

**CRMC File No. 2012-09-065**  
**Deepwater Wind, Block Island, LLC &**  
**Deepwater Wind Block Island Transmission, LLC**  
**CRMC Staff Report**  
**January 24, 2014**

**A. Project Description:** For purposes of this CRMC Staff Report, the Block Island Wind Farm (BIWF) and the Block Island Transmission System (BITS) will be referred to collectively as “The Project” except where the two component projects are identified for individual discussion and evaluation purposes. For ease of discussion, the applicant is referred to as “Deepwater or Deepwater Wind”.

- 1. Block Island Wind Farm (BIWF):** Deepwater Wind proposes the Block Island Wind Farm (BIWF), a 30-megawatt (MW) offshore wind farm located approximately 3 miles southeast of Block Island, Rhode Island. The BIWF will consist of five, 6-MW wind turbine generators located entirely within State waters, a submarine cable interconnecting the turbines (referred to as the Inter-Array Cable), and a 34.5-kilovolt transmission cable from the northernmost turbine to an interconnection point on Block Island (referred to as the “export cable”).
- 2. Block Island Transmission System (BITS):** The Block Island Transmission System (BITS), a 34.5-kV alternating current (AC) bi-directional submarine transmission cable that will run approximately 21.8 miles (35.1 km) from Block Island to the Rhode Island mainland. The BITS will be capable of delivering power both to and from the Rhode Island mainland. Deepwater Wind will develop and construct the BITS and will likely transfer ownership of the BITS to National Grid. The BITS cable is located within Rhode Island state territorial waters and in federal waters between Block Island and the mainland. The mainland landing site is at Scarborough State Beach with the cable continuing along state roads to a new substation located at the Dillon Rotary/Corner. The Project will also include construction of one new substation (Block Island Substation) in the Town of New Shoreham on Block Island at the site of an existing power generation facility on property owned by the Block Island Power Company (BIPCO). The Block Island Substation will provide a point of interconnection for the power from the BIWF and will also be the point of interconnection for BITS on Block Island. The onshore portions of the BIWF and BITS cables on Block Island will be collocated along the same route to the Block Island Substation. The Block Island Substation will consist of two adjoining switchyards, one dedicated to the BIWF (BIWF Generation Switchyard) and the other dedicated to the BITS (BITS Island Switchyard). The Project will also include upgrades to the existing substation on the BIPCO property.

**B. Staff Summary of the Entire Project:**

- 1. Block Island Wind Farm (BIWF):** The wind farm portion of the project consists of five 6-MW direct drive wind turbine generators that are spaced approximately half a mile apart with an inter-array cable that connects the turbines to the Block Island switchyard. The turbines are located in the Renewable Energy Zone as designated by the OSAMP which is located approximately 3 miles southeast of Block Island. The wind turbine generators will be installed on jacketed structures (similar to oil rigs in the Gulf of Mexico) in approximately 80 feet of water. It is the opinion of staff that the wind turbine

generators proposed within the renewable energy zone utilizing construction methods which include appropriate time of year restrictions to mitigate potential impacts to North Atlantic Right Whales and other species of concern meets the requirements of the RI Coastal Resources Management Program (RICRMP) and the Ocean Special Area management Plan (OSAMP).

2. **Block Island Transmission System (BITS):** The BITS cables will be installed using a jet plow which is typical for this type of cable installation. The jet plow liquefies the sediment and allows the cable to be buried without any excavation and backfill. This method has benthic impacts but they are limited to the immediate cable area and are short in duration. It is the opinion of staff that the proposed BITS cable locations and installation methods meet the program requirements of the RICRMP and OSAMP for all areas with the exception of the beach landing at Scarborough Beach. The proposals from the beach landing submitted have two options with limited geotechnical and geophysical information. It is the opinion of Staff that the applicant will not satisfactorily achieve the 10 foot burial depth utilizing the Short Distance Horizontal Directional Drilling (HDD) alternative. Accordingly, staff recommends that the Council require that the Long Distance HDD alternative be utilized for transmission cable installation should an assent be granted for the project (see stipulations).
3. **Final Plan Set:** The final plan set is a combination of three different plan sets that were provided during the review process. The set is entitled "BIWF and BITS Preliminary Engineering Drawings – Submitted by: Deepwater Wind Block Island, LLC and Deepwater Wind Block Island Transmission System, LLC – Attachment 1 – Block Island Wind Farm(submitted September 2012 ER/COP) – Attachment 2 – Block Island Transmission System (September 2012 ER/COP Route updated in the September 2013 ER/COP Modification – Attachment 3- Block Island Transmission System Terrestrial Scarborough Beach Route"
  - Attachment 1** – Drawing Numbers G1-1, P1-1,P1-2, P1-3, P1-3, P1-4, P1-5, P1-6, P1-7, P1-8, P1-9, P1-10, P1-11, U3-1
  - Attachment 2** – Drawing Numbers G1-1, P1-2, P1-3, P1-4, P1-5, P1-6, P1-7, P1-8, P1-9, P1-10, P1-11, P1-12, P1-13, P1-13A, P1-14, U3-1, U3-2
  - Attachment 3** – Drawing Sheet 1 -33 (entire plan set 33 of 33)

If the Council should approve the Project, these plans would be considered the "Approved Project Plans"

4. **Block Island Substation:** CRMC staff has not conducted a review of the Block Island Substation which involves activities in the vicinity of Freshwater Wetlands. Regulatory jurisdiction over this portion of the project has been deferred to RI Department of Environmental Management and will include both a Freshwater Wetlands assessment and assessment of work to be performed in the areas of existing environmental contamination. The official transfer of jurisdiction to RIDEM occurred pursuant to a letter dated November 19, 2012 and signed by Grover J. Fugate, Executive Director, Coastal Resources Management Council.

**5. State and Federal Permit Requirements:** The following State and Federal Permits are required or are Prerequisites of the RICRMP:

- RIDEM – Water Quality Permit (**Prerequisite for CRMC Assent**)
- RIDEM Freshwater Wetlands Permit
- RIDEM RIPDES Permit
- Army Corps of Engineers – Individual Permit
- BOEM – Right of Way Grant Area for BITS cable in Federal Waters between Block Island and the Rhode Island mainland
- NOAA, National Marine Fisheries Service Concurrence for species protected under the Marine Mammal Protection Act (MMPA). An assent may not be issued without a completed ESA Section 7 consultation.
- US Fish and Wildlife Service concurrence for species protected under the Endangered Species Act (ESA- section 7 consultation) and Migratory Bird Treaty Act (MBTA)

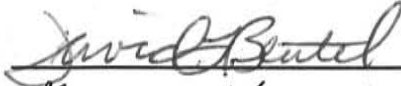
**6. Public Comments:** The project has had two separate public notices that were advertised in the Providence Journal, sent to abutters and posted on CRMC's website. The first public notice was on November 15, 2012 and was for 60 days. The notice was extended until February 4, 2013 due to requests for additional time to review the significant amount of material submitted by Deepwater. This notice garnered 78 written comments and a petition signed by 214 people. There was some overlap of the written comments and signers of the petition. The comments had 5 main themes which were: the Application fee; the permitting process; the costs of the project; environmental impacts; and general comments such as aesthetics and decommissioning. Many of the comments listed several of these items. Of the 78 comments received, 19 were in favor of the project, the remaining are opposed to the project or portions of the project. The 214 people who signed the petition are opposed to the project.

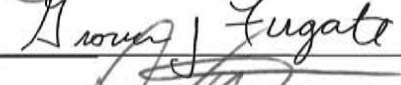
Deepwater Wind modified the project to move the transmission cable landing from Narragansett Town Beach to Scarborough State Beach. This modification required an additional public notice. The second public notice was sent on November 22, 2013 and was to notify the public including those in the vicinity of the proposed Scarborough beach landing that the project had been modified. This notice was issued in a similar manner but only for 30 days. There were a total of 7 comments with only one in favor, one neutral and the remaining opposed.


**7. CRMC Staff's Conclusion and Recommendations:** This is complex project that requires evaluation under the newly adopted Ocean SAMP as well as the RICRMP. The project will result in impacts to the benthic environment, avian resources, fish and fisheries as well as view sheds both in general and from historic resources. The applicant has endeavored to minimize the impacts through project design, construction methods and consultation with regulatory authorities and interested parties. In some cases, the actual level of potential impact is difficult to quantify and some impacts will not be thoroughly understood until monitoring of the completed demonstration project is undertaken. The OSAMP outlined a set of performance standards and process steps that

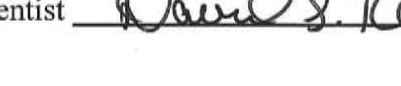
have been addressed by the applicant - Deepwater Wind. CRMC Staff have reviewed the applicable standards and have evaluated the applicant's consistency with those standards. Based on this review, CRMC Staff has no objection to the project provided the Council adopts the recommended stipulations, but we defer to the Council for consideration of the Staff report and the substantive testimony expected during the public hearing process. It is also the opinion of staff that the material submitted for this phase of the application process meets the applicable OSAMP requirements sufficiently to move onto the Final Design.

8. Staff Signatures: The following Staff members contributed to this report:

David Beutel, CRMC Aquaculture Coordinator 

Grover J. Fugate, CRMC Executive Director 

Danni Goulet, Marine Infrastructure Coordinator 

David S. Reis, CRMC Sup. Environmental Scientist 

C. Applicability of CRMC Regulations:

1. Rhode Island Coastal Resources Management Program (RICRMP):

a. **General applicability:** In the case of this project, the RI Coastal Resources Management program applies to all project activities located beyond the jurisdictional boundaries of the Ocean SAMP. This includes activities located on land, on coastal features and in tidal waters out to 3 nautical miles. Pursuant to RICRMP Section 100 (Alterations and Activities That Require an Assent from the Coastal Resources Management Program), all portions of the project, including activities inland of the nominal 200' jurisdictional area, are subject to jurisdiction when "...any alteration or activity any portion of which extends onto the most inland coastal feature or its 200 coastal area..." Furthermore, the Ocean Special Area Management Plan (O SAMP) states: "All construction activities shall comply with the policies and standards outlined in the Rhode Island Coastal Resources Management Program (aka, the "Red Book"), as well as the regulations of other relevant state and federal agencies."

b. **Section 120 – Variances:** Pursuant to RICRMP Section 120, a variance is required for any alteration or activity which does not meet the Standards contained in the RICRMP. In this case, the potential variances area associated with work proposed within the minimum 50' setback required by RICRMP Section 140. However, setback variances are not required if the Council determines that the BIWF and BITS transmission cables are considered "water dependant" pursuant to

RICRMP Section 140.B.4. CRMC Staff has identified the following potential variances for this project:

- Installation (including filling, removing and grading) of the BIWF export cable within the minimum 50' setback of the coastal beach and dune setback on Block Island.
- Installation (including filling, removing and grading) of the BITS transmission cable within the minimum 50' setback of the coastal beach and dune setback on Block Island.
- Installation (including filling, removing and grading) of the BITS transmission cable within the minimum 50' setback of the coastal beach in Narragansett.
- Installation (including filling, removing and grading) of the transmission cable ductbank within 50' of the coastal wetlands both in Narragansett and on Block Island and dune setback on Block Island.

With regard to these potential variances, it is CRMC Staff's opinion that the facility components (transmission cables) identified above are water dependent activities/uses consistent with the definition contained in the RICRMP glossary which defines "Water-dependant activity use" as: "Activities or uses which can only be conducted on, in, over, or adjacent to tidal waters or coastal ponds because the use requires access to the water for transportation, recreation, energy production, or source of water..." Staff's conclusion is based on the production of wind farm energy envisioned by the Ocean SAMP which in all cases requires transmission cables to direct the energy back to shore thereby being directly associated with the water-dependant production of energy. **On this basis, CRMC Staff concludes that variances are not required for the above noted activities.**

c. **Section 130 – Special Exceptions:** Pursuant to RICRMP Section 130, a special exception is required for any alteration or activity which is identified as a prohibition by the RICRMP. CRMC Staff have identified the following special exceptions for this project:

- Installation of the **BIWF export cable** in the Type 1 waters surrounding the Block Island shoreline and out to 500 feet from shore (ref. RICRMP Section 300.3.D.1 and Table 1 - Water Type Matrices).

