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January 26, 2012

Ms. Ellie Irons  
Program Manager, Office of Environmental Impact Review  
Virginia Department of Environmental Quality  
629 East Main Street, 6<sup>th</sup> Floor  
Richmond, VA 23219

**Re: *Federal Consistency Certification  
Pursuant to the Coastal Zone Management Act  
For The Gamesa G11X Offshore Wind Turbine Project  
Lower Chesapeake Bay, Cape Charles, Virginia***

Dear Ms. Irons:

Attached please find a copy of the federal consistency certification prepared by ESS Group, Inc. on behalf of Gamesa Energy USA, LLC in joint development with Newport News Shipbuilding (Gamesa), to install and operate the Gamesa G11X Offshore Wind Turbine Project (the Project) in the nearshore and subaqueous tidelands of Lower Chesapeake Bay and lands in Northampton County. The Project will be located entirely within the Tidewater Virginia Designated Coastal Management Area. The Project consists of the installation and operation of a single 5-Megawatt (MW) offshore wind turbine generator prototype and its supporting infrastructure at Cape Charles, Virginia. The offshore G11X will be located in Virginia waters approximately three miles southwest of Cape Charles, off the western side of the Delmarva Peninsula. A Standard Joint Permit Application for the Project has been submitted to the Virginia Marine Resources Commission and the United States Army Corps of Engineers – Norfolk District.

The Project has been carefully sited and designed to avoid minimize and mitigate impacts to the waters and submerged lands of the United States within the Commonwealth of Virginia and to environmental resources subject to review under state and federal regulations and accordingly is consistent with the enforceable provisions of the Virginia Coastal Zone Management Program.

We respectfully request that you distribute the attached certification to the appropriate cooperating state agencies for comments and concurrence.

If you have any questions, please contact me at 401-330-1206 or [swood@essgroup.com](mailto:swood@essgroup.com). We look forward to your review and comments.

Sincerely,

**ESS GROUP, INC.**

Stephen Wood  
Vice President

Attachments: Federal Consistency Certification

C: Dan Renshaw – Gamesa  
Todd Hopper – Gamesa





# COASTAL ZONE MANAGEMENT ACT CONSISTENCY CERTIFICATION

Gamesa G11X Offshore Wind Turbine Project  
Lower Chesapeake Bay, Cape Charles, Virginia

**PREPARED FOR:**

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Philadelphia, Pennsylvania 19103

**PREPARED BY:**

ESS Group, Inc.  
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ESS Project No. G216-000.01

January 26, 2012





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## **1. 0 INTRODUCTION**

Pursuant to the federal Coastal Zone Management Act of 1972 as amended (CZMA) and its implementing federal regulations at 15 CFR Part 930, subpart D, Gamesa Energy, USA LLC in joint development with Newport News Shipbuilding (Gamesa) has prepared this CZMA consistency certification for the installation, operation and maintenance of the Gamesa G11X Offshore Wind Turbine Project (the Project) in the nearshore and subaqueous tidelands of the Virginia Lower Chesapeake Bay's Eastern Shore near Cape Charles, Virginia (see Figure 1).

The Project consists of the installation and operation of a single 5-Megawatt (MW) offshore wind turbine generator (WTG) prototype and its supporting infrastructure at Cape Charles, Virginia. The offshore G11X will be located in Virginia waters approximately three miles southwest of Cape Charles, off the western side of the Delmarva Peninsula. The Project will be located entirely within the Tidewater Virginia Designated Coastal Management Area. The WTG electric transmission system will connect the WTG to the local and regional electric system and includes a 3.2-mile-long submarine cable installed approximately 6 feet below the seabed, connecting to a shore-based transition vault to be constructed on industrial land at Cape Charles Harbor Pier. From the vault, a buried upland cable system will extend 0.6 mile along an existing railroad right-of-way (ROW) to a newly constructed substation. There the power will be interconnected to an existing A&N Electric Cooperative (ANEC) 25-kilovolt (kV) overhead electric transmission line for distribution through the existing electric grid.

The purpose of the Project is to advance the demonstration of Gamesa's new offshore WTG technology. The G11X prototype WTG is specifically designed for deployment in offshore wind environments worldwide. The Project is a single WTG and as a prototype is not principally intended as a supply resource. However, an added benefit of the Project will be the production of up to 5 MW of clean renewable wind power to the local Virginia transmission grid for public use.

Through Gamesa's rigorous Alternative Siting Analysis, state-of the art design development and use of low impact construction methods and means, the G11X Offshore Prototype Project will minimize impacts to the surrounding environment, general navigation and other marine dependent uses of this area of the lower Chesapeake Bay. Moreover, Gamesa will not impose any permanent water-dependent use restrictions of the watershed area surrounding the offshore WTG. Some temporary safety zones for construction activities may be established.

The Project has been carefully sited and designed to avoid, minimize, and mitigate impacts to the waters and submerged lands of the United States within the Commonwealth of Virginia and environmental resources subject to review under state and federal regulations. As a result, the construction and operation of the Project will only have minor, unavoidable impacts upon the jurisdictional areas of the U.S. Army Corps of Engineers (USACE) as defined in 33 CFR 328.3 and Virginia Marine Resources Commission (VMRC) as per Chapter 12 of Title 28.2 of the Code of Virginia. Because the Project's generating capacity is 5 MW or less, the Virginia Department of Environmental Quality (VADEQ) Permit By Rule is not required, pursuant to statute and regulations for Small Renewable Energy Projects (Wind) under Chapter 40:90VAC15-40 through 9VAC15-40-140 of the Code of Virginia.

## **2. 0 CERTIFICATION**

Gamesa Energy, USA LLC certifies that the proposed Project complies with the enforceable policies of federally approved Virginia Coastal Zone Management Program (VCP) and will be conducted in a manner consistent with the VCP.

## **3. 0 NECESSARY DATA AND INFORMATION**

This certification includes all necessary data and information under the CZMA and implementing federal regulations. Pursuant to the CZMA, in 1986 National Oceanic and Atmospheric Administration (NOAA)

approved the VCP. Accordingly, federal activities which are reasonably likely to affect any land or water use or natural resources of Virginia's designated coastal resources management area must be consistent with the enforceable policies of the VCP. This certification also evaluates the Project's consistency with Virginia's advisory coastal policies, as requested by the Program Manager for the VADEQ Office of Environmental Impact Review (Irons, December 12, 2011).

As recommended by VADEQ (Irons, pers. comm., December 12, 2011), this consistency certification generally follows the outline and includes the necessary data and information for non-federal entities in the Federal Consistency Information Package on the VADEQ's Office of Environmental Impact Review website at [www.deq.virginia.gov/eir/federal.html](http://www.deq.virginia.gov/eir/federal.html) accessed on multiple dates in December 2011 and January 2012.

### **3.1 Federal License or Permit Requested**

A Virginia Standard Joint Permit Application has been filed for the Project with the USACE – Norfolk District, as lead federal agency, and the VMRC. Detailed information about the Project, existing environmental conditions and potential impacts can be found in the Joint Permit Application. The Project will also be reviewed by the Town of Cape Charles Wetlands Board and the VADEQ. The Project requires a federal Section 10/404 Permit from the USACE for activities in waters of the United States under Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. §403) and Section 404 of the Clean Water Act (33 U.S.C. §1344). Section 10 regulates work and structures that are located in, or that affect, navigable waters of the United States, which applies to installation of the monopile foundation, scour protection, and submarine cable system. Section 404 under USACE purview regulates discharges of dredged or fill material into waters of the United States. These discharges of dredged or fill material may result as a consequence of installation activities associated with the monopile foundation, scour protection and submarine cable system.

As the lead federal agency for the Project, USACE will conduct a review of the Project in accordance with the National Environmental Policy Act (NEPA) of 1969. Based on the scale and negligible impacts associated with the proposed Project, it is likely that only a NEPA Environmental Assessment will be required, resulting in a Finding of No Significant Impact for federal approval of the Project. In fact, the Project as proposed may even be eligible for Nationwide Permit approval as may be judged by the USACE – Norfolk District. For projects located in Virginia Waters of the United States, the USACE Application for a Section 10/404 Individual or Nationwide Permit is part of the Standard Joint Permit Application as provided herein, where regulatory review is conducted jointly by federal and state agencies, including the VMRC.

At the state level, the Project requires a Marine Resources Commission Permit from the VMRC, which regulates activities on state-owned submerged lands and tidal wetlands under Code of Virginia Title 28.2, Chapters 12 and 13. The G11X and submarine cable route are sited on state-owned subaqueous lands below mean low water. Pursuant to this authority, Gamesa is applying for a Marine Resources Commission Permit.

In addition to the permits above, the development and operation of the Project is likely to involve or require the following primary federal, state, and local permits and approvals:

- Private Aid to Navigation Permit from U.S. Coast Guard to light and mark the G11X.
- Determination of No Hazard and Notice of Proposed Construction from the Federal Aviation Administration: The proposed G11X will have a maximum estimated height of 479 feet above mean sea level and is therefore subject to Federal Aviation Administration approval required for a vertical structure greater than 200 feet in height.

- 401 Water Quality Certification under the purview of the VADEQ; the application is part of the Standard Joint Permit Application.
- Coastal Zone Management Consistency Determination (VADEQ): The subject of this certification.
- Stormwater Permit for all upland construction activities under the Virginia Stormwater Management Project, administered by the Virginia Department of Conservation and Recreation (VADCR).
- Cape Charles Wetlands Board review for the proposed in-water and shoreline construction activities at the submarine cable landfall, to determine whether the proposed activities at the Cape Charles Harbor shoreline will require a Wetlands Permit. The Wetlands Permit application is part of the Standard Joint Permit Application.

### **3.2 Proposed Project Location and Activity**

Gamesa conducted a rigorous site alternatives assessment, resulting in the selection of offshore Cape Charles, Virginia as the preferred location to meet Gamesa's project-specific siting criteria. The criteria included:

- Favorable wind capacity resources of the lower Chesapeake Bay to meet prototype testing needs;
- Accessible offshore location in state waters;
- Minimal impacts to aquatic, avian, and wetland/tideland resources;
- Minimal potential to impact existing navigation and local area water-sheet uses;
- Relatively short submarine cable route and overland run to facilitate interconnection with the existing onshore public transmission grid;
- Favorable environmental and load bearing capacity of subsurface marine geologic conditions;
- A receptive Host Community; and
- Favorable Virginia Regulatory Agency permitting reviews and timelines.

Additional details about the Alternatives Analysis that led to the selection of the proposed location can be found in the Standard Joint Permit Application.

