.2.7.1	The Lessee must ensure all vessels maintain a separation distance of 100 meters (328 feet) or greater from any sighted non-delphinoid cetacean.
4.2.7.2	The Lessee must ensure that the following avoidance measures are taken if a vessel comes within 100 meters (328 feet) of any sighted non-delphinoid cetacean:
4.2.7.2.1	If any non-delphinoid cetacean is sighted, the vessel underway must reduce speed and shift the engine to neutral, and must not engage the engines until the non-delphinoid cetacean has moved outside of the vessel's path and beyond 100 meters (328 feet).
4.2.7.2.2	If a vessel is stationary, the vessel must not engage engines until the sighted non-delphinoid cetacean has moved out of the vessel's path and beyond 100 meters (328 feet).
<b>4.2.8 Delphinoid Cetaceans and Pinnipeds</b>	
4.2.8.1	The Lessee must ensure that all vessels underway do not divert to approach any delphinoid cetacean and/or pinniped.
4.2.8.2	The Lessee must ensure that if a delphinoid cetacean and/or pinniped approaches any vessel underway, the vessel underway must avoid excessive speed or abrupt changes in direction to avoid injury to the delphinoid cetacean and/or pinniped.
<b>4.2.9 Sea Turtles</b>	
4.2.9.1	The Lessee must ensure all vessels maintain a separation distance of 50 meters (164 feet) or greater from any sighted sea turtle.
<p>Note:</p> <p>1. A Dynamic Management Area is defined in Section 1.2 of the Lease. Vessel operators may send a blank email to <a href="mailto:ne.rw.sightings@noaa.gov">ne.rw.sightings@noaa.gov</a> for an automatic response listing all current Dynamic Management Areas.</p>	

In addition to the Lease stipulations, between November 1 and July 1, vessel operators will monitor NMFS North Atlantic right whale reporting systems (e.g., the Early Warning System, Sighting Advisory System, and Mandatory Ship Reporting System) for the presence of North Atlantic right whales.

#### 4.4.1 Reporting of Injured or Dead Protected Species

During all phases of marine activities, sightings of any injured or dead protected species (sea turtles and marine mammals) will be reported within 24 hours, regardless of whether the injury or death was caused by a vessel as specified in Stipulation 4.5.1 of the Lease. All marine activities will be suspended immediately and the circumstances reported as specified below if a dead or injured right whale is found in any of the deployment areas. The Lease stipulations summarized in Table 4-2 below apply and must also be adhered to.

**Table 4-2 Protected Species Reporting Requirements in the Lease Area**

Addendum "C" Stipulation	Lease Requirement
4.5.1 Reporting Injured or Dead Protected Species	The Lessee must ensure that sightings of any injured or dead protected species (e.g., marine mammals, sea turtles or sturgeon) are reported to the Lessor, NMFS and the NMFS Northeast Region's Stranding Hotline (866-755-6622 or current) within 24 hours of sighting, regardless of whether the injury or death is caused by a vessel. In addition, if the injury or death was caused by a collision with a project-related vessel, the Lessee must notify the Lessor of the strike within 24 hours. The Lessee must use the form provided in Appendix A to ADDENDUM "C" to report the sighting or incident. If the Lessee's activity is responsible for the injury or death, the Lessee must ensure that the vessel assists in any salvage effort as requested by NMFS.
<b>4.5.2 Reporting Observed Impacts to Protected Species</b>	
4.5.2.1	The Lessee must report any observed takes of listed marine mammals, sea turtles or sturgeon (as defined in 1.13) resulting in injury or mortality within 24 hours to the Lessor and NMFS.
4.5.2.2	The Lessee must report any observations concerning any impacts on Endangered Species Act listed marine mammals, sea turtles or sturgeon to the Lessor and NMFS Northeast Region's Stranding Hotline within 48 hours.
4.5.2.3	The Lessee must record injuries or mortalities using the form provided in Appendix A to ADDENDUM "C".
4.5.3 Protected Species Observer Reports	The Lessee must ensure that the protected-species observer record all observations of protected species using standard marine mammal observer data collection protocols. The list of required data elements for these reports is provided in Appendix B to ADDENDUM "C".
4.5.4 Reports of G&G Survey Activities and Observations	Reports of G&G Survey Activities and Observations. The Lessee must provide BOEM and NMFS with reports every 90 calendar days following the commencement of high-resolution geophysical (HRG) and/or geotechnical exploration activities, and a final report at the conclusion of the HRG and/or geotechnical exploration activities. Each report must include a summary of survey activities, all protected species observer and incident reports (See Appendices A and B), a summary of the survey activities, and an estimate of the number of listed marine mammals and sea turtles observed and/or taken during these survey activities.
4.5.5 Marine Mammal Protection Act Authorization(s)	If the Lessee is required to obtain an authorization pursuant to section 101(a)(5) of the Marine Mammal Protection Act prior to conducting survey activities, the Lessee must provide to the Lessor a copy of such authorization prior to commencing survey activities, pursuant to 30 CFR 585.801(b).

#### 4.5 Avian and Bat Protection

Atlantic Shores will provide an annual report to BOEM and the U.S. Fish and Wildlife Service (USFWS) using the contact information listed in the Lease, or updated contact information as provided by BOEM, by January 31 of each year of the site assessment term. This report will document dead or injured birds or bats found on vessels and/or the Metocean Buoys during installation, operations, and decommissioning. Each report will contain the following information: the name of species, date found, location, a picture to confirm species identity (if possible), and any other relevant information. In addition to submitting the annual report, Atlantic Shores will report carcasses with federal or research bands to the United States Geological Survey Bird Band Laboratory within 30 calendar days of discovery using the following website: <https://www.pwrc.usgs.gov/bbl/>, or updated contact information as provided by BOEM.

#### 4.6 Marine Trash and Debris Awareness and Elimination

Atlantic Shores will comply with and ensure that all employees and contractors are briefed on marine trash and debris awareness elimination, as required in Addendum C, Section 4.1.4 of the Lease and as described in the BSEE NTL No. 2015-G03 or any NTL that supersedes NTL 2015-G03.

#### 4.7 Health and Safety

Atlantic Shores will implement a project-specific HSE Plan to ensure the health and safety of all personnel involved in the installation, operation, and maintenance, and decommissioning of the Metocean Buoys. The project-specific plan will be prepared in accordance with Atlantic Shores' standard corporate HSE policies and

procedures. The HSE Plan will also address emergency response and reporting requirements. The HSE plan will be provided to BOEM prior to deployment of the Metocean Buoys.

## **5. OPERATIONS AND MAINTENANCE**

### **5.1 Data Collection and Operations for Wind and Metocean Data**

As stated in Section 3.0, the Metocean Buoys will remain moored in position and transmit wind data and metocean measurements autonomously via G-link data acquisition and remote data reception software which interfaces with Linux. Data is then converted to readable ASCII files by Fugro software, Pffx. The system stores up to 4 gigabytes of data.

### **5.2 Maintenance Activities**

Annual onshore inspection of the mooring systems will be carried out one year after deployment of the buoys. During the annual inspection, the entire mooring system will be recovered, and each buoy will be towed to shore for maintenance. Following completion of the annual inspection and maintenance, each buoy with a new mooring chain will be redeployed at the original location, with the exception of L1. The process and vessels to be used for recovery and redeployment of the buoys and mooring systems will be identical to the processes and vessels used for installation and decommissioning of the buoys. Annual inspection activities will require two round trips per buoy.

Inspection of the entire mooring system will be performed on the deck of the workboat while the buoys are being towed back to port. Items requiring service or replacement will be flagged to be addressed prior to redeployment. Maintenance tasks to be performed on the buoys while at port include removal of biofouling and replacement of the depleted methanol fuel cans located on each buoy.

In addition to the annual inspection, biannual (approximately every 6 to 9 months) on-site maintenance visits will be scheduled every 6 months for the 2-year operational life of the buoys. Biannual maintenance activities will include above surface buoy components, including replacement of consumables, service of sensors, data retrieval, and cleaning of solar panels, as well as an inspection of the underwater portion of the hull and chafe section. As stated in Section 3.3.1, the 19-millimeter chain link diameter in the chafe section of the mooring has been determined to be sufficient based on: 1) over specification of mooring chain, in this instance 19-millimeter chain is used instead of 16mm, and 2) Fatigue Analysis of mooring strength takes into account repeated cycling up to Total Fatigue Life.

#### **5.2.1 Unscheduled Visits**

In addition to the planned biannual maintenance activities, in exceptional circumstances an unscheduled visit to a deployment location may be required if there is evidence of damage (such as partial or total loss of data transmissions). Examples of events that could cause such damage or buoy displacement include, but are not limited to, hurricane-strength tropical or “nor’easter” storms, heavy snow accumulation, heavy icing in the event of extremely low temperatures, or a vessel strike. It has been assumed that up to one unscheduled round trip per year may be needed, and potential emissions for unscheduled visits have been based on the round-trip distance to the farthest deployment location from the Miller’s Launch, Staten Island, New York port, which Installation Area 3.

### **5.3 Reporting**

Per Lease stipulation 2.2.1, Atlantic Shores will submit a semi-annual progress report to BOEM every 6 months for the duration of the site assessment term. The semi-annual progress report will provide a brief narrative of

overall progress since the previous semi-annual progress report (or since the effective date for the first semi-annual progress report). The progress report will include updated survey plans to account for modifications in schedule, as necessary. In addition to the semi-annual progress reports, Atlantic Shores will prepare and submit a Self-Inspection Report, an Annual Report, and a Certification of Compliance to BOEM no later than November 1 of each year for the duration of the site assessment term. See Table 5-1 for a description of the content of each report and the associated regulatory citation.

**Table 5-1 Reporting Requirements**

Report Name	Content	Regulatory Citation
Self-Inspection Report	The Self-Inspection Report will be based on the comprehensive Self-Inspection Plan that Atlantic Shores will develop pursuant to 30 CFR 585.824(a).	30 CFR 585.824(b)
Annual Report	The Annual Report will provide a summary of site assessment activities and the results of those activities.	30 CFR 585.615(b)
Certification of Compliance	Together with the certification, Atlantic Shores will submit: <ul style="list-style-type: none"> <li>• Summary reports that demonstrate compliance with the terms and conditions that require certification; and</li> <li>• A statement identifying and describing any mitigation measures and monitoring methods that have been taken, as well as their effectiveness. If Atlantic Shores identifies measures that are not effective, we will make recommendations for substitute mitigations measures and monitoring methods, and explain why we believe they would be effective.</li> </ul>	30 CFR 585.615(c)

## 5.4 Potential Faults or Failures

The Metocean Buoys will be remotely monitored for the duration of operations, this monitoring will include a range of key indicators such as power level, buoy location, and data quality to provide an insight to the “health” of the buoy and payload. Unplanned maintenance activities may be required in the event of a power supply failure, hull leak, buoy drift outside of designated area, mooring component failure, or other such event. If any of these problems are suspected, a technical service crew would be promptly dispatched to investigate and repair the issue. The SEAWATCHs™ are capable of operating at full capacity without renewable power or backup generator supply to the batteries for up to 30 days.

## 6. DECOMMISSIONING

BOEM requires decommissioning of facilities described in the SAP in accordance with § 585.901. Atlantic Shores will submit a decommissioning application to BOEM as required by § 585.902(b) prior to decommissioning of the Metocean Buoys. Following BOEM approval of the decommissioning application, Atlantic Shores will submit a decommissioning notice to BOEM at least 60 days prior to vessel deployment as required by § 585.90(a).

### 6.1 Overview of Decommissioning Activities

Upon completion of SAP activities, the Metocean Buoys will be decommissioned. The decommissioning process will be similar to the installation process but in reverse; however, the buoys will be lifted onto the deck of the vessel rather than be towed back to shore. Similar types and numbers of vessels used for the installation of the Metocean Buoys would be used for decommissioning. Mooring recovery will begin with the connection and lift of the buoy to the deck using the vessel crane. The buoy will be disconnected from the mooring and moved away from the work area using the vessel crane and secured to the deck. The mooring chain will be connected to the winch and wound onto the main deck winch until the 6,614-pound (3,000-kilogram), first, and the 44 pounds (20 mg) clump weight, second, reach the surface. The 6,614-pound (3,000 kilograms) and

44 pounds (20 kilograms) clump weights will be lifted separately onto the deck, disconnected from the winch, moved away from the work area, and secured to the deck. The Metocean Buoys will then be hauled back to port.

## 6.2 Site Clearance

The operation of the Metocean Buoys is not expected to result in any trash or bottom debris. However, Atlantic Shores will ensure that the seafloor has been cleared of all obstructions created by activities on the Lease as required in § 585.902(a)(2). This will be accomplished via photo documentation of all deployed and retrieved equipment. As stated in Section 4.1, Atlantic Shores will provide an Installation Report that will contain the final coordinates and photo documentation of the equipment that was deployed. At the completion of decommissioning, similar documentation will be provided to BOEM to confirm that all equipment was retrieved from the site.