- Installation of the **BIWF export cable** through (under) the beach bordering the shoreline of Block Island adjacent to Corn Neck Road (ref. RICRMP Sections 300.3.D.1 and Table 1 - Water Type Matrices). This beach is locally known as Crescent Beach.
- Installation of the **BIWF export cable** within dunes and the foredune as defined by RICRMP Section 210.7 (ref. RICRMP Sections 300.3.D.1, 210.7.D.2). Installation on beaches and dunes bordering Type 1 waters (ref. RICRMP Water Type Matrices).
- Installation of the **BITS cable** in Type 1 Waters bordering the Block Island Shoreline and Scarborough Beach Shoreline and out to 500' from shore (ref. RICRMP Section 300.3.D.1 and Table 1 - Water Type Matrices).
- Installation of the **BITS cable** through (under) the beach bordering the Type 1 waters of the Block Island and Scarborough Beach shorelines (ref. RICRMP Sections 300.3.D.1 and Table 1 - Water Type Matrices).

In order to obtain a special exception, RICRMP Section 130 criteria must be met. Criteria #1 requires that the project serve a compelling public purpose and be one of several listed activities. Staff concludes the Deepwater wind project fits the criteria allowance for public infrastructure projects such as “utilities” and/or “energy” thereby meeting criteria 1. Criteria #2 requires that all reasonable steps shall be taken to minimize environmental impacts and user conflicts. In this regard, CRMC Staff have completed a comprehensive review of the applicant’s environmental reports and construction and operations plan and have reviewed the project for consistency with the RI Coastal Resources Management Program (RICRMP) and the Ocean Special Area Management Plan (O SAMP). Based on this review, CRMC Staff concludes the project has minimized potential environmental impacts and user conflicts. Finally, Criteria #3 requires that there be no reasonable means of, or location for, serving the compelling public purpose cited. When applying criteria 3 to the Deepwater project, the foremost consideration should be the proposed location of the wind farm within the preferred area established by the O SAMP which is identified as the “Block Island Renewable Energy Zone”. And, when considering the project intent of providing power to Block Island with an interconnection transmission cable to mainland Rhode Island, the transmission cables appear to be reasonably located as further evaluated in this report. ***On this basis, CRMC Staff concludes the project meets the required Special Exception Criteria and is eligible for the granting***

*of a Special Exception.* (Deepwater's most recent response to RICRMP Section 130 Special Exception Criteria is contained in a report prepared by Natural Resource Services, Inc. dated October 11, 2013.)

- d. **Section 140 – Setbacks:** Section 140 of the RICRMP requires a minimum 50' setback is required for all construction including filling removing and grading activities. A larger setback may be required where higher erosion rates have been mapped by the CRMC. In accordance with the most recently adopted Shoreline Change Maps (available on the CRMC website) there are no mapped erosion rates which result in a setback requirement larger than 50 feet for this project. Where the minimum setback requirement cannot be met, a variance is required. Setback variance requirements for this project are identified and evaluated within section C.1.b of this staff report.
- e. **Section 150 – Coastal Buffer Zones:** A coastal buffer zone is an upland area that it is retained in a naturally vegetated, primarily undisturbed condition bordering coastal features and freshwater wetlands. The RICRMP contains no coastal buffer zone standards applicable to a project of this type.
- f. **Section 200.1 – Type 1 Waters:** The RICRMP designates six (6) water types ranging from Type 1 which are Conservation Area Waters to Type 6 which are Industrial Waterfronts and Commercial Navigation Channels. Type 1 waters are considered to be the least impacted by usage and development whereby the policies and goals for Type 1 waters are oriented toward conservation and natural habitat values. Section 200.1.C.1 states: The Council's goal is to preserve and protect Type 1 waters from activities and uses that have the potential to degrade scenic, wildlife, and plant habitat values, or which may adversely impact water quality or natural shoreline types. As discussed in section C.1.c of this report, several project components will require work and the installation of "industrial type structures", namely transmission cables through and within the sediments below Type 1 waters. These activities are discussed within sections A.1 and A.2 of this report. The special exception requirement for these activities is discussed in Section C.1.c of this report.
- g. **Section 200.4 – Multipurpose Waters:** The RICRMP designates type 4 waters as "Multi-purpose Waters". Type 4 waters are often designated greater than 500' from shore and are typical of the open waters of Narragansett Bay and Block Island and Rhode Island Sounds. The Ocean SAMP further designates certain waters off Block Island as Type 4E which is further described as the "Renewable Energy Zone". Ocean SAMP policies for the Renewable Energy Zone are discussed in section C.2 of this report.

**h. Section 210.1 - Coastal Beaches:** Transmission cables will be installed by burial below coastal beaches both at Scarborough Beach in Narragansett and Crescent Beach on Block Island. Deep Water's preferred transmission cable installation option would involve short distance Horizontal Directional Drilling (HDD). This process would require excavating a steel sheet pile supported trench across both beaches up to 10' wide, 12' deep and 60-70' long terminating at Mean High Water (MHW). Short distance HDD would then be used to drill from the respective beach parking lots to the beach trench where the cable will be attached and pulled back to manholes installed in the parking lot at each beach. Cable installation from MHW seaward would be accomplished by a vessel towing a jet plow from the beach to a depth of approximately 20 feet. The jet plow will then be disconnected from the tow vessel and winched back to the beach trench by equipment on land. As the jet plow is winched back to land, the transmission cable will be installed in the trench previously excavated by the jet plow. It is the opinion of Staff based on research with the Army Corps of Engineers that jet plows can not effectively bury cables deeper than 6 feet into the sediment. Deepwater states short distance HDD will result in a cable burial depth of 10-12 feet (ref. May 31, 2013 supplemental letter). From the beach trench landward, the transmission cable will be pulled to the parking lot manhole through the shaft installed by short distance HDD.

The second (applicant's non-preferred) alternative involves utilizing long distance HDD from the respective beach parking lot to temporary steel sheet-pile cofferdams installed "between 300 and 1,800 feet offshore. The offshore cofferdam will consist of a temporary steel sheet-pile enclosure that will be removed upon cable installation to the main land. Deepwater submitted a letter dated October 17, 2013, which withdraws the long distance HDD alternative from consideration on Block Island (but remains an alternative for the beach landing at Scarborough). Long distance HDD results in a deeper cable installation depth in the nearshore and beach environment which is stated to be 15-20 feet below the sediment surface and is within the Council's purview to require this method of installation.

Due to the shallower transmission cable depth in the nearshore environment achieved with the short distance HDD technique, CRMC Staff believes Long Distance HDD is the better alternative considering the highly dynamic nature of beaches particularly during significant coastal storms. In addition, after careful review of the information submitted, CRMC Staff remains unconvinced that a 10-12' burial depth can be achieved by the jet plow in the near-shore environment. On this basis, staff has offered a stipulation that a minimum burial depth of 10' below grade be achieved between MHW and -10' MLW. Staff has also



offered a stipulation requiring long distance HDD at Scarborough beach due to the limited amount of geotechnical information provided. In addition, since both cable landing areas will occur beneath public bathing beaches, the deeper cable installation depth achieved with long distance HDD appears to provide a greater margin of safety.

Both transmission cable installation methods are considered to represent activities which impact coastal beaches thereby requiring the granting of a special exception. Although long distance HDD will involve transmission cable installation approximately 15-20 feet below the beach and nearshore subtidal marine sediments, the end result is the installation of an industrial type structure in beach sediments bordering the shoreline. On this basis, CRMC Staff believes a special exception is required. CRMC Staff's review of RICRMP Section 130 special exception criteria is contained in C.1.c of this report.

- i. Section 210.2 - Barrier Island and Spits:** The proposed Block Island Transmission System (BITS) cable and export cable will make landfall and traverse a barrier beach on Block Island. The cable will make landfall on the State Beach portion of Crescent Beach which is a CRMC designated "moderately developed barrier beach". From the State Beach landfall, the cable will turn south and traverse a portion of Crescent Beach which is a CRMC designated "developed barrier beach". Pursuant to RICRMP Section 210.2.D, the construction or expansion of new infrastructure is prohibited on barrier beaches (ref. section 210.2.D.5) except where such infrastructure is "... intended to service the needs of the state..." and is "...intended to meet a demonstrated state need that provides public benefit" (ref. section 210.D.9). The BITS and export cable is considered to be consistent with this exemption and is not considered to be prohibited on a barrier beach.
- j. Section 210.3 - Coastal Wetlands:** The proposed transmission cable "ductbank" (includes export cable on BI) will be located in close proximity to coastal wetlands in Narragansett and Block Island. These wetlands include coastal wetland (salt marsh, brackish wetland and contiguous areas of freshwater wetland) located in Narragansett and Coastal Wetlands (salt marshes) located on Block Island. According to the project plans, no work in wetlands is proposed. However transmission cable installation will occur within the minimum 50' setback both on Block Island and in Narragansett thereby requiring a potential variance to RICRMP Section 140 (unless determined to be water dependent). On Block Island the transmission cable will be installed within the 50' setback of several areas of coastal wetland (primarily salt marsh) bordering Harbor Pond. In Narragansett, the transmission cable will be installed within the 50' setback of 6 coastal

wetlands (contiguous freshwater wetlands) that extend from Point Judith Pond to the transmission cable route along Route 108. Along Route 108, all work is proposed within the existing paved roadway and/or cleared shoulders where no direct impacts to wetlands are proposed. Provided appropriate erosion and sediment controls and proper dewatering techniques are utilized, no indirect impacts to coastal wetlands are expected from this project. In addition, variances are not required if the Council determines the transmission cable is a "water dependent structure". See staff stipulations.

**k. Section 220 Areas of Historic and Archaeological Significance:**

Pursuant to RICRMP Section 220.C.3 & 4, the Council's Policy (and practice) is to solicit comments from the RI Historical Preservation and Heritage Commission (HPHC), with regard to historic and archaeological resources. HPHC has reviewed the project and has provided a "final" comment letter dated November 20, 2013. Comments are provided with regard to marine archaeological resources, terrestrial archaeological resources and above-ground historic properties. HPHC concludes that impacts on marine archaeological resources can be avoided by avoiding two "clusters" (side scan or magnetic anomalies) in the vicinity of the BITS, by avoiding a "cluster" near the Scarborough landing and by providing a 100' buffer zone from potential paleo-landforms identified by project surveys and by monitoring of the beach excavation at Block Island's Crescent Beach. With regard to terrestrial archaeological resources, HPHC concludes potential impacts can be mitigated through data recovery conducted during transmission cable excavation provided consultation occurs with HPHC if significant archaeological sites are identified. With regard to potentially affected above-ground historic properties, a list of these properties is provided in the HPHC comment letter. In considering the listed properties, HPHC states: "In summary, it is our conclusion that the proposed combined undertaking will result in adverse effects to significant cultural resources. In the absence of prudent and feasible alternatives that would avoid these effects, it would be appropriate to develop a Memorandum of Agreement to stipulate measures to mitigate them". The HPHC letter of November 20, 2013 further provides draft conditions to be incorporated into a Memorandum of Agreement. A more detailed review of the Visual Impact Analysis is contained in section C.1.t of this report.

**l. Section 300.1 – Category B requirements:**

Deepwater Wind has addressed the written requirements of RICRMP Section 300.1 by referencing pertinent sections of the Ocean SAMP which expand upon the Section 300.1 criteria. Specifically, Deep Water's 300.1 responses are contained in pages 1-7 to 1-11 of the Environmental Report /Construction and Operations Plan (ER/COP). For each of the 11

criteria contained in RICRMP Section 300.1, Deep Water identifies where in the ER/COP appropriate responses have been provided. Consistent with this approach, CRMC Staff have reviewed and evaluated the Deepwater's responses to "companion criteria" specified in the Ocean SAMP. CRMC Staff's review comments are provided in section C.3, D, F and G of this staff report.