The selected Project Area is defined as the water, shoreline and land areas in and seaward of Cape Charles evaluated by Gamesa for the Project location and construction (see Figure 1). The Project Area includes 1) the WTG siting area, a rectangular area offshore with dimensions of approximately 0.4 by 2.0 miles (0.6 kilometers by 3.2 kilometers) covering 512 acres, 2) the submarine cable route to shore, and 3) the route for the upland cable to the interconnection location with the existing electric system. This includes a corridor 400 feet (122 meters) wide, centered on the proposed submarine cable route, which is approximately 3.2 miles (5.1 kilometers) long. The upland transition cable corridor and easement, once the submarine cable makes landfall, is 15 feet wide and extends 0.6 miles (0.2 kilometers) from the landfall location to the upland substation where it will interconnect with the local grid. The planned area for the substation construction on Bay Coast Railroad property may be up to 7,000 square feet (650 square meters) in total, depending on equipment and yard area needs.

The anticipated installation of the G11X WTG will be in the third quarter of 2013. The expected design life of the Gamesa G11X WTG is anticipated to be 20 years or more. The submarine cable systems design life is estimated to be at least 100 years, given the armoring and other protective elements. If for some unlikely reason the G11X WTG is no longer needed for research and development efforts or renewable wind energy generation, the structural elements of the WTG will be removed from the site by Gamesa.

### **3.2.1 Wind Turbine Generator**

The proposed Project will involve the installation of the G11X, a prototype WTG designed for use in the marine environment, with a nameplate capacity of 5 MW. The nacelle (i.e., the component of the structure which houses the generator, gear boxes and electrical control systems) will be mounted on a monopile tower, which will be affixed to a monopile foundation system (Figure 2). The center of the rotor hub will be attached to the nacelle at a height between 262 and 269 feet (80 and 82 meters) above mean sea level. With the rotor blades attached to the hub the rotor swept zone will be approximately 420 feet (128 meters) in diameter and have a maximum estimated height with the blade in the 12 o'clock position of 479 feet (146 meters) above mean sea level. The minimum estimated height above water, with the blade in the 6 o'clock position, will be 52.5 feet (16 meters) above mean sea level.

The monopile foundation structure will have a diameter of approximately 16.4 feet (5 meters) and will be installed into the seabottom approximately 98 feet (30 meters). A transition piece will be attached to the top of the monopile foundation and a monopile tower structure will be installed onto the transition piece. The diameter of the monopile tower tapers from bottom to top ranging from approximately 19.4 feet (5.9 meters) at its base on the transition piece down to approximately 12.8 feet (3.9 meters) at the top.

Major WTG components, subassemblies, and construction staging and transfer activities in support of the offshore construction will take place at existing port facilities at the Portsmouth Marine Terminal in Portsmouth, Virginia. The components of the WTG will likely be assembled in Europe and transferred in bundled fashion for further assembly and fabrication at the Portsmouth Marine Terminal facility, which does not require any waterfront construction upgrades or overhaul to complete this project. Properly equipped flat barges, jack-up barges, heavy lift cranes, and various installation support vessels will be utilized to transport WTG components to the offshore installation site. Construction personnel and materials will be ferried by crew boats depending upon weather conditions and other factors.

The monopile foundation installation is expected to take approximately one day depending on local weather and sea state conditions at the time of construction. Prior to installation, the monopile will be loaded onto a transport barge from the Portsmouth Marine Terminal for delivery to the offshore installation site. During installation activities, it is estimated that several vessels would be present in the general vicinity to facilitate pile driving, setting, and installation. Most of these vessels will be stationary (anchor, spud, or jack-up) or slow moving barges and tugs conducting or supporting the installation activities.

The monopile will be installed into the seabed by means of a pile driving hammer or vibratory head. Since the monopile is hollow, the sediment column will inject into the piling core as it is driven into the seabed such that no residual sediment removal will be required.

Once the monopile foundation is in place and the accompanying transition piece to support the WTG tower is installed, the balance of the wind turbine components will be erected. To prevent excess scour riprap rock armor will be placed around the monopile foundation. The rock armor and filter material will be placed on the seabed using a clamshell bucket or other effective methods.

### **3.2.2 Wind Turbine Generator Electric Transmission System**

The electric transmission system for the Project will consist of two distinct segments: a submarine cable and an upland cable. The approximately 3.2-mile long single circuit 34.5 kV solid dielectric Alternating Current (AC) submarine cable will run from the WTG tower to the shore-based transition vault located on the property of Bay Coast Railroad in Cape Charles, Virginia. The approximately 0.6-

mile long upland cable system will extend from the transition vault to a newly constructed substation where the power will be transformed from 34.5 kV to 25 kV and interconnected to an existing ANEC 25 kV overhead electric transmission line, for distribution to the transmission grid. Two fiber optic cables will also be bundled with the submarine and upland cable systems such that the WTG can communicate with the land-based substation. Further details are provided below.

### **Submarine Cable System**

The submarine cable will consist of a single three-phase solid dielectric AC cable with integrated fiber optic communication cables. The proposed WTG will be connected to the local and regional transmission grid system via a 34.5 kV/60Hz AC medium voltage submarine cable. This three-core, cross linked polyethylene cable will have armoring protection using 5-millimeter galvanized steel band wrap making up the final outside layer. Two fiber optic cables will be integrated into the cable bundle for data transfer and communication purposes between the WTG and the substation. The submarine cable has a diameter of approximately 4 inches and will be buried to a target depth of 6 feet BPB, to minimize potential for mechanical damage by anchors or other marine or fishing activities that may occur in the area. Within the limits of Cape Charles City Harbor Federal Channel bottom, the cable will be installed 6 feet below authorized depth. Within approximately 40 feet of the bulkhead at Cape Charles Pier, the burial depth will transition to 3 feet BPB. Pre-cast concrete protection mats will be placed on the seabed over the embedded cable at its connection to the WTG tower and at its inner harbor landfall transition to minimize potential for anchor or other mechanical damage.

The submarine cable will be installed using minimally intrusive low impact hydraulic jetting methods and via mechanical dredging and trenching methods at the Cape Charles landfall to the upland transition vault. Hydraulic jetting embedment of the submarine cable system to 6 feet BPB in predominantly sand-sized sediments along the proposed route represents the most efficient and effective installation method for the submarine cable system. It is a hydraulically operated jetting device that uses seawater under pressure to fluidize *in situ* marine sediments to burial depth while the dead weight of the cable settles in the trench and the fluidized sediment settles almost immediately back into the trench cut, naturally burying the cable at depth with minimal and short term associated water column turbidity.

Gamesa has conducted extensive sediment transport and turbidity modeling for the WTG submarine cable installation as a predictive means to assess potential Project impacts to water quality. Given that the sediment type for which the cable system will be jetted into is predominantly sand-sized sediment, short term turbidity effects are predicted to be negligible and well within the range of natural variability of the site location and its surrounding shoal areas.

Due to the relatively shallow water depths in the middle of the proposed submarine cable route, shallow draft vessels/barges which typically use anchors for positioning are most likely to be used for installation.

### **Landfall Transition**

The submarine cable system will make its landfall transition to upland cable at the shoreline property of Bay Coast Railroad. A portion of the existing deteriorated steel bulkhead and riprap armor at the shoreline landfall location will be replaced with a new steel bulkhead/cofferdam section. The cable system will be directly buried underground within Gamesa's existing ROW easement where it will transition to an upland cable system approximately 150 feet landward of the shoreline landfall within an underground concrete transition vault.

As the submarine cable system traverses along the northern edge of the Cape Charles Harbor within Bay Coast Railroad's privately owned submerged lands property and approaches the bulkhead, the burial depth of the cable will transition from 6 feet to 3 feet BPB close to the bulkhead. Once the submarine cable system is within approximately 40 feet of the shoreline, the cable will be laid within a mechanically dredged or land based excavated trench to a bottom elevation of approximately 13 feet below Mean Lower Low Water at the shoreline. After the submarine cable system is laid, the trench will be backfilled using clean sand and covered with two 20-foot-long by 8-foot-wide articulated concrete mattresses comprised of 12-inch by 12-inch concrete blocks connected with fiber rope.

To maintain the structural stability of the shoreline at the landfall location, a section of the existing deteriorated steel sheet pile bulkhead will be replaced with a new structurally independent steel sheet pile bulkhead and cofferdam cell that will be constructed to allow the cable landfall transition to be made without disturbing the flanking existing steel bulkhead. All connections between the existing and the new bulkhead sheeting will be structurally secure and water tight to prevent outflanking of the new structure should the existing seawall fail.

The existing soils material within the limits of the new sheet pile cofferdam cell will be excavated on land to a depth below the invert of the submarine cable conduit contained in the cofferdam cell using conventional excavation equipment and, if necessary a hydraulic jetting device. Small openings will be cut through the new bulkhead's seaward face and a pipe sleeve with watertight seals will be installed to allow the submarine cable to be pulled through the cofferdam cell to the nearby upland transition vault. Once the submarine cable is pulled through and landward of the cofferdam, it will then be buried in the upland natural soils through traditional open trench cut and cover methods until reaching the proposed underground transition vault. Within the transition vault, the submarine cable will then be pulled and spliced to connect with the upland transmission cable.

### **Upland Cable**

The 0.6-mile (1.0-kilometer) upland cable system will consist of three standard 34.5 kV underground cross linked polyethylene transmission cables and two fiber optic cables. The submarine cable will terminate within the upland transition vault located within approximately 150 feet of the shoreline at the proposed landfall within an easement from Bay Coast Railroad to Gamesa. The upland cables, which are spliced within the transition vault to the submarine cable, will exit the vault in a single trench and run within a 15-foot wide easement at a minimum depth of 3 feet below grade within the existing Bay Coast Railroad ROW along the northern side of the track. The cable will cross beneath the track approximately 200 feet before passing under the elevated roadway, and run along the southern side of the tracks to an existing ANEC overhead 25 kV line where the buried cable will enter a newly proposed substation to allow interconnection to the existing ANEC overhead electric transmission line for distribution to the transmission grid.

Most excavation will be performed with typical construction equipment, including excavators and backhoes, with the exception of one crossing of the railroad bed which will be accomplished by pipe jacking. All work will be performed in accordance with local, state, and/or federal safety standards.

Where soil is stored in the upland Project Area, it will be stabilized with erosion and sedimentation controls in accordance with Virginia Stormwater Management Program Permit Regulations. Following the completion of the installation of the upland cable system, the excavation will be backfilled with thermal fill, returned to original grade, loamed and seeded. Stormwater run-off and erosion and sedimentation controls will be in place prior to initiation of all excavations. Once construction is completed, all equipment and construction debris will be removed from the Project Area and the area will be returned to its pre-construction condition.

