Kitty Hawk Wind

AVANGRID

Construction and Operations Plan

Chapter 1 - Introduction

September 30, 2022

Submitted by
Kitty Hawk Wind, LLC
1125 NW Couch Street, Suite 600
Portland, Oregon 97209

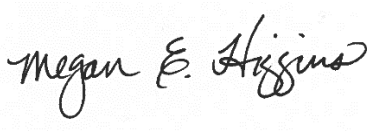
Submitted to
Bureau of Ocean Energy Management
45600 Woodland Road
Sterling, Virginia 20166

Prepared by
Tetra Tech, Inc.
10 Post Office Square, 11th Floor
Boston, Massachusetts 02109

AVANGRID

COP – Chapter 1: Introduction

Document Reference: KTH-GEN-CON-PLN-AGR-000067_001 Rev 07

Prepared by:	Checked by:	Approved by:
TETRA TECH **September 30, 2022**	 **September 30, 2022**	 **September 30, 2022**

Revision Summary				
Rev	**Date**	**Prepared by**	**Checked by**	**Approved by**
01	10 Dec 2020	Tetra Tech, Inc.	Brian Benito Jr.	Megan Higgins
02	28 Jun 2021	Tetra Tech, Inc.	Brian Benito Jr.	Marcus Cross
03	26 Jul 2021	Tetra Tech, Inc.	Brian Benito Jr.	Marcus Cross
04	16 Aug 2021	Tetra Tech, Inc.	Brian Benito Jr.	Marcus Cross
05	01 Oct 2021	Tetra Tech, Inc.	Amanda Mayhew	Marcus Cross
06	01 Nov 2021	Tetra Tech, Inc.	Amanda Mayhew	Marcus Cross
07	30 Sep 2022	Tetra Tech, Inc.	Amanda Mayhew	Megan Higgins

Description of Revisions			
Rev	**Page**	**Section**	**Description**
01	All	All	Submitted to BOEM
02	All	All	Updated based on BOEM comments and Project updates
03	All	All	Updated based on BOEM comments and Project updates
04	32-33	1.11	Updated supplemental filing table
05	Many	Various	Updated based on Project updates and updated supplemental filing table
06	Many	Various	Updated based on BOEM comments and updated supplemental filing table
07	Many	Various	Updated based on BOEM comments and Project name

Table of Contents

Table of Figures

Table of Tables

Abbreviations & Definitions

Acronym	Definition
BOEM	Bureau of Ocean Energy Management
CFR	Code of Federal Regulations
COP	Construction and Operations Plan
CVA	Certified Verification Agent
EA	Environmental Assessment
ESP	electrical service platform
FAST-41	Title 41 of the Fixing America's Surface Transportation Act
ha	hectare
HRG	high resolution geophysical
km	kilometer
Lease	Commercial Lease of Submerged Lands for Renewable Energy Development on the Outer Continental Shelf of Lease Area OCS-A 0508
Lease Area	the designated Renewable Energy Lease Area OCS-A 0508
m	meter
MW	megawatt
NHPA	National Historic Preservation Act of 1966
OCS	Outer Continental Shelf
onshore substation site	A site located within the Corporate Landing Business Park in Virginia Beach, Virginia, which will contain the onshore substation, interconnection lines, and switching station
PDE	Project Design Envelope
Project	Kitty Hawk North Wind Project
the Company	Kitty Hawk Wind, LLC
U.S.	United States
U.S.C.	United States Code
WEA	Wind Energy Area
Wind Development Area	approximately 40 percent of the Lease Area in the northwest corner closest to shore (19,441 ha)
WTG	wind turbine generator

1 INTRODUCTION

1.1 Project Overview

Kitty Hawk Wind, LLC (the Company), a wholly owned subsidiary of Avangrid Renewables, LLC, proposes to construct, own, and operate the Kitty Hawk North Wind Project (hereafter referred to as the Project). The Project will be located in the designated Renewable Energy Lease Area OCS-A 0508 (Lease Area). The Commercial Lease of Submerged Lands for Renewable Energy Development on the Outer Continental Shelf (OCS) of Lease Area OCS-A 0508 (Lease) was awarded through the Bureau of Ocean Energy Management (BOEM) competitive renewable energy lease auction of the Wind Energy Area (WEA) offshore of North Carolina.[1] The Lease Area covers 49,536 hectares (ha) and is located 44 kilometers (km) offshore of Corolla, North Carolina.

At this time, the Company proposes to develop approximately 40 percent of the Lease Area, an area located in the northwest corner closest to shore (19,441 ha, referred to as the Wind Development Area). The Project will connect from the electrical service platform (ESP) through offshore export cables (within a designated corridor) and onshore export cables to the new onshore substation and switching station in the City of Virginia Beach, Virginia within the Corporate Landing Business Park parcel owned by the City of Virginia Beach, where the renewable electricity generated will be transmitted to the electric grid (Figure 1.1-1 and Figure 1.1-2).

1.1.1 BOEM Renewable Energy Lease OCS-A 0508

On 13 Dec 2012, BOEM published a "Call for Information and Nominations" (or "Call") to determine interest in three WEAs off the coast of North Carolina and requested comments on site conditions, resources, and other uses within these Call areas. The initial 45-day public comment period was extended to 07 Mar 2013. Concurrent with the Call, BOEM published a "Notice of Intent to Prepare an Environmental Assessment (EA)" in the Federal Register. The EA evaluated the reasonably foreseeable potential environmental and socioeconomic impacts associated with the issuance of the commercial wind leases and site assessment activities within the lease areas.

Based on comments received during the Call, BOEM identified three WEAs off the coast of North Carolina in August 2014. These WEAs are the Kitty Hawk WEA; the Wilmington West WEA (18.5 km from shore and 20,880 ha); and the Wilmington East WEA (27.8 km from Bald Head Island and 54,062 ha).

The EA for the WEAs offshore North Carolina was published on 23 Jan 2015 for public comment. BOEM revised the EA based on comments received and published the Revised EA on 17 Sep 2015. Based on the environmental and socioeconomic assessments, BOEM issued a "Finding of No Significant Impact" determining that potential effects associated with issuance of the commercial wind lease and associated activity would not have a significant impact on the environment.

BOEM published the *Atlantic Wind Lease Sale 7 for Commercial Leasing for Wind Power on the Outer Continental Shelf Offshore North Carolina (Kitty Hawk)* on 16 Aug 2016 in the Federal Register. Legally and financially qualified bidders were requested to affirm interest in the Lease Area and provide public comments on BOEM's proposal to auction the Kitty Hawk WEA. BOEM published the Final Sale Notice on 17 Jan 2017 for the lease sale of the Kitty Hawk WEA.

[1] The commercial lease sale was held on 16 Mar 2017. At the conclusion of the sale, BOEM announced Avangrid Renewables, LLC as the provisional winner. On 01 Nov 2017, the commercial wind energy lease went into effect.