## 6.3 Reporting

As specified in the Lease, Addendum C, Section 2.2, Atlantic Shores will submit semi-annual progress reports to BOEM throughout the duration of activities covered by the SAP. At the conclusion of the site assessment activities, a Decommissioning Report will be prepared in accordance with §§ 585.900-913 and provided to BOEM with the semi-annual progress reports, or upon request. This report will include a description of the process and equipment used for decommissioning the Metocean Buoys and confirmation of site clearance.

## 7. AFFECTED ENVIRONMENT, POTENTIAL IMPACTS, AND MITIGATION MEASURES

The following sections describe the affected environment, impacts, and proposed mitigation measures for benthic resources, archaeological resources, and geophysical conditions that have been developed through the desktop analysis conducted in support of the SAP.

The following analysis focuses on the four identified deployment locations described in Section 3.2, which have been given unique identifiers (Table 3-1). The coordinates for these locations are provided in Table 3-1 and depicted on Figure 1-1.

### 7.1 Geological Conditions

As demonstrated in Section 2, the equipment and methodologies proposed herein by Atlantic Shores are consistent with the activity considered by BOEM in the Mid-Atlantic EA (BOEM 2012). Section 3.1.2 of the EA provide details of the affected environment and potential impacts to the geologic conditions that may result from site assessment activity. The information in BOEM (2012) is incorporated by reference.

A geophysical and geohazard survey was conducted in September 2019 and is provide in Appendix E (TerraSond Limited 2019). The geophysical and geohazard survey focused on the buoy Installation Areas, each comprised of a maximum area of potential disturbance (APD) of 3,937 by 689 feet (1,200 by 210 meters) centered on the proposed buoy Installation Area. A total of 25.4 miles (40.9 kilometers) was surveyed to cover the APD for each Installation Area. Eight lines and three crosslines were run to acquire coverage of 98.4 feet (30 meters) around the APD of the Installation Areas to meet the requirements of this SAP. HRG survey data was acquired using the following:

- **Sub-bottom Profiler (SBP)** - acoustic reflection profiling subsurface investigation using a medium parametric sub-bottom profiler system to investigate shallow (up to 33 feet [10 meters]) sediment stratigraphy at a high resolution;
- **Side Scan Sonar (SSS)** - acoustic seabed imagery used to map surficial sediment distributions and bedforms, as well as detect possible natural and anthropogenic hazards on the seabed such as boulders, debris, and shipwrecks;
- **Multibeam Echosounder** - acoustic swath mapping to determine water depths and topographic features on the seabed and initial review of surficial sediment;
- **Magnetometer/Transverse Gradiometer (MAG/TVG)** - magnetic field anomaly mapping to detect ferrous items on the seabed that could be potential hazards or cultural deposits, included debris and shipwrecks; and
- **Sediment grab samples** - acquisition of physical samples of the surficial seabed to ground-truth interpretation of the geophysical data.

Data from the geophysical and geohazard survey along with information from publicly-available databases, were compiled and reviewed to describe the surface and subsurface geologic conditions in the Installation Area's APDs. Table 7-1 summarizes the seabed hazards identified within these areas. Results from the SSS data are summarized in Section 7.3, Benthic Resources.

**Table 7-1 Seabed Hazards**

Hazard	Definition	Description
Scarp	An exposed face of soil above the head of a landslide.	No evidence of these features was observed in the dataset.
Channels	The deepest portion of a body of water through which the main volume or current of water flows.	No evidence of these features was observed in the dataset.
Ridges	A relatively narrow elevation which is prominent on account of steep angle at which it rises.	No ridges were interpreted to be within the APDs. No slopes exceeded 10 degrees.
Bedforms	Features that develop due to the movement of sediment by the interaction of flowing water; critical angle and forces required for movement are dependent upon many factors.	Most prominent features visible in sonar records were sand ripples outside the APD of IA1, Across the entirety of IA2, along the northern quarter of IA3, and outside the western APD of IA4. All four areas are best described as unconsolidated sands.
Exposed Rocky Areas	Surface expression of bedrock outcropping on seafloor.	No rocky areas are identified in the survey area.
Boulders	Glacial erratics (boulders) greater than 12 inches in diameter; outcropping coarse till/drift or lag deposit.	No boulders are identified within the survey area.
Buried Boulders	Glacial erratics (boulders) greater than 12 inches in diameter; subsurface coarse till/drift or lag deposits.	No sub-surface data were interpreted as boulders.
Pock Marks / Depressions	Craters in the seabed caused by fluids (gas and liquids) erupting /streaming through the seabed sediments.	No Pock Marks or Depressions were interpreted within the four APDs.

**Table 7-1 Seabed Hazards**

Hazard	Definition	Description
Seabed Scars / Ice Scour / Drag Marks	Incisions or cuts into the seafloor may be associated with glacial advances/retreats or bottom fishing activity.	Possible anthropogenic drag scars (shallow in nature) are present throughout the survey area. One short scar crosses the northern section of IA1; many drag scars are present within the southern and central sections of IA2 as well as numerous scouring outside the APD to the northwest of this location; two drag scars cross IA3 in the northern section.
Buried Channels	Former fluvial drainage pathways during sea level low stands, usually only deepest portion of the waterway in-filled and preserved. Mark ancestral patterns of glacier meltwater runoff or river outflow.	Evidence of an incised channel present within IA3. This channel incises Holocene units and is capped by the surficial Holocene deposition that was mapped consistently through IA1, IA3, and IA4. The incised channel is likely isolated to the Holocene and reaches 6 meters below seabed at its deepest point in the thalweg. Incised channel margins appear to be consistent around 1.5 m below seabed, and likely not to be impacted by the APD of the Metocean Buoy placement.
Submarine Canyons	Steep-sided valley cut into the seafloor of the continental slope, sometimes extending well onto the continental shelf.	No evidence of these features was observed in the dataset.
River Channel	Outline of a path of relatively shallow and narrow body of fluid.	No evidence of these features was observed in the dataset.
Exposed Hardbottom Surfaces	Any semi-lithified to solid rock strata exposed at the seafloor; in this area, may include bedrock or a nearly continuous pavement of fragmented rock or boulders.	No evidence of hardbottom was observed in the dataset. The differences in overall seabed reflectivity is minor. Reflectivity changes, such as those seen in the APD for IA3, are not indicative of hard bottom conditions. Changes in reflectivity are cross verified to be under 5% gravel as per the independent Benthic Report conducted by RPS (see Benthic Assessment Report 2019).
Shallow Gas	Subsurface concentration of material in gaseous form that has accumulated by the process of decomposition of carbon-based materials (former living organisms).	No evidence of Shallow Gas was observed in the dataset.
Gas Hydrates	Subsurface gas deposits that were formed at or near the seafloor in association with hydrocarbon seeps.	No evidence of Gas Hydrates was observed in the dataset.
Gas / Fluid Expulsion Features	Upward movement of gas/fluid via low resistance pathways through sediments onto the seafloor; may be related to other hazards diapirs, faults, shallow water flows).	No evidence of Gas or Fluid Expulsion was observed in the dataset.
Diapiric Structure Expressions	The extrusion of more mobile and ductile-deformable material forced onto the seafloor from pressure below.	No evidence of Diapiric uplift was observed in the dataset.
Karst Areas	Landscape formed from the dissolution of soluble rocks.	No evidence of any Karst areas was observed in the dataset.
Faults / Faulting Expression / Fault Activity	Physiographic feature (surface expression) related to a fracture, fault, or fracture zone along which there has been displacement of the sides relative to one another.	No evidence of faulting was observed in the dataset.
Slumping / Sliding / Seafloor Features	Large scale structures that result from the downslope movement of sediments due to instability and gravity. In the submarine environment these structures are often found in slope environments along coastal margins.	No evidence of slumping or slides was observed in the dataset.
Steep / Unstable Seafloor Slopes	Large scale feature/stretch of ground forming a natural or artificial incline, with a slope that approaches the angle of repose (maximum angle at which the material remains stable).	No evidence of steep/unstable sloping was observed in the dataset.



**Table 7-1 Seabed Hazards**

Hazard	Definition	Description
Scour / Erosion Features	Erosion of material due to water flow. Often associated with erosion adjacent to larger natural and man-made structures.	No evidence of scouring was observed.
Sensitive Benthic Habitats	Sensitive benthic habitats include submerged aquatic vegetation (e.g., macroalgae and seagrass), hardbottom (e.g., gravel, cobble, boulder), shellfish beds, colonial anthozoans, and other biogenic reef-forming communities.	No sensitive benthic habitats were observed.
Manmade Features	Anthropogenic debris caused by offshore activities.	SSS and Mag dataset correlations indicate the presence of anthropogenic debris in the survey area. No sonar contacts were observed within the APD of the Installation Areas. 21 Magnetic Anomalies were observed within the Installation Areas: 8 within the APD of IA1, 5 within the APD of IA2, 6 within the APD of IA3, and 2 within the APD of IA4. No Infrastructure was observed within the dataset.

### 7.1.1 Installation Area 1

IA1 is relatively flat, with an average seafloor depth of -87.8 feet (-26.75 meters) mean lower low water (MLLW) within the APD (TerraSond Limited 2019). IA1 depths ranged minimally by little over one meter (-85.3 feet [-26 meters]) with a slight dip in depth to the north reaching approximately -89.1 feet (-27.15 meters). No hazards were interpreted as present within bathymetric datasets, and no contacts were recorded within the APD.

IA1 SSS data exhibits moderate reflectivity, which can be indicative of sandy sediments (TerraSond Limited 2019). See Section 7.3.1 for further discussion and ground truthing results.

IA1 MAG/TVG data exhibits a relatively continuous total field across the survey area (TerraSond Limited 2019). No widespread geologic influence on the magnetic field was observed across any lines or crosslines within the data. Eight magnetic anomalies (M19-024 to M19-031) were recorded within the APD. These anomalies ranged in amplitude from approximately eight to 302 nanotesla (nT), and in duration from approximately 68.9 feet (21 meters) to approximately 164 feet (50 meters). Anomaly No. M19-027 exhibited the highest amplitude of 302.97 nT with a duration of 122.1 feet (37.23 meters). This could be indicative of a large mass of ferrous material and may represent a potential hazard to bottom-disturbing equipment.

IA1 SBP data exhibits a discontinuous series of reflectors that may be indicative of Holocene marine deposits (TerraSond Limited 2019). These discontinuous reflectors are observed on crossline X312 above the foreset bedding of what appeared to be a channel system outside of the APD for the Installation Area location. Mainline M304 does not indicate resolvable horizons to the depths observed within the crossline, which exhibited potential penetration of 32.8 feet (10 meters) below seabed. The interpreted horizon falls along the general trend where the reflectors appear most contiguous in the northeastern portion of the APD. These discontinuous reflectors are slightly higher in amplitude from the surrounding substrate but are not interpreted as hazardous to the Metocean buoy placement.

### 7.1.2 Installation Area 2

IA2 exhibits similarly unremarkable bathymetric variability less than two meters, with an average seafloor depth of -81.2 feet (-24.75 meters) MLLW within the APD (TerraSond Limited 2019). Depth trends to dip in the north of this area reaching approximately -82 feet (-25 meters). No hazards were interpreted as present within

bathymetric datasets, and no contacts were recorded within the APD. IA2 SSS data exhibits moderate reflectivity, which can be indicative of sandy sediments (TerraSond Limited 2019). Several drag scars were observed across the APD of this Installation Area. See Section 7.3.2 for further discussion and ground truthing results.

IA2 MAG/TVG data exhibits a relatively continuous total field across the survey area (TerraSond Limited 2019). Influence from sensor tow cable extension and retraction can be seen in the raw profiles; however, the observed data were not overly affected by changes in the total field. No widespread geologic influence on the magnetic field was observed across any lines or crosslines within the data. Five magnetic anomalies (M19-001 to M19-005) were recorded within the APD. These anomalies range in amplitude from approximately nine to approximately 16 nT, and in duration from approximately 85.3 feet (16 meters) to approximately 128 feet (39 meters). No hazards were interpreted from these anomalies.

IA2 SBP data exhibits no continuous mappable reflectors and appears to consist of Holocene marine deposits (TerraSond Limited 2019). Utilizing crossline X332, a single reflector appears to exist just below the seabed but becomes unresolvable as it deepens across the profile. Mainline M325 does not contain any continuous resolvable horizons within the SBP data. No interpreted hazards were observed regarding the Metocean Buoy placement.

### 7.1.3 Installation Area 3

IA3 was mostly flat, with maximum bathymetric change over the entire area being less than two meters (TerraSond Limited 2019). The average seafloor depth is -108.8 feet (-33.15 meters) MLLW. The maximum bathymetric difference was 1.4 meters. There are three areas that demonstrate texture changes. No hazards were interpreted as present within bathymetric datasets, and no contacts were recorded within the APD. IA3 SSS data exhibits moderate reflectivity (sand) with linear expression of coarse sands (TerraSond Limited 2019). See Section 7.3.3 for further discussion and ground truthing results.