To minimize the potential for erosion during construction, mitigation measures required as part of the Virginia Stormwater Control Permit, such as hay bales and silt fences will be placed, as appropriate, around disturbed areas and any stockpiled soils. Prior to commencing construction activities, erosion control devices will be installed between the work areas and any downslope water bodies or wetlands that may exist to reduce the risk of soil erosion and siltation. Erosion control measures will also be installed downslope of any temporarily stockpiled soils in the vicinity of waterbodies and wetlands.

### **3.2.3 Substation for Overhead Transmission Line Interconnection**

A new medium voltage electric substation will be constructed to facilitate the underground upland cable connection to the existing overhead ANEC public electric transmission line. Preliminary assessments indicate this new substation will likely occupy up to 7,000 square feet of upland area, and will be located adjacent to the intersection of the existing Bay Coast Railroad ROW and the ANEC 25 kV ROW within Gamesa's designated easement area. The substation will contain a step-down 34.5/25 kV transformer, circuit breakers, switch gear, relaying, metering, communication and control equipment. The station will be enclosed in a fence to control access and provide security.

## **4.0 PROJECT CONSISTENCY WITH VCP'S ENFORCEABLE POLICIES**

The enforceable policies in bold italic below are addressed in the order presented in the Federal Consistency Information Package for the VCP prepared by the VADEQ Office of Environmental Impact Review (at [www.deq.virginia.gov/eir/federal.html](http://www.deq.virginia.gov/eir/federal.html) accessed on multiple dates in December 2011 and January 2012). Because some policies include different implementing regulations and administering agencies, they are shown in bold and the Project's involvement with each is addressed separately within the overall policy.

Where applicable, direct, indirect and cumulative potential impacts of the Project on each of the policy resources are considered. Activities that may cause cumulative impacts include typical marine vessel and fishing activities for the offshore area within and near the Project Area. In addition, a reasonable foreseeable project also includes the installation of the remaining three of five permitted offshore gapped breakwater system at the entrance to the harbor, to minimize the potential for storm wave and tide damage to the harbor's waterfront area. In 2009, the Town installed two of five permitted segmented breakwaters, constructed of concrete and stone riprap material, at the mouth of Cape Charles Harbor (see Figure 3). However, given that these three remaining breakwaters planned for installation by the Town of Cape Charles are unfunded and unscheduled at this time, no cumulative impacts due to the Project and the breakwater project are anticipated.

### **a. Fisheries Management**

***The program stresses the conservation and enhancement of finfish and shellfish resources and the promotion of commercial and recreational fisheries to maximize food production and recreational opportunities. This program is administered by the Virginia Marine Resources Commission (VMRC) (Virginia Code §28.2-200 to §28.2-713). In summary, these regulations apply to management of finfish, oysters, clams and crabs.***

#### **Finfish Resources**

The Chesapeake Bay is home to approximately 350 species of fish. Some of these fish are resident species, living in the Bay year-round, and others are migratory or seasonal species that utilize the Bay during certain times of the year to feed, reproduce or find shelter (CBP, 2009). Common fish species that can be found in the lower portion of Chesapeake Bay include: American eel, American halfbeak, American shad, Atlantic croaker, Atlantic menhaden, Atlantic needlefish, Atlantic sturgeon, bay anchovy, black drum, black sea bass, blennies, bluefish, cobia, cownose ray, gobies, hickory shad, hogchoker,

lined seahorse, lockdown, mackerels, northern puffer, northern stargazer, oyster toadfish, pipefish, red drum, sandbar shark, searobin, shortnose sturgeon, skilletfish, spot, spotted seatrout, sticklebacks, striped bass, summer flounder, tautog, and weakfish (CBP, 2009).

Habitat within the Project Area has been designated as Essential Fish Habitat (EFH) for 16 federally managed fish species according to the Magnuson-Stevens Fishery Conservation and Management Act. EFH is defined by the Act as “those waters and substrate necessary to fish for spawning, breeding, feeding or growth to maturity” (16 U.S.C. 1802 §3). The Act requires an assessment of potential impacts to the 16 federally managed fish species with designated EFH in the Project Area. A summary table of designated EFH species within the Project Area and the specific life stage EFH designations for these species is provided below.

**Table 4-1 Summary of EFH Designations for Finfish in the Project Area**

Species	Eggs	Larvae	Juveniles	Adults
Red hake ( <i>Urophycis chuss</i> )			X	X
Windowpane flounder ( <i>Scophthalmus aquosus</i> )			X	X
Atlantic sea herring ( <i>Clupea harengus</i> )				X
Bluefish ( <i>Pomatomus saltatrix</i> )			X	X
Atlantic butterfish ( <i>Peprilus triacanthus</i> )	X	X	X	X
Summer flounder ( <i>Paralichthys dentatus</i> )		X	X	X
Scup ( <i>Stenotomus chrysops</i> )			X	X
Black sea bass ( <i>Centropristus striata</i> )			X	X
King mackerel ( <i>Scomberomorus cavalla</i> )	X	X	X	X
Spanish mackerel ( <i>Scomberomorus maculatus</i> )	X	X	X	X
Cobia ( <i>Rachycentron canadum</i> )	X	X	X	X
Red drum ( <i>Sciaenops ocellatus</i> )	X	X	X	X
Sand tiger shark ( <i>Odontaspis taurus</i> )		X		
Atlantic sharpnose shark ( <i>Rhizopriondon terraenovae</i> )				X
Dusky shark ( <i>Charcharinus obscurus</i> )		X	X	
Sandbar shark ( <i>Charcharinus plumbeus</i> )		X	X	X

Potential impacts to finfish and finfish habitat from installation of the submarine cable and G11X foundation will be localized and temporary, resulting from direct and indirect sediment disturbance. Egg and larval stages of demersal fish species that lie within the direct footprint of the submarine cable or G11X foundation and scour protection are expected to experience mortality since they lack mobility. Only ten out of the 36 species identified as commonly occurring in lower Chesapeake Bay have the potential for demersal eggs and/or larvae to be present in the Project Area during the in-water construction period. These species include: Atlantic croaker, black sea bass, hogchoker, northern puffer, northern stargazer, oyster toadfish, red drum, spotted seatrout, tautog, and weakfish.

Juvenile and adult finfish species common to the Project Area are not likely to become buried given the limited nature of the sediment disturbance. The use of hydraulic jetting technology to install the submarine cable will greatly limit the amount of sediment introduced into the water column. The predicted

suspended sediment concentrations will be minimal when compared with other ongoing man-made activities and natural occurrences in Chesapeake Bay. Modeling shows that hydraulic jetting induced suspended sediment concentrations are predicted to decrease rapidly and be comparable to ambient conditions approximately 6 hours after the passage of the installation device (ASA, 2011).

There will be little to no adverse impact to finfish resulting from operation of the G11X or submarine cable. The G11X foundation is expected to be colonized by an invertebrate fouling community similar to that found on piers, revetments and other hard structures. The placement of scour protection around the G11X foundation is not expected to interfere with fish migration or use of existing habitats or nursery areas. However, the rock armoring or other scour protection instruments to be placed around the monopile may serve as habitat for fish species that are attracted to structure. Some of the fish species considered common in the Project Area that may be attracted to this structure include: black drum, black sea bass, king mackerel, oyster toadfish, red hake, scup, spot, and tautog. The rock armoring may serve as a single small patch reef habitat that could enhance species diversity locally, but would not be expected to alter the fish community or ecology of the lower Chesapeake Bay.

### **Shellfish Resources**

Common shellfish found within Chesapeake Bay include blue crabs (*Callinectes sapidus*), oysters (*Crassostrea virginica*), and bay scallops (*Argopecten irradians*). These shellfish form the basis for an important commercial and recreational fishery along much of the Mid-Atlantic Region.

The proposed location for the G11X foundation is approximately 555 feet within Area 1 of the Virginia Blue Crab Sanctuary (the majority of the associated submarine cable is located outside of the sanctuary). According to Chapter 4 VAC 20-752-10 et seq., the harvest or possession of blue crabs for commercial and recreational purposes within Area 1 is prohibited between May 16 and September 15.

While some impacts to habitat utilized by blue crabs are expected due to the proposed construction activities, impacts would be minimal due to the small footprint of the construction area and the short time duration. Population level impacts to Chesapeake Bay's blue crab populations are not expected. Blue crabs enter a period of dormancy during late fall and winter months when water temperature within Chesapeake Bay drops. During this time, the crabs will migrate to deeper waters and bury themselves within the bottom substrate; during the remainder of the year, this species is extremely mobile. The planned construction period is scheduled to be outside of this dormancy period, and therefore the mobile crabs will likely avoid disturbances by displaying avoidance behaviors. Limited mortality of blue crabs can be anticipated due to impacts associated with a small number of individuals not avoiding the jetting device, which may crush or otherwise kill crabs which do not flee far enough from the area of cable embedment or monopile installation.

While some of the nearshore waters off of Cape Charles have been identified as optimal for clam and oyster aquaculture by the State of Virginia, no clam or oyster beds have been identified within the vicinity of the Project Area. Coordination with VMRC has also confirmed that there are no shellfish or fish trap leases within the Project Area.

Cape Charles Harbor and the waters immediately north and south of the harbor mouth have been declared condemned shellfish areas and therefore harvesting is precluded. This condemnation became effective December 2, 2005 and is due to a waste water treatment outfall located within the Harbor.

Due to the lack of shellfish beds within the Project Area, no negative impacts to shellfish resources are anticipated due to the proposed construction activities. Placement of the monopile foundation and any associated scour protection will provide hard substrate which may be utilized for settlement and colonization by organisms such as oysters, and crabs.

### **Commercial and Recreational Fishing**

The potential effects of Project construction on commercial and recreational fishing gear and commercial and recreational fishing activities are expected to be minimal. Commercial or recreational fishing activities may be temporarily disrupted in the immediate vicinity of Project construction. Given the proposed Project construction schedule, the main fisheries that could be active during in-water construction include flounder, croaker, cobia, striped bass, and blue crab.

Construction of the G11X will occur in a small area (immediately surrounding the single monopile), allowing use of the surrounding area. During installation of the submarine cable, construction will occur in a linear fashion. Construction vessels and associated equipment will move along the route, minimizing disruption to any single area; therefore, impacts will be temporary and localized. In addition to active construction being limited to a small area, Gamesa will work with federal and state fisheries agencies to publish the project schedule and construction locations to minimize disruption of regular commercial fishing activities. With advance notice of project construction activities, commercial fishermen could choose to fish outside of the construction area or to remove any fixed gear such as crab pots that may be in the direct line of Project construction. The U.S. Coast Guard may establish limited temporary vessel restrictions around immediate construction sites and vessels to protect public safety. However, as noted, this will occur in a small area and only for a limited amount of time during actual construction of the monopile (approximately one day) and installation of the submarine cable (approximately two weeks).