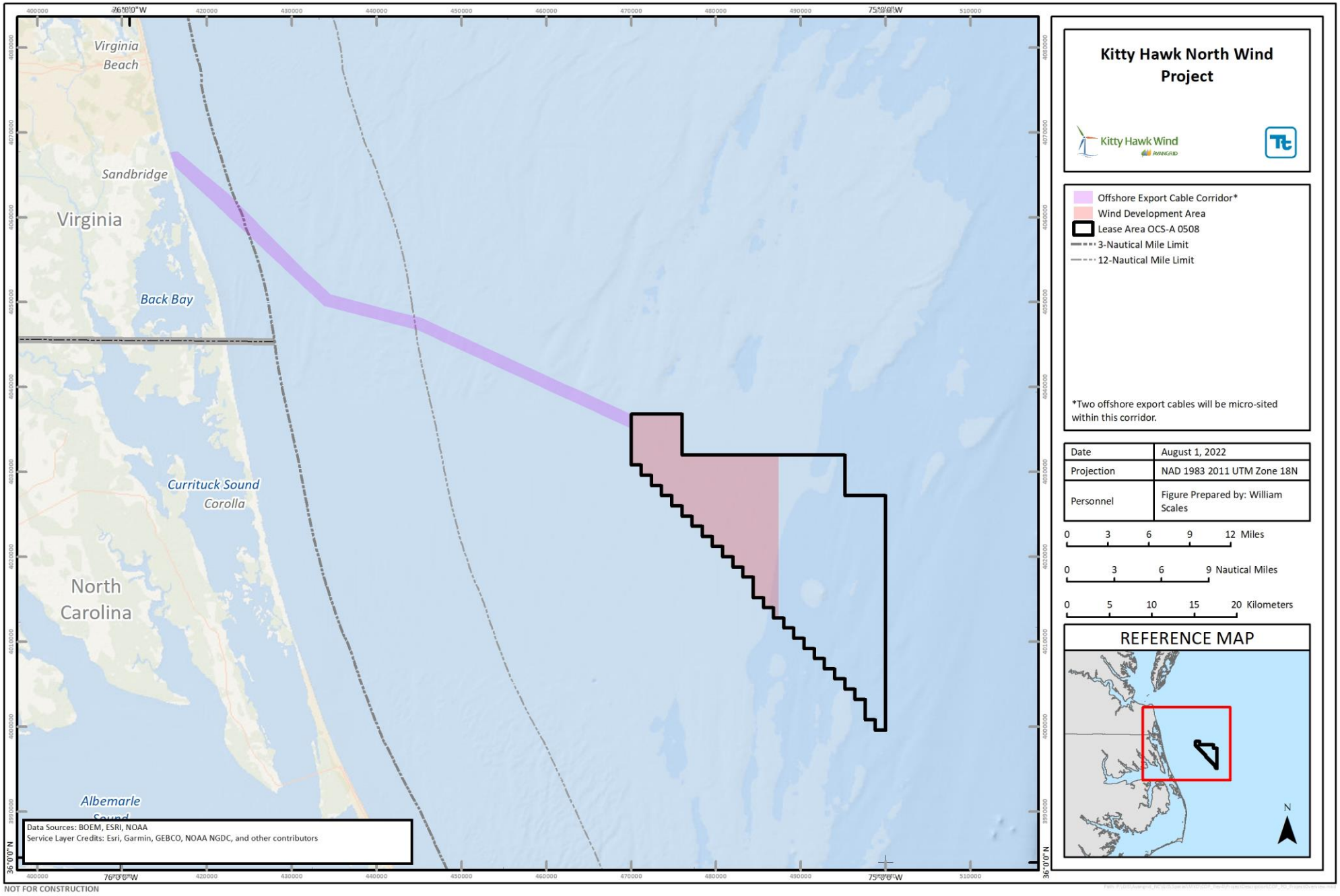


Figure 1.1-1 Offshore Project Overview

Figure 1.1-2 Onshore Project Overview

The competitive lease sale was held on 16 Mar 2017 for the Kitty Hawk WEA, with Avangrid Renewables, LLC announced as the winner. The Lease went into effect on 01 Nov 2017. On 09 Mar 2018, Avangrid Renewables, LLC requested an extension of the primary lease term from 01 Nov 2018 to 01 Nov 2019. BOEM granted this request on 17 May 2018. The Lease is currently being reassigned from Avangrid Renewables, LLC to Kitty Hawk Wind, LLC. Therefore, the Construction and Operations Plan (COP) and associated attachments refer to Kitty Hawk Wind, LLC as the Lessee. However, it should be noted that some technical reports and survey reports were completed prior to the name change and may still refer to Avangrid Renewables, LLC, Avangrid Renewables, or Avangrid as the Applicant.

In accordance with the Lease (Addendum C, Lease Condition 2.1.1), the Company submitted a High Resolution Geophysical (HRG) Survey Plan to BOEM on 04 Jan 2019 for site characterization surveys of the entire Lease Area and offshore export cable corridors. On 07 Jun 2019, BOEM approved the High Resolution Geophysical Survey Plan, and HRG reconnaissance-level surveys began in Q3 2019 and were completed in Q1 2020.

On 18 Sep 2019, the Company submitted its Site Assessment Plan to BOEM. It was deemed sufficient and complete on 05 Feb 2020 and was approved by BOEM on 08 Apr 2020.The Site Assessment Plan allowed for the deployment of up to two Floating Light Detection and Ranging buoys and up to two metocean platforms, to collect meteorological and metocean data (i.e., surface wind, barometric pressure, air temperature, relative humidity, wave conditions, ocean currents, water temperature). The buoy was deployed on 07 Jun 2020 and will collect metocean data for up to two years. The buoy is located at 479157.05 N, 4029598.92 E. Access to real-time data from the buoy is available here: https://portal.axys-aps.com/platforms/P2026P/. After one year, the buoy may be moved to one of two locations (either 490961.23 N, 4023633.35 E or 494923.29 N, 4012384.80 E).

On 04 Feb 2020, the Company revised and resubmitted the High Resolution Geophysical Survey Plan (Revised Geophysical Survey Plan) to include full coverage HRG survey activities focused on the Wind Development Area and an offshore export cable corridor to shore. BOEM deemed the Revised Geophysical Survey Plan compliant with the relevant portions of the Lease on 11 Mar 2020. Full coverage HRG survey activities, followed by benthic surveys, commenced in Q2 2020 and were completed in Q4 2020. The results of the HRG reconnaissance survey were incorporated into the ground model and have informed the Project Design Envelope (PDE); the results of the full coverage HRG survey are provided in Appendix K Marine Site Investigation Report. The Company anticipates submitting additional ground model data to BOEM in Q4 2022.

The Company submitted a Geotechnical and Geophysical Survey Plan to BOEM on 08 Apr 2020. This Survey Plan was approved on 25 Jun 2020. The geotechnical survey activities began and were completed in Q3 2020. Results of the preliminary geotechnical investigations are incorporated into the ground model and have informed the PDE. Additional results are provided in Appendix K Marine Site Investigation Report.

Construction and operations of the Project will require federal, state, and local permits and environmental reviews. The Company has prepared this COP in accordance with BOEM's renewable energy program regulations (30 Code of Federal Regulations [CFR] § 585) and BOEM's *Information Guidelines for a Renewable Energy Construction and Operations Plan (COP)* (2020; see Table 1.1-1). It is intended to support the environmental impact assessment process, under the National Environmental Policy Act, as amended (42 United States Code [U.S.C.] §§ 4321 *et seq.*), as well as the environmental analyses required as part of other federal, state, and local approvals and consultations for the Project, which are discussed in Section 1.5 Regulatory Framework.

1 **Table 1.1-1 BOEM's Regulatory Framework for Renewable Energy Facilities on the OCS**

Regulation	Location in COP
30 CFR § 585.105(a)	
(1) Design your projects and conduct all activities in a manner that ensures safety and will not cause undue harm or damage to natural resources, including their physical, atmospheric, and biological components to the extent practicable; and take measures to prevent unauthorized discharge of pollutants including marine trash and debris into the offshore environment.	Chapter 3 Description of Proposed Activity Chapter 4 Physical Resources Chapter 5 Biological Resources Chapter 6 Cultural Resources Chapter 7 Socioeconomic Resources Appendix F Safety Management System Appendix I Oil Spill Response Plan
30 CFR § 585.621(a-g)	
(a) The project will conform to all applicable laws, implementing regulations, lease provisions, and stipulations or conditions of the lease.	Section 1.5 Regulatory Framework
(b) The project will be safe.	Section 7.12 Health and Safety and Low Probability Events Appendix F Safety Management System Appendix I Oil Spill Response Plan Appendix BB Navigation Safety Risk Assessment Appendix HH Desk Study for Potential UXO Contamination Kitty Hawk Wind Farm – Virginia Beach
(c) The project will not unreasonably interfere with other uses of the OCS, including those involved with National security or defense.	Section 7.1 Recreation and Tourism Section 7.2 Commercial and Recreational Fishing Section 7.3 Marine Transportation and Navigation Section 7.4 Department of Defense and Outer Continental Shelf National Security Maritime Uses Section 7.5 Offshore Renewable Energy, Mineral Exploration, and Infrastructure Section 7.6 Aviation and Radar Section 7.7 Other Coastal and Marine Uses Appendix Q Radar and Navigational Aid Screening Study Appendix BB Navigation Safety Risk Assessment Appendix CC Obstruction Evaluation and Airspace Analysis Appendix HH Desk Study for Potential UXO Contamination Kitty Hawk Wind Farm – Virginia Beach

Regulation	Location in COP
(d) The project will not cause undue harm or damage to natural resources; life (including human and wildlife); property; the marine, coastal, or human environment; or sites, structures, or objects of historical or archaeological significance.	Chapter 2 Project Siting and Design Development Chapter 4 Physical Resources Chapter 5 Biological Resources Chapter 6 Cultural Resources Chapter 7 Socioeconomic Resources Appendix H Sandbridge Export Cable Landfall Conceptual Design Study Appendix J Preliminary Cable Burial Risk Assessment Appendix K Marine Site Investigation Report Appendix M Sediment Transport Modeling Report Appendix N Air Emission Calculations and Methodology Appendix R Federally and State-Listed Species Mapping Tools Appendix S Ornithological and Marine Fauna Aerial Survey Results Appendix T Offshore Bat Acoustic Survey Report Appendix U Assessment of the Potential Effects of the Kitty Hawk Offshore Wind Project on Bats and Birds Appendix V Benthic Resource Characterization Reports Appendix W Essential Fish Habitat Assessment Appendix X Marine Archaeological Resources Assessment Appendix Y Phase IA and Phase IB Archaeological Survey Reports Appendix Z Historic Resources Visual Effects Assessment Appendix AA Visual Impact Assessment Appendix GG Section 106 Supporting Materials Appendix HH Desk Study for Potential UXO Contamination Kitty Hawk Wind Farm – Virginia Beach
(e) The project will use the best available and safest technology.	Section 2.3 Project Components and Technology Chapter 3 Description of Proposed Activity Appendix E Foundation Structure Concept Screening Appendix G Conceptual Project Design Drawings Appendix H Sandbridge Export Cable Landfall Conceptual Design Study Appendix J Preliminary Cable Burial Risk Assessment Appendix HH Desk Study for Potential UXO Contamination Kitty Hawk Wind Farm – Virginia Beach