IA3 MAG/TVG data exhibits a relatively continuous total field across the survey area (TerraSond Limited 2019). No widespread geologic influence on the magnetic field was observed across any lines or crosslines within the data. Six magnetic anomalies (M19-011, M19-012, M19-014 to M19-016, and M19-020) were recorded within the APD. These anomalies range in amplitude from approximately nine to 27 nT, and in duration from approximately 78.7 feet (24 meters) to approximately 344.5 feet (105 meters). No hazards were interpreted from these anomalies.

IA3 SBP data exhibits a semi-continuous series of shallow reflectors that may be indicative of Holocene marine deposits with at least one incised channel that trends northwest-southeast along the northern half of the APD (TerraSond Limited 2019). Utilizing crossline X312, the shallow Holocene horizon is seen to be interrupted by the incised channel. Alternatively, the horizon could be interpreted as continuous and extending through the incised channel. Along Line M352, the same shallow horizon is interpreted to be potentially disrupted by the same incised channel. The channel margins are obstructed by truncation at the seabed. Although the incised channel present within the data may also still contain portions of near-seabed topset bed to the northeast, no interpreted hazards are associated with the placement of the Metocean Buoy. The overall structure of the incised channel appears to be mostly reworked and may not contain a cohesive intact levee or terrace. The likely infilled incised channel may have had potential to have been a part of the post-Pleistocene landscape (11,500 years to present). It is unlikely any remaining, intact sub-surface material within the thalweg, topset, levee, or infill would be affected by the proposed one-meter vertical depth impacts of the Metocean Buoy. No hazards were interpreted among the other discontinuous reflectors present within the APD for Metocean Buoy placement.

#### 7.1.4 Installation Area 4

IA4 is relatively flat across the APD, with an average seafloor depth of -81.2 feet (-24.8 meters) MLLW (TerraSond Limited 2019). Bathymetric changes were all less than two meters. No hazards were interpreted as present within bathymetric datasets, and no contacts were recorded within the APD. IA4 SSS data exhibits moderate reflectivity, which can be indicative of sandy sediments (TerraSond Limited 2019). The southern edge of the APD shows a slight increase in reflectivity, which may be indicative of coarser sands. See Section 7.3.4 for further discussion and ground truthing results.

IA4 MAG/TVG data exhibits a relatively continuous total field across the survey area (TerraSond Limited 2019). A possible geologic influence on the magnetic field was observed across the center of the APD. Two magnetic anomalies (M19-009 and M19-010) were recorded within the APD. These anomalies range in amplitude from approximately 17 to 18 nT, and in duration from approximately 55.8 feet (17 meters) to approximately 78.7 feet (24 meters). No hazards were interpreted from either of these anomalies.

IA4 SBP data exhibits mostly discontinuous series of reflectors that may be indicative of Holocene marine deposits (TerraSond Limited 2019). These discontinuous reflectors are observed on crossline X371 above descending foreset bedding of what appears to be a channel system outside of the APD for the Installation Area location. The general trend of the shallow Holocene horizon dip along this trend was outlined, but the observable horizon exceeds the penetration that SBP data were able to achieve across IA4. Mainline M364 does not indicate continuous resolvable horizons to the depths observed within the crossline, though side-lobes of potential foreset bedding may be present deeper within the subsurface beyond 10 m below seabed. No hazards were interpreted within the APD of the placement of the Metocean Buoy.

#### 7.1.5 HRG Dataset Summary

The HRG datasets were analyzed for seabed hazards, which could pose a potential risk to the installation, operation, maintenance and recovery of the Metocean Buoys. Installation of the Metocean Buoys has the potential to affect a small area as a result of the small vertical and horizontal region of impact on the seafloor. The geophysical and geohazard surveys were conducted at an appropriate scale for the size of the proposed Metocean Buoys.

To rule out the presence of other specific hazards as noted in § 585.610(b), the side scan sonar, multibeam bathymetry, and sub-bottom profiler datasets were reviewed and do not indicate any evidence of seismic activity, such as extensive or regional faulting or slump and mass wasting features. No fault zones, nor any other faulting activity, are identified either from seabed data or from the sub-bottom profiler records, as would typically be indicated by offset sedimentary bedding planes in the sub-bottom profiles or linear fault-related features on the seabed. No faults or other sedimentary features indicative of differential compaction or localized seabed subsidence have been identified. These results are consistent with the expected nature of the passive continental margin off of New Jersey.

No areas of acoustic whiteouts or other significant amplitude anomalies were observed in the sub-bottom profiler data, as would be anticipated for any significant accumulation of shallow gas. The sub-bottom profiler records do not contain any bottom simulating reflectors, which are a typical indication of the presence of gas hydrates. The interpretation of the side-scan sonar, multibeam bathymetry, and sub-bottom profile datasets provide no evidence of ice scour, such as seabed gouging by either icebergs or sea ice pressure ridges, which is consistent with the location and history of the site.

Ripple-scale bedforms identified by the survey effort may indicate some currents acting on the seabed. The absence of larger-scale scour-related features, such as moats around seabed features, and the lack any larger

migrating bedforms indicates that seabed currents are likely minimal. As such, the risk of scour to the Metocean Buoy mooring equipment is not anticipated to be an issue.

Based on the SAP Geophysical and Geohazard Report (Appendix E), the site conditions are suitable for the installation of the proposed Metocean Buoys and associated moorings within the four Installation Areas. Overall, the survey area exhibits a mostly flat, continuous seafloor with occasional slight (approximately one meter) bathymetric changes (TerraSond Limited 2019). Sand ripples appear in the northernmost survey area (IA2). Sonar data indicates mostly moderate reflectivity, typically indicative of fine to coarse sandy sediments, supported by the preliminary observations made of nearby grab samples. Twenty-one (21) total magnetic anomalies were recorded within the APD of all Installation Areas. However, magnetometer data highlights a single potentially hazardous anomaly, Number M19-027, which should be avoided during Metocean Buoy placement. No SSS contacts appeared within any of the APDs. Subsurface datasets exhibit mostly shallow, likely Holocene deposits that appear to have been reworked within the uppermost 16.4 to 32.8 feet (5 to 10 meters). One incised channel was interpreted within buoy IA3. These channels were likely infilled with recent Holocene marine sediments and are not likely to pose a hazard or be impacted by the APD of Metocean Buoy placement. No correlation exists between magnetic anomalies or SSS contacts. No other features appear to present hazards to buoy deployment, operation, or recovery.

## 7.2 Archaeological Resources

Installation of the Metocean Buoys has the potential to affect submerged archaeological resources that may relate to the pre-contact and historic time periods. Documentary and field research show the submerged installation area to have low to moderate potential for human activity, with the exception of pre-contact periods as paleolandscapes were not identified in the Installation Areas (SEARCH 2019).

During the prehistoric era, habitation of the exposed coastal plain was possible beginning around 13,000 years ago. From an archaeological perspective the area was only subaerial from approximately 13,000 to approximately 11,100 years ago, during the Paleoindian period (12,500 – 10,000 years Before Present) and Early-Middle Archaic period (10,000 – 5,000 Before Present). By the subsequent Late Archaic period the exposed coastal plain was inundated due to rapid marine transgression. To date, no paleolandscapes or previously identified pre-contact archaeological sites have been documented in the Installation Areas (SEARCH 2019).

Historic period archaeological sites that could occur within offshore portions of the survey area are predominantly related to marine activity, such as historic shipwrecks from the 17th to 20th centuries (SEARCH 2019). Background research indicates that there have been numerous vessel wrecks within 1 mile (1.6 kilometers) in the Lease Area but none are located within or in close proximity to the proposed Installation Areas (see Appendix C).

In 2019 SEARCH conducted an archaeological assessment of the HRG survey data gathered by TerraSond within the Met Buoy Installation Areas. The HRG survey and archaeological analysis were performed in accordance with the *Atlantic Shores Offshore Wind Marine Reconnaissance Survey Plan* and BOEM Guidelines in the Mid-Atlantic EA (BOEM 2012). The detailed Marine Archaeological Resource Assessment for The Atlantic Shores Offshore Wind Project Site Assessment Plan (OCS-A 0499), is provided in Appendix C. The survey area consisted of a detailed review of the four 1,200 x 210-meter (3,937 x 689-foot) Installation Areas centered on each of the proposed Metocean Buoys deployment locations. To achieve the required site characterization data, the HRG survey provided 100 percent coverage of the entire geographic area (horizontal and vertical extents) that could be physically disturbed by project activities.

The HRG survey utilized numerous remote survey methods including: marine magnetometer, side scan sonar, sub-bottom profiler, multibeam echosounder, and gradiometer. Archaeological resources review of the data focused on areas of planned bottom-disturbing activities within the Installation Areas that have the potential to impact submerged archaeological resources. Review of remote sensing data identified a total of 21 magnetic anomalies and two series of acoustic reflectors within the four Installation Areas. Only one magnetic anomaly was determined to potentially represent a cultural resource as it shares many characteristics with verified shipwreck magnetic signatures (see Appendix C). An avoidance buffer of 164 feet (50 meters) has been recommended for this anomaly. The two series of acoustic reflectors were determined to be shallow Holocene reflectors and do not represent potential relict land surfaces. The reflectors are at depths of burial that will not be adversely affected during or after the Metocean Buoy's deployment under the current installation, operation and decommissioning plan as described within this SAP. Sub-bottom profiler data was collected and analyzed to identify paleolandscape features. This data indicated that no paleo-landforms are present that may preserve inundated archaeological sites.

### **Potential Impacts and Proposed Mitigation Measures**

Based upon the results of the 2019 marine archaeological investigations, one potential submerged cultural resource was identified (see Appendix C). An avoidance buffer of 164 feet (50 meters) has been recommended for the anomaly. No other potential submerged cultural or archaeological resources were identified within the installation areas as such the installation and operation of the proposed Met Buoys would result in no impacts to marine archaeological resources. However, in compliance with 30 CFR § 585.802 Atlantic Shores will develop an Unanticipated Discoveries Plan prior to the start of met buoy deployment activities. In the case of an inadvertent discovery of a cultural resource, Atlantic Shores' Unanticipated Discoveries Plan will be implemented to prevent further disturbance of the resource.

### **7.3 Benthic Resources**

As demonstrated in Section 2, the equipment and methodologies proposed herein by Atlantic Shores are consistent with the activity considered by BOEM in the Mid-Atlantic EA (BOEM 2012). Section 4.1.2.2 of the EA provides details of the affected environment and potential impacts to benthic resources that may result from site assessment activity. The information in BOEM (2012) is incorporated by reference.

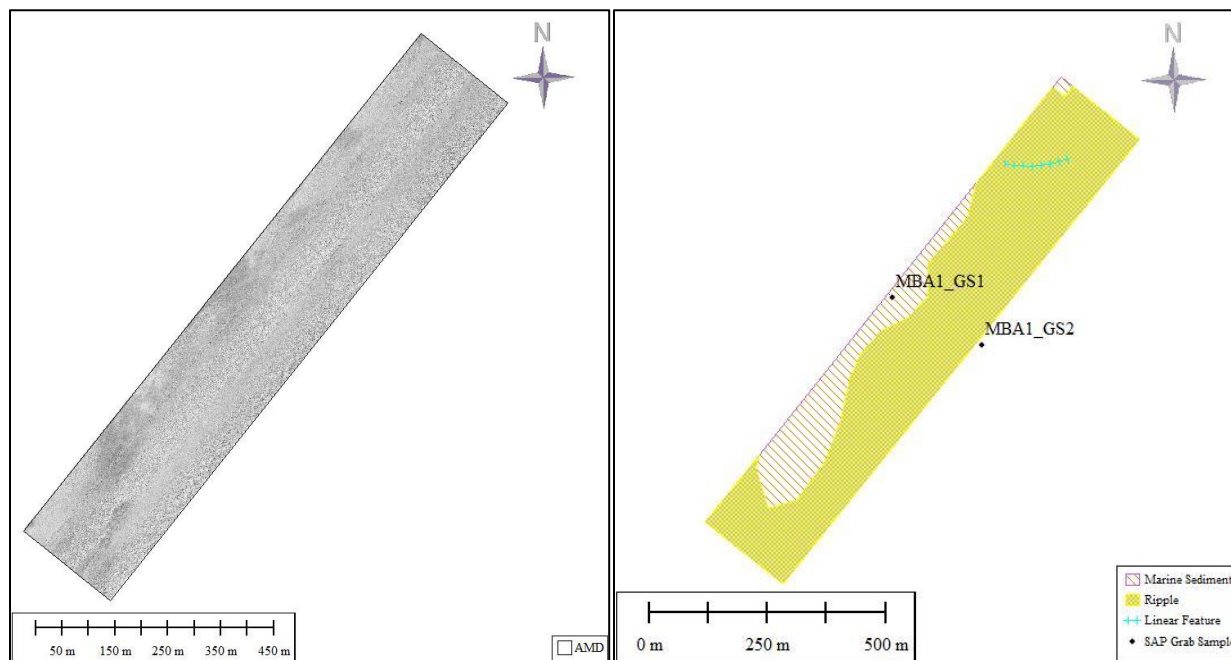
A benthic habitat assessment was conducted as part of the geophysical and geohazard survey conducted in September 2019 (TerraSond Limited 2019).