Operation of the proposed Project should not adversely affect commercial or recreational fishing in the Project Area. During Project operation, Gamesa will not be placing any restrictions on commercial or recreational fishing activities nor creating any fishing exclusion zones surrounding the single G11X or submarine cable.

Once installed, the submarine cable will have no impact to commercial or recreational fishing in the Chesapeake Bay or Cape Charles Harbor. The submarine cable will be jetted (buried) into the harbor sediments to a target depth of 6 feet BPB, except within the limit of Cape Charles City Harbor Federal Channel bottom where it will be installed 6 feet below authorized depth. This cable burial depth is expected to provide sufficient sediment overburden to avoid cable damage by vessel anchors or other mechanical impacts. In addition, there will be no measurable compass deflection effects for commercial or recreational vessels transiting over the cables and no electrical interference with radio, GPS, or radio-beacon navigational equipment. The presence of the G11X may serve as a source of structure and may attract fish species thereby enhancing habitat diversity and density in the area and also enhancing recreational or commercial fishing for certain species such as black drum, black seabass, flounder, and tautog. Post-construction commercial and recreational fishing is expected to be unchanged from pre-construction, except that the single G11X may serve as an attraction for certain fish species and therefore an attraction for recreational and possibly commercial anglers.

***Virginia Code §29.1-100 through §29.1-570 administered by the Virginia Department of Game and Inland Fisheries (VADGIF). In summary, these regulations apply to management of game, inland fisheries, and boating, including the issuance of fishing and hunting licenses and permits.***

Construction or operation of the Project will not directly or indirectly affect inland fishing activities, as no inland fisheries are located within or adjacent to the Project Area. The Project will not affect hunting for game in the upland. Hunting for migratory waterfowl from vessels that may operate in the vicinity of offshore construction activities could be temporarily restricted for safety reasons, if Project construction coincides with hunting seasons. No restrictions are anticipated during Project operation.

Vessels used to construct and operate the Project will comply with all applicable boating requirements in these regulations.

**Virginia Code §3.1-249.59 through §3.1-249.62, superseded by §3.2-3936: administered by the VMRC, the VADGIF and the Virginia Department of Agriculture and Consumer Services. In summary, the State Tributyltin (TBT) Regulatory Program regulates the possession, sale or use of any marine antifouling paint containing tributyltin compounds. Tributyltin-containing paints with acceptable release rates may be applied only within commercial boat yards and to vessels with specific characteristics.**

The Project's vessel captains will be informed of the requirement to comply with this policy.

#### **b. Subaqueous Lands Management**

***The management program for subaqueous lands establishes conditions for granting or denying permits to use state-owned bottomlands based on considerations of potential effects on marine and fisheries resources, wetlands, adjacent or nearby properties, anticipated public and private benefits, and water quality standards established by the VADEQ Water Division.***

**Virginia Code §28.2-1200 through §28.2-1213: administered by the VMRC.**

The Commonwealth of Virginia owns bottomlands beneath Chesapeake Bay to the mean low-water line, unless submerged land is privately held, as is the case in Cape Charles Harbor where the Bay Coast Railroad owns submerged lands out to the mouth of the harbor (see Figure 3). Approximately 215 square feet of seabed will be permanently altered for the installation of the monopile foundation. Although seabed habitat will be eliminated within this footprint of the monopile foundation, given the very small size of the impacted area, impacts to seabed marine life are negligible. Approximately 16,240 square feet of seabed at the base of the monopile foundation will be permanently altered by the installation of rock armoring for scour protection. This area will be transformed from a sandy, flat benthic habitat to a raised hard bottom feature, capable of supporting a wide array of marine and estuarine life.

The submarine cable from the G11X to the bulkhead in the Cape Charles Harbor basin will run a total length of approximately 3.2 miles. Of these 3.2 miles, approximately 2.9 miles is within Chesapeake Bay and subject to VMRC jurisdiction, while the seabed within Cape Charles Harbor is owned by the Bay Coast Railroad (see Figure 3). An area of seabed 3.2 miles long and 2 to 4 feet wide will be temporarily altered by hydraulic jetting during the installation of the submarine cable. Temporarily altered bay bottom areas are expected to fully recover, shortly after jetting is complete, and provide equally productive habitat as before the submarine cable was installed. In the vicinity of the landfall, approximately 150 square feet of the harbor immediately seaward of the existing bulkhead will be filled so as to allow the installation of a new steel bulkhead.

The VMRC regulates activities on state-owned submerged lands and tidal wetlands under Code of Virginia Title 28.2, Chapters 12 and 13. The G11X and the majority (except for the Cape Charles Harbor segment) of the submarine cable will be located in or on state-owned subaqueous lands of the Virginia Chesapeake Bay. All work will be conducted below mean low water. Gamesa is applying for a Marine Resource Commission Submerged Lands lease or easement for the use of bottomlands for the G11X and the submarine cable, subject to the terms for an offshore renewable energy project pursuant to §28.2-1208. Gamesa or its assignees will maintain or remove the G11X upon its abandonment, and in compliance with §28.2-1209. Gamesa will comply with other applicable regulations in the Virginia Code citations above. The Bay Coast Railroad owns the submerged lands within Cape Charles Harbor (see Figure 3) and therefore the segment of the submarine cable route associated with this area is non-

jurisdictional to the VMRC. Gamesa has obtained an easement from the railroad to occupy the privately held submerged lands within the harbor.

### **c. Wetlands Management**

***The purpose of the wetlands management program is to preserve tidal wetlands, prevent their despoliation, and accommodate economic development in a manner consistent with wetlands preservation.***

The digital National Wetlands Inventory mapping (USFWS, 2011a) was reviewed to determine the extent of any jurisdictional wetland resource areas in the Project Area.

***i) Tidal wetlands: The tidal wetlands program is administered by the VMRC (Virginia Code §28.2-1301 through §28.2-1320)***

No tidal wetlands (either vegetated or un-vegetated) are expected to be directly or indirectly impacted by the proposed Project activities pursuant to § 28.2-1302 of the Virginia State Code.

The Town of Cape Charles Wetlands Board is responsible for regulating activities in tidal wetlands and adjacent areas pursuant to the Code of Virginia Title 28.2, Chapters 13. Proposed in-water and shoreline construction activities at the submarine cable landfall will be subject to review by the Cape Charles Wetlands Board. It will determine whether the proposed work activities at the Cape Charles Harbor shoreline will require a Wetlands Permit as a component of the local By-Law and associated VMRC review.

An application for a Wetlands Permit for consideration by the Town of Cape Charles Wetlands Board is included as part of the Joint Permit Application review process.

***ii) The Virginia Water Protection Permit program administered by VADEQ includes protection of wetlands—both tidal and non-tidal. This program is authorized by Virginia Code §62.1-44.15.5 and the Water Quality Certification requirements of §401 of the Clean Water Act of 1972.***

The upland portion of the electric export cable route is located within a previously developed, existing railroad ROW. The upland cable route does not cross any mapped National Wetlands Inventory wetlands. The closest mapped National Wetlands Inventory upland wetland to the Project Area is a palustrine, unconsolidated shore wetland (PUSKCh) located approximately 200 feet to the east of the substation easement, and will not be affected due to placement of erosion and sedimentation controls prior to the start of construction.

### **d. Dunes Management**

***Dune protection is carried out pursuant to the Coastal Primary Sand Dune Protection Act and is intended to prevent destruction or alteration of primary dunes. This program is administered by the VMRC (Virginia Code §28.2-2 through §28.2-1420).***

This policy does not apply to the Project, as no primary dunes will be affected by the Project. The submarine cable will make landfall through a bulkhead in Cape Charles Harbor and will then transition to the upland cable within an existing railroad yard.

### **e. Non-point Source Pollution Control**

***Virginia's Erosion and Sediment Control Law requires soil-disturbing projects to be designed to reduce soil erosion and to decrease inputs of chemical nutrients and sediments to the Chesapeake Bay, its tributaries, and other rivers and waters of the Commonwealth. This program***

***is administered by the Virginia Department of Conservation and Recreation (VDCR (Virginia Code §10-1-560 et seq.).***

Upland soil disturbing activities are necessary to install the Project. Soil disturbing activities will include replacement of the deteriorated bulkhead, construction of the transition vault, transition of the submarine cable to upland cable, installation of the buried upland cable, and construction of the new substation.

During upland construction, potential erosion of soils and siltation will be controlled by using Best Management Practices in accordance with the Virginia Erosion and Sediment Control Handbook, 3<sup>rd</sup> Edition (1992). These measures will be fully detailed in an Erosion and Sedimentation Control and Stormwater Management Plan, which will be prepared once final design has been completed. Project design and construction will be conducted in accordance with applicable engineering and building standards, Best Management Practices and regulatory requirements.

#### **f. Point Source Pollution Control**

***The point source program is administered by the State Water Control Board pursuant to Virginia Code §62.1-44.15. Point source pollution control is accomplished through the implementation of the National Pollutant Discharge Elimination System permit program established pursuant to §402 of the federal Clean Water Act and administered in Virginia as the VPDES permit program. The Water Quality Certification requirements of §401 of the Clean Water Act of 1972 is administered under the Virginia Water Protection Permit program.***

The VADEQ is responsible for issuing the state water quality certification, pursuant to Section 401 of the Clean Water Act, for activities that require a federal permit, license, or approval. In Virginia, the State Water Control Board issues 401 water quality certifications, under the authority established by the Virginia Water Control Law (Code of Virginia Title 62.1), pursuant to the Virginia Water Protection Permit Program Regulations 9VAC25-210. The 401 certification will be issued by the State Water Control Board upon determination that the Project meets the requirements of the Virginia Water Protection regulation based on the required permits and approvals.

The application for a 401 Water Quality Certification is included as part of the Standard Joint Permit Application.

There are no Section 402 point source discharges associated with the WTG or cable system.

#### **g. Shoreline Sanitation**

***The purpose of this program is to regulate the installation of septic tanks, set standards concerning soil types suitable for septic tanks, and specifies minimum distances that tanks must be placed away from streams, rivers, and other waters of the Commonwealth. This program is administered by the Virginia Department of Health (Virginia Code §32.1-164 through §32.1-165).***

This policy is not applicable to Project activities. Installation of septic tanks will not be required during construction and operation of the Project.