Regulation		Location in COP
(f) The project will use best management practices.		Chapter 3 Description of Proposed Activity Chapter 4 Physical Resources Chapter 5 Biological Resources Chapter 6 Cultural Resources Chapter 7 Socioeconomic Resources
(g) The project will use properly trained personnel.		Section 7.12 Health and Safety and Low Probability Events Appendix F Safety Management System Appendix HH Desk Study for Potential UXO Contamination Kitty Hawk Wind Farm – Virginia Beach
30 CFR § 585.626(a)		
(1) Shallow hazards	(i) Shallow faults;	Section 4.1 Physical and Oceanographic Conditions Appendix K Marine Site Investigation Report
	(ii) Gas seeps or shallow gas;	
	(iii) Slump blocks or slump sediments;	
	(iv) Hydrates; or	
	(v) Ice scour of seabed sediments.	
(2) Geological survey relevant to the design and siting of facility	(i) Seismic activity at your proposed site;	Section 4.1 Physical and Oceanographic Conditions Appendix K Marine Site Investigation Report Appendix M Sediment Transport Modeling Report Appendix HH Desk Study for Potential UXO Contamination Kitty Hawk Wind Farm – Virginia Beach
	(ii) Fault zones;	
	(iii) The possibility and effects of seabed subsidence;	
	(iv) The extent and geometry of faulting attenuation effects of geological conditions near your site.	
(3) Biological	A description of the results of biological surveys used to determine the presence of live bottoms, hard bottoms, and topographic features, and surveys of other marine resources such as fish populations (including migratory populations), marine mammals, sea turtles, and sea birds.	Section 5.3 Bat and Avian Species Section 5.4 Benthic Resources and Finfish, Invertebrates, and Essential Fish Habitat Section 5.5 Marine Mammals Section 5.6 Sea Turtles Appendix S Ornithological and Marine Fauna Aerial Survey Results Appendix T Offshore Bat Acoustic Survey Report

Regulation		Location in COP
		Appendix U Assessment of the Potential Effects of the Kitty Hawk Offshore Wind Project on Bats and Birds Appendix V Benthic Resource Characterization Reports Appendix W Essential Fish Habitat Assessment
(4) Geotechnical survey	(i) The results of a testing program used to investigate the stratigraphic and engineering properties of the sediment that may affect the foundations or anchoring systems for your facility.	Section 4.1 Physical and Oceanographic Conditions Appendix K Marine Site Investigation Report
	(ii) The results of adequate in situ testing, boring, and sampling at each foundation location, to examine all important sediment and rock strata to determine its strength classification, deformation properties, and dynamic characteristics.	BOEM approved Departure Request in letter received 27 Sep 2021.
	(iii) The results of a minimum of one deep boring (with soil sampling and testing) at each edge of the project area and within the project area as needed to determine the vertical and lateral variation in seabed conditions and to provide the relevant geotechnical data required for design.	Section 4.1 Physical and Oceanographic Conditions Appendix K Marine Site Investigation Report
(5) Archaeological resources	A description of the historic and prehistoric archaeological resources, as required by the National Historic Preservation Act of 1966 (NHPA) (16 U.S.C. 470 *et. seq.*), as amended.	Chapter 6 Cultural Resources Appendix X Marine Archaeological Resources Assessment Appendix Y Phase IA and Phase IB Archaeological Survey Reports Appendix GG Section 106 Supporting Materials
(6) Overall site investigation	(i) Scouring of the seabed;	Section 4.1 Physical and Oceanographic Conditions Section 4.2 Water Quality Appendix E Foundation Structure Concept Screening Appendix J Preliminary Cable Burial Risk Assessment Appendix K Marine Site Investigation Report Appendix M Sediment Transport Modeling Report
	(ii) Hydraulic instability;	
	(iii) The occurrence of sand waves;	
	(iv) Instability of slopes at the facility location;	

Regulation		Location in COP
	(v) Liquefaction, or possible reduction of sediment strength due to increased pore pressures;	Appendix HH Desk Study for Potential UXO Contamination Kitty Hawk Wind Farm – Virginia Beach
	(vi) Degradation of subsea permafrost layers;	
	(vii) Cyclic loading;	
	(viii) Lateral loading;	
	(ix) Dynamic loading;	
	(x) Settlements and displacements;	
	(xi) Plastic deformation and formation collapse mechanisms; and	
	(xii) Sediment reactions on the facility foundations or anchoring systems.	
30 CFR § 585.626(b)		
(1) Contact information	The name, address, e-mail address, and phone number of an authorized representative.	Section 1.7 Authorized Representative
(2) Designation of operator, if applicable	As provided in § 585.405.	Section 1.7 Authorized Representative
(3) The construction and operation concept	A discussion of the objectives,	Section 1.4 Purpose and Need
	description of the proposed activities,	Section 1.1 Project Overview
	tentative schedule from start to completion, and	Section 1.1.3 Schedule
	plans for phased development, as provided in § 585.629.	Not Applicable. The Company intends to pursue development of the remainder of the Lease Area subject to commercial and technical decisions; however, the timeline for these efforts is currently unknown. A COP(s) will be submitted as necessary to support future project(s) in the Lease Area.
(4) Commercial lease stipulations and compliance	A description of the measures you took, or will take, to satisfy the conditions of	Section 1.1 Project Overview Section 1.5 Regulatory Framework

Regulation		Location in COP
	any lease stipulations related to your proposed activities.	
(5) A location plat	The surface location and water depth for all proposed and existing structures, facilities, and appurtenances located both offshore and onshore, including all anchor/mooring data.	Section 1.1 Project Overview (Figure 1.1-1 and Figure 1.1-2) Section 4.1 Physical and Oceanographic Conditions
(6) General structural and project design, fabrication, and installation	Information for each type of structure associated with your project and, unless BOEM provides otherwise, how you will use a Certified Verification Agent (CVA) to review and verify each stage of the project.	Section 1.8 Certified Verification Agent Chapter 3 Description of Proposed Activity Appendix C Certified Verification Agent Nomination Appendix G Conceptual Project Design Drawings
(7) All cables and pipelines, including cables on project easements	Location, design and installation methods, testing, maintenance, repair, safety devices, exterior corrosion protection, inspections, and decommissioning.	Chapter 3 Description of Proposed Activity
(8) A description of the deployment activities	Safety, prevention, and environmental protection features or measures that you will use.	Chapter 3 Description of Proposed Activity Appendix F Safety Management System Appendix I Oil Spill Response Plan Appendix BB Navigation Safety Risk Assessment Appendix HH Desk Study for Potential UXO Contamination Kitty Hawk Wind Farm – Virginia Beach
(9) A list of solid and liquid wastes generated	Disposal methods and locations.	Section 3.2.8 Oils, Fuels, and Project-related Waste
(10) A listing of chemical products used (if stored volume exceeds U.S. Environmental Protection Agency Reportable Quantities)	A list of chemical products used; the volume stored on location; their treatment, discharge, or disposal methods used; and the name and location of the onshore waste receiving, treatment, and/or disposal facility. A description of how these products would be brought onsite, the number of	Chapter 3 Description of Proposed Activity Appendix I Oil Spill Response Plan

Regulation		Location in COP
	transfers that may take place, and the quantity that that will be transferred each time.	
(11) A description of any vessels, vehicles, and aircraft you will use to support your activities	An estimate of the frequency and duration of vessel/vehicle/aircraft traffic.	Chapter 3 Description of Proposed Activity Appendix N Air Emissions Calculations and Methodology
(12) A general description of the operating procedures and systems	(i) Under normal conditions.	Section 3.3 Operations and Maintenance
	(ii) In the case of accidents or emergencies, including those that are natural or manmade.	Section 3.3 Operations and Maintenance Appendix F Safety Management System Appendix I Oil Spill Response Plan
(13) Decommissioning and site clearance procedures	A discussion of general concepts and methodologies.	Section 3.4 Decommissioning
(14) A listing of all Federal, State, and local authorizations, approvals, or permits that are required to conduct the proposed activities, including commercial operations.	(i) The U.S. Coast Guard, U.S. Army Corps Of Engineers, and any other applicable authorizations, approvals, or permits, including any Federal, State or local authorizations pertaining to energy gathering, transmission or distribution (e.g., interconnection authorizations).	Section 1.5 Regulatory Framework
	(ii) A statement indicating whether you have applied for or obtained such authorization, approval, or permit.	
(15) Your proposed measures for avoiding, minimizing, reducing, eliminating, and monitoring environmental impacts	A description of the measures you will use to avoid or minimize adverse effects and any potential incidental take before you conduct activities on your lease, and how you will mitigate environmental impacts from your proposed activities, including a description of the measures you will use as required by subpart H of this part.	Chapter 2 Project Siting and Design Development Chapter 4 Physical Resources Chapter 5 Biological Resources Chapter 6 Cultural Resources Chapter 7 Socioeconomic Resources Appendix FF Summary of Applicant-Proposed Avoidance, Minimization, and Mitigation Measures
(16) Information you incorporate by reference	A listing of the documents you referenced.	References are cited by chapter and within each appendix.