- m. Section 300.2 – Filling, Removing and Grading of Shoreline Features:** Filling, removing and grading activities will occur on beaches, dunes and barrier beaches to accommodate installation of the BIWF and BITS transmission cables. RICRMP Section 300.2.C.1 prohibits filling removing and grading on beaches, dunes and undeveloped barrier beaches bordering Type 1 and 2 waters. Although RICRMP Section 210.2.D.9 exempts infrastructure which is "... intended to service the needs of the state...", the RICRMP does not contain a "companion exemption" with regard to the filling, removing and grading activities necessary to install such infrastructure. This prohibition and the special exemption requirements necessary for relief are addressed in Section C.1.c of this Staff report.
- n. Section 300.3 – Residential, Commercial, Industrial and Recreational Structures:** The facilities (wind turbine generators and transmission cables) proposed by this application fit the definition of a commercial/industrial structures pursuant to RICRMP Section 300.3.A.2. Portions of RICRMP Section 300.3 applicable to this project include section 300.3.D.2 which prohibits industrial operations and structures in Type 1 and 2 waters and on shoreline features abutting these waters. While the wind turbine generators will be located in Type 4E waters as designated by the Ocean SAMP, transmission cables will be located "below" Type 1 waters (in the "sediment") in shoreline areas bordering the Block Island and Narragansett shorelines. Pursuant to Section 300.3.E.1.d, a Structural Perimeter Limit (SPL) must be prepared to delineate the limits of the "in-water facilities". In this case the applicant has requested a utility corridor easement which will act as the limits of the SPL. It is recommended that the applicant provide a precise survey of the installed cable should the Council approve the project.
- o. 300.6 – Treatment of Sewage and Stormwater:** With the exception of pollutants which may be associated with marine construction equipment, there are no expected discharges of sewage (pollutants) associated with this project. Impervious surfaces which require the management of runoff (stormwater) will be limited to the Block Island Substation/ Switchyard and the Dillon Rotary Switchyard in Narragansett. The Block Island facility is subject to RIDEM review authority and will not

be discussed here. The proposed Dillon Rotary Switchyard will result in the creation of impervious surfaces (parking lot and building rooftop) that require stormwater management pursuant to applicable CRMC standards. The project plans provide a conceptual plan for stormwater treatment to consist of infiltration trench or similar design. Complete specifications and supporting calculations have not been provided as of the writing of this report.

- p. **300.9 – Dredging and Dredged materials Disposal:** The project will have operations that are technically considered dredging since they involve the excavation of sediments from beneath tidal waters. This work is associated with the cable landings. The work is incidental to the project and the areas will be backfilled a within a short time after the cable work. This type of dredging is typical for some large scale projects and is not considered a major impact since the area being dredged is very limited and the sediment is mostly all sand. There are no staff concerns with the locations or methods of “dredge” work.
- q. **300.10 Filling in Tidal Waters:** Several aspects of the project will result in the placement of “fill” (material from upland sources) in tidal waters. The most significant activity considered “filling in tidal waters” shall be the proposed placement of protective armoring (concrete filled bags, concrete matting, rocks) over the projects transmission cables and in 2 crossings of existing ocean bottom cables. The ER/COP estimates one percent of the BITS cable and BIWF inter-array and export cables will require armoring. Additional armoring will be required at the WTG foundation bases where the inter-array cable exits the “J” tube into the seafloor. The total area of seafloor expected to be converted to hard (filled/armored bottom) is approximately 2 acres (ref. ER/COP pg 4-51).

Pursuant to RICRMP Section 300.10.D.1, filling in Type 1 waters is prohibited thereby requiring a special exception. Section 300.10.D.3 prohibits filling in Type 4 waters unless several criteria are met. These criteria require: The filling is to support a designated priority use, all reasonable alternatives have been examined and the CRMC determines the selected alternative is the most reasonable, and, the filling is the minimum necessary to support the designated priority use. Based on policies contained in the Ocean SAMP and after considering the proposed transmission cable installation options, CRMC Staff concludes the work meets the necessary criteria and would not be considered a prohibited activity in Type 4 waters. With regard to the “renewable energy zone” south of Block Island which are designated Type 4E waters by Section 860.2.1.2 of the Ocean SAMP, staff concludes the minimal filling proposed is allowable to support a wind energy project in this area.

- r. **300.18 – Submerged Aquatic Vegetation and Aquatic Habitats of Particular Concern:** The BIWF export cable and the BITS cable landfall locations on Block Island are proposed in close proximity to known eelgrass beds. Eelgrass is marine vascular plants that along with other “sea grasses” are collectively referred to as Submerged Aquatic Vegetation (SAV). To determine if the project (BIWF export cable and BITS cable) would impact eelgrass, seafloor mapping surveys were conducted in 2010 utilizing side scan sonar and an underwater video sled. Although these survey methods do not conform to the standard survey methods contained in RICRMP Section 300.18, staff agreed with the survey methods proposed by Deepwater’s consultants considering the survey standards contained in the RICRMP are oriented toward addressing eelgrass presence in Narragansett Bay, the Salt Ponds and other protected near shore areas. Based on the surveys conducted by Deepwater on Block Island, it was determined that the transmission cables are not proposed in an area of SAV (eelgrass) although eelgrass beds were found approximately 2,000 feet southeast of the BI cable landfall location. SAV surveys consisting of side scan sonar and underwater video sled transects were also performed in the vicinity of the previously considered BITS cable landfall location at Narragansett Town Beach. However, for purposes of an eelgrass survey, only side scan sonar was utilized for marine bottom/sediment profiling at the Scarborough Beach alternative. When questioned regarding the lack of an underwater video sled survey at Scarborough, Aileen Kenney of Deepwater Wind replied (via email) that the side scan sonar survey conducted during July 2013 nor 2010 eelgrass coverage data available through RIGIS identified eelgrass at Scarborough Beach. CRMC Staff responded (via email) that the most recent eelgrass coverage available through RIGIS is 2012 data (not 2010) and the 2012 data is not conclusive for the RI Ocean front. Staff further responded that the agreement reached early in the pre-application process was that eelgrass survey methods would consist of side scan sonar and underwater videography (as suggested by the consultant at that time (Coastal Vision, LLC). On this basis, although CRMC Staff believes it is somewhat unlikely that eelgrass exists at the Scarborough Beach alternative location, based on side scan sonar results only; Staff does not agree that a conclusive eelgrass survey has been conducted consistent with prior agreements for this project. With regard to remainder (deeper) portions of the BITS transmission cable route, sea floor mapping efforts to determine if SAV is present are not necessary since eelgrass only occurs in waters less than 12 meters deep.
- s. **Section 325: Activities Located in Critical Coastal Areas:** Portions of the transmission cable installed within the Point Judith Road right-of-way will occur within the watershed of the Salt Ponds. However, the transmission cable does not represent a “watershed activity” subject to

the regulatory provisions of the Salt Pond Special Area Management Plan (SP SAMP). In addition, the buffer zone provisions contained in the SAMP for activities located within 200' of a coastal feature do not apply to the installation of a transmission cable within the paved road or cleared roadway shoulders. On this basis, there are no activities in critical coastal areas subject to the provision of Salt Pond SAMP (or activities located in or subject to the Narrow River SAMP).

- t. **Section 330: Guidelines for the Protection and Enhancement of the Scenic Value of the Coastal Region:** Section 330 of the RICRMP states: "The primary goal of all Council efforts to preserve, protect, and, where possible, restore the scenic value of the coastal region is to retain the visual diversity and often unique visual character of the Rhode Island coast as it is seen by hundreds of thousands of residents and tourists each year from boats, bridges, and such public vantage points as roadways, public parks and public beaches". In an effort to assess the visual impact of the project, Deepwater Wind conducted a "Visual Impact Assessment" (VIA). The complete VIA included the following methodologies: A sensitive site inventory, definition of Landscape Similarity Zones (LSZ), a viewshed analysis, cross section analysis, field verification, visual simulations and an evaluation of visual impacts.

The VIA sensitive site inventory identified visual resources and receptors within a 30 mile radius of the WTGs. This inventory identified 677 visually sensitive public resources such as historic sites, parks, public beaches, conservation areas, designated scenic areas, wildlife refuges, etc. Identified receptors included 198 historic sites (i.e., properties designated as National Historic Landmarks or sites and districts listed on the National Register of Historic Places), 14 state parks, 20 state wildlife management areas, 5 national wildlife refuges, 75 designated scenic areas, 5 scenic overlooks, and 6 designated byways. Most of the identified areas are located in RI but receptors were also identified in New York, Connecticut and Massachusetts.

Potentially impacted viewer groups include residents, "through travelers" and tourists/vacationers. Within the 30 mile radius "visual study area", approximately 86% of the study area was determined to be over the open ocean while a majority of the identified visually sensitive areas occur on the RI mainland over 16 miles from the WTGs. At this distance, Deepwater claims published studies suggest only minor visual impacts and further states views toward the project site from areas north of U.S. Route 1 are "practically non-existent". On Block Island, due to screening effects of topography and vegetation, Deepwater claims the project would only be visible from 45% of the island. Specifically, Block Island views of the project site will occur from the south shore and areas of "high ground" on the southern section of the island.

Available views will include areas from Spring Street to Snake Hole Road, Clay Head Bluffs, beaches along the eastern shoreline of the island, the northwest side of Great Salt Pond and the Block Island Ferry route(s). Unobstructed views toward the WTGs will not be available from areas such as the North Light, beaches and bluffs along the western and northern shorelines, from the Town center and interior roads such as Center Road, West Side Road and Beach Avenue. The VIA further states "Open ground-level views are extremely limited north of Cooneymus Road and Rodman's Hollow".

Visual impacts can also be attributed to WTG lighting requirements. The WTGs will include Federal Aviation Administration (FAA) aviation warning lights and United States Coast Guard (USCG) navigation warning lights. A single aviation warning light (plus a backup) will be installed on each WTG at the hub height which is approximately 403 feet above Mean Low Water (MLW). Aviation warning lights are described as medium intensity, flashing red lights which are only operated at night. Two USCG warning lights will be mounted on the tower base deck of each WTG approximately 60 feet above MLW. USCG lights on the outer two turbines will have a range of 4.6 miles and will have a synchronized flash rate of 50 flashes per minute. Interior turbine USCG lighting will have a range of 2.3 miles and a synchronized flash rate of 20 flashes per minute.

Twenty five sites from the sensitive site inventory were selected for visual simulations based on their sensitivity as visual receptors. Twenty two daytime simulations and 6 nighttime simulations are provided (28 simulations from 25 sites). The sites chosen for visual simulations are contained on table 4.8-1 of the ER/COP and the visual simulations are contained in Volume 5, Appendix S. At each site, computer simulated models are superimposed on actual photographs taken from each viewpoint. This process is more fully described as using "high-resolution computer-enhanced image processing ... to create realistic photographic simulations of the completed turbines, and, the process ensures "...project elements are shown in proportion, perspective and proper relation to existing landscape elements in the view". Actual photographs taken from each site are provided with corresponding visual simulations of the same site photograph depicting the view following WTG installation (and lighting).

Beyond evaluating the potential project visibility, the visual impact of the Block Island Wind Farm was evaluated utilizing the US Army Corps of Engineers Visual Resource Assessment Procedure (USACE VRAP). The procedure utilized information obtained from the sensitive site inventory, Landscape Similarity Zones (LSZs) assessment, viewshed analysis and visual simulations, etc. to quantify the effect of the project

using forms and a scoring system provided by the VRAP Manual. This work is completed by a panel of four registered landscape architects. Panel member ratings were compiled and averaged for each viewpoint. Based on this assessment, it was determined that although thresholds were exceeded for two viewpoints, acceptable visual impacts were not exceeded for any of the Landscape Similarity Zones (LSZs). The most appreciable impacts were assigned to shoreline bluffs, shoreline residential, maintained recreation area (LSZs) on the south shore of Block Island.

**Visual Impacts on Historic Resources:** Indirect impacts on “above-ground” historic resources associated with alterations of the visual setting due the operation of the BI Wind Farm were evaluated by the Visual Impact Assessment (VIA). A historic properties inventory including an assessment of potential alterations to the “visual setting” associated with historic resources is contained in Appendix R with the full VIA for the wind farm contained in Appendix S. The VIA sensitive site inventory identified 198 historic sites (i.e., properties designated as National Historic Landmarks or sites and districts listed on the National Register of Historic Places).