#### **h. Air Pollution Control**

***The program implements the federal Clean Air Act to provide a legally enforceable State Implementation Plan for the attainment and maintenance of the National Ambient Air Quality Standards. This program is administered by the State Air Pollution Control Board (Virginia Code §10-1.1300 through 10.1-1320).***

In accordance with the requirements of the Clean Air Act and Amendments, the U.S. Environmental Protection Agency has established National Ambient Air Quality Standards for criteria pollutants to protect

public health and the environment. Currently, Virginia air quality, including the area of Eastern Virginia and Northampton County within which the Project is proposed, is in attainment for all of the criteria pollutants.

The Project will have insignificant temporary emissions associated with the installation of the wind turbine which are similar to current marine activities in the area. The operation of the wind turbine will produce clean renewable electric power that will offset emission of current and future fossil fuel sources thereby providing a positive and beneficial effect on local and regional air quality.

### **i. Coastal Lands Management**

***Coastal Lands Management is a state-local cooperative program administered by the VDCR's Division of Stormwater Management—Local Implementation (previously the division of Chesapeake Bay Local Assistance) and 88 localities in Tidewater, Virginia established pursuant to the Chesapeake Bay Preservation Act; Virginia Code §10-1.2100 through §10-1.2114 and Chesapeake Bay Preservation Area Designation and Management Regulations; Virginia Administrative Code 9 VAC 10-20-10 et seq.***

The upland portion of the Project is within the Northampton County Chesapeake/Atlantic Preservation (CAP) District, which encompasses the entirety of the county. The CAP District is an overlay district designated in the Code of Northampton County §154.164 (effective October 21, 2009), and is comprised of the sum of Resource Protection Areas and Resource Management Areas. The CAP District was established pursuant to the citations above to protect water quality and resource areas across the county (Northampton County Planning and Zoning Department accessed December 15, 2011 at <http://www.co.northampton.va.us/departments/pdf/2009%20Comprehensive%20ZOAs%20Eff%2010-21-09.pdf>)

No portions of the Project are located within or will directly affect Resource Protection Areas designated by the Northampton County CAP District. Adherence to best management practices during construction will avoid indirect impacts to Resource Protection Areas. Construction of the Project will occur in RMAs, as they comprise the remaining portions of the county by local regulation. Best Management Practices will avoid or minimize direct or indirect impacts to water quality and other regulated resources. The Project components will be located largely belowground in areas already disturbed by previous commercial/industrial use.

## **5.0 PROJECT CONSISTENCY WITH VIRGINIA COASTAL ZONE MANAGEMENT PROGRAM'S ADVISORY POLICIES**

As requested by VADEQ, this certification also evaluates the Project's consistency with Virginia's advisory coastal policies (Irons, December 12, 2011). The advisory policies in bold italic below are addressed in the order presented in the Federal Consistency Information Package for the Virginia Coastal Zone Management Program prepared by the VADEQ Office of Environmental Impact Review (at [www.deq.virginia.gov/eir/federal.htm](http://www.deq.virginia.gov/eir/federal.htm)) accessed on multiple dates in December 2011 and January 2012). Because some policies include different implementing regulations and administering agencies, the Project's involvement with each is addressed separately within the overall policy.

### **5.1 Advisory Policies for Geographic Areas of Particular Concern**

Although not required for the purposes of consistency, in accordance with 15 CFR §930.39(c), the federal agency should consider the advisory policies (recommendations) of the VCP as well.

### **a. Coastal Natural Resource Areas**

***These areas are vital to estuarine and marine ecosystems and/or are of great importance to areas immediately inland of the shoreline. Such areas receive special attention from the Commonwealth because of their conservation, recreational ecological and aesthetic values. These areas are worthy of special consideration in any planning or resources management process and include the following resources.***

#### **i) Wetlands**

**Non-tidal wetlands:** The upland portion of the electric export cable route is located within a previously developed, existing railroad ROW. The upland cable route will not directly affect any mapped National Wetlands Inventory (NWI) non-tidal wetlands. Because there are no wetlands along the upland portion of the transmission cable route, no wetland mitigation is required.

The closest mapped NWI non-tidal wetland to the Project Area is a palustrine, unconsolidated shore wetland (PUSKCh) located approximately 200 feet to the east of the substation easement. During upland construction, potential erosion of soils and siltation may affect nearby water bodies. Best Management Practices (BMPs) will be utilized in accordance with the Virginia Erosion and Sediment Control Handbook, 3rd Edition (1992) during construction to avoid or reduce potential erosion of soils and siltation into nearby water bodies. Project design and construction will be conducted in accordance with applicable engineering and building standards, BMPs and regulatory requirements. Due to the implementation of these measures, no non-tidal wetlands will be indirectly affected by the Project.

**Tidal wetlands:** No tidal wetlands (either vegetated or un-vegetated) are expected to be directly or indirectly impacted by the proposed Project activities pursuant to § 28.2-1302 of the Virginia State Code.

The Town of Cape Charles Wetlands Board is responsible for regulating activities in tidal wetlands and adjacent areas pursuant to the Code of Virginia Title 28.2, Chapters 13. Proposed in-water and shoreline construction activities at the submarine cable landfall will be subject to review by the Cape Charles Wetlands Board. It will determine whether the proposed work activities at the Cape Charles Harbor shoreline will require a Wetlands Permit as a component of the local By-Law and associated VMRC review.

An application for a Wetlands Permit for consideration by the Town of Cape Charles Wetlands Board is included as part of the Joint Permit Application review process.

#### **ii) Aquatic Spawning, Nursery, and Feeding Grounds**

Direct Impacts to benthic-oriented spawning, nursery and feeding grounds in the Project Area during construction will be minimized by the use of low impact hydraulic jetting for the submarine cable and the localized and short-term nature of the construction activities. Impacts are further minimized since the Project has only one bundled cable that will be installed in a single installation pass. Compared to traditional dredging, hydraulic jetting will reduce the direct impact to the Bay bottom, the temporary increase in suspended sediments from construction, and the subsequent deposition of sediments outside the immediate cable trench. These factors decrease the potential for impacts to benthic habitat that may serve as spawning, nursery (including feeding) habitat for finfish.

The area disturbed by jetting and installation of the single G11X monopile is minimal compared to the surrounding habitat in the lower Chesapeake Bay. There is plenty of unoccupied area with similar habitat conditions in the surrounding Project Area and lower Chesapeake Bay.

Egg and larval stages of demersal fish species that lie within the direct footprint of the submarine cable or G11X foundation and scour protection are expected to experience mortality since they lack mobility. Only ten out of the 36 species identified as commonly occurring in Lower Chesapeake Bay have the potential

for demersal eggs and/or larvae to be present in the Project Area during the in-water construction period. These species include: Atlantic croaker, black sea bass, hogchoker, northern puffer, northern stargazer, oyster toadfish, red drum, spotted seatrout, tautog, and weakfish. None of the early life stages with designated EFH have demersally oriented eggs or larvae.

Fish species with pelagic eggs and larvae will be less affected by temporary benthic disturbance since they are not as closely associated with the bottom; however, those in the immediate area of construction could experience some injury or mortality. Fifteen out of the 36 species identified as commonly occurring in Lower Chesapeake Bay have the potential for pelagic eggs and/or larvae to be present in the Project Area during the in-water construction period.

The temporary dispersal of benthic prey that may occur during hydraulic jetting-related activities or installation of the G11X may temporarily disrupt feeding for some benthic-oriented juveniles or adults; however given the limited area of disturbance, sufficient food base is expected to be available to foraging fish species.

Indirect impacts to aquatic spawning, nursery, and feeding grounds can occur from the temporary increase in total suspended solids generated during in-water construction. Those life stages most affected by low-level increases in suspended sediment are larval fish. Demersal larvae that are present during in-water construction activities could be affected by temporary elevated levels of suspended sediment generated during hydraulic jetting activities. Modeling results indicate that the suspended sediment concentrations from the hydraulic jetting operation are expected to decrease rapidly with distance from the operating jetting device and within 24 hours after jetting, predicted suspended sediment concentrations return to ambient conditions. Therefore, impacts to these demersal larvae would be very localized and temporary.

In addition, along the west half of the proposed submarine cable route, the highest suspended sediment concentrations (greater than 100 milligrams per liter) are predicted to remain in the bottom 5 to 6 feet of the water column under all tide conditions, according to modeling results. Therefore, pelagic larvae in the deeper waters along the west half of the route may occur in the water column above the indirect influence of the elevated suspended sediment concentrations. Any larvae that are affected may be temporarily displaced in the water column as a result of the limited disturbance associated with hydraulic jetting. However, the overall area of habitat disturbed is insignificant in comparison to surrounding areas of larval habitat in the Project Area.

The temporary elevated TSS levels could indirectly affect finfish species by making it more difficult to navigate, forage, and find shelter. However, the narrow area of sediment disturbance assures that fish will not have to relocate very far. These fish species are also expected to rapidly return once the installation activities at a given location have been completed. Therefore, indirect disturbance from temporary elevated suspended sediment concentrations to these older life stages will be minimal.

Sedimentation generated during in-water construction can potentially bury any demersal eggs or larvae that are within the Project Area. Any larvae in the immediate vicinity of the equipment needed for hydraulic jetting and installation of the G11X would experience mortality and others may experience localized increases in physical abrasion, burial or mortality. However, as previously stated, the area affected by hydraulic jetting and installation of the G11X is small when compared to the surrounding habitat of lower Chesapeake Bay; therefore, the Project will not result in population-level effects.

As the submarine cable will be buried, it will not create a physical barrier that could interfere with fish migration or use of existing habitats or nursery areas. The G11X foundation is expected to be colonized by an invertebrate fouling community similar to that found on piers, revetments and other hard structures. The placement of scour protection around the G11X foundation is not expected to interfere with fish migration or use of existing habitats or nursery areas. However, the rock armoring or other scour

protection instruments to be placed around the monopile may serve as habitat for fish species that are attracted to structure.

Additional details on finfish, including aquatic spawning, nursery, and feeding grounds are described in the Joint Permit Application and the EFH Assessment for this Project.

**iii) Coastal Primary Sand Dunes**

No coastal primary dunes will be directly or indirectly affected by the Project.

**iv) Barrier Islands**

No barrier islands will be directly or indirectly affected by the Project.

**v) Significant Wildlife**

**Avian Resources:**

Published literature provides substantial information on avian resources associated with the Delmarva Peninsula with much less information on avian resources data over Chesapeake Bay. The Delmarva Peninsula contains documented migratory staging areas and wintering areas utilized by a wide diversity of bird species, including species of importance at the federal and global levels (Watts, 2006). The entire Delmarva Peninsula is characterized as an important bottleneck along the Atlantic Flyway where birds migrating along the Atlantic Coast pass through (mostly on the eastern (ocean) side of the peninsula away from the proposed offshore location for the G11X, and/or congregate in large numbers (Watts, 2006 and Watts pers. comm., 2011).