The geophysical and geohazard survey report is provided in Appendix E. The geophysical and geohazard survey focused on the buoy Installation Areas, each comprised of an APD of 3,937 by 689 feet (1,200 by 210 meters) centered on the proposed four Installation Areas. Benthic data was acquired using SSS data processing and grab sampling at the four buoy Installation Areas. See Section 7.1 for SSS method summary. No features presenting significant hazards were observed within the APD of the buoy Installation Areas (TerraSond Limited 2019). SSS data within the buoy Installation Areas' APD appear to be representative of mostly unconsolidated sands at the surface (Figures 7-1 through 7-4). Drag marks, likely due to fishing activities, are present within IA1, IA2, and IA3. There were no observed hazards within the proposed APD of the buoy Installation Areas.

#### **7.3.1 Installation Area 1**

IA1 SSS data exhibited moderate reflectivity, which may be indicative of sandy sediments (TerraSond Limited 2019). Grab samples indicated that the bottom was sandy in content (Table 7-2). The relatively continuous reflectivity demonstrates that no significant seabed sediment changes are expected to be present within the APD for IA1. The western edge of the APD shows a slight increase in reflectivity, which may be indicative of

coarser sands. A drag scar cuts across the northern section of the APD. Seabed features have been highlighted in Figure 7-1.



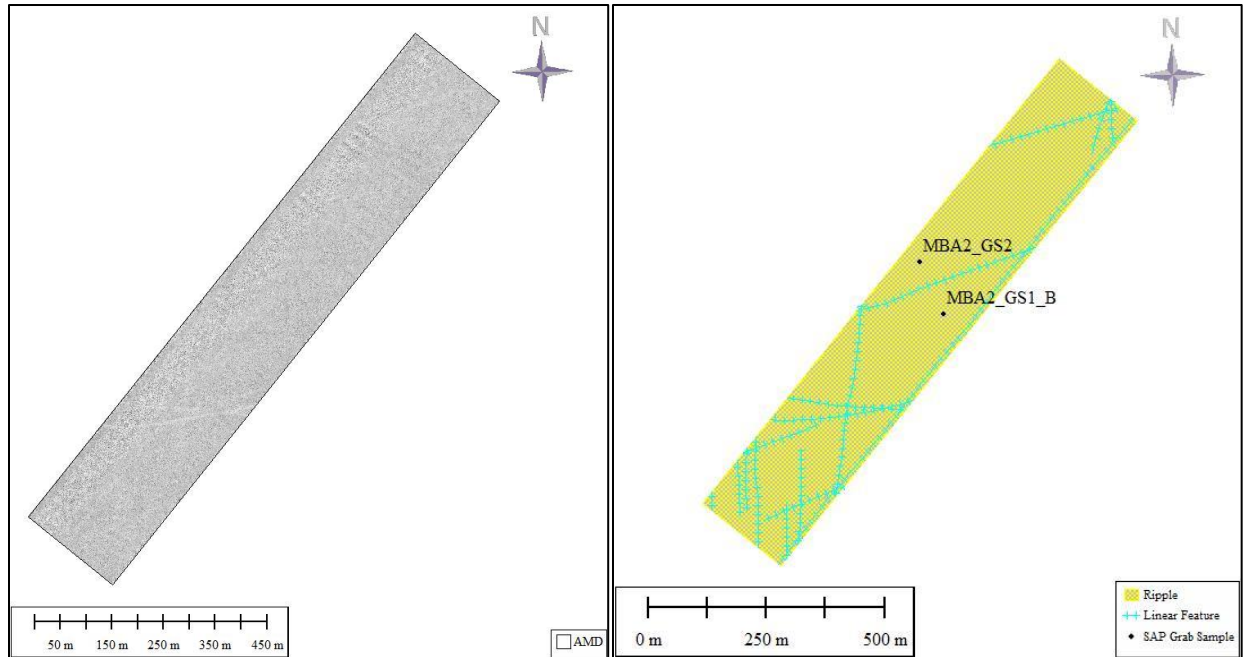
**Figure 7-1 Clipped SSS Mosaic with Interpreted Seabed within APD of IA1**

**Table 7-2 Grain Size Distribution for IA1**

IA or SOI	Station	Gravel (%)	Coarse Sand (%)	Medium Sand (%)	Fine Sand (%)	Silt (%)	Clay (%)	Total Organic Carbon (mg/kg)
IA 1	1	0.7	3.6	36.3	54.6	1.0	3.8	Not Detected
	2	0.0	0.1	26.1	70.8	0.4	2.7	Not Detected

### 7.3.2 Installation Area 2

IA2 SSS data exhibited moderate reflectivity, which may be indicative of sandy sediments (TerraSond Limited 2019). Grab samples indicated that the bottom was sandy in content (Table 7-3). Multiple drag scars cut across several parts of the APD for IA2, trending in either a North-South pattern (South) or in an East-West pattern (North). Seabed scars may be indicative of fishing activities in the area. Sand ripples make up the entirety of the seabed within the APD. No evidence of ripple movement was observed. No hazards were interpreted as present within the SSS datasets. Seabed features have been highlighted in Figure 7-2.



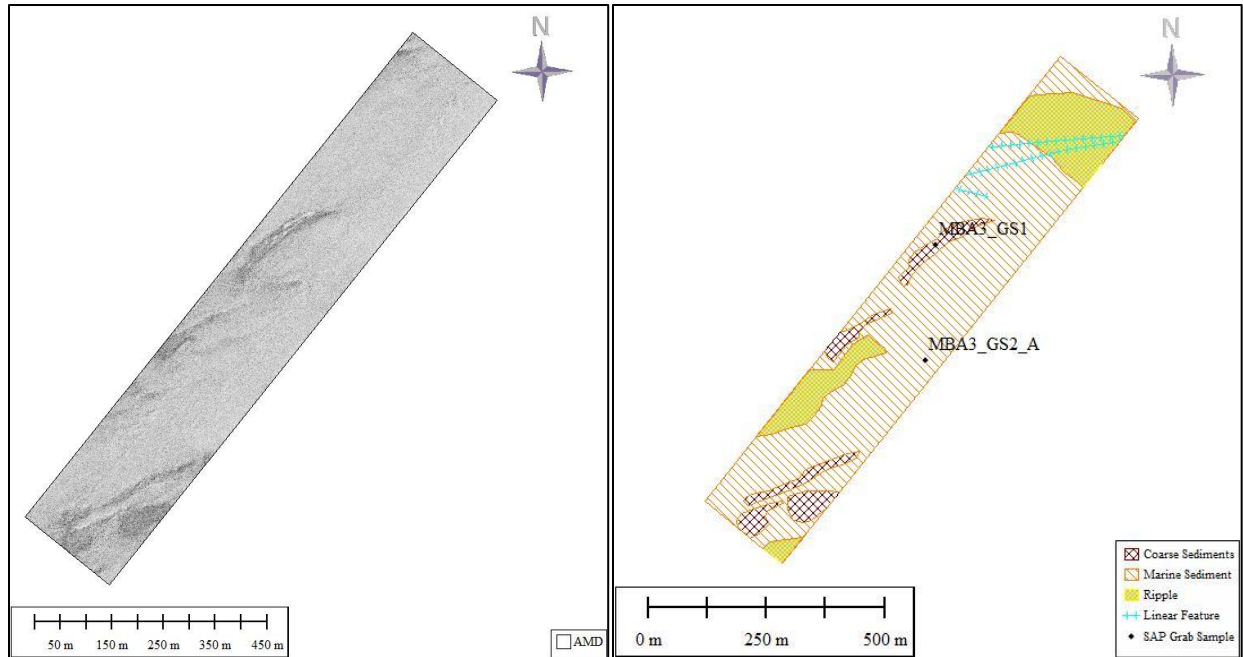
**Figure 7-2 Clipped SSS Mosaic with Interpreted Seabed within APD of IA2**

**Table 7-3 Grain Size Distribution for IA2**

IA or SOI	Station	Gravel (%)	Coarse Sand (%)	Medium Sand (%)	Fine Sand (%)	Silt (%)	Clay (%)	Total Organic Carbon (mg/kg)
IA 2	1	0.4	3.1	50.3	44.3	0.1	1.8	Not Detected
	2	0.7	1.4	52.0	43.9	0.4	1.6	Not Detected

### 7.3.3 Installation Area 3

IA3 SSS data exhibited moderate reflectivity of fine sands with five linear expressions of relatively coarser sandy sediments (<5% gravel) (TerraSond Limited 2019). Grab samples indicated that the area was mostly fine sand with isolated medium sands, not indicative of high gravel, cohesive, or consolidated sediments (Table 7-4). No hazards were interpreted as present within the SSS datasets. Seabed features have been highlighted in Figure 7-3.



**Figure 7-3 Clipped SSS Mosaic with Interpreted Seabed within APD of IA3**

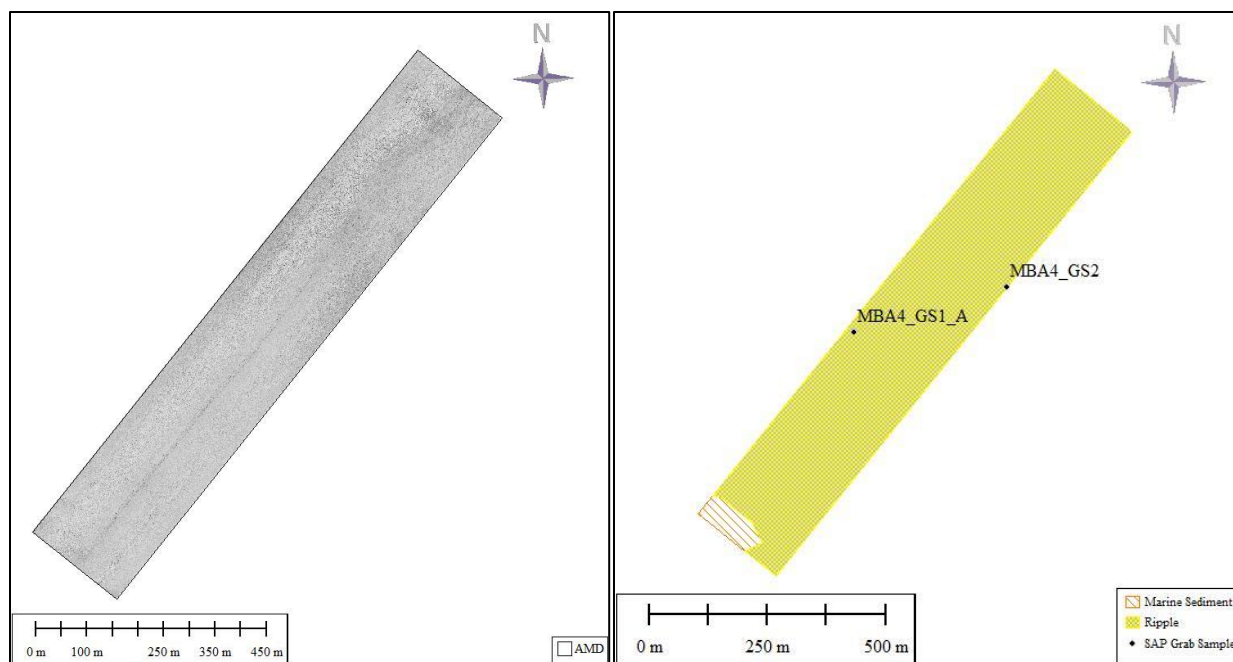
**Table 7-4 Grain Size Distribution for IA3**

IA or SOI	Station	Gravel (%)	Coarse Sand (%)	Medium Sand (%)	Fine Sand (%)	Silt (%)	Clay (%)	Total Organic Carbon (mg/kg)
IA 3	1	1.8	0.6	20.1	73.9	0.1	3.5	Not Detected
	2	0.2	0.0	1.5	94.3	0.2	3.8	Not Detected

### 7.3.4 Installation Area 4

IA4 SSS data exhibited moderate reflectivity, which can be indicative of sandy sediments (TerraSond Limited 2019). Grab samples indicated that the bottom was sandy in content (Table 7-5Error! Reference source not found.). The relatively continuous reflectivity demonstrates that no significant seabed sediment changes are expected to be present within the APD of IA4. The southern edge of the APD shows a slight increase in reflectivity, which may be indicative of coarse sands. No other seabed features were interpreted within the APD. No evidence of ripple movement was observed. No hazards were interpreted as present within the SSS datasets. Seabed features have been highlighted in Figure 7-4.