**CRMC Staff Scenic Value Assessment:** Despite the use of a standardized visual impact assessment procedure (USACE VRAP), visual impacts and considerations are typically considered to be subjective. The subjective nature of assessing visual impacts is revealed by the use of a panel of 4 registered landscape architects to conduct a procedural evaluation where each member’s ratings are averaged. In addition, CRMC staff has not received training in scenic impact assessment and typically rely on individual judgment based on past experiences in coastal permitting. Past practice has also been to defer to the Council on scenic issues in order to obtain public comment and allow for a full council assessment. On this basis, CRMC Staff defers to the Council with the following recommendations:

- Consider the assessment visual impact assessment provided by Deepwater Wind which utilized a standardized procedure (USACE VRAP).
- Review the computer-enhanced visual simulations provided.
- With regard to impacts on Historic Resources, consider comments provided by the RI Historic Preservation and Heritage Commission. HPHC’s comments have been provided through a number of letters with the most recent letter dated November 20, 2013. As noted by this most recent comment letter, HPHC has concluded an adverse effect to cultural resources will occur. However, the letter indicates efforts are underway to mitigate these impacts through Memorandum of



Understanding (MOAs). The November 20<sup>th</sup> letter further provides draft conditions to be included in the MOA.

- In accordance with Section 106 of the National Historic Preservation Act, the Advisory Council on Historic Preservation (ACHP) has provided a comment letter addressed to Robert DeSista of the Army Corps of Engineers dated November 21, 2013 which states the ACHP will not participate in the consultation process. However, the letter specifies that a final Memorandum of Agreement developed through consultation with the Rhode Island State Historic Preservation Officer and other consulting parties must be filed with the ACHP at the conclusion of the consultation process. (CRMC Staff does not have any information which would indicate when the consultation process will be concluded.)
- Consider public testimony to be provided at the public hearings.

**BITS Visual Impact Assessment (VIA):** Deepwater Wind prepared a second VIA assessment to specifically address potential visual impacts associated with the electrical substation and overhead electrical lines to be constructed and installed at the Block Island Power Company (BIPCO) property on BI. Regulatory jurisdiction over activities at the BIPCO property have been deferred to RIDEM's regulatory review pursuant to a letter dated November 19, 2012 to Ron Gagnon of RIDEM. On that basis, CRMC defers to RIDEM with regard to the BITS Block Island VIA. (BITS transmission cables from the land fall at Crescent Beach to the BIPCO property will be installed below ground.)

With regard to the Scarborough transmission cable landing alternative including the Dillon Rotary substation, HPHC has provided comment letters dated October 28, 2013 and November 20, 2013 which does not identify any specific visual impacts on historic resources except for a minimal, non-adverse impact associated with the Dillon Substation on the nearby Shadow Farm historic property. (The burial of the transmission cable from the Scarborough Landing to the Dillon Substation alleviates potential visual impacts.)

- u. Section 335: Protection and Enhancement of Public Access to the Shore:** CRMC's Executive Director has determined the project is not subject to Section 335 public access requirements. This determination is based on the fact that the BIWF and its associated transmission cable (excluding cable landings) are located in tidal waters owned by the State of Rhode Island or are subject to Federal jurisdiction for transmission cable sections located beyond the 3 mile limit from mainland Rhode Island and Block Island. Further, cable landing locations on Block Island and Narragansett are located on public beaches which provide public access that will not be impacted by the project.

2. **Rules and Regulations Governing the Protection and Management of Freshwater Wetlands in the Vicinity of the Coast (FWVC):** The project involves work in close proximity (within jurisdictional areas) of Freshwater Wetlands located both on Block Island and Narragansett. In both locations, work proposed in the vicinity of freshwater wetlands subject to CRMC jurisdiction is associated with the installation of the terrestrial portions of the power transmission cables. Proposed work on Block Island and in Narragansett is summarized below.

- a. **Block Island:** Freshwater Wetlands in the vicinity of the Block Island Switchyard/Substation (Town of New Shoreham, Plat 17, Lots 35-38 and 40 owned by BI Power Company and Estate of Marjorie McGuinness) have been deferred to the review of the RI Department of Environmental Management (RIDEM). The transmission cable affects a single isolated freshwater wetland located on the north side of Beach Avenue (wetland 6). Cable (ductbank) installation will occur within the existing cleared shoulder associated with Beach Avenue. Pursuant to Rule 6.10 of CRMC's "Freshwater Wetland Rules", utilities installed within the cleared shoulders of existing roadways are considered "exempt" provided certain conditions are met. Considering the close proximity of this work to the wetland, CRMC Staff recommends that the standard conditions for exemptions be included as permit stipulations in any assent issued by the Council (see stipulations). Provided that these stipulations are met, wetland impacts will be considered avoided and minimized by the work proposed.
- b. **Narragansett:** The Deepwater "Scarborough Beach Alternative" application submission identifies 12 freshwater wetlands under CRMC jurisdiction which occur along the 4.3 mile transmission cable route between the Scarborough Beach landing and the connection to the Wakefield substation. Wetlands subject to CRMC jurisdiction occur primarily on the west side of Route 108 where they are located within the watershed of the Point Judith Pond and subject to the Salt Pond Special Area Management Plan. Of these 12 freshwater wetlands, 6 are contiguous to salt marshes bordering Point Judith Pond while the remaining 7 are "isolated" freshwater wetlands (e.g., not contiguous to salt marshes). Other freshwater wetlands, mostly east of Route 108 are regulated by RIDEM. All isolated freshwater wetlands both in RIDEM and CRMC jurisdiction are subject to a "companion" set of Freshwater Wetland rules which are implemented in a similar manner by both RIDEM and CRMC. These companion rules **exempt** new utility line installations in existing roadways and their cleared shoulders, with certain conditions, pursuant to rule 6.10. CRMC staff will prepare stipulations reflecting the conditions for exemptions in order that the transmission cable remains exempt from the freshwater wetland rules. Staff further concludes that a transmission cable properly installed with

appropriate erosion and sediment controls will not affect nearby freshwater wetlands thereby supporting the exemption applicable to this work. (Coastal Wetland issues are addressed by Section C.1.j of this report.)

3. **Rhode Island Ocean Special Area Management Plan (Ocean SAMP):** The OSAMP has various policies and regulatory standards outlined in sections within each of the chapters. While most of the pertinent standards are in Chapters 8 and 11, each section has standards that are outlined in this section of this report and discussed as appropriate. The OSAMP was created to allow the Council to uphold its obligation to preserve, protect, develop and where possible restore coastal resources. These seemingly opposite charges are possible with clear science based policies and standards that are protective of existing human uses and the natural resources. The OSAMP has policies and “standards” in most chapters, the majority of the standards that are required for the Block Island wind project are found in Chapters 8 and 11. There is a significant amount of redundancy and overlap between the requirements found in these chapters. Due to the large numbers of policies and standards that are required for this large project, staff has provided a table that details the OSAMP section, the standards to be met (or paraphrased in some cases) and either how this application has met the requirement or the location of the response by the applicant, which ever is most appropriate.

- D. **Project Need:** The need for the proposed project is best described by the following statute that outlines the “need” and public interest for the project.

**§ 39-26.1-7 Town of New Shoreham Project.** – (a) The general assembly finds it is in the public interest for the state to facilitate the construction of a small-scale offshore wind demonstration project off the coast of Block Island, including an undersea transmission cable that interconnects Block Island to the mainland in order to: position the state to take advantage of the economic development benefits of the emerging offshore wind industry; promote the development of renewable energy sources that increase the nation's energy independence from foreign sources of fossil fuels; reduce the adverse environmental and health impacts of traditional fossil fuel energy sources; and provide the Town of New Shoreham with an electrical connection to the mainland. To effectuate these goals, and notwithstanding any other provisions of the general or public laws to the contrary, the Town of New Shoreham project, its associated power purchase agreement, transmission arrangements, and related costs are authorized pursuant to the process and standards contained in this section. The Narragansett Electric Company is hereby authorized to enter into an amended power purchase agreement with the developer of offshore wind for the purchase of energy, capacity, and any other environmental and market attributes, on terms that are consistent with the power purchase agreement that was filed with the commission on December 9, 2009 in docket 4111, and amendments changing dates and deadlines, provided that the pricing terms of such agreement are amended as more fully described in subsection 39-26.1-7(e), in addition to other amendments that are made to take into account the provisions of this section as amended since the filing of the agreement in docket 4111. Any amendments shall ensure that the pricing can only be

lower, and never exceed, the original pricing included in the power purchase agreement that was reviewed in docket 4111. The demonstration project subject to the amended power purchase agreement shall include up to (but not exceeding) eight (8) wind turbines with aggregate nameplate capacity of no more than thirty (30) megawatts, even if the actual capacity factor of the project results in the project technically exceeding ten (10) megawatts.

**E. Potential Environmental Impacts:** The following staff evaluation includes an analysis of potential environmental impacts associated with the BIWF (Block Island Wind Farm) and the BITS (Block Island Transmission System). The evaluation includes potential construction and operational impacts to marine fish, marine mammals and marine reptiles (turtles), birds (both marine and terrestrial species) and bats.

**a. Fish and Fisheries**

Fish and fisheries will be affected by the BIWF and the BITS. The effects will be different for construction activities, operations, and decommissioning. The pilot scale project proposed is an opportunity to determine many of the effects and their duration. The trawl survey and ventless trap survey that are now being conducted are part of the plan to determine short term to long term, and significant to insignificant effects of offshore renewable energy on fish and fisheries. The information obtained in this project will help to determine strategies to minimize impacts in future large scale offshore energy projects.

The Ocean SAMP has many regulatory standards concerning fisheries and each standard is addressed in the matrix in the final section of this report. Essential Fish Habitat (EFH) for numerous species is reviewed in Chapter 4.5.3 in the application and includes proposed mitigation measures. In a July 2013 letter NOAA Fisheries provided EFH conservation recommendations to the USACE to minimize the adverse effects for this project. Some of the seven recommendations provided are addressed in the Ocean SAMP requirements.

A proposed fisheries mitigation plan was submitted on November 8, 2013. The plan needs Council approval. Staff has concerns that some of the mitigation measures are not actually mitigation measures, but are requirements of the Ocean SAMP. Three of the proposed measures are mitigation: funding an executive director for the Commercial Fisheries Center of Rhode Island; the conceptual agreement with the RI Charter Boat Association; and the proposed package to offset commercial impact of the BIWF APE/Work Area closure. These mitigation measures are acceptable. Staff is concerned that there is no mechanism to address long term negative impacts.

**b. Marine Mammals and Reptiles:**

Marine mammals (Cetaceans and Pinnipeds) and sea turtles are addressed beginning in Chapter 4.5.4 of the Deepwater application. Chapter 4.5.4 reviews the marine mammals and sea turtles that are not listed under the Endangered Species Act (ESA) but are protected under the Marine Mammal Protection Act (MMPA). Chapter 4.5.7 reviews the marine mammals and sea turtles that are listed as threatened or endangered under the ESA and protected under the MMPA. The application identifies two major impact issues that may affect marine mammals and sea turtles: collision and noise. Proposed mitigation measures identified include: exclusions zones; protected species observers; modified construction procedures; vessel speed restrictions; and time restrictions. Seasonal restrictions for construction were negotiated between Deepwater and Conservation Law Foundation (CLF) and agreed upon in December 2012. The seasonal restriction is designed to protect migrating whales and will be included in the stipulations.

Projects that may affect threatened and endangered marine mammals and sea turtles must be reviewed in an ESA Section 7 consultation. The USACE requested the Section 7 consultation with NOAA Fisheries in July 2012. The consultation was initiated in July 2013 and is not yet complete (as of 1-13-2014). NOAA Fisheries Protected Resources have the expertise to determine any issues concerning marine mammals and sea turtles. An assent may not be issued without a completed ESA Section 7 consultation.

- c. Birds:** The following studies were conducted to provide a baseline analysis of avian resources for the Ocean SAMP. Studies for the Ocean SAMP began in 2009 and ran until July 2012. Avian studies conducted for the Deepwater Wind project (BIWF & BITS) were conducted concurrently with the Ocean SAMP studies. A brief summary of the study methodologies and study time frames are provided below.

**Summary of Ocean SAMP Bird Studies:**

- A.** Paton, P., Winiarski, K., Trocki, C and McWilliams, S. 2010. Spatial Distribution, abundance and flight ecology of birds in nearshore and offshore waters of Rhode Island. Interim Report Part 1 for Rhode Island Ocean Special Area Management Plan.