Data base information shows that approximately thirty rare avian species have documented occurrences within this broad region (Table 5-1), however the USFWS has reviewed the proposed project location and stated that the agency does not have any records of federally listed avian species occurring in the Project Area (USFWS, 2011). Similarly, the VADCR, Natural Heritage Program, also reported that it does not have any records of rare, threatened or endangered avian species near the proposed offshore WTG location (VADCR, 2011b).

**Table 5-1 Rare Bird Species with Documented Occurrences in the Coastal Plain Physiographic Province of Virginia according to the Virginia Natural Heritage Program (2011a)**

Common Name	Scientific Name	Federal Status	State Status
Saltmarsh Sharp-tailed Sparrow <sup>†</sup>	<i>Ammodramus caudacutus</i>		
Gadwall	<i>Anas strepera</i>		
Great Egret	<i>Ardea alba</i>		
Short-eared Owl <sup>‡</sup>	<i>Asio flammeus</i>		
Piping Plover <sup>†</sup>	<i>Charadrius melodus</i>	LT	LT
Wilson's Plover	<i>Charadrius wilsonia</i>		LE
Northern Harrier	<i>Circus cyaneus</i>		
Sedge Wren	<i>Cistothorus platensis</i>		
Wayne's Black-throated Green Warbler	<i>Dendroica virens waynei</i>		
Little Blue Heron	<i>Egretta caerulea</i>		
Snowy Egret	<i>Egretta thula</i>		
Tricolored Heron	<i>Egretta tricolor</i>		
White Ibis	<i>Eudocimus albus</i>		

Common Name	Scientific Name	Federal Status	State Status
Peregrine Falcon	<i>Falco peregrinus</i>		LT
Gull-billed Tern	<i>Gelochelidon nilotica</i>		LT
Bald Eagle	<i>Haliaeetus leucocephalus</i>		LT
Black-necked Stilt	<i>Himantopus mexicanus</i>		
Caspian Tern	<i>Hydroprogne caspia</i>		
Black Rail†	<i>Laterallus jamaicensis</i>		
Swainson's Warbler	<i>Limnothlypis swainsonii</i>		
Yellow-crowned Night-heron	<i>Nyctanassa violacea</i>		
Brown Pelican	<i>Pelecanus occidentalis</i>		
Glossy Ibis	<i>Plegadis falcinellus</i>		
Sora	<i>Porzana carolina</i>		
King Rail‡	<i>Rallus elegans</i>		
Virginia Rail	<i>Rallus limicola</i>		
Black Skimmer	<i>Rynchops niger</i>		
Least Tern	<i>Sternula antillarum</i>		
Royal Tern	<i>Thalasseus maximus</i>		
Sandwich Tern	<i>Thalasseus sandvicensis</i>		
Roseate tern	<i>Sterna dougallii</i>	LE	LE

LE = Listed-endangered

LT = Listed-threatened

† = Audubon Society and American Bird Conservancy Red Watchlist

‡ = Audubon Society and American Bird Conservancy Yellow Watchlist

A preliminary assessment of potential avian impacts has been conducted. The potential for displacement or collision of some avian species during various phases of the project was considered. Literature reviews served as the primary basis for this evaluation. Also, Gamesa is conducting voluntary aerial and land-based avian surveys in the Project Area to gain a better understanding of species utilization and seasonal activities in the project area as a precautionary measure. Based on studies and surveys completed to date, it is anticipated that the G11X Prototype WTG effects on avian species are as follows.

- Upland and offshore construction activities may result in some birds being scared off by the use of equipment and human activities, in general, but this already occurs due to the developed nature of Cape Charles Harbor and marine activities that occur daily in this area. The submarine cable landfall location and upland electric transmission cable route is located in a heavily industrialized area that is active year round. Construction activities will be limited to only a few weeks during the year and there are no documented nesting sites near the proposed upland electrical cable route, so no temporary or permanent impacts on breeding birds are anticipated.
- The areas of the Delmarva Peninsula reported as important migratory staging areas and bottlenecks are located 2 to 6 miles or more to the east of the proposed WTG location. Raptors and passerines are generally thought to be associated with staging areas that provide roosting and foraging habitat. None of these habitats correspond to the immediate surroundings of the proposed location for the G11X.

- Breeding birds are at low risk of collision with the G11X since no shorebird breeding colony or prime nesting habitat is adjacent to the proposed offshore location of the G11X. The shoreline of the Chesapeake Bay adjacent to the proposed location for the G11X is heavily developed and predominated by industrial, commercial, and residential land uses. There are no documented nesting and staging areas along the shoreline adjacent to the proposed location for the G11X thus minimizing the chance for congregations of birds in the area.
- Minimal impacts to state or federally listed species are anticipated due to the project being a single WTG and the USFWS does not have any records of federally listed avian species occurring in the Project Area (USFWS, 2011). Similarly, the VADCR, Natural Heritage Program, also reported that it does not have any records of rare, threatened or endangered avian species near the proposed offshore WTG location (VADCR, 2011b).

### Bat Resources

State and federal agency data sources were queried to determine the bat species that are most likely to occur on the land near the proposed location for the G11X. Table 5-2 identifies the ten bat species that result from these database queries (USFWS, 2012; VADCR, 2012; VADGIF, 2012). This species list contains cave-dwelling and tree-dwelling bats. None of these bat species is listed by state or federal endangered species programs (USFWS, 2012).

**Table 5-2 List of Bat Species Known to Occur On Land near the Project Area**

Common Name	Scientific Name
Big brown bat	<i>Eptesicus fuscus</i>
Little brown bat	<i>Myotis lucifugus</i>
Northern myotis	<i>Myotis septentrionalis</i>
Eastern pipistrelle	<i>Perimyotis subflavus</i>
Silver-haired bat	<i>Lasionycteris noctivagans</i>
Eastern red bat	<i>Lasiurus borealis</i>
Hoary bat	<i>Lasiurus cinereus</i>
Seminole bat	<i>Lasiurus seminolus</i>
Evening bat	<i>Nycticeius humeralis</i>
Northern yellow bat	<i>Lasiurus intermedius</i>

Much of what is known about the negative impacts on bats due to WTG impacts comes from post-construction surveys where bat mortality at certain locations have been documented. However, bat behavior, migration patterns, and density levels are likely to be very different over water than over land and ridge tops where post construction bat surveys have occurred. The evaluation of potential Project impacts to bats used existing bat impact studies as a basis for analysis. There are several small upland wind energy projects that are located on the Atlantic Coast that offer some perspective on potential bat impacts based on post-construction monitoring studies.

There is no known data on bats utilizing the airspace above the Chesapeake Bay where the G11X WTG will be located. Studies of offshore bat movements along the Mid-Atlantic suggest that bats could be present in offshore areas where WTGs might be sited but these studies say nothing about bat movements over estuaries and bays like Chesapeake Bay, for example (NJDEP, 2010; Sjollem, et al,

2009). Due to the single G11X turbine, significant impacts are not anticipated. No direct impacts to bat habitat are expected from the construction and decommission of the G11X and associated electrical export cable system. Much of the proposed facilities are located offshore and the relatively small upland electrical components will be underground and located on previously developed industrial land use.

### **Significant Marine/Estuarine/Coastal Wildlife**

The National Marine Fisheries Service (NMFS) Northeast Regional Office, Protected Resources Division indicated in a letter dated November 7, 2011 (NMFS, 2011) that four species of federally threatened or endangered sea turtles, several species of marine mammals, including seals and dolphins protected under the Marine Mammal Protection Act (MMPA), and the proposed endangered Atlantic sturgeon (*Acipenser brevirostrum*) have the potential to utilize the Project Area during certain times of year. The VADCR Natural Heritage Program also indicated that loggerhead and Kemp's Ridley sea turtles are known to utilize the waters of the Project Area (VADCR, 2011). Many of these species would only occur occasionally on a transient basis or would be extremely unlikely to occur in the Project Area. A more detailed description of the marine turtles, marine mammals, and fish species identified in the NOAA and VADCR agency letters and their potential to be present in the Project Area is provided below.

#### **Sea Turtles**

Four species of federally and state-listed threatened or endangered sea turtles may be found seasonally in the vicinity of the Project Area: the federally threatened loggerhead (*Caretta caretta*), federally endangered Kemp's Ridley (*Lepidochelys kempi*), federally endangered green sea turtle (*Chelonia mydas*), and the federally endangered leatherback (*Dermochelys coriacea*). Sea turtles generally have the potential to migrate into waters in the vicinity of the Project Area in late spring when water temperatures warm and return south in the mid-fall when water temperatures drop in response to the changing season, but have the potential to occur from the beginning of April to the end of November (CBP, 2009a). Any sea turtles found in the vicinity of the Project Area are typically small juveniles, the most abundant being the loggerhead followed by the Kemp's Ridley (VIMS, 2010). The leatherback and green sea turtles are less common in Chesapeake Bay, and therefore less likely to be present within the Project Area (VIMS, 2010).

Construction and installation of the Project is expected to have minimal adverse impacts to the federally and/or state-listed threatened or endangered marine turtle species known to occur within the Project Area. Sea turtles are highly mobile animals and are likely to avoid the limited area of construction due to the presence of and noise generated by the construction vessels and activities. As none of the sea turtle species known to frequent Chesapeake Bay nests or resides there year-round, no direct or indirect impacts to sea turtle nesting or breeding sites will occur. Due to the transient and sporadic nature of any sea turtles potentially in the Project Area, construction, operation, and maintenance of the Project will have negligible impact, if any, on these protected species.

#### **Sturgeon**

Atlantic sturgeon are a demersal, anadromous species that migrate to freshwater for spawning during the late winter to early summer time period. They are known to spawn in the tributaries of the Chesapeake Bay during April and May, and then leave Chesapeake Bay in the fall for the near shore marine waters of Virginia (ASSRT, 2007; CBP, 2011a). Therefore, adult sturgeon could be migrating through the Chesapeake Bay Project area and past the Cape Charles offshore site in the late winter/early spring on their way to freshwater spawning sites, and then again in the fall when they migrate to near shore marine waters.

Construction, installation and maintenance of the Project are expected to have negligible impact on Atlantic sturgeon due to the limited potential for interaction and their transient nature. In the unlikely event

that random or transient Atlantic sturgeon adults are present during construction activities, they are highly mobile and can avoid the temporary area of disturbance during construction.