Regulation		Location in COP
(17) 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	Contact information and issues discussed.	Section 1.6 Agency and Public Outreach Section 7.2 Commercial and Recreational Fishing Appendix B Summary of Agency and Stakeholder Engagement
(18) Reference	A list of any document or published source that you cite as part of your plan. You may reference information and data discussed in other plans you previously submitted or that are otherwise readily available to BOEM.	References are cited by chapter and within each appendix.
(19) Financial assurance	Statements attesting that the activities and facilities proposed in your COP are or will be covered by an appropriate bond or security, as required by §§ 585.515 and 585.516.	Section 1.9 Financial Assurance
(20) CVA nominations for reports required in subpart G of this part	CVA nominations for reports in subpart G of this part, as required by § 585.706, or a request for a waiver under § 585.705(c).	Section 1.8 Certified Verification Agent Appendix C Certified Verification Agent Nomination
(21) Construction schedule	A reasonable schedule of construction activity showing significant milestones leading to the commencement of commercial operations.	Section 1.1.3 Schedule
(22) Air quality information	As described in § 585.659 of this section.	Section 4.3 Air Quality Appendix N Air Emissions Calculations and Methodology
(23) Other information	Additional information as required by BOEM.	Not Applicable
30 CFR § 585.627(a)		
(1) Hazard information	Meteorology, oceanography, sediment transport, geology, and shallow geological or manmade hazards.	Section 4.1 Physical and Oceanographic Conditions Section 4.2 Water Quality Appendix J Preliminary Cable Burial Risk Assessment Appendix K Marine Site Investigation Report

Regulation		Location in COP
		Appendix L Climatic Conditions Report Appendix M Sediment Transport Modeling Report Appendix HH Desk Study for Potential UXO Contamination Kitty Hawk Wind Farm – Virginia Beach
(2) Water quality	Turbidity and total suspended solids from construction.	Section 4.2 Water Quality Appendix M Sediment Transport Modeling Report
(3) Biological resources	Benthic communities,	Section 5.4 Benthic Resources and Finfish, Invertebrates, and Essential Fish Habitat Appendix V Benthic Resource Characterization Reports Appendix W Essential Fish Habitat Assessment
	marine mammals,	Section 5.5 Marine Mammals Appendix S Ornithological and Marine Fauna Aerial Survey Results
	sea turtles,	Section 5.6 Sea Turtles Appendix S Ornithological and Marine Fauna Aerial Survey Results
	coastal and marine birds,	Section 5.3 Bat and Avian Species Appendix S Ornithological and Marine Fauna Aerial Survey Results Appendix U Assessment of the Potential Effects of the Kitty Hawk Offshore Wind Project on Bats and Birds
	fish and shellfish,	Section 5.1 Wetlands and Waterbodies Section 5.4 Benthic Resources and Finfish, Invertebrates, and Essential Fish Habitat Appendix V Benthic Resource Characterization Reports Appendix W Essential Fish Habitat Assessment
	plankton,	
	seagrasses, and	
	plant life.	
(4) Threatened or endangered species	As defined by the Endangered Species Act of 1973 (16 U.S.C. §§ 1531 *et seq.*).	Section 5.3 Bat and Avian Species Section 5.4 Benthic Resources and Finfish, Invertebrates, and Essential Fish Habitat Section 5.5 Marine Mammals Section 5.6 Sea Turtles Appendix R Federal and State-Listed Species Mapping Tools Appendix S Ornithological and Marine Fauna Aerial Survey Results Appendix T Offshore Bat Acoustic Survey Report

Regulation		Location in COP
		Appendix U Assessment of the Potential Effects of the Kitty Hawk Offshore Wind Project on Bats and Birds Appendix V Benthic Resource Characterization Reports Appendix W Essential Fish Habitat Assessment
(5) Sensitive biological resources or habitats	Essential fish habitat,	Section 5.4 Benthic Resources and Finfish, Invertebrates, and Essential Fish Habitat Appendix V Benthic Resource Characterization Reports Appendix W Essential Fish Habitat Assessment
	refuges, preserves, special management areas identified in coastal management programs, sanctuaries, rookeries,	Section 7.7 Other Coastal and Marine Uses Appendix R Federal and State-Listed Species Mapping Tools
	hard bottom habitat, chemosynthetic communities,	Section 4.1 Physical and Oceanographic Conditions Section 5.4 Benthic Resources and Finfish, Invertebrates, and Essential Fish Habitat Appendix K Marine Site Investigation Report Appendix V Benthic Resource Characterization Reports
	calving grounds,	Section 5.5 Marine Mammals
	barrier islands, beaches, dunes, and wetlands.	Section 5.1 Wetlands and Waterbodies
(6) Archaeological resources	As required by the NHPA (16 U.S.C. §§ 470 *et seq.*), as amended.	Chapter 6 Cultural Resources Appendix X Marine Archaeological Resources Assessment Appendix Y Phase IA and Phase IB Archaeological Survey Reports Appendix GG Section 106 Supporting Materials
(7) Social and economic resources	Employment,	Section 7.8 Population, Economy, Employment, and Housing Appendix EE Economic Impact of Kitty Hawk Offshore Wind
	existing offshore and coastal infrastructure (including major sources of supplies, services, energy, and water), land use	Section 7.3 Marine Transportation and Navigation Section 7.5 Offshore Renewable Energy, Mineral Exploration, and Infrastructure Section 7.7 Other Coastal and Marine Uses Section 7.8 Population, Economy, Employment, and Housing Section 7.10 Land Use and Zoning

Regulation		Location in COP
		Section 7.11 Land Transportation and Traffic
	subsistence resources and harvest practices,	Section 7.2 Commercial and Recreational Fishing
	recreation, recreational and commercial fishing (including typical fishing seasons, location, and type),	Section 7.1 Recreation and Tourism Section 7.2 Commercial and Recreational Fishing Section 7.7 Other Coastal and Marine Uses
	minority and lower income groups,	Section 7.8 Population, Economy, Employment, and Housing Section 7.9 Environmental Justice Appendix EE Economic Impact of Kitty Hawk Offshore Wind
	coastal zone management programs, and	Appendix A Coastal Zone Management Act Consistency Certifications
	viewshed.	Section 6.3 Aboveground Historic Resources Section 6.4 Visual Resources Appendix Z Historic Resources Visual Effects Assessment Appendix AA Visual Impact Assessment
(8) Coastal and marine uses	Military activities,	Section 7.2 Commercial and Recreational Fishing Section 7.3 Marine Transportation and Navigation Section 7.4 Department of Defense and Outer Continental Shelf National Security Maritime Uses Section 7.5 Offshore Renewable Energy, Mineral Exploration, and Infrastructure Section 7.6 Aviation and Radar Section 7.7 Other Coastal and Marine Uses Appendix Q Radar and Navigational Aid Screening Study Appendix BB Navigation Safety Risk Assessment Appendix CC Obstruction Evaluation and Airspace Analysis Appendix DD Air Traffic Flow Analysis
	vessel traffic, and	
	energy and nonenergy mineral exploration or development.	
(9) Consistency certification	As required by the CZMA regulations: (i) 15 CFR part 930, subpart D, if your COP is submitted before lease issuance.	Section 1.5.1 Permits, Approvals, and Consultations Appendix A Coastal Zone Management Act Consistency Certifications

Regulation		Location in COP
	(ii) 15 CFR part 930, subpart E, if your COP is submitted after lease issuance.	
(10) Other resources, conditions, and activities	As identified by BOEM.	Not Applicable
30 CFR § 585.627(b)		
Consistency certification	(1) One copy of your consistency certification under either subsection 307(c)(3)(B) of the CZMA (16 U.S.C. § 1456(c)(3)(B)) and 15 CFR § 930.76 or subsection 307(c)(3)(A) of the CZMA (16 U.S.C. § 1456(c)(3)(A)) and 15 CFR § 930.57, stating that the proposed activities described in detail in your plans comply with the State(s) approved coastal management program(s) and will be conducted in a manner that is consistent with such program(s); and (2) "Necessary data and information," as required by 15 CFR § 930.58.	Section 1.5.1 Permits, Approvals, and Consultations (1) Appendix A Coastal Zone Management Act Consistency Certifications (2) Necessary data and information is provided in the COP.
30 CFR § 585.627(c)		
Oil spill response plan	As required by 30 CFR part 254.	Appendix I Oil Spill Response Plan
30 CFR § 585.627(d)		
Safety management system	As required by 30 CFR § 585.810.	Appendix F Safety Management System