This study utilized 5 primary survey methods to assess avian use of the Ocean SAMP:

1. **Land-based seawatches:** Conducted by biologists utilizing binoculars and spotting scopes, six 1-2 hour per month surveys at 11 coastal mainland stations from January 23, 2009 to mid-February 2010.
  2. **Ship-based line transect surveys:** Ship based avian surveys conducted by biologists with binoculars, approximately once per month on two 4 x 5 nautical mile (nm) grids from February to May 2009 and four times per month on eight 4 x 5 nm grids from June 2009 to March 2010.
  3. **Aerial strip transect surveys:** Plane based avian surveys conducted by biologists along 24 transects, perpendicular to the coast 3 km apart approximately once per week from November 2009 to March 2010.
  4. **Boat-based line transect surveys:** Boat based avian surveys conducted by biologist utilizing binoculars in nearshore waters in the NW corner of the Ocean SAMP area during August and September 2009 to assess the distribution and abundance of Roseate Terns. (Salt Pond and beach surveys were also conducted on foot to assess Roseate Terns in July and August, 2009.)
  5. **Dual horizontal and vertical Block Island radar unit study:** Radar based surveys conducted by the New Jersey Audubon Society to monitor the movement ecology of birds from March to mid-December, 2009 (24 hours/day and 7days/week). This dual-band unit had both X-band (3 cm target, capable of detecting passerines) vertical-scanning radar to monitor flight elevation and number of targets passing the unit and a S-band (10 cm, best for larger birds such as ducks) horizontal unit to assess target movement directions.
- B. Winiarski, K., Paton, P., Trocki, C. and McWilliams, S. 2011. Spatial distribution, abundance, and flight ecology of birds in nearshore and offshore waters of Rhode Island. Interim Report Part II for Rhode Island Ocean Special Area Management Plan.

This study extended work conducted in Phase 1 by the following:

1. **Land-based seawatches:** Additional seawatches were conducted until July 2010.
  2. **Ship-based lines transect surveys:** Extended 4 x 5 nm grid surveys until late- August 2010.
  3. **Aerial strip transect surveys:** Extended strip transect surveys until August 2010.
- C. Winiarski, K., Paton, P., McWilliams, S. and Miller, D. 2012. Rhode Island Special Area Management Plan: Studies investigating

the spatial distribution, and abundance of marine birds in nearshore and offshore waters of Rhode Island. Final technical report.

This study extended work conducted in Phase 1 by the following:

1. **Aerial lines transect surveys:** Conducted additional surveys along 24 transects lines, 3 km apart, approximately 3 times per month from October 20, 2010 to July 22, 2012.

### **Summary of Deepwater Wind Avian Studies:**

The following avian studies were conducted for the Deepwater Wind project. These studies are utilized by Deepwater Wind to assess the potential impact of their project on avian resources as described by their CRMC application for the project:

1. **On shore (land based) sea watch surveys:** Conducted by biologists utilizing binoculars and spotting scopes, at least twice per month and four times per month in April and September from 10 point count stations on Block Island from July 2009 through June 2010.
2. **On shore (land based) raptor migration surveys:** Conducted by biologists utilizing binoculars and spotting scopes, approximately each week from August 15 – October 15, 2009 at a station at South East Light on Block Island and secondary (roving surveys) on Block Island conducted approximately weekly from late August to late October, 2009.
3. **Avian acoustic monitoring** Conducted from three locations on Block Island utilizing “song meter” units which began recording 45 minutes before sunset and recorded continuously until 45 minutes after sunrise, on various dates, from late summer through early fall 2009 and again in the spring of 2010.
4. **Off-shore boat-based avian surveys:** Boat based avian surveys conducted by biologists utilizing binoculars on transects established in the vicinity of the proposed wind farm approximately twice per month from July 2009 – June 2010 and in August and September 2011.
5. **Off-shore aerial high definition videography:** High definition video surveys utilizing a camera mounted to the side of a helicopter were conducted which flew transects established in the vicinity of the proposed wind farm once per month from August 2009 through April 2010.
6. **Merlin radar surveys:** A DeTect Merlin radar unit was deployed and operated at Southeast Light from February 2009 to September 2011. This dual-band radar unit also had horizontal and vertical

radar units as units as used in the Ocean SAMP. The radar unit collected data on avian targets within the project area and was optimized to sample targets out to 3 nautical miles. A ground truthing effort was undertaken between March and June 2009 to verify the detection capabilities of the system.

7. **Vespar radar surveys:** DeTect Vesper vertical profiling radar was deployed and operated on the west side of Block Island from September 3, to October 21, 2009 and again from March 17 to June 9, 2010. The Vespar radar is non-scanning and is directed vertically from the deployment site. Deepwater states the Vesper was deployed in conjunction with Merlin Radar to provide additional insight into the type of activity occurring at the site and to identify activities that may pose relevant collision risks with the wind turbines.
8. **Nexrad radar assessment:** An analysis of Nexrad data was undertaken. Nexrad radar consists of a nationwide network of 148 Doppler radars arrayed across the continental United States. Achieved radar data from Nexrad installations near Boston and New York were reviewed for evidence of biological activity in the airspace monitored in the vicinity of the project.

#### **Avian Study Results and CRMC Staff Impact Analysis for the Deepwater Wind Project:**

The Ocean SAMP avian studies documented an extensive use of both nearshore and offshore marine waters by a wide variety of birds during all seasons of the year. Avian research documented species occurrence, abundance, seasonal distribution and examined both seasonal and daily movement patterns throughout the Ocean SAMP area. These studies identified 121 individual species which can be grouped into “guilds” for discussion and impact assessment purposes. A guild is a group of species which occupy similar areas and exploit the same or similar resources, often in comparable ways. For instance, “seaducks”, as discussed in the Ocean SAMP comprise a group of waterfowl species that occupy the coast and feed by diving below the sea surface to forage on the ocean bottom.

In addition to utilizing avian data collected for the Ocean SAMP, Deepwater Wind collected additional project-specific data to support their application. Deepwater’s full Avian assessment is provided in Volume 4, Appendix “O” of their application. It states: “The purpose of the assessment was to characterize the Study Area’s avian and bat communities to meet permitting requirements, provide baseline data that may be used to evaluate the potential impacts resulting from the proposed development, and measure any changes to these resources that may occur following construction.” Deepwater further states that an



“Avian and Bat Study Plan” was developed in cooperation with the U.S. Fish and Wildlife Service to address the following goals: 1. Address gaps in existing data. 2. Identify the specific survey techniques and analyses required to determine the level of impact, if any, on avian and bat species within the Study Area; and 3. Help comply with state and federal regulatory requirements. Deepwater reports the study plan was approved by the USFWS in 2009.

Section 860.2.5.3 of the Ocean SAMP allows projects proposed within Type 4E waters to incorporate data collected for the development of the Ocean SAMP if the project is proposed within 2 years of the data collected to support the SAMP, or where the data is “... determined to be current enough to meet the requirements of the Council in coordination with the Joint Agency Working Group.” Additionally, pursuant to Section 860.2.5.3.q, the Executive Director may approve study designs including the use of available data on behalf of the Council. The Deepwater Wind application was received by the CRMC on September 20, 2012. Avian data developed for the Ocean SAMP and utilized to support the application was “collected” between 2009 and 2011. On this basis, data utilized to support the Deepwater Wind application collected for the Ocean SAMP prior to September 2010 must be deemed “current enough” to be utilized in support of the application. As detailed by the study synopsis above, Deepwater Winds individual avian studies were conducted concurrently with studies undertaken to support the development of the Ocean SAMP. On this basis, the Executive Director has determined that the studies contained in the Ocean SAMP are considered “current enough” for use in supporting the application for the Deepwater project.

In order to evaluate the Deepwater Wind application, avian guild and individual species information will be reviewed by CRMC Staff and summarized with regard to the potential for exposure to risk from the construction and operation of the proposed wind farm and associated utilities. The range of potential impacts is discussed both in the Ocean SAMP and the Deepwater Wind application. The Deepwater Wind application further provides a risk assessment based on potential impacts to birds which may include but not be limited to the following:

1. Collision with spinning wind turbine rotors (blades) or other wind turbine structures. The area of airspace impacted by the spinning rotor is referred to as the Rotor Swept Zone (RSZ). Deepwater reports the RSZ associated with the range of wind turbines being considered for this project is 23 meters at the low end to 210 meters at the high end.
2. Destruction of habitat by structural placement and construction/decommissioning impacts.

3. Loss of access to habitat through avoidance responses to the wind farm during construction/ decommissioning and operation and maintenance.
4. Barriers to movement and increased flight distances by wind farm avoidance (i.e., flight detours) resulting in increased energy consumption and decreased fitness.
5. Pollutant exposure (including spills) during construction/decommissioning and operation and maintenance.

*(Note: construction and eventual decommissioning (demolition and removal) are considered to have similar impacts.)*

This CRMC Staff evaluation of the potential impacts on avian resources follows avian guild and species specific discussions provided by the avian studies undertaken to support the Ocean SAMP. Ocean SAMP information is then compared to the avian studies and the risk analysis provided in the Deepwater Wind application. The following evaluation will focus on the potential impacts on avian resources associated with the operation and maintenance of the proposed Block Island Wind Farm (BIWF). This evaluation will be followed by a discussion of the potential impacts associated with the construction and decommissioning of the facility and other facility considerations.

1. **Loons:** The Ocean SAMP studies identified 3 species of loons utilizing the Ocean SAMP Area (Common Loon, Red-throated Loon and Pacific Loon). The Pacific Loon is rare to the East Coast while Common Loons are the most frequently observed loon. Ocean SAMP studies indicate the Ocean SAMP area provides critical wintering habitat for loons and it has been estimated that the Ocean SAMP area supports the equivalent of approximately 50% of the Northeast breeding population during the winter. Loons are abundant fall and spring migrants and are one of the most common winter avian residents of the Ocean SAMP Area. Densities of Common and Red-throated Loons are highest near shore but can also reach high densities in deeper offshore waters. Loons feed primarily on fish but their diet also includes other aquatic vertebrates and invertebrates. According to Winiarski, 2011, Loons frequently fly at lower elevations where 58% of observations exhibited flight heights of less than 10m; although approximately 22% of observations were flying between 10 and 25m and 18% of observations between 25 and 125m. Most individual flying higher than 10m were observed during migratory periods. Deepwater's studies documented loons present within the BIWF area with a preference for an area within a 1km buffer around the wind farm. Deepwater further reports that loons exhibit a high level of avoidance behavior of offshore wind farms based on studies in Denmark. Therefore, avoidance of the wind farm is likely to result in a

localized barrier to movement. Flight heights for loons observed within the wind farm area are reported to be approximately 97% below a height of 26 m for Common Loons and 100% below a flight height of 26m for Red-throated Loons. The Rotor Swept Zone (RSZ) for the Deepwater project is reported as being between 23 and 201m. Based on the low flight heights of loons and high avoidance behavior, collision impact risk appears to be low. However, due to avoidance behavior, loss of habitat through avoidance of the BIWF is likely to be considerable. Since loons are widely dispersed throughout the Ocean SAMP area and the affected area does not appear to be unique in its support of loons, CRMC Staff estimates insignificant impact to Loons from the operation of the BIWF.

2. **Grebes:** The Ocean SAMP studies identified 2 species of grebes utilizing the Ocean SAMP Area (Horned Grebe and Red-necked Grebe). Pied-billed Grebes which are endangered in Rhode Island were not observed during the Ocean SAMP avian studies. Grebes almost exclusively inhabit nearshore and inshore waters in areas of shallow water depths (<6m) where they feed on small schooling fish. Grebes are common fall and spring migrants and are common winter residents. Although infrequently observed in flight, daytime flight height is reported as being low with over 80% of all observations at elevations less than 10m. Grebes are nocturnal migrants and little is known about their nocturnal in-migration flight heights. Deepwater reports that both species were observed almost exclusively in nearshore waters and were only observed during land-based point counts from Block Island primarily during the months of January through April. No grebes were observed during ship-based surveys of the project area. Based on this information, CRMC Staff estimates insignificant impacts to Grebes from the operation of the BIWF.
  