### **Marine Mammals**

All marine mammals are protected by the MMPA and some are additionally listed as endangered or threatened under the Endangered Species Act of 1973. Initial consultation with the NMFS confirmed that the Project Area is not a high use area for whales, and that the presence of any whale listed under the ESA would be rare in the Project Area (NMFS, 2011).

Atlantic Bottlenose Dolphins (protected by the MMPA, but not listed as endangered or threatened) have reportedly been found in the lower Chesapeake Bay in the summer. Harbor seals (*Phoca vitulina*) are also found in the Chesapeake Bay, typically in the winter months. Harbor seals have been observed hauled out on riprap near the Chesapeake Bay Bridge tunnel and are protected under the MMPA.

Construction and installation of the Project is not expected to have adverse impacts to any of the federally or state-listed threatened or endangered marine mammal species or any marine mammal protected under the MMPA. NMFS (2011) reports that only rare, transient marine mammal individuals would be expected to occur within the Project Area. If transient marine mammals are present during construction, they are extremely mobile animals which can avoid the limited area of construction. Due to the limited potential for interaction between marine mammals and Project activities, it is anticipated that construction, operation, and maintenance of the Project will have negligible impact, if any, on these protected species.

### **Northeastern Beach Tiger Beetle**

According to correspondence from the USFWS dated November 30, 2011, the northeastern beach tiger beetle (*Cicindela dorsalis dorsalis*) is the only federally listed species known to occur near the terrestrial boundary of the Project Area. This species is listed by the USFWS and the VADCR as threatened. Northeastern beach tiger beetle habitat includes long, wide beaches with little human and vehicular activity. Threats to this species include shoreline development, beach stabilization, and high levels of recreational use.

The existing site conditions are not considered suitable habitat for the northeastern beach tiger beetle, and activities related to the Project will not affect any local beaches in the vicinity of the Project which may support this species.

### **vi) Public Recreation Areas**

No designated public recreation areas will be directly affected by the Project. Public recreational use of the watershed and recreational fishing within in the Project Area may be temporarily limited by construction vessels during installation of the G11X and submarine cable, for safety reasons. However, these impacts will be highly localized and temporary. No permanent effects on public recreational areas are anticipated due to the Project.

The closest designated recreation areas that may be indirectly affected by views of the G11X are the Cape Charles town beaches and adjacent Eastern Shore Loop Trail along State Route 184/Stone Road (approximately 2.7 miles at the closest), The Cape Charles Coastal Habitat Natural Area Preserve (approximately 2.6 miles); and the William B. Trower Bayshore State Natural Area Preserve (approximately 4.4 miles). Viewers located in these shoreline areas and oriented toward the single G11X might expect low to moderate visual impacts when the G11X is clearly visible. Under hazy or adverse weather conditions this impact will be further reduced.

### **vii) Sand and Gravel Resources**

There are no sand and gravel harvesting sites in or near the Project Area.

### **viii) Underwater Historic Sites**

A submerged archeological cultural resources assessment was conducted by marine archeologists at R.C Goodwin & Associates, Inc. of Frederick, Maryland, to determine the presence or absence of underwater historic sites that may be affected by construction of the Project (Goodwin, 2011). The assessment included archival research and review of data collected during a remote sensing geophysical field investigation at the G11X location and within a corridor centered on the proposed submarine cable location. No previously recorded historic sites were identified on or near the offshore Project Area. Seven geophysical targets that were found to exhibit the potential to represent submerged cultural resources, and avoidance was recommended by the marine archeologists, subject to concurrence by the Virginia Department of Historic Resources. These areas will be marked for avoidance. Project construction maps and communicated to the applicable contractors; compliance will be overseen by an environmental inspector.

No portion of the Project is located within the upland Cape Charles Historic District, which is listed on the National Register of Historic Places.

### **b. Coastal Natural Hazard Areas**

***This policy covers areas vulnerable to continuing and severe erosion and areas susceptible to potential damage from wind, tidal, and storm related events including flooding. New buildings and other structures should be designed and sited to minimize the potential for property damage due to storms or shoreline erosion. The areas of concern are as follows.***

- i) Highly Erodible Areas**
- ii) Coastal High Hazard Areas, including flood plains.**

The submarine cable will approach and make landfall within Cape Charles Harbor. The edges of the harbor shorelines are engineered. A small section of the bulkhead at the landfall location will be improved and replaced with a bulkhead just seaward of the existing bulkhead, and will not be susceptible to erosion. Review of the Virginia GIS GEMs database identified no Highly Erodible Areas and no Coastal High Hazard Areas in the vicinity of the Project Area. The federally designated coastal high hazard area is identified as Zone V on Flood Insurance Rate Maps, review of which for the Project Area indicated the submarine cable and landfall is within Zone AE, at elevations above Zone V. Therefore no Highly Erodible Areas or Coastal High Hazard Areas will be directly or indirectly affected by the Project, as none are located within the Project vicinity.

### **c. Waterfront Development Areas**

***These areas are vital to the Commonwealth because of the limited number of areas suitable for waterfront activities. The areas of concern are as follows:***

- i) Commercial Ports**
- ii) Commercial Fishing piers**
- iii) Community Waterfronts**

***Although the management of such areas is the responsibility of local government and some regional authorities, designation of these areas as Waterfront Development Areas of Particular Concern under the VCP is encouraged. Designation will allow the use of federal CZMA funds to be used to assist in planning for such areas and in the implementation of such plans. The VCP recognizes two broad classes of priority uses for waterfront development Areas of Particular Concern:***

**i) water access-dependent activities.**

**ii) activities significantly enhanced by the waterfront location and complementary to other existing and/or planned activities in a given waterfront area.**

The submarine cable will approach landfall within the Cape Charles Harbor, a commercial port, and will make landfall and transition to the upland cable along the Cape Charles Harbor waterfront.

Based upon a review of the Town of Cape Charles zoning ordinances and the VCP GEMS GIS database, no Waterfront Development Areas and no Waterfront Development Areas of Particular Concern have been designated using those specific terms. The Project landfall, transition vault and a portion of the upland cable will be located within the Harbor District designated by the Town of Cape Charles (Town of Cape Charles Official Zoning Map revised June 2, 2008). The Project is a Permitted Use in the Harbor District as a public utility facility, in accordance with Article III, § 3.9, B.8 of the Town of Cape Charles Zoning Ordinance revised January 8, 2009.

The Project is a water-dependent use. The landfall, upland transition vault, and upland cable route have been sited to be complementary to the existing waterfront uses in and adjacent to Cape Charles Harbor. The submarine cable will be located in the dredged harbor, the transition vault will be located within a previously disturbed active railroad yard in the Cape Charles, and the upland cable will be installed adjacent to an existing railroad track within an easement granted by the railroad.

Review of the Harbor Area Conceptual Mater Plan + Design Guidelines, Town of Cape Charles, Virginia (dated August 4, 2006) indicates future improvements to the Harbor District in the vicinity of the Project may include increased public pathways along the waterfront to connect a network of existing and proposed open and public spaces, and a planned fishing pier at the jetty at the north mouth of the harbor. The Project will not present any constraint to the plans as identified in the Plan.

## **5.2 Advisory Policies for Shorefront Access Planning and Protection**

### **a. Virginia Public Beaches**

***Approximately 25 miles of public beaches are located in the cities, counties and towns of Virginia exclusive of public beaches on state and federal land. These public shoreline areas will be maintained to allow public access to recreational resources.***

The Project will have no direct or indirect effect on access to public beaches.

### **b. Virginia Outdoors Plan**

***Planning for coastal access is provided by the DCR in cooperation with other state and local government agencies. The Virginia Outdoors Plan (VOP), which is published by the Department, identifies recreational facilities in the Commonwealth that provide recreational access. The VOP also serves to identify future needs of the Commonwealth in relation to the provision of recreational opportunities and shoreline access. Prior to initiating any project, consideration should be given to the proximity of the project site to recreational resources identified in the VOP.***

The Project is not within or adjacent to any recreational facilities identified in the VOP, and therefore none will be directly affected. The closest designated recreation areas that may be indirectly affected by views of the G11X are the Cape Charles town beaches and adjacent Eastern Shore Loop Trail along State Route 184/Stone Road (approximately 2.7 miles at the closest), The Cape Charles Coastal Habitat Natural Area Preserve (approximately 2.6 miles); and the William B. Trower Bayshore State Natural Area Preserve (approximately 4.4 miles). Individuals located in these shoreline areas and oriented toward the single G11X may have a view of the offshore WTG depending on weather conditions.

Public recreational use of the watershed and recreational fishing within in the Project Area may be temporarily limited by construction vessels during installation of the G11X and submarine cable, for safety reasons. However, these impacts will be highly localized, short in duration and temporary. No permanent effects on public recreational areas are anticipated due to the Project.

#### **c. Parks, Natural Areas, and Wildlife Management Areas**

***Parks, Wildlife Management Areas, and Natural Areas are provided for the recreational pleasure of the citizens of the Commonwealth and the nation by local, state and federal agencies. The recreational values of these areas should be protected and maintained.***

The Project will have no direct effect on parks, wildlife management areas and natural areas. As noted above, the Project may have a low to moderate indirect visual effect on viewers in shoreline areas at two natural area preserves. These are the Cape Charles Coastal Habitat Natural Area Preserve (approximately 2.6 miles); and the William B. Trower Bayshore State Natural Area Preserve (approximately 4.4 miles).

#### **d. Waterfront Recreational Land Acquisition**

***It is the policy of the Commonwealth to protect areas, properties, lands, or any estate or interest therein, of scenic beauty, recreational utility, historical interest, or unusual features which may be acquired, preserved, and maintained for the citizens of the Commonwealth.***

The Project does not involve waterfront recreational land acquisition, and therefore this policy is not applicable.

#### **e. Waterfront Recreational Facilities**

***This policy applies to the provision of boat ramps, public lands, and bridges which provide water access to the citizens of the Commonwealth. These facilities shall be designed, constructed, and maintained to provide points of water access when and where practicable.***

The Project does not involve provisions of boat ramps, public lands and bridges, and therefore this policy is not applicable.

#### **f. Waterfront Historic Properties**

***The Commonwealth has a long history of settlement and development, and much of that history has involved both shorelines and near-shore areas. The protection and preservation of historic shorefront properties is primarily the responsibility of the Department of Historic Resources. Buildings, structures, and sites of historical, architectural, and/or archaeological interest significant resources for the citizens of the Commonwealth. It is the policy of the Commonwealth and VCP to enhance the protection of buildings, structures, and sites of historical, architectural, and archaeological significance from damage or destruction when practicable.***

The Cape Charles Historic District extends to the western shoreline north of the harbor, but does not include the railroad property abutting the north side of the Harbor where the submarine cable will make landfall and transition to the upland cable.