1.1.2 Company Overview

AVANGRID, Inc. (NYSE: AGR) is a leading, sustainable energy company with $36 billion in assets and operations in 24 United States (U.S.) states. AVANGRID has two primary lines of business: Avangrid Networks and Avangrid Renewables. Avangrid Networks owns eight electric and natural gas utilities, serving 3.25 million customers in New York and New England. Avangrid Renewables owns and operates approximately 7,600 megawatts (MW) of electricity capacity, primarily through wind power, with a presence in 22 states across the U.S. AVANGRID employs approximately 6,600 people. AVANGRID supports the United Nations' Sustainable Development Goals and was awarded Compliance Leader Verification by Ethisphere, a prestigious third-party verification of its ethics and compliance program. AVANGRID is part of the IBERDROLA Group. Iberdrola S.A. is an energy pioneer with one of the largest renewable asset bases of any company in the world, with more than 32,000 MW of renewable energy spread across a dozen countries. A company with a 170-year history, Iberdrola S.A. employs more than 35,000 people in nearly 40 countries and has placed the environment and sustainable development at the center of its global strategy.

The applicant of this COP is Kitty Hawk Wind, LLC, a wholly owned subsidiary of Avangrid Renewables, LLC. Avangrid Renewables, LLC is wholly owned by AVANGRID, Inc. Avangrid Renewables, LLC is a leader in the renewable energy industry in the U.S. and is the nation's third-largest renewable energy operators. Avangrid Renewables, LLC is playing a leading role in the growing U.S. offshore wind industry, a reliable source of clean energy with significant job-creation potential in the U.S., with the mission to lead America's energy transformation to a competitive, clean energy future. The company is headquartered in Portland, Oregon and has regional offices in Boston, Philadelphia, Chicago, and Austin as well as a Project office in the City of Virginia Beach.

Avangrid Renewables, LLC is a joint owner of the Vineyard Wind 1 Offshore Wind Project, an 800 MW offshore wind project (Lease OCS-A 0501) off the coasts of Martha's Vineyard and Nantucket, Massachusetts. The Vineyard Wind 1 project is a joint venture between Avangrid Renewables, LLC and Copenhagen Infrastructure Partners. Additionally, Avangrid Renewables, LLC and Copenhagen Infrastructure Partners, as Vineyard Wind LLC, are developing the 800 MW Vineyard Wind 1 project off Massachusetts with Lease OCS-A 0501. In addition, Avangrid Renewables, LLC has taken 100% ownership of the OCS-A 0534 Lease Area that includes the Park City Wind project in the northern half of the lease. The Park City Wind project will supply 804 MW to the State of Connecticut. Park City Wind will generate approximately $890 million in direct economic benefits and thousands of jobs over the life of the project. Park City Wind plans to base its operations and maintenance hub in Bridgeport, Connecticut.

1.1.3 Schedule

A schedule for the construction and development of the Project is provided in Table 1.1-2. The schedule presumes that all permits and authorizations will be received prior to the start of onshore construction in Q1 2027 and offshore construction in Q2 2027. Start of operations is anticipated at the end of Q1 2029. Construction schedules are subject to various factors, for example, state and federal permitting approvals, financial investment decisions, power purchase agreements, and supply chain considerations that may result in the construction being deferred to a later date.

Table 1.1-2 Schedule a/

Activity	2026				2027				2028				2029			
	Q4	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Large Generator Interconnection Agreement																
Wind turbine generator (WTG) foundation installation																
Transition piece installation																
WTG installation																
WTG commissioning																
Electrical service platform (ESP) foundation installation																
ESP topside installation and commissioning																
Offshore export cable installation																
Inter-array cable installation																
Onshore export cable installation																
Onshore substation and switching station construction																
Landfall construction																

Note:
a/ The construction schedule will be adjusted according to the Company's PJM Interconnection Large Generator Interconnection Agreement timeline.

1.2 Project Design Envelope

Development of an offshore wind facility is an extensive and complex process spanning several years. While it is not possible to finalize a plan for development at the time of the COP submittal, the Company has presented a reasonable range of designs associated with the Project. In Europe, it is a standard practice for offshore wind energy developers to present a range of potential final design parameters through a realistic maximum design scenario approach to the assessment and in the U.S.; this is supported by BOEM's *Draft Guidance Regarding the Use of a Project Design Envelope in a Construction and Operations Plan* (BOEM 2018). This is achieved by assessing the maximum parameters for key components (i.e., wind turbine generators [WTGs], foundations, and installation methodologies) within which the Project will be limited. By assessing the realistic maximum design scenario for each component, the environmental, cultural, and social impact assessment can be robust while allowing for flexibility further on in the development process. This process and set of parameters adopted for a specific project is referred to as a PDE.

The primary goal of applying a PDE is to allow for meaningful assessments by the jurisdictional agencies of the proposed project activities, while concurrently providing the Lessee reasonable flexibility to make prudent development and design decisions prior to construction. Offshore wind technologies are rapidly advancing and evolving, and the flexibility to take advantage of industry advancements and innovative technologies as a project progresses through development is critical to ensuring that the most technologically sound, environmentally appropriate, and cost-effective project is constructed. In addition, as a project progresses through the permitting process and ongoing consultations, flexibility is needed to be able to effectively apply feedback, new design data, and permitting conditions placed on the project.

In an effort to analyze and apply industry-wide best practices in the U.S., BOEM funded a one-year study entitled *Phased Approaches to Offshore Wind Developments and Use of the Project Design Envelope, Final Technical Report* (Rowe et al. 2017). The study provided the foundation for BOEM's *Draft Guidance Regarding the Use of a Project Design Envelope in a Construction and Operations Plan* (2018) and defined a design envelope as "a reasonable range of project designs" associated with various components of the project (i.e., WTGs, foundations, and installation methodologies) (BOEM 2018). The design envelope is used to assess the potential impacts on key environmental and human use resources (e.g., marine mammals, fish, benthic habitats, commercial fisheries, navigation) focusing on the design parameter (within the defined range) that represents the realistic maximum design scenario for each unique resource (Rowe et al. 2017).

The definition of what is considered the realistic maximum design scenario varies based on the potentially impacted resource and is provided at the beginning of each subsection within Chapters 4 through 7; the Maximum Project Design Scenario is detailed in Chapter 3 Description of Proposed Activity. The Company has ensured that only 'realistic' development scenarios are considered when defining these maximum dimensions for any given asset or activity. In keeping with the guidance, the Project has developed a maximum design scenario that allows for a robust assessment of the maximum impact while also allowing the efficient and effective utilization of a renewable resource over the long-term within the wind energy area. For example, the largest foundation sizes are included in the application; the largest foundations that would support the range of WTG technologies are reasonably foreseeable. The range of options in the PDE applies to the entire Wind Development Area developed within this Project but does not apply to all of the Lease Area.

The Company will continue to progress detailed design and engineering studies in order to identify conditions and the Project components that would be best suited to the Project Area. Once regulatory permissions have been obtained, a Facility Design Report and Fabrication and Installation Report will be submitted to BOEM. These reports will be reviewed by the selected Certified Verification Agent (CVA) prior to the commencement of any fabrication or construction activities.

Details regarding the PDE for the Project are provided in Chapter 3 Description of Proposed Activity. A summary of PDE parameters is provided in Table 1.2-1.