3. **Shearwaters:** The Ocean SAMP studies identified 4 species of shearwaters utilizing the Ocean SAMP Area (Cory's, Great, Manx and Sooty). Shearwaters are gull like birds of the open sea that are mainly found in the Ocean SAMP area as migrants during the summer and fall months. Shearwater densities were higher offshore while Cory's Shearwater was the only shearwater regularly detected nearshore. In 2009, shearwaters were observed in water depths between 25 and 55m which represents a large portion of the Ocean SAMP area (>40%) Additionally, Ocean SAMP ship based and aerial surveys appear to indicate that the spatial distribution and density of shearwaters are higher greater than 3 miles from shore. Shearwaters feed on fish, squid and crustaceans. Shearwaters are most often observed flying low (<10m) as they take advantage of wind currents near the ocean surface to actively search for food. Deepwater's studies report that each of these species was observed during the BIWF studies as well as a 5<sup>th</sup> species,

the Audubon's Shearwater. (Ocean SAMP scientists believe this may have been a misidentified Manx Shearwater.) The Deepwater studies documented flight heights of all shearwaters as below 10m with the exception of the Greater Shearwater that was found approximately 8% of the time between 10m and 25m. Deepwater's studies documented shearwaters present within the BIWF area with a strong preference for an area within a 1km buffer around the wind farm. On this basis, Deepwater concludes that the BIWF may exclude a large portion of the shearwaters foraging in the BIWF area. It should also be considered that the occurrence of pelagic (open sea) birds such as shearwaters is reported as being episodic and likely related to shifting patterns of food resources. Considering the wide spread use of the Ocean SAMP area by this migrant pelagic species group, that the BIWF will occupy approximately 2% of the Ocean SAMP Area, higher shearwater densities greater than 3 miles from shore, changing patterns of food availability and their low flight height, CRMC Staff estimates insignificant impacts to shearwaters from the operation of the BIWF.

**4. Petrels:** The Ocean SAMP studies identified 2 species of storm-petrels utilizing the Ocean SAMP Area (Wilson's Storm-petrel and Leach's Storm-petrel). Wilson's Storm-petrel is reported as being common during the summer months while Leach's Storm-petrel is reported as being uncommon. Storm-petrels are small, dark colored pelagic seabirds which feed on plankton, crustaceans and small fish. Storm-petrels are reported as being most abundant in off-shore waters but may be found in moderate densities nearshore. Flight height is reported as always being low over the water (<10m). Ocean SAMP ship based and aerial surveys appear to indicate that the spatial distribution and density of Wilson's Storm-petrel are higher greater than 3 miles from shore and beyond the BIWF area. Deepwater identified storm-petrels within the proposed BIWF area and reports that storm-petrels exhibited foraging preferences for the area within a 1km buffer around the wind farm. Ninety-nine percent of Deepwater's observations identified storm-petrels flying low over the water (<10m). Considering the wide spread use of the Ocean SAMP area by storm petrels, higher densities greater than 3 miles from shore, changing patterns of food availability and their low flight height, CRMC Staff estimates insignificant impacts to storm-petrels from the operation of the BIWF..

**5. Northern Gannets:** The Ocean SAMP studies determined that the Northern Gannet is a common spring and fall migrant and common winter resident in the Ocean SAMP Area. The Northern Gannet is a large (goose-sized) white seabird with black wing tips that "plunge dives" from various heights for fish and squid. Northern Gannets are

widely distributed within the Ocean SAMP area and can be found in areas with water depths ranging from 10 to 60m. Northern Gannet distribution was often associated with commercial fishing boat activity. A broad range of flight heights have been observed with only 10% of flight height observations within the range of the Rotor Swept Zone (RSZ) of the proposed BIWF. The Deepwater studies identified Northern Gannets year-round within their Block Island Offshore Study area and that 20% of the gannets observed (250 individuals) were within the 1km buffer around the proposed wind farm. Deepwater observed similar flight height observations with 78% of observed gannets flying below 10m which is well below the RSZ (23-201m). Deepwater reports that the wind farm is likely to be a barrier to gannet movement based on studies in Europe. However, based on the wide spread use of the Ocean SAMP area by Northern Gannets and predominant low flight height, and exclusion of commercial fishing activity in close proximity to the wind turbines, CRMC Staff estimates insignificant impacts to Northern Gannets from the operation of the BIWF..

6. **Cormorants:** The Ocean SAMP studies identified 2 species of cormorants utilizing the Ocean SAMP Area (Double-crested and Great). Double-crested cormorants breed in Rhode Island while Great Cormorants winter in Rhode Island. Both species also migrate through Rhode Island. Double-crested cormorants nest on islands in Narragansett Bay. Cormorants inhabit nearshore and inshore (bay, salt pond) waters and rarely venture far from shore. Flight heights are described as variable but most observations (81% or more) place cormorants flying at heights of less than 10m. Contrary to the results of the Ocean SAMP studies, Deepwater wind reports that 87% of Double-crested Cormorant flight heights during ship-based surveys were between 26m and 125m which are within the RSZ. The higher flight heights observed in the vicinity of Block Island (i.e., offshore) and a lack of cormorant observations foraging within 4km of the proposed BIWF lead to the assumption that Double-crested Cormorants observed flying in the vicinity of Block Island were undertaking migratory flights as opposed to flights associated with foraging movements. Deepwater also reports that cormorants are one of the species groups most likely to exhibit turbine avoidance behavior based on studies in Europe. Based on the significant breeding colony of Double-crested Cormorants in Rhode Island's inland waters where the birds also concentrate, the wide, more northern range of Great Cormorants, lack of cormorant foraging observations in the vicinity of the proposed wind farm and reported wind farm avoidance behavior by cormorants in Europe, CRMC Staff estimates insignificant impacts to Cormorants from the operation of the BIWF.

7. **Seaducks:** The Ocean SAMP studies identified 6 species of waterfowl which were collectively evaluated as “seaducks”. Seaducks comprise a group of species that occupy coastal areas where they feed by diving below the sea surface to forage near the ocean bottom. Although variability exists between species, common prey items include mollusks (bivalves, snails etc.), crustaceans (crabs, lobster, shrimp), and other benthic invertebrates. Seaducks include Common Eider, Long-tailed Duck, Black Scoter, White-winged Scoter, Surf Scoter and Harlequin Ducks. Seaducks are considered to be some of the most common waterbirds inhabiting the Ocean SAMP area in winter. Seaducks are also common migrants in spring and fall with some non-breeding individuals such as Common Eiders spending the summer in RI waters. However, Harlequin Ducks are a rare State listed species of special concern. Harlequins prefer rocky shorelines nearshore and are typically found only at two RI locations: Sachuest Point in Middletown and Beavertail Point in Jamestown. In general, seaduck densities tend to be highest nearshore due to limited foraging depths which can range from less than 10 meters to a maximum depth of approximately 25 meters (for scoters). The Ocean SAMP identifies water depths of 20 meters or less as the primary foraging habitat for seaducks. Section 860.2.3 of the Ocean SAMP also designates waters less than 20 meters deep as an “Area Designated for Preservation” due to their value as seaduck foraging habitat. Flight heights of seaducks are typically low at less than 10-15 meters but may be higher when flying over land, migrating or flying to roosting locations. Seaducks may undertake diurnal (daytime) daily movements between nearshore foraging (feeding) locations and offshore roosting (resting/non-feeding) locations. Deepwater reports that most observations of seaducks in the BIWF study area were made from land-based sea-watch surveys and that no seaducks were observed within 2 km (1.2 miles) of the BIWF project area during boat-based studies. However, Deepwater’s Avian Radar Studies, (Merlin/Vertical Scanning Radar) identified numerous biological targets traveling through the Rotor Swept Zone of the proposed BIWF. Based on the time of day the targets were detected, ground truthing efforts and phenology (time of year), Deepwater concluded that seaducks (and gulls) were likely the radar detected “targets”. If so, the radar studies place seaduck movement at higher flight heights than documented in SAMP studies or Deepwater’s sea watch and boat based studies. Radar information also appears to document substantial seaduck activity in the area and daily movements from nearshore roosting areas to offshore foraging areas which are inconsistent with Ocean SAMP observations which have seaducks moving from nearshore foraging locations to offshore roosting locations. Water depths at the wind turbine locations are reported as being 22.8 to 23.3 meters (75-93 feet) which is beyond the prime foraging habitat depth for seaducks as established by the

Ocean SAMP. Deepwater also reports that scoters and Long-tailed Ducks are considered most likely to exhibit avoidance behavior based on post-construction monitoring studies conducted in Europe. Although the BIWF is beyond the prime foraging habitat depth for seaducks and flight heights are believed to be low and beneath the RSZ, Deepwater's radar studies appear to document a substantial use of the proposed BIWF area by seaducks despite a lack of seaduck observations by Deepwater in the vicinity of the proposed BIWF during boat-based studies. Radar studies also place seaduck flight heights primarily within the RSZ. Additionally, the Ocean SAMP studies estimate moderate seaduck densities in the vicinity of the wind farm. Deepwater further reports that seaducks often exhibit high fidelity to foraging areas and would likely be susceptible to displacement apparently due to avoidance behavior. Based on avoidance behavior of certain seaducks and an apparent lack of collision mortality documented by European studies, CRMC Staff concludes that seaducks will be displaced by the BIWF but are unlikely to suffer significant collision impacts. Due to the limited scope of the BIWF area and the availability of nearshore habitat both on Block Island and the mainland, CRMC Staff estimates that the overall impacts on the seaduck population from this one project will be less than significant.

8. **Waterfowl:** The general term "waterfowl" typically applies to the family "Anatidae" which includes marsh ducks ("dabbling ducks"), diving ducks ("sea and bay ducks"), mergansers, geese and swans. The Ocean SAMP avian studies appropriately included seaducks with waterfowl for evaluation and discussion purposes but also evaluated seaducks separately due to their habitat preferences which include both nearshore and offshore ocean waters with less, if any, use of estuarine ponds and bays. Eighteen species of waterfowl (including seaducks) were observed during the Ocean SAMP studies. Other than seaducks and mergansers, the Ocean SAMP studies report that all other waterfowl are restricted to habitats too close to shore to be identified during aerial surveys. Rather, most waterfowl (other than seaducks) were observed during land-based seawatches and some rare detection during ship-based surveys. Waterfowl, in general, are more abundant during the winter months, are common migrants through Rhode Island and some species, particularly certain dabbling ducks are present year round. Flight ecology (heights) are primarily described as "variable" Deepwater Wind reports that waterfowl, other than seaducks were rarely encountered during ship-based surveys in the vicinity of the BIWF but were frequently observed nearshore on Block Island. Based on the proposed BIWF being located approximately 3 miles offshore where minimal waterfowl usage (other than seaducks) is expected, CRMC Staff estimates insignificant impacts to waterfowl from the operation of the BIWF.

**9. Gulls:** Ten species of Gulls were identified during the Ocean SAMP studies (Herring Gull, Lesser Black-backed Gull, Great Black-backed Gull, Bonaparte's Gull, Black-headed Gull, Glaucous Gull, Laughing Gull, Ring-billed Gull, Black-legged Kittiwake and Iceland Gull). Iceland Gulls, Black-headed Gulls and Less Black-backed Gulls are noted as being rare in the Ocean SAMP area. The Ocean SAMP Avian studies report that Gulls are year-round residents in the Ocean SAMP Area. Herring Gulls and Great Black-backed Gull, which are considered the "large gulls" of the Ocean SAMP area both nest in Rhode Island. Both species become concentrated nearshore in the vicinity of breeding colonies during the summer months. During the fall, Great Black-backed Gulls disperse to offshore areas in Block Island and Rhode Island Sound while Herring Gulls appeared to be more restricted to nearshore habitats during winter, although some birds utilized offshore waters. Smaller gulls including Bonaparte's, Ring-billed and Laughing Gulls were found to be common migrants and winter residents which are widely dispersed throughout the Ocean SAMP area. Black-legged Kittiwakes are migrants and winter residents which are most common in offshore waters of the Ocean SAMP area. Gulls were found to exhibit a broad range of flight heights with approximately 56% of observations below 10m while 31% of observations were between 10m and 25m. The BIWF RSZ will have a low range of 23m. Deepwater found that approximately one third of all Gulls observed within the BIWF offshore study area were located within 4km (2.5 miles) of the proposed wind farm. However, Deepwater's radar studies appear to document a substantial use of the proposed BIWF area by gulls despite limited observations by deepwater wind in the vicinity of the proposed BIWF during boat-based studies. Deepwater's radar studies further found that targets attributed to gulls were within the RSZ. Based on studies in Denmark, Deepwater reports that Herring Gulls were found to have a slight attraction to wind farms and that Herring Gulls and Great Black-backed Gull flew between the turbines with no signs of avoidance. However, Deepwater does not specifically address potential collision impacts to gulls. Deepwater reports gulls represented approximately 15% of all birds observed in the BIWF offshore study area. Due to the widespread use of the Ocean SAMP area by Gulls and the proposed BIWF (including a 2.5 mile buffer) representing only 2.1% of the Ocean SAMP area, CRMC Staff estimates that the overall impacts on the gull population from this one project will be less than significant.