**Figure 7-4 Clipped SSS Mosaic with Interpreted Seabed within APD of IA4**

**Table 7-5 Grain Size Distribution for IA4**

IA or SOI	Station	Gravel (%)	Coarse Sand (%)	Medium Sand (%)	Fine Sand (%)	Silt (%)	Clay (%)	Total Organic Carbon (mg/kg)
IA 4	1	0.1	0.4	17.7	77.8	0.6	3.4	Not Detected
	2	1.6	2.9	33.5	59.4	0.1	2.6	Not Detected

## 7.4 Protected Fish Species, Managed Fisheries, and Essential Fish Habitat

As demonstrated in Section 2, the equipment and methodologies proposed herein by Atlantic Shores are consistent with the activity considered by BOEM in the Mid-Atlantic EA (BOEM 2012). Section 4.1.2.7 of the revised EA describes the affected environment and potential impacts to protected fish species, managed fisheries, and essential fish habitat (EFH) that may result from site assessment activity. The information in BOEM (2012) is incorporated by reference.

Atlantic Shores recently conducted a benthic assessment of the buoy Installation Areas (RPS Ocean Science 2020). Visibility in digital images was limited by turbidity at buoy Installation Area (IA) 1. Flat sand and shell aggregate were observed within IA2 (RPS Ocean Science 2020). These site-specific data were used to update and expand the Mid-Atlantic EA (BOEM 2012). In addition, Atlantic Shores reviewed literature and data on protected fish species, managed fisheries, and EFH in and near the Lease Area that has become available since the publication of the Mid-Atlantic EA (BOEM 2012) (see Section 8).

The description of species assemblages in the Mid-Atlantic EA are considered representative of current conditions, although stock assessments for fisheries resources are regularly updated. No specific fishing

restrictions associated with habitat protection exist in the Lease Area. Anchoring, clam dredging, and other maritime activities that involve bottom contact are not restricted.

#### **7.4.1 Protected Species**

Four fish species listed under federal or New Jersey state endangered species statutes potentially occur in the Lease Area. Of these, only the Atlantic sturgeon has the potential to occur in the Project Area (Table 7-2).

**Table 7-6 Protected Fish Species**

Common Name	Scientific Name	Federal Status <i>a/</i>	New Jersey Status <i>a/</i>	Likelihood of Occurrence <i>b/</i>
Atlantic sturgeon	<i>Acipenser oxyrinchus</i>	E	E	High
Shortnose sturgeon	<i>Acipenser brevirostrum</i>	E	E	Low
Giant manta ray	<i>Manta birostris</i>	T	-	Low
Oceanic whitetip shark	<i>Carcharhinus longimanus</i>	T	-	Low

*a/* Species Status: E – Endangered; T –Threatened  
*b/* The likelihood of occurrence was informed by field observations, consultation with federal and state agencies, and available literature. Low – The species is uncommon or generally absent from Project Area, but marginally suitable habitat is present; High – Suitable habitat is present, and the species is known or expected to occur in the Lease Area.

Sources: NOAA Fisheries 2019a, NJDEP 2019

Despite the potential for Atlantic sturgeon to occur within the Lease Area, no critical habitat has been designated in offshore waters (NOAA Fisheries 2019b). Critical habitat for the Atlantic sturgeon is designated in the Hudson River to the north of the Lease Area and the Delaware River to the south of the Lease Area (Ingram et al. 2019). The proposed activity is not anticipated to result in any take of Atlantic sturgeon or other protected species.

#### 7.4.2 Managed Species and EFH in the Lease Area

Managed fisheries with EFH in the Atlantic Shores Lease Area were identified using the NMFS Habitat Mapper (NOAA Fisheries 2020), New England Fishery Management Council (NEFMC) Omnibus Amendment 2 (NEFMC 2017), Mid-Atlantic Fishery Management Council (MAFMC) Fisheries Management Plans (MAFMC 2020), NMFS’s Highly Migratory Species Amendment 10 (NOAA Fisheries 2017), EFH source documents, and other reports and published literature. The 41 managed species with designated EFH intersecting the Lease Area are listed in **Error! Reference source not found.**7.3. Designated EFH for species and life stages in each Installation Area are in detailed in Table 7-4 (NEFMC), Table 7-5 (MAFMC) and Table 7-6 (Atlantic Highly Migratory Species).

**Table 7-7 Managed Fisheries with Designated Essential Fish Habitat in the Lease Area**

New England Fishery Management Council	Mid-Atlantic Fishery Management Council	NMFS (Highly Migratory Species)
Atlantic Cod	Atlantic Butterfish	Atlantic Albacore Tuna
Atlantic Herring a/	Atlantic Mackerel	Atlantic Bluefin Tuna
Atlantic Sea Scallop	Atlantic Surfclam	Atlantic Skipjack Tuna
Clearnose Skate	Black Sea Bass a/	Atlantic Yellowfin Tuna
Haddock	Bluefish a/	Blue Shark
Little Skate	Longfin Inshore Squid	Common Thresher Shark
Monkfish a/	Northern Shortfin Squid	Dusky Shark
Ocean Pout	Ocean Quahog	Sand Tiger Shark
Red Hake	Scup a/	Sandbar Shark
Silver Hake	Spiny Dogfish a/, b/	Shortfin Mako Shark
White Hake	Summer Flounder	Smoothhound Shark/Smooth Dogfish
Windowpane Flounder		Tiger Shark
Winter Flounder		White Shark
Winter Skate		
Witch Flounder		
Yellowtail Flounder		

a/ Joint management with Atlantic States Marine Fisheries Commission (ASMFC)  
b/ Joint management by NEFMC and MAFMC

**Table 7-8 NEFMC Designated Essential Fish Habitat in the Lease Area**

Species/Lifestage	Lease Area (acres)	IA1	IA2	IA3	IA4
Atlantic Cod Adult	22,796	--	--	--	--
Atlantic Cod ALL	107,579	--	x	--	--
Atlantic Cod Eggs	13,405	--		--	--
Atlantic Cod Larvae	71,424	--	x	--	--
Atlantic Herring Adult	183,253	x	x	x	x
Atlantic Herring ALL	183,253	x	x	x	x
Atlantic Herring Juvenile	183,253	x	x	x	x
Atlantic Sea Scallop ALL	106,572		x	x	--
Clearnose Skate Adult	169,060	x	--	--	x
Clearnose Skate ALL	169,061	x	x	--	x
Clearnose Skate Juvenile	169,061	x	x	--	x
Haddock ALL	114,631	x	x	x	x
Haddock Juvenile	114,631	x	x	x	x
Little Skate Adult	84,110	x	--	--	x
Little Skate ALL	183,253	x	x	x	x
Little Skate Juvenile	183,253	x	x	x	x
Monkfish Adult	63,614	x	--	--	--
Monkfish ALL	149,299	x	x	x	x
Monkfish Eggs/Larvae	149,299	x	x	x	x
Ocean Pout Adult	166,715	x	x	--	x

**Table 7-8 NEFMC Designated Essential Fish Habitat in the Lease Area**

Species/Lifestage	Lease Area (acres)	IA1	IA2	IA3	IA4
Ocean Pout ALL	166,715	x	x	--	x
Ocean Pout Eggs	166,719	x	x	--	x
Red Hake Adult	86,072	--	x	x	--
Red Hake ALL	180,991	x	x	x	x
Red Hake Eggs/Larvae/Juvenile	181,005	x	x	x	x
Silver Hake Adult	82,159	--	x	--	x
Silver Hake ALL	171,323	x	x	--	x
Silver Hake Eggs/Larvae	171,323	x	x	--	x
White Hake Adult	32,723	--	x	x	--
White Hake ALL	32,723	--	x	x	--
Windowpane Flounder Adult	183,253	x	x	x	x
Windowpane Flounder ALL	183,253	x	x	x	x
Windowpane Flounder Eggs	148,103	x	x	--	x
Windowpane Flounder Juvenile	171,322	x	x	--	x
Windowpane Flounder Larvae	127,679	x	x	--	x
Winter Flounder ALL	74,479	--	x	--	--
Winter Flounder Eggs	2,196	--	--	--	--
Winter Flounder Juvenile	73,854	--	x	--	--
Winter Flounder Larvae/Adult	74,137	--	x	--	--
Winter Skate Adult	103,423	x	x	x	x
Winter Skate ALL	183,253	x	x	x	x
Winter Skate Juvenile	183,253	x	x	x	x
Witch Flounder Adult	129,868	x	--	x	x
Witch Flounder ALL	136,904	x	--	x	x
Witch Flounder Eggs	124,970	x	--	--	x
Witch Flounder Larvae	111,563	x	--	--	x
Yellowtail Flounder Adult	106,555	--	x	x	--
Yellowtail Flounder ALL	180,909	x	x	x	x
Yellowtail Flounder Eggs	125,111	x	--	--	x
Yellowtail Flounder Juvenile	151,091	x	x	x	x
Yellowtail Flounder Larvae	111,557	x	--	--	x

**Table 7-9 MAFMC Designated Essential Fish Habitat in the Lease Area**

Species/Lifestage	Lease Area (acres)	IA1	IA2	IA3	IA4
Atlantic Butterfish Adult	169,073	x	x	--	--
Atlantic Butterfish ALL	183,253	x	x	x	--
Atlantic Butterfish Eggs	30,153	--	x	--	--
Atlantic Butterfish Juvenile	183,253	x	x	x	--
Atlantic Butterfish Larvae	95,150	x	x	--	--
Atlantic Mackerel Adult	173,469	x	x	x	--
Atlantic Mackerel ALL	180,909	x	x	x	x
Atlantic Mackerel Eggs	111,568	x	--	--	x
Atlantic Mackerel Juvenile	137,442	x	--	x	x
Atlantic Mackerel Larvae	60,953	x	--	--	x
Atlantic Surfclam Adult	183,253	x	x	x	x
Atlantic Surfclam ALL	183,253	x	x	x	x
Atlantic Surfclam Juvenile	183,253	x	x	x	x
Black Sea Bass Adult	171,321	x	x	--	x
Black Sea Bass Juvenile	86,388	x	--	--	x
Black Sea Bass Larvae	125,337	x	x	--	x
Bluefish Adult	162,709	x	x	x	x
Bluefish ALL	162,711	x	x	x	x
Bluefish Eggs	43,595	--	--	--	--
Bluefish Juvenile	66,787	--	--	--	--
Bluefish Larvae	145,762	x	x	--	x
Longfin Inshore Squid Adult	171,323	x	x	--	x
Longfin Inshore Squid ALL	183,253	x	x	x	x
Longfin Inshore Squid Eggs	30,576	--	x	--	--
Longfin Inshore Squid Juvenile	183,253	x	x	x	x
Northern Shortfin Squid ALL	146,296	x	x	--	x
Northern Shortfin Squid Juvenile	146,296	x	x	--	x
Ocean Quahog Adult	14,182	--	--	x	--
Ocean Quahog ALL	14,182	--	--	x	--
Ocean Quahog Juvenile	2,249	--	--	--	--
Scup Adult	183,253	x	x	x	x
Scup ALL	183,253	x	x	x	x
Scup Juvenile	125,480	x	x	--	x
Spiny Dogfish Adult Female	183,253	x	x	x	x
Spiny Dogfish Adult Male	169,082	x	x	--	x
Spiny Dogfish ALL	183,253	x	x	x	x
Spiny Dogfish Sub-Female	181,010	x	x	x	x

**Table 7-9 MAFMC Designated Essential Fish Habitat in the Lease Area**

Species/Lifestage	Lease Area (acres)	IA1	IA2	IA3	IA4
Spiny Dogfish Sub-Male	20,792	--	x	--	--
Summer Flounder Adult	183,253	x	x	x	x
Summer Flounder ALL	183,253	x	x	x	x
Summer Flounder Eggs	43,595	--	--	--	--
Summer Flounder Juvenile	84,144	x	--	--	x
Summer Flounder Larvae	66,727	--	x	--	--

**Table 7-10 Atlantic Highly Migratory Species Designated Essential Fish Habitat in the Lease Area**

Species/Lifestage	Lease Area (acres)	IA1	IA2	IA3	IA4
Albacore Tuna ALL	3,350	--	--	--	--
Albacore Tuna Juvenile	3,350	--	--	--	--
Blue Shark ALL	10,923	--	--	x	--
Blue Shark Juvenile/Adult	10,923	--	--	x	--
Bluefin Tuna ALL	182,837	x	x	x	x
Bluefin Tuna Juvenile	182,837	x	x	x	x
Common Thresher Shark ALL	183,253	x	x	x	x
Dusky Shark ALL	183,253	x	x	x	x
Dusky Shark Juvenile/Adult	177,810	x	x	x	x
Dusky Shark Neonate	183,253	x	x	x	x
Sand Tiger Shark ALL	123,154	x	x	--	--
Sand Tiger Shark Neonate/Juvenile	123,154	x	x	--	--
Sandbar Shark Adult	183,253	x	x	x	x
Sandbar Shark ALL	183,253	x	x	x	x
Sandbar Shark Juvenile	183,253	x	x	x	x
Sandbar Shark Neonate	182,661	x	x	x	x
Shortfin Mako Shark ALL	132,694	x	--	x	x
Skipjack Tuna Adult	183,253	x	x	x	x
Skipjack Tuna ALL	183,253	x	x	x	x
Skipjack Tuna Juvenile	177,810	x	x	x	x
Smoothhound Shark Complex (Atlantic Stock) ALL	183,253	x	x	x	x
Tiger Shark ALL	183,253	x	x	x	x
Tiger Shark Juvenile/Adult	183,253	x	x	x	x
White Shark ALL	141,666	x	x	x	--
White Shark Neonate	141,666	x	x	x	--
Yellowfin Tuna ALL	183,253	x	x	x	x
Yellowfin Tuna Juvenile	183,253	x	x	x	x

No measurable degradation of EFH or adverse effect on managed fisheries species would result from installation, operation, or removal of the Metocean buoys, consistent with BOEM's finding of no significant impact of site assessment activities on managed species and EFH in the Atlantic EA (BOEM 2012). The project area does not overlap with any designated Habitat Areas of Particular Concern (HAPC).