Table 1.2-1 Summary of PDE Parameters

Project Parameter Details	
General (Layout and Project Size)	
• Up to 70 locations	• Anticipated to begin construction no earlier than 2027
Foundations	
• Installation of one or more foundation types: monopile, piled jacket, and up to three suction caisson jacket • Installation using hammered pile driving (for monopiles and/or piled jacket foundations); drilling of sediment may be required to reduce resistance • Scour protection may be installed around all foundation types	
Wind Turbine Generators	
• Up to 69 WTGs • Rotor diameter up to 285 meters (m) • Hub height up to 175 m above mean sea level • Tip height up to 317.5 m above mean sea level • Lowest blade tip height 27 m above mean sea level	
Inter-Array Cables	
• 66 or 132-kilovolt, 3-core cables buried up to 1.5 to 2.5 m beneath the seabed • Maximum total cable length 240 km • Jet trencher, mechanical trencher, and free-lay and post-lay burial installation • Proposed protection if target cable burial depth is not achieved includes rock armor, gabion rock bags, concrete mattresses, and protective half-shells	
Offshore Export Cables	
• Up to two 275-kilovolt export cables buried up to 1.5 to 2.5 m beneath the seabed • Minimum separation distance between circuits is 50 m a/ • Maximum total corridor length is 80 km • Jet trenching, jet plow, mechanical plow, and free-lay and post-lay burial installation, with dredging in some locations to achieve burial depth • Proposed protection if target cable burial depth is not achieved includes rock armor, gabion rock bags, concrete mattresses, and protective half-shells	
Electrical Service Platform	
• One ESP • ESP installed atop monopile, piled jacket, or suction caisson jacket foundation	
Onshore Facilities	
• Landfall of export cables will be completed via horizontal directional drilling • Construction work area for the onshore substation site at Corporate Landing to disturb up to 13.1 ha • Onshore transmission and interconnection cables with total maximum cable length of 8.9 km • Up to six 275-kilovolt onshore export cables and two fiber optic cables • Up to 31.7 ha of disturbed area for the onshore export cable corridors	
Construction and Operations & Maintenance Facilities	
• Portsmouth, Virginia • Newport News, Virginia	• Cape Charles, Virginia • Chesapeake, Virginia
Note: a/ Separation distance between cables is based on site-specific conditions (e.g., water depth and seabed constraints). Circuits will be separated by a minimum of 50 m or four times the water depth, whichever is greater.	

1.3 Commercial Lease Conditions and Compliance

Kitty Hawk Wind, LLC has been and will continue to be in compliance with all Lease conditions throughout the Lease term. Kitty Hawk Wind, LLC's compliance with Lease conditions is detailed in Table 1.3-1.

Table 1.3-1 Commercial Lease Conditions and Compliance

Lease Condition	Description	Statement of Compliance
Section 4: Payments	(a) The Lessee must make all rent payments to the Lessor in accordance with applicable regulations in 30 CFR Part 585, unless otherwise specified in Addendum "B."	Kitty Hawk Wind, LLC agrees to and will comply with this condition.
	(b) The Lessee must make all operating fee payments to the Lessor in accordance with applicable regulations in 30 CFR Part 585, as specified in Addendum "B."	Kitty Hawk Wind, LLC agrees to and will comply with this condition.
Section 5: Plans	The Lessee may conduct those activities described in Addendum "A" only in accordance with a COP approved by the Lessor. The Lessee may not deviate from an approved COP except as provided in applicable regulations in 30 CFR Part 585.	Kitty Hawk Wind, LLC agrees to and will comply with this condition.
Section 6: Associated Project Easement(s)	Pursuant to 30 CFR 585.200(b), the Lessee has the right to one or more project easement(s), without further competition, for the purpose of installing gathering, transmission, and distribution cables, pipelines, and appurtenances on the OCS, as necessary for the full enjoyment of the lease, and under applicable regulations in 30 CFR Part 585. As part of submitting a COP for approval, the Lessee may request that one or more easement(s) be granted by the Lessor. If the Lessee requests that one or more easement(s) be granted when submitting a COP for approval, such project easements will be granted by the Lessor in accordance with the Act and applicable regulations in 30 CFR Part 585 upon approval of the COP in which the Lessee has demonstrated a need for such easements. Such easements must be in a location acceptable to the Lessor, and will be subject to such conditions as the Lessor may require. The project easement(s) that would be issued in conjunction with an approved COP under this lease will be described in Addendum "D" to this lease, which will be updated as necessary.	Kitty Hawk Wind, LLC agrees to and will comply with this condition.
Section 7: Conduct of Activities	The Lessee must conduct, and agrees to conduct, all activities in the leased area and project easement(s) in accordance with an approved COP, and with all applicable laws and regulations. The Lessee further agrees that no activities authorized by this lease will be carried out in a manner that: (a) could unreasonably interfere with or endanger activities or operations carried out under any lease or grant issued or maintained pursuant to the Act, or under any other license or approval from any Federal agency; (b) could cause any undue harm or damage to the environment; (c) could create hazardous or unsafe conditions; or (d) could adversely affect sites, structures, or objects of historical, cultural, or archaeological significance, without notice to and direction from the Lessor on how to proceed.	Kitty Hawk Wind, LLC agrees to and will comply with this condition.

Lease Condition	Description	Statement of Compliance
Section 9: Indemnification	The Lessee hereby agrees to indemnify the Lessor for, and hold the Lessor harmless from, any claim caused by or resulting from any of the Lessee's operations or activities on the leased area or project easement(s) or arising out of any activities conducted by or on behalf of the Lessee or its employees, contractors (including Operator, if applicable), subcontractors, or their employees, under this lease, including claims for: (a) loss or damage to natural resources, (b) the release of any petroleum or any Hazardous Materials, (c) other environmental injury of any kind, (d) damage to property, (e) injury to persons, and/or (f) costs or expenses incurred by the Lessor. Except as provided in any addenda to this lease, the Lessee will not be liable for any losses or damages proximately caused by the activities of the Lessor or the Lessor's employees, contractors, subcontractors, or their employees. The Lessee must pay the Lessor for damage, cost, or expense due and pursuant to this section within 90 days after written demand by the Lessor. Nothing in this lease will be construed to waive any liability or relieve the Lessee from any penalties, sanctions, or claims that would otherwise apply by statute, regulation, operation of law, or could be imposed by the Lessor or other government agency acting under such laws. (*See Lease document for definition of "Hazardous Material"*).	Kitty Hawk Wind, LLC agrees to and will comply with this condition.
Section 10: Financial Assurance	The Lessee must provide and maintain at all times a surety bond(s) or other form(s) of financial assurance approved by the Lessor in the amount specified in Addendum "B." As required by the applicable regulations in 30 CFR Part 585, if, at any time during the term of this lease, the Lessor requires additional financial assurance, then the Lessee must furnish the additional financial assurance required by the Lessor in a form acceptable to the Lessor within 90 days after receipt of the Lessor's notice of such adjustment.	Kitty Hawk Wind, LLC agrees to and will comply with this condition.
Section 13: Removal of Property and Restoration of the Lease Area and Project Easement(s) on Termination of Lease	Unless otherwise authorized by the Lessor, pursuant to the applicable regulations in 30 CFR Part 585, the Lessee must remove or decommission all facilities, projects, cables, pipelines, and obstructions and clear the seafloor of all obstructions created by activities on the leased area and project easement(s) within two years following lease termination, whether by expiration, cancellation, contraction, or relinquishment, in accordance with any approved Site Assessment Plan, COP, or approved Decommissioning Application, and applicable regulations in 30 CFR Part 585.	Kitty Hawk Wind, LLC agrees to and will comply with this condition.

Lease Condition	Description	Statement of Compliance
Section 14: Safety Requirements	The Lessee must: a. maintain all places of employment for activities authorized under this lease in compliance with occupational safety and health standards and, in addition, free from recognized hazards to employees of the Lessee or of any contractor or subcontractor operating under this lease; b. maintain all operations within the leased area and project easement(s) in compliance with regulations in 30 CFR Part 585 and orders from the Lessor and other Federal agencies with jurisdiction, intended to protect persons, property and the environment on the OCS; and c. provide any requested documents and records, which are pertinent to occupational or public health, safety, or environmental protection, and allow prompt access, at the site of any operation or activity conducted under this lease, to any inspector authorized by the Lessor or other Federal agency with jurisdiction.	Kitty Hawk Wind, LLC agrees to and will comply with this condition.
Section 15: Debarment Compliance	The Lessee must comply with the Department of the Interior's non-procurement debarment and suspension regulations set forth in 2 CFR Parts 180 and 1400 and must communicate the requirement to comply with these regulations to persons with whom it does business related to this lease by including this requirement in all relevant contracts and transactions.	Kitty Hawk Wind, LLC agrees to and will comply with this condition.
Section 16: Equal Opportunity Clause	During the performance of this lease, the Lessee must fully comply with paragraphs (1) through (7) of section 202 of Executive Order 11246, as amended (reprinted in 41 CFR 60- 1.4(a)), and the implementing regulations, which are for the purpose of preventing employment discrimination against persons on the basis of race, color, religion, sex, or national origin. Paragraphs (1) through (7) of section 202 of Executive Order 11246, as amended, are incorporated in this lease by reference.	Kitty Hawk Wind, LLC agrees to and will comply with this condition.
Section 18: Notices	All notices or reports provided from one party to the other under the terms of this lease must be in writing, except as provided herein and in the applicable regulations in 30 CFR Part 585. Written notices and reports must be delivered to the Lessee's or Lessor's Lease Representative, as specifically listed in Addendum "A," either electronically, by hand, by facsimile, or by United States first class mail, adequate postage prepaid. Each party must, as soon as practicable, notify the other of a change to their Lessee's or Lessor's Contact Information listed in Addendum "A" by a written notice signed by a duly authorized signatory and delivered by hand or United States first class mail, adequate postage prepaid. Until such notice is delivered as provided in this section, the last recorded contact information for either party will be deemed current for service of all notices and reports required under this lease. For all operational matters, notices and reports must be provided to the party's Operations Representative, as specifically listed in Addendum "A," as well as the Lease Representative.	Kitty Hawk Wind, LLC agrees to and will comply with this condition.