**10. Terns and Skimmers:** Seven species of terns and one species of skimmer were identified during the Ocean SAMP studies (Caspian Tern, Royal Tern, Common Tern, Forester's Tern, Roseate Tern, Least Tern,



Black Tern and Black Skimmer). Common, Least and Roseate Terns were the most abundant while Caspian Tern, Royal Tern, Forester's Tern, Black Tern and Black Skimmer were relatively uncommon in the Ocean SAMP area. Roseate Terns are a federally-listed Endangered Species and State Historical (breeding) species in Rhode Island while the Least Tern is a State Threatened species in Rhode Island. Terns both migrate and breed in the Ocean SAMP area. Common and Least Terns breed in Rhode Island while the federally endangered Roseate Tern breeds in colonies nearby Rhode Island. The Ocean SAMP studies determined Terns tend to concentrate in nearshore areas. Roseate Terns were primarily found in the western end of coastal Rhode Island while New Jersey Audubon Ornithologist observed numerous Roseate Terns on Block Island, primarily in the Great Salt Pond and other inland coastal embayments or nearshore areas. During the Ocean SAMP studies (Peyton, et. Al 2010), only 8 Roseate Terns observations were recorded in ship-based surveys with 7 of the 8 observations west and north of Block Island. (The BIWF is proposed southeast of BI.) Common Terns were the most abundant tern. They were found throughout the nearshore areas of the SAMP study area while Least Terns tended to be found more in Block Island Sound and near Goosewing (Little Compton). Flight heights of terns were generally low with approximately 50% below 10m and 90% below 25m. All tern species and skimmer were found to reside a maximum of 6 months in the Ocean SAMP area. The Deepwater BIWF offshore study area boat based surveys found that 85% of all Terns were found within 4km (2.5 miles) of the proposed BIWF. This percentage is based on 20 individuals identified by boat pursuing "sawtooth" type transects from the southwest point of BI to the east central portion of the island approximately 1.5 to just over 3 miles from shore. Videography results showed similar encounter rates for "unidentified" terns (29 individuals total, 3.2 individuals/survey). Deepwater does not report avoidance behavior patterns for terns. Considering the wide spread use of the Ocean SAMP area by terns and a strong preference for nearshore areas, CRMC Staff estimates insignificant impacts on Terns including the federally endangered Roseate Tern which appeared to favor nearshore areas, inland embayments (Great Salt Pond, Trims Pond) and the west and north sides of BI.

11. **Alcids:** Six species of Alcids were identified during the Ocean SAMP studies (Razorbill, Common Murre, Thick-billed Murre, Dovekie, Black Guillemont and Atlantic Puffin). Alcids are migrants and winter residents in the Ocean SAMP Area. They are widely distributed and common from Fall to Spring but most abundant in Winter and Spring. Dovekie, Common Murre and Razorbill are abundant winter residents while Thick-billed Murre, Black Guillemont, and Atlantic Puffin are

found in relatively low numbers. The Ocean SAMP studies appeared to suggest spatial partitioning between the common species with Razorbills more abundant nearshore, Common Murres tending to use central sections of RI Sound and Dovekies farthest from shore in the deep-water sections of RI Sound. Overall, Dovekies were the most common Alcid in the Ocean SAMP Study Area. Flight heights of all alcids are low with 100% of all observed flights below 10m. Deepwater Wind reports that 4 of the 6 six species identified in the Ocean SAMP study area were encountered in the BIWF study area and 66% of all observed alcids occurred within 4km (2.5 miles) of the proposed wind farm. Alcids represent 6.6% of all birds encountered offshore during the BIWF studies and were observed on 12 percent of all surveys. Razorbills were the most frequently observed alcid during the BIWF studies; a finding which is comparable to the Ocean SAMP studies which estimated that the waters near Block Island support the highest densities of Razorbill in RI Sound. Based on offshore wind farm studies in Denmark, Deepwater reports that alcids are believed to exhibit moderate avoidance behavior which is consistent with other pelagic seabirds that tend to avoid manmade structures. Deepwater's observations of Alcids in the study area indicate that most movements are daily (as opposed to migratory) and based on a moderate level of avoidance behavior, the wind farm is likely to act as a local barrier to movement. This barrier effect may particularly impact Razorbills which are locally abundant in the area. However, based on the widespread use of the Ocean SAMP Area by alcids, including the nearshore use of mainland RI by razorbills, CRMC Staff estimates limited (insignificant) impact on alcids. Also, due to avoidance behavior and low flight heights, collision risk appears to be minimal.

**12. Wading Birds:** Seven species of wading birds (herons, egrets and allies) were observed during the Ocean SAMP studies (Great Blue Heron, Black-crowned Night-heron, Green Heron, Great Egret, Snowy Egret, Cattle Egret and Glossy Ibis). Most species are migrants in RI although they breed on islands throughout Narragansett Bay; while 3 species (Great Egret, Snowy Egret and Black-crowned Night Heron) have been reported to nest on Block Island. Wading birds are most common in RI from May through September although Great Blue Herons and an occasional Black-crowned Night Heron winter in Rhode Island. The Ocean SAMP studies report wading birds are most common nearshore in areas such as salt marshes, and, they avoid flying out over the open ocean although egrets were observed flying between Block Island and the mainland. Flight heights are typically low with approximately one half of observations below 10m and another approximately one quarter flying between 10 and 25m. Deepwater

reports observing 4 species during onshore sea watch surveys (Great Blue heron, Great Egret, Snowy Egret and Black-crowned Night-heron) and report no detections during boat-based surveys. Deepwater appears to offer little other discussion or evaluation of potential project impacts on wading birds. However, due to wading birds being most common in nearshore areas with a tendency to avoid flights over the open ocean with the exception of flights between the mainland and Block Island, CRMC Staff estimates insignificant impacts on wading birds from the operation of the BIWF.

**13. Shorebirds:** Nineteen species of shorebirds including sandpipers, plovers, phalarope, and oystercatcher were detected during the Ocean SAMP studies. Observed species included: Greater Yellow-legs, Lesser Yellow-legs, Spotted Sandpiper, Whimbrel, Ruddy Turnstone, Purple Sandpiper, Sanderling, Dunlin, White-rumped Sandpiper, Semi-palmated Sandpiper, Least Sandpiper, Short-billed Dowitcher, Black-bellied Plover, Piping Plover, Semi-palmated Plover, Killdeer, American Oystercatcher, and Red-necked Phalarope. Shorebirds, as a group are migrants, breeders and some are winter residents in Rhode Island. Approximately 80 pairs of the federally-endangered piping plover nest on beaches in southern RI. Shorebirds which winter in Rhode Island include Purple Sandpiper, Sanderling and Dunlin. Migrant populations peak in the Ocean SAMP Area during August through September as they migrate south from their more northern breeding grounds. Migrant populations peak again in May and June during their spring migration. With the exception of the Red-necked Phalarope which is an offshore specialist, shorebirds favor nearshore areas. Only 6 species of shorebirds were detected away from nearshore areas during ship-based surveys. Flight heights were variable but over 85% of observation were below 10 meters. Deepwater Wind states that shorebirds occur in the BIWF area during the spring and fall migration and onshore during the summer residency period. Deepwater reports that "shorebirds" were observed migrating over open water where the BIWF is proposed but identifies Sanderling and an unidentified shorebird as the only species observed in the BIWF study area. During land-based surveys Deepwater identified 15 shorebird species including piping plover and states most shorebirds were observed in nearshore areas in proximity to intertidal foraging habitat. Overall, Deepwater's observations are consistent with the Ocean SAMP studies. Shorebird activity is similar to wading birds. Shorebirds are most common in nearshore areas and are usually found offshore only during migration including flights to Block Island where they inhabit nearshore areas upon arrival. Flight heights are low and below the RSZ in most cases. Additionally, the wind farm does not appear to be proposed in a location which increase flight distances associated with daily foraging movements. On this basis, CRMC Staff

estimates insignificant impacts to shorebirds from the operation of the BIWF.

**14. Raptors:** Seven species of Raptors (hawks, falcons and osprey) were observed during the Ocean SAMP studies. Raptors were included in the “landbird” category in the Ocean SAMP studies and little other information is provided. The Ocean SAMP studies state that with the exception of falcons and osprey, raptors avoid crossing large bodies of water. Raptor mortality has received considerable attention at land-based wind farms due to mortality caused by collisions with spinning rotors. Mortality of raptors is of particular concern due to low reproductive rates and mortality to sensitive species such as Golden Eagles. Deepwater’s consulting biologists observed 94 raptors on Block Island including Cooper’s Hawk, Northern Harrier, Bald Eagle, American Kestrel, Merlin and Peregrine Falcon. Most raptors were observed hunting over the bluffs and over fields on Block Island. Deepwater reports that no raptors were observed at the proposed BIWF location during any of the site specific avian surveys and that raptors were only observed on Block Island or in near-shore areas. Northeast hawk watch sites also suggest that the BIWF study area does not represent a significant raptor migration corridor. On this basis, CRMC Staff estimates insignificant impacts to raptors from the operation of the BIWF.

**15. Passerines:** The Ocean SAMP studies included passerine bird species (songbirds) with the landbird category and states landbirds are relatively uncommon in the Ocean SAMP area (excluding Block Island) since they are generally associated with terrestrial habitats. Very few songbirds were observed during the land-based seawatches conducted for the Ocean SAMP and a small number of songbirds (7) were observed during the ship-based line transect surveys. However, a significant songbird migration occurs along the Atlantic Coast. It is not surprising that few birds were observed during daytime surveys since most songbirds are nocturnal migrants with a few exceptions such as tree swallows, swifts, hummingbirds and finches. Since this migratory activity occurs at night and at altitudes that make detection difficult, the most effective method for documenting nocturnal migration is with radar. For purposes of the Ocean SAMP, a radar unit was deployed on Block Island throughout 2009. Deepwater also deployed two radar systems (Merlin and Vesper Radar) and examined Nexrad radar data which is based on a national network of Doppler radar systems. Graphical depictions of migratory activity utilizing Nexrad reflectivity values provided in Deepwater’s avian assessment (appendix 0) demonstrates significant migratory activity throughout coastal Massachusetts, Rhode Island, Connecticut

and Long Island but with greater migratory activity occurring inland of the coast. Deepwater's examination of this data further indicates that the proposed BIWF appears to experience a spike of nocturnal activity during the fall migration period with a lower level of nocturnal activity during the spring migratory period. Radar information obtained by the Merlin Radar System deployed by Deepwater showed substantial activity nearshore in the summer, at dawn, which was attributed to the morning activities of resident landbirds. During the fall, at night, Deepwater's Merlin Vertical Scanning Radar (VSR) detected high target activity onshore, nearshore and offshore attributed to the nocturnal migration of songbirds. The radar data showed higher target passage onshore and nearshore with less activity passing offshore. Avian acoustic data which recorded songbird vocalizations in flight confirmed nocturnal migration had occurred over Block Island. Based on higher target activity closest to and over the Island, Deepwater concludes nocturnal migration had occurred over the southwest corner of the Island and less migratory activity occurs offshore than nearshore or onshore. However, with documented passage rates of 473 targets per kilometer per hour (t/km/hr), CRMC Staff concludes significant nocturnal migration activity occurred in the vicinity of the proposed BIWF. The radar study for the Ocean SAMP documented nocturnal migration activity with peak flight heights of targets between 200 and 400 meters above sea level which is primarily above the RSZ of the proposed BIWF. However, Deepwater found that the average and mean nighttime flight height during the fall offshore was 85.2 and 76.9 meters, respectively, which is within the RSZ.