Atlantic Shores has committed to implementing all applicable Lease conditions, which include implementing BMPs during installation, operation, and decommissioning of the Metocean Buoys to minimize impacts on protected fish species, managed fisheries, and EFH. Atlantic Shores will comply with any additional stipulations as set forth in any subsequent approvals in support of the proposed site assessment activity. If a fisheries survey is required as part of the COP, then Atlantic Shores will prepare and submit a fisheries survey plan to BOEM for approval.

## 7.5 Marine Mammals and Sea Turtles

As demonstrated in Section 2, the equipment and methodologies proposed herein by Atlantic Shores are consistent with the activity considered by BOEM in the Mid-Atlantic EA (BOEM 2012). Sections 4.1.2.3 and 4.1.2.4 of the EA provide details on the species and seasonal occurrence of marine mammals and sea turtles that may be present during the proposed site assessment activity and is incorporated by reference and not repeated.

Atlantic Shores has reviewed publicly available literature and data published since the Mid-Atlantic EA. There is no substantive new information that warrants revision of the analysis and conclusions in the Mid-Atlantic EA (BOEM 2012) that the proposed activity is not anticipated to result in any significant or population-level effects to marine mammals or sea turtles.

BOEM's Mid-Atlantic EA references a NMFS Biological Opinion on the Cape Wind Energy Project (NMFS 2010) in Nantucket Sound that includes metocean buoy activities. This EA, as well as independent research studies performed by Harnois et al. (2015), have assessed metocean buoy mooring systems' potential impact to marine mammals and sea turtles by risk of entanglement. Both state that there is extremely low probability that marine mammals or sea turtles would interact with the buoys proposed in the Lease Area, and entanglement in the lines holding the buoys in place is extremely unlikely due to the low probability of a marine mammal or sea turtle encountering the mooring system. The high tension of the chain, and that chain's material also reduce the risk of entanglement to marine mammals and sea turtles (Harnois et al. 2015).

Atlantic Shores has committed to implementing all applicable Lease conditions, which include BMPs for the installation, operation, and decommissioning of the Metocean Buoys in order to further reduce the potential for interactions with or impacts on marine wildlife. Atlantic Shores will comply with any additional stipulations as set forth in any subsequent approvals in support of the proposed site assessment activity.

Pile-driving activity is not required for Metocean Buoy installation; therefore, there will be no acoustic harassment associated with the deployment of the Metocean Buoys, and therefore the associated mitigation measures are not applicable.

## 7.6 Avian and Bat Resources

As demonstrated in Section 2, the equipment and methodologies proposed herein by Atlantic Shores are consistent with the activity considered by BOEM in the Mid-Atlantic EA (BOEM 2012). Sections 4.1.2.5 and 4.1.2.6 of the Mid-Atlantic EA provide details on the species and seasonal occurrence of avian and bat resources that may be present during the proposed site assessment activity and are incorporated by reference and not repeated.



Atlantic Shores has reviewed currently available literature and data (see Section 8) regarding avian and bat resources in the Mid-Atlantic off the coast of New Jersey and has determined that no new substantive information has become available that warrants revision of the analysis in the Mid-Atlantic EA (BOEM 2012). The results of the Mid-Atlantic EA and BOEM's analysis and conclusion that the proposed activity is not anticipated to result in any significant or population-level effects to avian and bat resources are applicable.

Atlantic has committed to implementing all applicable Lease conditions, which include BMPs for the installation, operation, and decommissioning of the Metocean Buoys in order to further reduce the potential for interactions with or impacts on avian and bat resources. Atlantic Shores will comply with any additional stipulations as set forth in any subsequent approvals in support of the proposed site assessment activity.

## 7.7 Water Quality

As demonstrated in Section 2, the equipment and methodologies proposed herein by Atlantic Shores are consistent with the activity considered by BOEM in the Mid-Atlantic EA (BOEM 2012). Section 4.1.1.2 of the EA provide details on the potential impacts to water quality that result from the proposed site assessment activity and are incorporated by reference and not repeated.

Atlantic Shores has reviewed currently available literature and data (see Section 8) regarding water quality in the Mid-Atlantic off the coast of New Jersey and has determined that no new substantive information has become available that warrants revision of the analysis in the Mid-Atlantic EA (BOEM 2012). The results of the Mid-Atlantic EA and BOEM's analysis and conclusion that the proposed activity is not anticipated to result in any significant impact to water quality are applicable.

Atlantic Shores has committed to implementing all applicable Lease conditions, which include BMPs for the installation, operation, and decommissioning of the Metocean Buoys in order to further reduce the potential for impacts on water quality. Atlantic Shores will comply with any additional stipulations as set forth in any subsequent approvals in support of the proposed site assessment activity.

## 7.8 Air Quality

As demonstrated in Section 2, the equipment and methodologies proposed herein by Atlantic Shores are consistent with the activity considered by BOEM in the Mid-Atlantic EA (BOEM 2012). Section 4.1.1.1 of the Mid-Atlantic EA provides details on the potential impacts to air quality that result from the proposed site assessment activity and is incorporated by reference and not repeated. Detailed emission calculations and assumptions are presented in Appendix F.

The closest points of land to the proposed site assessment activity are located in Long Beach Township, located on Long Beach Island in Ocean County, New Jersey, approximately 8 nautical miles west-northwest of the nearest corner of the lease. Ocean County is part of the Philadelphia-Wilmington-Atlantic City, PA-NJ-MD-DE Air Quality Control Region. This region is designated as marginal nonattainment for both the 2008 and 2015 8-hour ozone standards in the revised National Ambient Air Quality Standards (NAAQS). In addition, vessels traveling from port to service the Lease Area could potentially transit through the state waters of several counties in New Jersey and New York. From the currently assumed port location of Staten Island, New York, vessels could transit through waters located the following counties, depending on the chosen route: Monmouth County, New Jersey; Richmond County, New York (Staten Island); Kings County, New York (Brooklyn), and Queens County, New York. All four of these counties have been designated as moderate nonattainment for the 1997 8-hour ozone (O<sub>3</sub>) standard. All four of these counties have also been designated serious nonattainment for the 2008 8-hour O<sub>3</sub> standard. Richmond, Kings, and Queens counties are designated as maintenance areas for the 1971 8-hour and 1-hour carbon monoxide (CO) standards. Finally, all four of these

counties are designated as maintenance areas for the 1997 annual and 2006 24-hour standards for particulate matter less than 2.5 microns in diameter (PM<sub>2.5</sub>). In addition, the EPA has designated New Jersey as an unclassifiable/attainment area for the new 1-hour nitrogen dioxide NAAQS, which was promulgated in 2010, pending the collection of additional monitoring data. A similar designation is expected for the 1-hour sulfur dioxide (SO<sub>2</sub>) NAAQS. New Jersey is designated as unclassifiable or attainment for all other NAAQS. Finally, all of New Jersey is within the Northeast Ozone Transport Region as designated by the Clean Air Act.

The proposed site assessment activity has the potential to impact local air quality. Potential emission sources would however be limited to a single work boat. The vessel associated with these activities would emit criteria air pollutants (nitrogen oxides [NO<sub>x</sub>], CO, SO<sub>2</sub>, particulate matter less than 10 microns in diameter [PM<sub>10</sub>], PM<sub>2.5</sub>), and volatile organic compounds [VOCs]), hazardous air pollutants (HAPs) and greenhouse gases [GHGs]). The vessel would emit pollutants both in state and federal waters while traveling to and from the Deployment Areas throughout the operational lifecycle of the proposed Metocean Buoys. Impacts from pollutant emissions associated with this vessel would likely be localized within the immediate vicinity of the site assessment activity. Equipment and fuel suppliers will be required to provide equipment and fuels for the Lease Area that have been certified to be in compliance with the applicable EPA standards or equivalent.

It is anticipated each Metocean Buoy will require two working days for installation, as well as two working days for decommissioning. After 2 years of operation, one of the two Metocean Buoys will be moved to a second location, requiring one workday for the work vessel. Each Metocean Buoy will have one planned semi-annual maintenance visit per year, and one planned annual maintenance activity per year. Finally, an allowance for unplanned maintenance trips has been included, with up to one unplanned round trip per year based on the deployment location with the longest roundtrip distance. A summary of the air emission estimates is presented in Table 7-7.

**Table 7-11 Atlantic Shores Metocean Buoys Air Emissions Summary**

Metocean Buoys Activity	VOC tons	NO <sub>x</sub> tons	CO tons	PM/PM <sub>10</sub> tons	PM <sub>2.5</sub> tons	SO <sub>2</sub> tons	HAPs tons	GHG tons CO <sub>2</sub> e
Deployment Activities (yr. 1)	8.75E-03	0.20	0.12	6.13E-03	5.95E-03	4.25E-05	1.00E-03	14.2
Move FLIDAR2 to second location (yr. 3)	5.06E-03	0.17	0.09	4.63E-03	4.49E-03	2.44E-05	9.69E-04	12.3
6-month Maintenance FLIDAR1 (yrs. 1, 2, and 3)	2.39E-03	0.09	0.04	2.28E-03	2.21E-03	1.15E-05	4.91E-04	6.2
6-month Maintenance FLIDAR2 (yrs. 1, 2, 3 and 4)	2.65E-03	0.10	0.05	2.54E-03	2.46E-03	1.28E-05	5.46E-04	6.9
Unscheduled 6-month Service FLIDAR1 (yrs. 1, 2, and 3)	2.39E-03	0.09	0.04	2.28E-03	2.21E-03	1.15E-05	4.91E-04	6.2
Unscheduled 6-month Service FLIDAR2 (yrs. 1, 2, 3 and 4)	2.65E-03	0.10	0.05	2.54E-03	2.46E-03	1.28E-05	5.46E-04	6.9
Deployment Activities (yr. 1)	0.10	1.97	1.02	0.12	0.12	2.75E-04	0.02	140.54
6-month Maintenance Buoy 1 (yr. 1)	0.02	0.50	0.26	0.03	0.03	6.66E-05	4.97E-03	35.76
6-month Maintenance Buoy 2 (yr. 1)	0.02	0.49	0.25	0.03	0.03	6.44E-05	4.80E-03	34.57
Annual Service Buoy 1 (end of yr. 1)	0.04	0.80	0.42	0.05	0.05	1.19E-04	7.94E-03	56.88
Annual Service Buoy 2 (end of yr. 1)	0.04	0.77	0.41	0.05	0.05	1.15E-04	7.64E-03	54.76

**Table 7-11 Atlantic Shores Metrocean Buoys Air Emissions Summary**

Metrocean Buoys Activity	VOC tons	NO <sub>x</sub> tons	CO tons	PM/PM <sub>10</sub> tons	PM <sub>2.5</sub> tons	SO <sub>2</sub> tons	HAPs tons	GHG tons CO <sub>2e</sub>
Unplanned Visit (yr. 1)	0.02	0.39	0.20	0.02	0.02	5.13E-05	3.95E-03	27.53
Move Buoy 1 to second location (yr. 2)	0.02	0.39	0.20	0.02	0.02	5.13E-05	3.95E-03	27.53
6-month Maintenance Buoy 1 (yr. 2)	0.02	0.44	0.22	0.03	0.02	5.77E-05	4.31E-03	30.99
6-month Maintenance Buoy 2 (yr. 2)	0.02	0.49	0.25	0.03	0.03	6.44E-05	4.80E-03	34.57
Annual Service Buoy 1 (end of yr. 2)	0.04	0.68	0.36	0.04	0.04	1.03E-04	6.73E-03	48.41
Annual Service Buoy 2 (end of yr. 2)	0.04	0.77	0.41	0.05	0.05	1.15E-04	7.64E-03	54.76
Unplanned Visit (yr. 2)	0.02	0.39	0.20	0.02	0.02	5.13E-05	3.95E-03	27.53
Move Buoy 1 to third location (yr. 3)	0.02	0.39	0.20	0.02	0.02	5.13E-05	3.95E-03	27.53
6-month Maintenance Buoy 1 (yr. 3)	0.02	0.49	0.25	0.03	0.03	6.44E-05	4.80E-03	34.57
6-month Maintenance Buoy 2 (yr. 3)	0.02	0.49	0.25	0.03	0.03	6.44E-05	4.80E-03	34.57
Annual Service Buoy 1 (end of yr. 3)	0.04	0.77	0.41	0.05	0.05	1.15E-04	7.64E-03	54.76
Annual Service Buoy 2 (end of yr. 3)	0.04	0.80	0.42	0.05	0.05	1.19E-04	7.94E-03	56.88
Unplanned Visit (yr. 3)	0.02	0.39	0.20	0.02	0.02	5.13E-05	3.95E-03	27.53
Decommissioning Activities (yr. 4)	0.10	1.96	1.02	0.12	0.12	2.73E-04	0.02	139.48
<b>Maximum Annual Emissions (tons) <sup>1</sup></b>	<b>0.25</b>	<b>4.91</b>	<b>2.56</b>	<b>0.30</b>	<b>0.29</b>	<b>6.92E-04</b>	<b>0.05</b>	<b>350.05</b>
<b>Total Project Lifetime Emissions (tons)</b>	<b>0.67</b>	<b>13.31</b>	<b>6.93</b>	<b>0.80</b>	<b>0.78</b>	<b>1.87E-03</b>	<b>0.13</b>	<b>949.18</b>
Note:								
1. The maximum annual emissions occur for Year 1 of the project and include deployment of both buoys, one round of 6-month inspections, one round of annual inspections, and one unscheduled visit.								