Lease Condition	Description	Statement of Compliance
Addendum B – Lease Term and Financial Schedule; Section III – Payments	Unless otherwise authorized by the Lessor in accordance with the applicable regulations in 30 CFR Part 585, the Lessee must make payments as described below. (*See Lease document for payment schedule*).	Kitty Hawk Wind, LLC agrees to and will comply with this condition.

1.4 Purpose and Need

The goals of the Kitty Hawk North Wind Project are to:

- Deliver sustainable, safe, and healthy domestic energy generation for all Americans through the responsible production of electricity using wind turbine generators.
- Efficiently and responsibly construct and operate an offshore wind energy facility that enhances the quality and long-term productivity of a renewable wind resources located on the OCS.
- Deploy technically and economically feasible technologies that maximize the sustainable electrical generation within, and as described in, Lease Area OCS-A 0508 located in a federally designated WEA.
- Contribute to the federal goal of delivering 30 gigawatts of offshore wind in the U.S. by 2030.[2]
- Contribute to the Commonwealth of Virginia enacted Virginia Clean Economy Act mandated to procure 5.2 gigawatts of offshore wind by 2034.

The Project will meet these goals by delivering domestic renewable energy from up to 69 WTGs to Virginia where it will be injected into the PJM Interconnection's energy grid to make a substantial contribution to the region's electrical reliability and energy security, in alignment with the clean energy mandates included in the Virginia Clean Economy Act.

In addition to these clean energy goals, the Project will create employment opportunities within Virginia and the region, as well as increase tax revenues for both state and local governments (see Section 7.8 Population, Economy, Employment, and Housing and Appendix EE Economic Impact of Kitty Hawk Offshore Wind). These include:

- Over $665 million dollars in total economic impact is projected to be generated by the Project over the next six years in Virginia and northeast North Carolina.
- Construction activities will increase sales by Virginia businesses over the next six years by an average of $503 million, of which $338 million will be in Hampton Roads.
- During construction, the Project will increase total net household earnings by an average of $132 million in Virginia, of which $93 million will be in Hampton Roads.
- Over a six-year period, the Project will generate an additional $32 million in income and sales tax revenues for the Commonwealth of Virginia and the City of Virginia Beach.
- Construction-related activities will result in an average estimated increase in employment of 470 jobs annually in Virginia. Once construction is complete, the Project will support over 400 full time equivalent new jobs in Virginia, of which 366 jobs will be in the Hampton Roads region.

[2] https://www.whitehouse.gov/briefing-room/statements-releases/2021/03/29/fact-sheet-biden-administration-jumpstarts-offshore-wind-energy-projects-to-create-jobs/

- It is expected that the Project, and the full build-out of all phases, will attract new offshore wind parts manufacturers and suppliers to Virginia or Hampton Roads, making the economic and fiscal impacts of the project larger than those currently estimated.

In support of these goals, the Company is submitting this COP to BOEM. The purpose and need of the federal agency action in response to the Kitty Hawk North Wind Project COP submittal is to determine whether to approve, approve with modifications, or disapprove the COP to construct, operate, and decommission the Project within Lease Area OCS-A 0508.

1.4.1 Virginia Clean Economy Act and other State initiatives

To combat climate change, the Commonwealth of Virginia enacted the Virginia Clean Economy Act in April 2020 to transition Virginia's biggest utility companies from the current electric portfolio to 100 percent carbon-free resources by 2050. The Act sets a target for Dominion Energy Virginia to produce their electricity from 100 percent renewable sources by 2045, with 5.2 gigawatts of offshore wind by 2034. The Lease Area is one of two existing BOEM lease areas eligible to meet the offshore wind target. Dominion Energy Virginia included 5.2 gigawatts of offshore wind in its proposed path to meet carbon and legislatively mandated renewable energy goals in its most recent Integrated Resource Plan (VEPC 2020). The Commonwealth of Virginia has established the third-largest U.S. offshore wind commitment. Energy from the Project will be essential to enabling the Commonwealth of Virginia and Dominion Energy Virginia to meet this clean energy objective.

Additionally, the Commonwealth of Virginia, State of North Carolina, and State of Maryland have established the Southeast and Mid-Atlantic Regional Transformative Partnership for Offshore Wind Energy Resources (SMART-POWER) to "promote, develop, and expand offshore wind energy generation and the accompanying industry supply chain and workforce" in the region (SMART-POWER 2020). Development of the Project will help SMART-POWER promote the region as an offshore wind energy and industry hub and build the region's supply of clean, renewable energy.

1.5 Regulatory Framework

1.5.1 Permits, Approvals, and Consultations

The Outer Continental Shelf Lands Act delegated authority to the Secretary of the Interior over mineral exploration and development of the OCS (Title 43, Chapter 29, Subchapter I, Section 1301), including the issuance of oil and gas leases to the "highest responsible qualified bidder" through a competitive bidding process (43 U.S.C. 1337). In 2005, the Outer Continental Shelf Lands Act was amended to authorize the Department of the Interior to issue submerged lands leases for alternate uses and alternative energy development on the OCS (Section 388 of the Energy Policy Act of 2005). Through this amendment and subsequent delegation by the Secretary of the Interior, BOEM has the authority to issue these leases and regulate activities that occur on the OCS, including the authorization of a COP.

The Bureau of Ocean Energy Management will serve as the lead federal agency throughout the permitting process of the COP. BOEM will also authorize an easement that will be necessary for the portion of the offshore export cables that is located in federal waters outside of the Lease Area.

As part of the COP approval process, BOEM must ensure that any activities approved are safe, conserve natural resources on the OCS, are undertaken in coordination with relevant federal agencies, provide a fair return to the U.S., and are compliant with all applicable laws and regulations (30 CFR § 585.102). This includes the National Environmental Policy Act, which requires the preparation of an environmental impact statement for any major federal action significantly affecting the quality of the human environment.

The Outer Continental Shelf Lands Act and National Environmental Policy Act are the primary federal regulations for the development of a renewable energy facility within the Lease Area; other federal, state,

and local regulations also have authority over the Project, given the location of the Project components. A list of the required approvals and consultations is provided in Table 1.5-1. At this time, the Company has not applied for other federal or state permits associated with construction and operations of the Project.

On 04 Dec 2015, President Obama signed into law the Fixing America's Surface Transportation (FAST) Act. The purpose of Title 41 of the FAST Act (FAST-41) (42 U.S.C. §§ 4370m *et seq.*) is "to improve the timeliness, predictability, and transparency of the federal environmental review and authorization process for covered infrastructure projects" (Performance.gov 2016). As of 12 Mar 2021, the Project is a Covered Project under FAST-41 with a schedule of the Environmental Review and Permitting processes provided on the Permitting Dashboard for Federal Infrastructure Projects. Updates are available online at: https://www.permits.performance.gov/permitting-project/kitty-hawk-offshore-wind-project. The schedule provided in Table 1.5-1 is consistent with the Permitting Dashboard as of 20 Jul 2021.

As Project components are proposed to be located in the Commonwealth of Virginia, approvals from the applicable state and local regulatory agencies will also be required. Additionally, while no Project components are proposed within North Carolina, the Project will be consistent with the enforceable policies of North Carolina's federally approved Coastal Zone Program (Appendix A Coastal Zone Management Act Consistency Certifications). At the state level, the Virginia Marine Resources Commission will issue a Submerged Lands Permit for the portions of the Project located in state waters under the Virginia Code and regulations. Virginia Marine Resources Commission and the Virginia Department of Environmental Quality will issue a joint permit called a Joint Tidal Wetland Permit and Virginia Water Protection Individual Permit pursuant to the Virginia Code and the Section 401 Water Quality Certification requirements of the federal Clean Water Act. Virginia Department of Environmental Quality also requires that the Project submit an air permit application under the Clean Air Act for marine vessels or other equipment used to construct and/or operate the Project.