A Phase 1A upland archeological reconnaissance and historic properties viewshed analysis was conducted by archeologists and architectural historians at John Milner Associates, Inc. (JMA) of Alexandria, Virginia to assess the potential impact of the Project on upland archeological resources and aboveground historic properties (JMA, 2011). JMA found that no waterfront historic properties, including archeological sites or aboveground historic structures, will be directly affected by the Project. JMA

concluded that views of the offshore WTG would not have a significant effect on the historic district, as the visual effect will be significantly moderated by distance (2.7 miles at its closest) and the presence of existing visual and auditory intrusions.

The Project will have no other effects on waterfront historic sites.

## **6.0 REQUEST FOR AGENCY COMMENTS**

By this certification that the Project is consistent with Virginia Coastal Zone Management Program, the Commonwealth of Virginia is notified that it has six months from the receipt of this letter and accompanying information to concur with or object to Gamesa Energy, USA LLC's certification. Pursuant to 15 CFR § 930.63(b), if Virginia has not issued a decision within three months following commencement of state agency review, it shall notify Gamesa and the federal agency of the status of the matter and the basis for further delay. The state's concurrence, objection, or notification of review status shall be sent to:

**Gamesa Energy USA, LLC**  
Attn: Todd Hopper  
1801 Market Street, Suite 2700  
Philadelphia, Pennsylvania, 19103

**U.S. Army Corps of Engineers – Norfolk District**  
Attn: Stephen Decker  
803 Front Street  
Norfolk, Virginia 23510-1096

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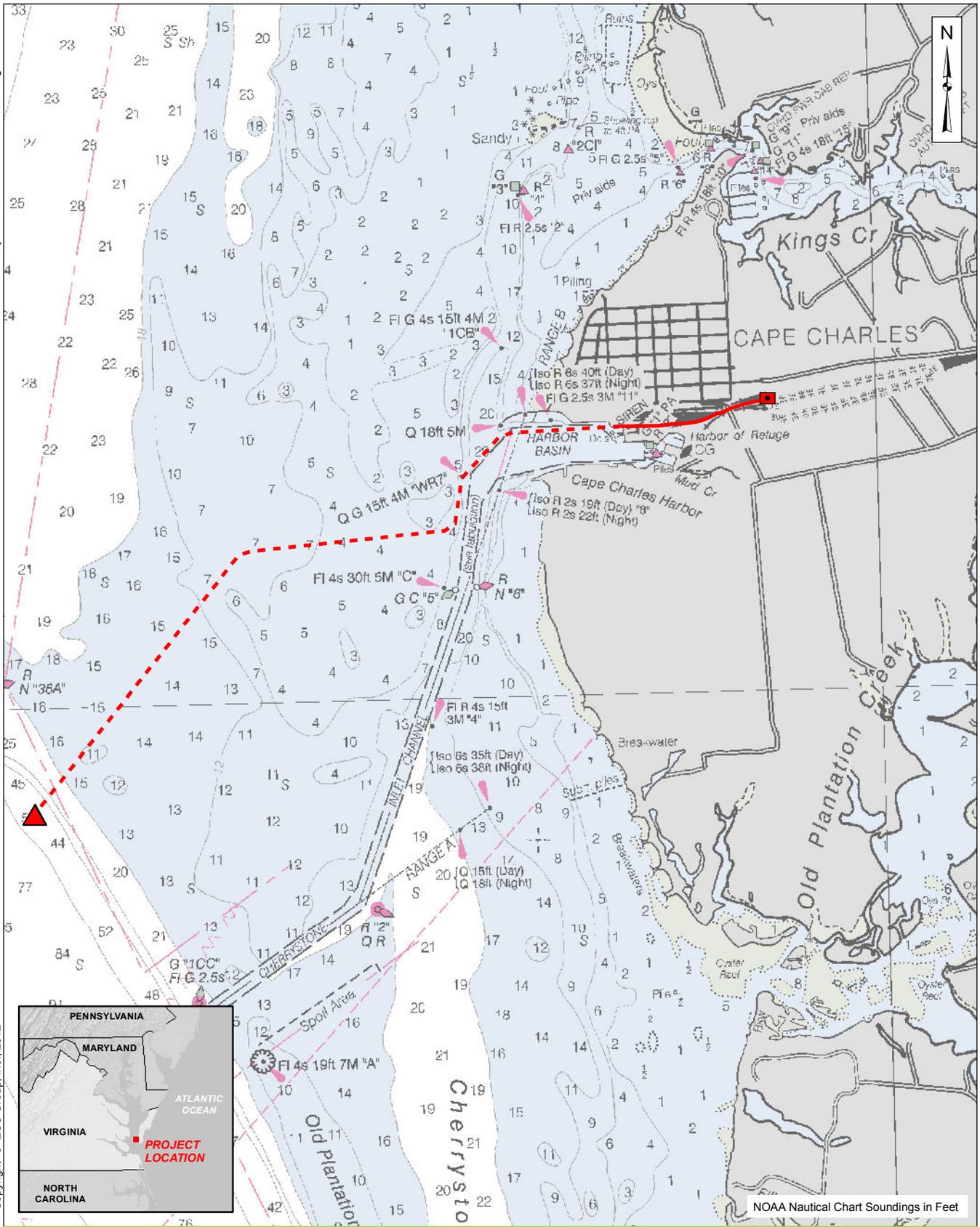
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## Figures

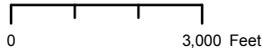
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**GAMESA ENERGY USA, LLC**  
Offshore Cape Charles, Virginia

Scale: 1" = 3,000'



Source: 1) ESS, Siting Area & Routing, 2011  
2) NOAA, Nautical Chart, 2011

**Legend**

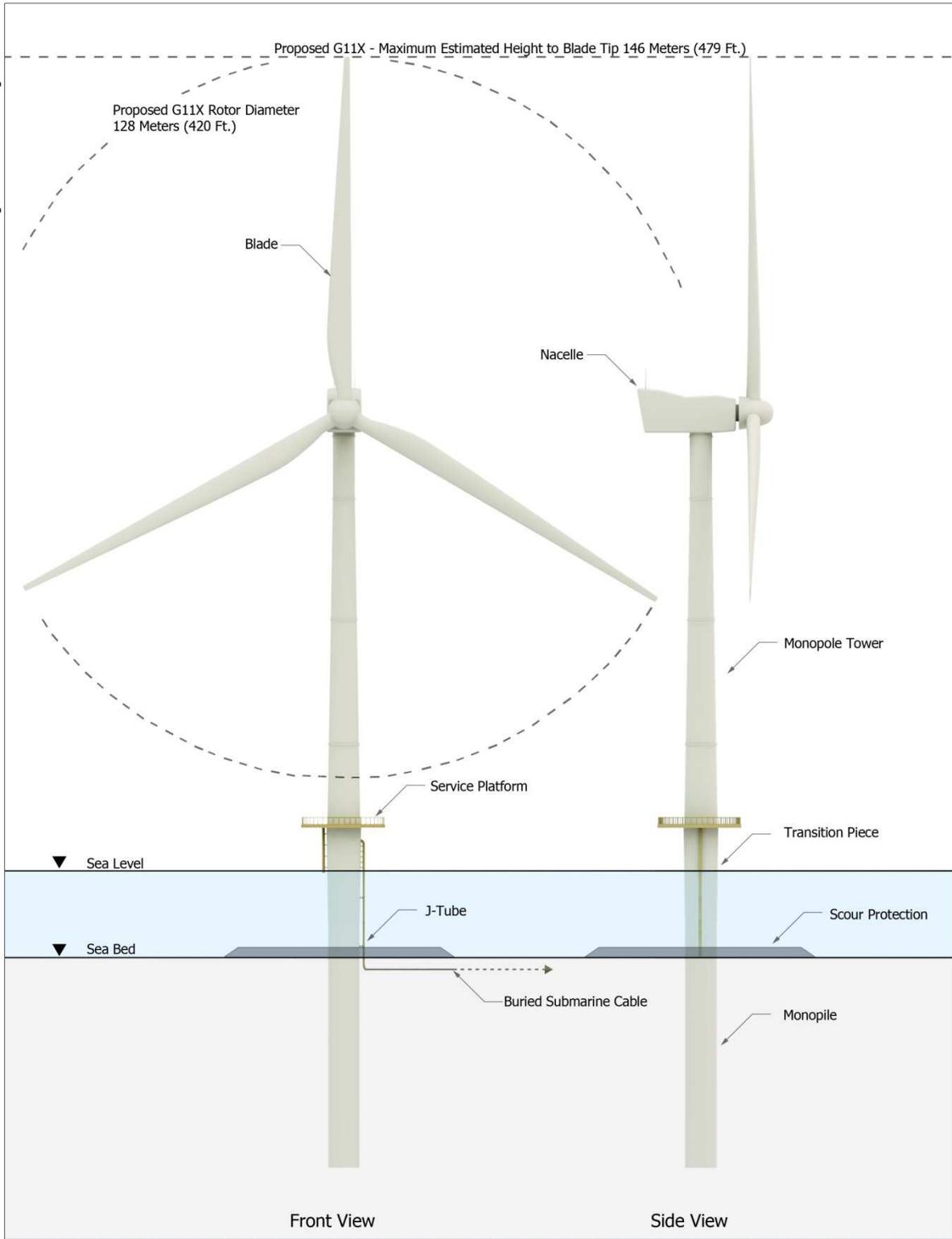
- Substation Easement
- ▲ Proposed G11X WTG Location
- - - Submarine Cable Route
- Upland Cable Route

**Site Locus**



**Figure 1.0-1**

Location: J:\G216-000 Gamesa Permitting\Joint Permit\Draft-Figures\PPT



GAMESA ENERGY USA LLC  
Offshore Cape Charles, Virginia

Scale: Not to Scale

**Typical Offshore Wind  
Turbine Schematic**

**Figure  
1.2-1**



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**GAMESA ENERGY USA, LLC**  
Offshore Cape Charles, Virginia

Scale: 1" = 800'  
0 800 Feet

Source: 1) ESS, Siting Area & Routing, 2011  
2) USDA, Ortho, 2011

**Legend**

- Proposed G11X WTG Location
- Submarine Cable Route
- Upland Cable Route
- Limit of Privately Held Submerged Lands
- Permitted Breakwaters (Not yet Built)
- Substation Easement

**Submarine Cable Landfall and Upland Cable Route**

**Figure 1.0-2**