Emissions associated with the site assessment activity would be minor based on the estimate of less than 50 tons (45,359 kilograms) per year of NO<sub>x</sub> and VOCs, 100 tons (90,719 kilograms) per year of the other criteria air pollutants, and 25 tons (22,680 kilograms) per year of HAPs or 10 tons (9,072 kilograms) per year of any individual HAP. The majority of these emissions would occur within Deployment Areas and therefore would not affect local onshore air quality in New Jersey.

## 7.9 Socioeconomic Resources

As demonstrated in Section 2, the equipment and methodologies proposed herein by Atlantic Shores are consistent with the activity considered by BOEM in the Mid-Atlantic EA (BOEM 2012) provides details on the affected environment and Section 4.1.3 of the Mid-Atlantic EA includes potential impacts to socioeconomic resources that may result from the proposed site assessment activity and is incorporated by reference and not repeated.

Atlantic Shores has reviewed currently available literature and data (see Section 8) regarding socioeconomic resources in the Mid-Atlantic off the coast of New Jersey and has determined that no new substantive information has become available that warrants revision of the analysis in the Mid-Atlantic EA (BOEM 2012). The results of the EA and BOEM's analysis and conclusion that the proposed activity is not anticipated to result in any significant impact to socioeconomic resources are applicable.

Atlantic Shores recognizes the many uses of the Lease Area and proposed Installation Areas. The most prevalent activity of socioeconomic importance within the Lease Area is commercial surf clam fishing originating from Point Pleasant, Barnegat Light, and Atlantic City, New Jersey. While no specific stipulations concerning interactions with commercial and recreational fishing are provided in the Lease, Atlantic Shores is aware of BOEM's recommended practices for outreach to commercial and recreational fisheries (BOEM 2015) and has been actively engaging with these stakeholders since Q4 2018. In order to build deeper connections to the fishing industry, during the first half of 2019, Atlantic Shores' parent companies were founding members of the Responsible Offshore Science Alliance (ROSA), and were among the first members of the Responsible Offshore Development Alliance (RODA) Task Force. During the summer of 2019 a local fisherman, Kevin Wark, was hired as Atlantic Shores' Fisheries Liaison Officer. Mr. Wark has been conducting regular outreach to fishermen along the coast of New Jersey. With his assistance, Atlantic Shores staff have met with the owners of all active surf clam vessels registered to fish off of New Jersey (primarily based out of Atlantic City), along with fishing company owners and dock managers in Cape May and Barnegat Light.)

As stated in Section 4.1, communications to the maritime community, including commercial and recreational fishermen, throughout the Metocean deployment period will be supported by the USCG LNM. Communication to the maritime community will also be supported in near real time via information provided directly through our website at: <https://www.atlanticshoreswind.com/mariners/>. Atlantic Shores is also actively developing a Fisheries Communication Plan that will support its long-term development efforts.

As evidenced throughout this SAP, Atlantic Shores is committed to implementing all applicable Lease conditions, which include BMPs for the installation, operation, and decommissioning of the Metocean Buoys in order to further reduce the potential for impacts on social and economic resources. Atlantic Shores will comply with any additional stipulations as set forth in any subsequent approvals in support of the proposed site assessment activity.

## 7.10 Meteorological and Oceanographic Hazards

As demonstrated in Section 2, the equipment and methodologies proposed herein by Atlantic Shores are consistent with the activity considered by BOEM in the Mid-Atlantic EA (BOEM 2012). Section 3.2.1 of the Mid-Atlantic EA provides details on the affected environment and potential impacts to meteorological and oceanographic hazards that may result from the proposed site assessment activity and is incorporated by reference and not repeated.

Atlantic Shores has reviewed currently available literature and data (see Section 8) regarding coastal and marine uses off the coast of New Jersey and has determined that no new substantive information has become available that warrants revision of the analysis in the Mid-Atlantic EA (BOEM 2012). The results of the EA and BOEM's analysis and conclusion that the proposed activity is not anticipated to result in any significant impact to meteorological and oceanographic hazards are applicable.

Atlantic Shores has committed to implementing all applicable Lease conditions, which include BMPs for the installation, operation, and decommissioning of the Metocean Buoys in order to further reduce the potential

for impacts on meteorological and oceanographic hazards. Atlantic Shores will comply with any additional stipulations as set forth in any subsequent approvals in support of the proposed site assessment activity.

## 8. REFERENCES

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# Appendix A

## Permits and Consultations





REPLY TO  
ATTENTION OF

CERTIFIED MAIL- RETURN RECEIPT REQUESTED

**DEPARTMENT OF THE ARMY**  
PHILADELPHIA DISTRICT CORPS OF ENGINEERS  
WANAMAKER BUILDING, 100 PENN SQUARE EAST  
PHILADELPHIA, PENNSYLVANIA 19107-3390

November 8, 2019

Regulatory Branch  
Application Section II

SUBJECT: CENAP-OP-R-2019-1069-39 (6 NWP 5)  
Atlantic Shores Offshore Wind, LLC  
Latitude and Longitude: See attached sheet

Ms. Jennifer Daniels  
Atlantic Shores Offshore Wind  
1 Beacon Street, 15th Floor  
Boston, MA 02108

Dear Ms. Daniels:

This is in regard to your proposal to install 2 monitoring buoys in the Atlantic Ocean, approximately 20 miles southeast of Atlantic City, Atlantic County, New Jersey. The 2 buoys will be deployed at six locations within the water. No more than 2 buoys will be installed at any one time, spread over the six locations shown on the attached drawing. Work shall be performed from vessels located off the New Jersey coast. The buoys will be secured to the ocean floor using a clump anchor and chains. The permittee will collect data using two SEAWATCH Wind Lidar Buoys. The work shall be performed as discussed in the Guidelines for Providing Geophysical, Geotechnical, and Geohazard Information Pursuant to 30 CFR Part 585 that was developed by the Bureau of Ocean Energy Management for survey work on the outer continental shelf. This document can be found at [https://www.boem.gov/G\\_G\\_Guidelines\\_Providing\\_Geophysical\\_Geotechnical\\_Geohazard\\_Information\\_Pursuant\\_to\\_30\\_CFR\\_Part\\_585/](https://www.boem.gov/G_G_Guidelines_Providing_Geophysical_Geotechnical_Geohazard_Information_Pursuant_to_30_CFR_Part_585/)

**Based upon our review of the information you have provided, it has been determined that your project is approved by the existing Department of the Army Nationwide Permit 5 (NWP 5) described below provided the work is conducted in compliance with the NWP general conditions, regional conditions, and the project specific special conditions.**

**NWP 5. Scientific Measurement Devices.** Devices, whose purpose is to measure and record scientific data, such as staff gages, tide and current gages, meteorological stations, water recording and biological observation devices, water quality testing and improvement devices, and similar structures. Small weirs and flumes constructed primarily to record water quantity and velocity are also authorized provided the discharge is limited to 25 cubic yards. Upon completion of the use of the device to measure and record scientific data, the measuring device and any other structures or fills associated with that device (e.g., foundations, anchors, buoys, lines, etc.) must be removed to the maximum extent practicable and the site restored to pre-construction elevations.

**(Authorities:** Section 10 of the Rivers and Harbors Act of 1899 and section 404 of the Clean Water Act (Sections 10 and 404))

You are advised that this verification of NWP authorization is valid until the Nationwide Permits expire on March 18, 2022, unless the NWP authorization is modified, suspended, or revoked prior to this date. In the event that the NWP authorization is modified during that time period, this expiration date will remain valid, provided the activity complies with any subsequent modification of the NWP authorization.

It is noted that CZM consistency from the State is only required for those activities in or affecting a State's coastal zone. Additionally, some of the NWPs do not involve a discharge of dredged or fill material, and as such, do not require a 401 WQC. If the State has denied the required WQC and/or not concurred with the Corps' CZM consistency determination, the NWP authorization is considered denied without prejudice until an individual project specific WQC and/or CZM approval is obtained. No WQC or CZM are required for this action.

The activities authorized by this NWP verification must comply with the NWP General Conditions, as applicable, in addition to any regional or case-specific conditions imposed by the division engineer or district engineer. A copy of the NWP General Conditions and the Philadelphia District 2017 NWP Regional Permit Conditions for New Jersey for which this verification is subject to, can be found at:

<http://www.nap.usace.army.mil/Portals/39/docs/regulatory/publicnotices/2017%20Nationwide%20Permit%20General%20Conditions.pdf>

[http://www.nap.usace.army.mil/Portals/39/docs/regulatory/publicnotices/2017\\_NJ\\_Reg\\_Cond\\_Final.pdf](http://www.nap.usace.army.mil/Portals/39/docs/regulatory/publicnotices/2017_NJ_Reg_Cond_Final.pdf)

In instances where you are unable to access a digital copy of the 2017 NWP General conditions and/or the 2017 NWP Regional Permit Conditions for New Jersey, a hard copy will be transmitted by registered mail to you per request. It is further noted that you may request a copy by email at any time in which the NWP General Conditions and Regional Permit Conditions will be provided to you by facsimile or other electronic means per your request.

Activities which have commenced (i.e., are under construction) or are under contract to commence in reliance upon an NWP will remain authorized provided the activity is completed within twelve months of the date of an NWP's expiration, modification, or revocation, unless discretionary authority has been exercised on a case-by-case basis to modify, suspend, or revoke the authorization in accordance with 33 CFR 330.4(e) and 33 CFR 330.5 (c) or (d). Activities completed under the authorization of an NWP which was in effect at the time the activity was completed continue to be authorized by that NWP.

You should carefully note that this NWP authorization is based upon your agreement to comply with the terms and conditions of this NWP including any and all attached project specific special conditions listed below. Initiation of any authorized work shall constitute your agreement to comply with all of the NWP's conditions. You should also note that the authorized work may

be subject to periodic inspections by a representative of this office. The verification of a Nationwide Permit including all general and special conditions is not subject to appeal.

**PROJECT SPECIFIC SPECIAL CONDITIONS:**

1. All work performed in association with the above noted project shall be located in accordance with the attached documents. The project plans provide for the installation of buoys to gather scientific data for a potential wind turbine farm approximately 20 nautical miles southeast of Atlantic City, Atlantic County, New Jersey. Two SEAWATCH Wind Lidar Buoys will be deployed in the ocean, spread over 6 locations. The buoys will be secured to the ocean floor using clump weights and chains.
2. Construction activities shall not result in the disturbance or alteration of greater than 1 acre of waters of the United States.
3. Any deviation in construction methodology or project design from that shown on the above noted drawings or repair plan must be approved by this office, in writing, prior to performance of the work. All modifications to the above noted project plans shall be approved, in writing, by this office. No work shall be performed prior to written approval of this office.
4. This office shall be notified prior to the commencement of authorized work by completing and signing the enclosed Notification/ Certification of Work Commencement Form (Enclosure 1). This office shall also be notified within 10 days of the completion of the authorized work by completing and signing the enclosed Notification/Certification of Work Completion/Compliance Form (Enclosure 2). All notifications required by this condition shall be in writing. The Notification of Commencement of work may be sent to this office by facsimile or other electronic means; all other notification shall be transmitted to this office by registered mail. Oral notifications are not acceptable. Similar notification is required each time maintenance work is to be done under the terms of this Corps of Engineers permit.
5. The permittee understands and agrees that, if future operations by the United States require the removal, relocation, or other alteration, of the structure or work herein authorized, or if, in the opinion of the Secretary of the Army or his authorized representative, said structure or work shall cause unreasonable obstruction to the free navigation of the navigable waters, the permittee will be required, upon due notice from the Corps of Engineers, to remove, relocate, or alter the structural work or obstructions caused thereby, without expense to the United States. No claim shall be made against the United States on account of any such removal or alteration.
6. A minimum of 30 days prior to commencing work, the permittee/contractor shall request in writing, from the U.S. Coast Guard, that a Local Notice to Mariners be issued regarding the authorized construction work. This written request shall include the location of work, a description of the construction activities; type of construction equipment to be used and expected duration of work in the waterway. The written request should be addressed to the following: Commander, Fifth Coast Guard District, Aids to Navigation Branch, Federal Building, 431 Crawford Street, Portsmouth, Virginia 23704-5004, FAX Number 804-398-6303. A copy of the cover letter shall be forward to our office for our records.