Table 1.5-1 Required Approvals and Consultations

Regulatory Agency	Permit or Approval	Status
Federal		
BOEM	Outer Continental Shelf Lands Commercial Lease	Effective 01 Nov 2017
	Site Assessment Plan	Approved 08 Apr 2020
	COP	Submitted 11 Dec 2020
U.S. Army Corps of Engineers Norfolk District	Section 10 Permit for structure in navigable U.S. waters	Anticipated submittal Q4 2023
	Section 404 Dredge Discharge Permit in navigable U.S. waters	Anticipated submittal Q4 2023
	Section 408 Permit to modify, alter, or occupy any existing U.S. Army Corps of Engineers-constructed public works project	Anticipated submittal Q4 2023
National Oceanographic and Atmospheric Administration's National Marine Fisheries Service	Section 7 Consultation under the Endangered Species Act of 1973	Concurrent with BOEM's review of the COP
	Endangered Species Act Incidental Take Permit, if necessary	Anticipated submittal Q1 2023
	Marine Mammal Protection Act Incidental Harassment Authorization or Letter of Authorization	Anticipated submittal Q1 2023
	Magnuson-Stevens Fishery Conservation and Management Act	Concurrent with BOEM's review of the COP

Regulatory Agency	Permit or Approval	Status
Advisory Council on Historic Preservation	NHPA Section 106 Consultation	Concurrent with BOEM's review of the COP
U.S. Coast Guard, Sector Virginia, Sector Hampton Roads	Approval for Private Aids to Navigation	4 weeks prior to offshore construction
	Local Notice to Mariners / Broadcast Notice to Mariners	2 weeks prior to offshore construction
U.S. Department of Defense	Consultation	Concurrent with BOEM's review of the COP
U.S. Environmental Protection Agency, Region 4, Air Programs Branch	OCS Air Quality Permit and General Conformity Determination	Anticipated submittal Q3 2025
State		
Virginia Department of Environmental Quality	Concurrence with Federal Consistency Certification	Concurrence provided 27 Sep 2021
Virginia Marine Resources Commission	Submerged Lands Permit	Anticipated submittal Q3 2023
Virginia Department of Environmental Quality	Water Quality Certification	Anticipated submittal Q3 2023
	Construction Stormwater General Permit Authorization	Anticipated submittal Q1 2026
	National Pollutant Discharge Elimination System Permit	Anticipated submittal Q1 2026
North Carolina Division of Coastal Management	Concurrence with Federal Consistency Certification	Submitted 05 Aug 2021
North Carolina State Historic Preservation Office	NHPA Section 106 Consultation	Concurrent with BOEM's review of the COP
Virginia Department of Historic Resources	NHPA Section 106 Consultation	Concurrent with BOEM's review of the COP

1.6 Agency and Public Outreach

Since November 2017, the Company has undertaken a comprehensive engagement and outreach campaign. The purpose of this stakeholder engagement program has been to solicit feedback from Project stakeholders, including federal, state, and local regulatory and resource management agencies, elected officials, interest groups, and the public. The input from stakeholders will advance the permitting and development process and create positive awareness of the Project by highlighting local community, state-wide, and regional benefits. The following is a summary of those agencies and organizations:

- Bureau of Ocean Energy Management;
- U.S. Fish and Wildlife Service;
- U.S. Environmental Protection Agency;
- National Oceanic and Atmospheric Administration's National Marine Fisheries Service;
- U.S. Coast Guard;
- U.S. Department of Defense;
- U.S. Army Corps of Engineers Norfolk and Wilmington Districts;
- National Park Service;

- Nansemond Indian Nation Tribe;
- Chickahominy Tribe;
- Pamunkey Tribe;
- Virginia Marine Resources Commission;
- Virginia Department of Historic Resources;
- Virginia Department of Wildlife Resources;
- Virginia Department of Mines, Minerals, and Energy;
- Virginia Department of Environmental Quality;
- North Carolina Division of Marine Fisheries;
- North Carolina Department of Natural and Cultural Resources;
- North Carolina Department of Environmental Quality;
- North Carolina Wildlife Resources Commission;
- Virginia Port Authority;
- Virginia Maritime Association;
- World Shipping Council;
- Chamber of Shipping of America; and
- Virginia Pilot Association.

A more detailed summary of the agency coordination and outreach meetings conducted on behalf of the Project is provided in Appendix B Summary of Agency and Stakeholder Engagement. See Section 7.2 Commercial and Recreational Fishing for more information regarding engagement with the fishing communities.

1.7 Authorized Representative

The Company will be the operator of the Project. The contact information for an authorized representative for the Project is as follows:

Table 1.7-1 Contact Information

Name of Authorized Representative	Megan Higgins
Title	Sr. Director of Offshore Business Development, Avangrid Renewables, LLC
Email	KittyHawk@avangrid.com
Address	125 High Street, 6th Floor, Boston, Massachusetts 02110

1.8 Certified Verification Agent

Pursuant to 30 CFR § 585.705, a CVA must be engaged to certify to BOEM that the proposed facility is designed to withstand the environmental and functional load conditions for the intended life of a project at its proposed location. In accordance with 30 CFR § 585.706, the Company is including with this COP a CVA nomination for BOEM approval. The CVA Nomination is included as Appendix C under confidential cover.

1.9 Financial Assurance

In accordance with 30 CFR § 585.516, the Company is required to provide BOEM a supplemental bond, a decommissioning bond, or other financial assurance to assure that Lessee obligations can be fulfilled prior to issuance of the COP. BOEM, however, has the authority to allow evidence of financial strength and reliability to meet financial assurance requirements, as detailed in 30 CFR § 585.527.

The Company has a strong financial standing and a long history of undertaking, self-funding, or obtaining the necessary financing for large infrastructure projects in a responsible manner. Demonstration of financial strength as required by 30 CFR § 585.527 will be provided during the COP process.

1.10 Design Standards

BOEM has acknowledged in its *Information Guidelines for a Renewable Energy Construction and Operations Plan* (2020) that there is no single, comprehensive design standard yet to be applied for an offshore wind energy installation in the U.S. (see Appendix C, Section I referring to 30 CFR 585.626(b)(6)). Further, the *Guidelines* state that "[f]or offshore wind turbines, BOEM will accept a 'design-basis' approach whereby the applicant proposes which criteria and standards to apply, and then justifies why each particular criterion and standard is appropriate" (Appendix C, Section I). The Company has created a Preliminary Hierarchy of Standards, provided in Appendix D to inform the Project design and development process.

1.11 References

See Table 1.11-1 for data sources used in the preparation of this chapter.

Table 1.11-1 Data Sources

Source	Includes	Available at	Metadata Link
BOEM	Lease Area	https://www.boem.gov/BOEM-Renewable-Energy-Geodatabase.zip	N/A
BOEM	State Territorial Waters Boundary	https://www.boem.gov/Oil-and-Gas-Energy-Program/Mapping-and-Data/ATL_SLA(3).aspx	http://metadata.boem.gov/geospatial/OCS_SubmergedLandsActBoundary_Atlantic_NAD83.xml
National Oceanic and Atmospheric Administration	Territorial Sea (12-Nautical Mile Limit)	http://maritimeboundaries.noaa.gov/downloads/USMaritimeLimitsAndBoundariesSHP.zip	https://inport.nmfs.noaa.gov/inport-metadata/NOAA/NOS/OCS/inport/xml/39963.xml

BOEM (Bureau of Ocean Energy Management). 2018. *Draft Guidance Regarding the Use of a Project Design Envelope in a Construction and Operations Plan.* U.S. Department of the Interior, Bureau of Ocean Energy Management, Office of Renewable Energy Programs. Available online at: https://www.boem.gov/sites/default/files/renewable-energy-program/Draft-Design-Envelope-Guidance.pdf. Accessed 20 Oct 2020.

BOEM. 2020. *Information Guidelines for a Renewable Energy Construction and Operations Plan (COP)*. U.S. Department of the Interior, Bureau of Ocean Energy Management, Office of Renewable Energy Programs. Available online at: https://www.boem.gov/sites/default/files/documents/about-boem/COP%20Guidelines.pdf. Accessed 20 Oct 2020.

Performance.gov. 2016. "Fast-41." Available online at: https://www.permits.performance.gov/about/fast-41. Accessed 01 Dec 2020.

Rowe, J., A. Payne, A. Williams, D. O'Sullivan, and A. Morandi. 2017. *Phased Approaches to Offshore Wind Developments and Use of Project Design Envelope*. Final Technical Report to the U.S. Department of the Interior, Bureau of Ocean Energy Management, Office of Renewable Energy Programs. OCS Study BOEM 2017-057. 161 pp. Available online at: https://www.boem.gov/sites/default/files/environmental-stewardship/Environmental-

Studies/Renewable-Energy/Phased-Approaches-to-Offshore-Wind-Developments-and-Use-of-Project-Design-Envelope.pdf. Accessed 20 Oct 2020.

SMART-POWER. 2020. *Memorandum of Understanding Among Maryland, North Carolina, and Virginia to Create the Southeast and Mid-Atlantic Regional Transformative Partnership for Offshore Wind Energy Resources (SMART-POWER)*. Available online at: https://www.governor.virginia.gov/media/governorvirginiagov/governor-of-virginia/pdf/SMART-POWER-MOU_FINAL.pdf. Accessed 04 Nov 2020.

VEPC (Virginia Electric Power Company). 2020. *Virginia Electric and Power Company's Report of Its Integrated Resource Plan*. Available online at: https://www.dominionenergy.com/-/media/pdfs/global/2020-va-integrated-resource-plan.pdf?la=en&rev=fca793dd8eae4ebea4ee42f5642c9509. Accessed 03 Nov 2020.