7. The permittee shall submit a copy of Enclosure 2 when the buoys are removed from the ocean.

Also enclosed is a pre-addressed postal card (Enclosure 3) soliciting your comments on the processing of your application. Any comments, positive or otherwise, on the procedures, timeliness, fairness, etc., may be made on this card. If you should have any questions regarding this matter, please contact Lawrence Slavitter at 215-656-6734 or write to the above address.

Sincerely,

A handwritten signature in cursive script, appearing to read "Edward E. Bonner".

Edward E. Bonner  
Chief, Regulatory Branch

Enclosures

Copies Furnished:

NJDEP, LURP  
NMFS (Gloucester, MA)  
NMFS (Sandy Hook, NJ)  
USFWS (Galloway, NJ)  
USEPA, Region II  
USCG Fifth District  
USCG Philadelphia  
BOEM Michelle Morin

James Ransom  
Fugro  
6100 Hillcroft Avenue  
Houston, Texas 77081

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DEPARTMENT OF HOMELAND SECURITY

U.S. Coast Guard

PRIVATE AIDS TO NAVIGATION APPLICATION

OMB Approval: 1625-0011

Expiration Date: 12/31/2017

(See attached instructions and copy of Code of Federal Regulations, Title 33, Chap. 1, Part 66)

NO PRIVATE AID TO NAVIGATION MAY BE AUTHORIZED UNLESS A COMPLETED APPLICATION FORM HAS BEEN RECEIVED (14 U.S.C. 83; 33 CFR. 66. 01-5).

1. ACTION REQUESTED FOR PRIVATE AIDS TO NAVIGATION:	<input checked="" type="checkbox"/> A. ESTABLISH AND MAINTAIN	<input type="checkbox"/> B. DISCONTINUE	<input type="checkbox"/> C. CHANGE	<input type="checkbox"/> D. TRANSFER OWNERSHIP	2. DATE ACTION TO START: 12/12/2019
3. AIDS WILL BE OPERATED:	<input type="checkbox"/> A. YEAR-ROUND	<input checked="" type="checkbox"/> B. TEMPORARILY UNTIL 06/20/2023	<input type="checkbox"/> C. SEASONAL FROM _____ TO _____		
4. NECESSITY FOR AID (Continue in Block 8)	5. GENERAL LOCALITY 17 nm W of Brigantine		6. AUTHORIZING PERMIT FOR THIS STRUCTURE OR BUOY USACE <input checked="" type="checkbox"/> PERMIT AND/OR STATE <input type="checkbox"/> PERMIT (Valid Permit Number) NWP-5		

FOR DISTRICT COMMANDERS ONLY		7. APPLICANT WILL FILL IN APPLICABLE REMAINING COLUMNS									
LIGHT LIST NUMBER	NAME OF AID	NO. OR LTR (7a)	LIGHT			POSITION (7e)	DEPTH OF WATER (7f)	CANDELA (7g)	FOCAL PLANE HEIGHT (7h)	STRUCTURE TYPE, COLOR, AND HEIGHT ABOVE GROUND (7i)	REMARKS (See instructions) (7j)
			FLASH PERIOD (7b)	FLASH LENGTH (7c)	COLOR (7d)						
50	ASOW Lighted Meteorological Buoy	± A	20	5	Yellow	39 16' 18" N 73 56' 21" W	32 m		4 m	2.8 m diameter yellow disc buoy	Flash cycle is 20 seconds. 5s (0.5on/0.5off), 15 seconds off. Light range 4 nm.
55	ASOW Lighted Meteorological Buoy	± B	20	5	Yellow	39 18' 34" N 74 06' 33" W	27 m		4 m	2.8 m diameter yellow disc buoy	Flash cycle is 20 seconds. 5s (0.5on/0.5off), 15 seconds off. Light range 4 nm.

8. ADDITIONAL COMMENTS  
Flash Characteristic: Fl (5) Y 20s

9a. NAME AND ADDRESS OF PERSON IN DIRECT CHARGE OF THE AID(S) James Ranson 6100 Hillcroft, Houston, TX 77081	10a. NAME AND ADDRESS OF PERSON OR CORPORATION AT WHOSE EXPENSE THE AID(S) WILL BE MAINTAINED Fugro USA Marine, Inc 6100 Hillcroft, Houston, TX 77081	10b. THE APPLICANT AGREES TO SAVE THE COAST GUARD HARMLESS WITH RESPECT TO ANY CLAIM OR CLAIMS THAT MAY RESULT ARISING FROM THE ALLEGED NEGLIGENCE OF THE MAINTENANCE OR OPERATION OF THE APPROVED AID(S).
9b. TELEPHONE NO. +1 713 346 3615		10c. DATE 10/31/2019
9c. E-MAIL ADDRESS j.ranson@fugro.com		10d. SIGNATURE AND TITLE OF OFFICIAL SIGNING <i>Garshar James Ranson</i>

FOR USE BY DISTRICT COMMANDER		RECD	DATE APPROVED	SIGNATURE (By direction)
SERIAL NO. 19-0073	CLASSIFICATION OF AIDS(S) II	CHART 12318		
		LNM		

# **Appendix B**

## **Equipment Specifications**

***(Contains Privileged or Confidential Information -  
Provided Under Separate Cover)***



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**Appendix C**  
**Marine Archaeological Resource**  
**Assessment Report in Support of the**  
**Atlantic Shores Offshore Wind**  
**Project**

***(Contains Privileged or Confidential Information -  
Provided Under Separate Cover)***

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# Appendix D

## Vessel Specifications

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## Vessel Information



Specifications for 180' Class Supply Vessel			
<b>Station</b>	Long Beach, CA	<b>Official #</b>	1085966
<b>Callsign</b>	WDF 9573	<b>Telephone #</b>	718-727-7303
<b>Type of Vessel</b>	Supply Vessel	<b>Hull Construction</b>	Steel
<b>Length</b>	180'	<b>Beam</b>	44'
<b>Draft</b>	Max 12.0'	<b>Deck Space</b>	104' x 39'
<b>Deck Capacity</b>	As Per Stability Letter	<b>Fuel Capacity</b>	94,000 Gallons
<b>Cruising Speed</b>	10 KTS	<b>Water Capacity</b>	15,000 Gallons
<b>Top Speed</b>	12 KTS	<b>Gross Tonnage</b>	99 Tons
<b>Communications</b>	Rig Net	<b>Single Side Band</b>	Furuno
<b>Fuel Transfer Rate</b>	1 400GPM @ 260 Feet	<b>GMDSS</b>	
<b>Liquid Mud</b>	69,000 Gallons	<b>Radar</b>	Furuno
<b>Cargo Water</b>	75,000	<b>GPS</b>	2 Furuno GP-32
<b>Fire Monitor</b>	4" Ekhart	<b>VHF Radio</b>	3 Icom M-504
<b>Main Engines</b>	2-Cat 3512	<b>Generators</b>	2-Cat 3304 99 KW
<b>Bow Thruster</b>	Cat 3116 - Schotel	<b>Accomodations</b>	28 Crew
<b>Galley</b>	Commercial Style	<b>Stern Roller</b>	16 foot Long
<b>Winch</b>	99,000LBS Line Pull	<b>Tuggers</b>	2 Tuggers, 10,000LBS Line Pull Each

# **Appendix F**

## **Air Emissions Analysis**

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**ATLANTIC SHORES OFFSHORE WIND FARM**  
**Air Emission Calculations**  
**Emission Summary - FLiDAR Buoy Deployment**

<b>Met Facilities Activity</b>	<b>VOC tpy</b>	<b>NO<sub>x</sub> tpy</b>	<b>CO tpy</b>	<b>PM/PM<sub>10</sub> tpy</b>	<b>PM<sub>2.5</sub> tpy</b>	<b>SO<sub>2</sub> tpy</b>	<b>HAPs tpy</b>	<b>GHG tpy CO<sub>2</sub>e</b>
Deployment Activities (yr. 1)	0.10	1.97	1.02	0.12	0.12	2.75E-04	0.02	140.54
6-month Maintenance Buoy 1 (yr. 1)	0.02	0.50	0.26	0.03	0.03	6.66E-05	4.97E-03	35.76
6-month Maintenance Buoy 2 (yr. 1)	0.02	0.49	0.25	0.03	0.03	6.44E-05	4.80E-03	34.57
Annual Service Buoy 1 (end of yr. 1)	0.04	0.80	0.42	0.05	0.05	1.19E-04	7.94E-03	56.88
Annual Service Buoy 2 (end of yr. 1)	0.04	0.77	0.41	0.05	0.05	1.15E-04	7.64E-03	54.76
Unplanned Visit (yr. 1)	0.02	0.39	0.20	0.02	0.02	5.13E-05	3.95E-03	27.53
Move Buoy 1 to second location (yr. 2)	0.02	0.39	0.20	0.02	0.02	5.13E-05	3.95E-03	27.53
6-month Maintenance Buoy 1 (yr. 2)	0.02	0.44	0.22	0.03	0.02	5.77E-05	4.31E-03	30.99
6-month Maintenance Buoy 2 (yr. 2)	0.02	0.49	0.25	0.03	0.03	6.44E-05	4.80E-03	34.57
Annual Service Buoy 1 (end of yr. 2)	0.04	0.68	0.36	0.04	0.04	1.03E-04	6.73E-03	48.41
Annual Service Buoy 2 (end of yr. 2)	0.04	0.77	0.41	0.05	0.05	1.15E-04	7.64E-03	54.76
Unplanned Visit (yr. 2)	0.02	0.39	0.20	0.02	0.02	5.13E-05	3.95E-03	27.53
Move Buoy 1 to third location (yr. 3)	0.02	0.39	0.20	0.02	0.02	5.13E-05	3.95E-03	27.53
6-month Maintenance Buoy 1 (yr. 3)	0.02	0.49	0.25	0.03	0.03	6.44E-05	4.80E-03	34.57
6-month Maintenance Buoy 2 (yr. 3)	0.02	0.49	0.25	0.03	0.03	6.44E-05	4.80E-03	34.57
Annual Service Buoy 1 (end of yr. 3)	0.04	0.77	0.41	0.05	0.05	1.15E-04	7.64E-03	54.76
Annual Service Buoy 2 (end of yr. 3)	0.04	0.80	0.42	0.05	0.05	1.19E-04	7.94E-03	56.88
Unplanned Visit (yr. 3)	0.02	0.39	0.20	0.02	0.02	5.13E-05	3.95E-03	27.53
Decommissioning Activities (yr. 4)	0.10	1.96	1.02	0.12	0.12	2.73E-04	0.02	139.48
<b>Total Project Lifetime Emissions (tons)</b>	<b>0.67</b>	<b>13.31</b>	<b>6.93</b>	<b>0.80</b>	<b>0.78</b>	<b>1.87E-03</b>	<b>0.13</b>	<b>949.18</b>

<b>Emissions by Operating Year</b>	<b>VOC tpy</b>	<b>NO<sub>x</sub> tpy</b>	<b>CO tpy</b>	<b>PM/PM<sub>10</sub> tpy</b>	<b>PM<sub>2.5</sub> tpy</b>	<b>SO<sub>2</sub> tpy</b>	<b>HAPs tpy</b>	<b>GHG tpy CO<sub>2</sub>e</b>
Year 1	0.25	4.91	2.56	0.30	0.29	6.92E-04	0.05	350.05
Year 2	0.16	3.14	1.64	0.19	0.18	4.43E-04	0.03	223.80
Year 3	0.17	3.31	1.72	0.20	0.19	4.66E-04	0.03	235.85
Year 4	0.10	1.96	1.02	0.12	0.12	2.73E-04	0.02	139.48
<b>Total Project Lifetime Emissions (tons)</b>	<b>0.67</b>	<b>13.31</b>	<b>6.93</b>	<b>0.80</b>	<b>0.78</b>	<b>1.87E-03</b>	<b>0.13</b>	<b>949.18</b>