Deepwater states: "The greatest concern for potential bird impacts by the proposed BIWF project involves the movement of migratory birds during the spring and fall periods. Of particular concern is the movement of night migrants that would pass along the coast during these migrations." Rhode Island Department of Environmental Management (RIDEM) Biologist, Christopher Raithel, examined bird migration patterns in an unpublished Rhode Island guidance document entitled: "Patterns and Timing of Bird Migration as it Relates to the Placement of Wind Turbines", dated July 2008. In this document, Raithel states: "The largest risk from turbines to bird populations is expected to involve nocturnal migrants, especially during conditions of fog." Raithel further states: All towers and tall objects along the immediate coast have the potential, eventually, to cause catastrophic collisions for nocturnal migrants." In offering conclusions which appear consistent with Deepwater's concerns, Raithel describes migration patterns and weather conditions that may lead to collision events. Raithel suggests nocturnal migrants located over open water near dawn may have been "deflected" from preferred migratory pathways by wind, weather and

through inexperience. In the fall, inexperienced, young of the year birds are making their first migratory flight south. Migrants may also face inclement weather toward dawn as they descend from higher altitude migratory flights to make landfall. Local weather conditions such as ground fog and other poor visibility conditions can lead to further difficulty particularly for birds which find themselves over open water. Poor visibility conditions during pre-dawn descents and subsequent “reorientation flights” can lead to collisions with structures including tall buildings, cell towers, and wind turbines. When this happens with large migratory flocks, catastrophic events may occur leading to a high number of songbird fatalities. To address visibility concerns associated with avian species, including migrants, Deepwater performed a visibility analysis by examining 2 + years of visibility data from the Block Island Airport. During this period (mid July 2009 – mid Sept. 2011), poor or very poor visibility occurred less than 5% of the time during fall nights.

Considering the significant passage of nighttime targets within the RSZ during the fall as documented by Deepwater’s offshore Merlin VSR radar study, there appears to be some potential for impact to migrating songbirds. While Deepwater reports poor to very poor visibility occurred less than 5% of the time during fall nights, potential impacts to nocturnal migrants passing through the wind farm at night during fair visibility, or conversely, avoiding the wind farm, if visible, thereby acting as a barrier to nocturnal migrants was not addressed in Deepwater’s risk analysis. The potential also remains for catastrophic events should displaced nocturnal migrants attempt a pre-dawn landing on Block Island by passing through the proposed wind farm during times of poor visibility including early am “sea or ground fog”. However, considering the “one turbine deep” orientation of the wind farm, migrants will unlikely need to navigate past more than one turbine. In order to obtain a better understanding of the potential impacts on migrating songbirds, CRMC Staff met with Ocean SAMP contributing Avian Scientist, Dr. Peter Peyton of the University of Rhode Island on June 20, 2013. Dr. Peyton suggested several mitigating factors that should be considered, these include:

- When displaced migrants re-orient on Block Island in the morning (typically after being deflected offshore during adverse weather conditions at night), they head for the north end of the Island and then fly north towards the mainland thereby avoiding the area proposed for the wind farm.
- Most nocturnal migrants that end up on Block Island are inexperienced birds that were either blown off course or made navigation errors resulting in being located over open water at dawn. Young-of-the-year birds (those hatched the spring of the same year) typically suffer high mortality rates (20-30%

survive to their second year) and those that end up over open water during migration are not likely to survive.

- The largest movement of nocturnal migrants as documented by Nexrad Radar data occurs inland of the coastline rather than over open water and Block Island.
- Radar studies conducted for the Ocean SAMP have determined that nocturnal migrants are only flying over Block Island in large numbers 4-5 nights during the fall.
- Based on meta-analysis of land based wind turbines, the average collision rate is 3 birds per turbine per year. ([http://seagrant.gso.uri.edu/resp/pdfs/resp\\_volume\\_2\\_final.pdf](http://seagrant.gso.uri.edu/resp/pdfs/resp_volume_2_final.pdf))

### **Conclusion**

In conclusion, CRMC Staff estimates that the potential impacts on passerine birds, in total, is likely to be less than significant with the exception of the potential for periodic impacts to nocturnal migrants passing over the south end of Block Island at low flight heights and unfavorable weather conditions. The nocturnal migratory movement documented by Deepwater may also be atypical and not representative of fall nocturnal migratory movements through the coastal Northeast. Although patterns of nocturnal migration appear relatively consistent, variability does occur based on weather conditions during migration. Due to this variability and the potential for episodic impacts due to weather and other factors, as described by Raithel, CRMC Staff believes additional post-construction monitoring should be required to address the inherent variability of migratory movements. With regard to the monitoring proposed, CRMC Staff concludes the avian monitoring measures described by Deepwater in the "Post-Construction Avian and Bat Monitoring Plan", Draft; last updated September 2012 is insufficient to address post-construction impacts on nocturnal migrants considering the level of risk documented by avian radar studies conducted by Deepwater Wind for the BIWF. Specifically, two years of monitoring on the first and third years following operation is not considered proportional to the degree of risk. While CRMC staff supports the proposed use of vertically oriented thermal imaging cameras mounted on two turbines in addition to continued use of Merlin Radar for the 2 years of post-construction monitoring proposed, due to the variable nature of migration and possible "deflections" associated with adverse weather, CRMC staff recommends the following additional requirements as stipulations for any permit issued by the CRMC:

1. Vertically oriented thermal imaging cameras mounted on a minimum of two turbines shall be installed and monitored on a permanent basis. A plan for installing and monitoring the thermal imaging cameras shall be developed for CRMC review and approval.

(Note: If the CRMC determines this requirement to be too burdensome, an alternative may be to deploy the cameras during the specific time of year and weather conditions deemed supportive of nocturnal mass-migration which typically occurs only over several nights each year, particularly during the fall. However, it should be noted that the cameras would also be valuable for determining impacts on other avian species.)

2. It is recommended that an agreement be developed to make operational adjustments should significant impacts to nocturnal migrants be documented during the post-construction operation of the wind farm. Operational adjustments may include, but not be limited to, developing a procedure to temporarily idle the wind turbines, if deemed necessary, during the spring and fall nocturnal bird migration period. The requirement for operational adjustments should be a requirement of the CRMC Assent and contained within the Construction and Operation Plan (COP) but the actual procedure, if any, may be developed based on "need" as determined by the additional monitoring described in mitigation stipulation 1 above. It should be considered that an idling system may be a manual system operated by a qualified avian biologist stationed on-site during critical migration periods or it may be an automated system based on an avian profiling radar system or other system. In the later case, automatic idling of the wind turbines would only occur when pre-determined conditions trigger a monitoring system response. CRMC Staff notes that an automated Merlin Radar based turbine idling system is now in use in Kennedy County Texas at a land based wind farm.

**Potential Avian Impacts associated with Facility Construction:** The marine operations necessary to construct the Block Island Wind Farm (BIWF) and Block Island Transmission System (BITS) may result in adverse temporal impacts to avian resources. The primary impact is likely to be disturbance associated with marine construction activities including pile driving, jacket foundation installation, Wind Turbine Generator (WTG) installation, cable installation (inter-array, export and BITS) and cable landfall installations on Block Island and in Narragansett. The equipment necessary to perform marine operations may include but not be limited to towing tugs, a transportation barge, material barges, a derrick (crane) barge, a jack-up barge, a cable laying barge, work vessels and support tugs, a helicopter and support vessel(s). Equipment such as jacket foundations, pilings, transition decks, etc will likely be shipped from the Gulf of Mexico via ocean-going tugs and barges while WTG's and smaller equipment will be transported to the site from a staging area at Quonset Point in Narragansett Bay.



Preliminary construction operation timeframes specified by Deepwater include the following: Pile driving activities to support jacket foundations is predicted to take 4 days per jacket conducted during daylight hours only. Each jacket foundation is expected to take 7 days (24 hours/day) x 5 jacket foundations (one for each WTG) = 5 weeks. The installation of each WTG is expected to take 2 days at 24 hours/day. The export cable is expected to take 2-4 weeks to install while the BITS cable is expected to take 4-6 weeks at 24 hours/day, 7 days per week. All construction is weather dependant. Mobilization and transportation activities will occur throughout the construction period. Deepwater has provided projected construction schedules which indicate marine construction activities (absent terrestrial cable installation and switchyard work) will take approximately one full year to complete with most BIWF marine construction activities occurring between May and November of the calendar year. After completion, the BIWF is estimated to be in operation for 25 years after which it will be decommissioned and removed in a manner similar to its installation. The BITS cable is expected to be in service for 50 years to retain Block Island's connection to the grid after the BIWF is decommissioned. The BITS cable is proposed to be abandoned in place after serving its useful life of 50 years (or more).

Avian impacts will include the displacement of certain marine (sea) birds and seaducks from the BIWF area due to activity and disturbance during construction. It is likely that most birds will avoid the area when active construction is on-going, particularly where loud activities such as pile driving are being undertaken. This may result in a temporary loss of habitat availability and "flight detours" during daily and migratory movements. Detours during migration are likely to have insignificant impacts on energy expenditures and fitness whereas detours to daily movements of some birds such as seaducks, gulls and alcids may have greater impacts. However, with construction limited to only one full year, it is unlikely that any impact to the fitness of birds which commonly utilize the area through avoidance and increased energy expenditures will adversely affect bird populations.

Installation of the transmission cable systems (BITS, inter-array, export) is unlikely to have significant impacts on avian resources. Transmission cables will be installed by a vessel towing a jet plow which hydraulically excavates a trench while laying the cable as the plow is towed forward. Hydraulically fluidized sediment will settle back in the trench as the cable is laid and natural bottom currents and sediment movement will eventually restore the bottom allowing benthic habitat to recover over the installed cable. The jet plow will cause temporary turbidity in the vicinity of work during installation. A complete assessment of this work

and its associated impacts is provided by Deepwater Wind in their application package.

The BIWF will require maintenance during operation which may cause localized temporary disturbance of avian resources in the vicinity of the wind farm. Each Wind Turbine Generator (WTG) is expected to receive 3 to 5 days of planned maintenance per year (3-5 days per WTG x 5 WTG's = 15 to 25 days/year). Deepwater Wind will develop and Environmental Compliance Manual to govern maintenance activities. CRMC Staff have recommended a stipulation be included in any assent issued by the CRMC which requires that the Environmental Compliance Manual be reviewed and approved by the CRMC. It is expected that the Manual will address the control and management of pollutants which may affect the marine environment.

When the BIWF is eventually decommissioned and removed, environmental impacts including potential impacts on avian resources are expected to be similar to impacts associated with its construction. This work is expected to have only minor temporary impacts on avian resources.

- d. US Fish and Wildlife Service Concurrence (and update):** Pursuant to a letter dated January 10, 2014 to Robert J. DeSista of the U.S. Army Corps of Engineers, the USFWS had provided the following opinion regarding the Deepwater Wind project: “Based on the record of coordination with Service and incorporation of reasonable conservation and monitoring measures into the project design, the Service concurs with your determination that the proposed Block Island Wind Farm and Block Island Transmission System projects are not likely to adversely affect species protected under the MBTA.”
- e. Bats:** Deepwater’s environmental report states Rhode Island is within the range of 9 bat species and 4 of those species are probable summer residents on Block Island. “During migration, species that are likely to be found on Block Island and the surrounding waters include the big brown bat, little brown bat, hoary bat, silver-haired bat and eastern red bat (Harvey et., al., in Deepwater Wind ER/COP)” Deepwater further states that Block Island may act as a migration stopover point for long distance migratory tree roosting species based on field studies conducted on Block Island. However, Deepwater reports ‘.... Acoustic monitoring efforts demonstrated that the occurrence of bats was largely limited to the island and near shore waters and no observations were recorded at the WTGs locations; however bats were detected elsewhere offshore at a very low rate’.

Deepwater utilized radar and acoustic monitoring studies to characterize bat activity on Block Island and states their work was conducted nearly concurrently with bat acoustic studies performed as part of the Ocean SAMP. Due to these studies documenting low occurrence levels of bat activity found in offshore waters including the BIWF study area, and due to the limited expertise of CRMC Staff regarding bat ecology, these studies have not been reviewed in detail for this staff report. Rather Staff accepts Deepwater's overall conclusion that: "Overall there was very little bat activity offshore." And: "Patterns of activity in the Project Area detected during the Project surveys do not suggest the presence of a large bat migration corridor in the vicinity of the BIWF WTG Array." Based on low offshore activity rates attributed to both foraging and migration, and, especially low occurrence rates within the BIWF WTG, Deepwater concludes: "...the risk of bat colliding with the BIWF turbines is also expected to be very low."

Although bats are not common at the BIWF project area, Deepwater acknowledges that bats may be attracted to insects which congregate near the bright deck lights of vessels operating at night during the construction period. To address this concern Deepwater proposes to monitor bat activity near select vessels which will be operating at night with the deck lights on. In addition, Deepwater has developed a "Post-Construction Avian and Bat Monitoring Plan (Draft dated March 2012) to further investigate potential impacts to birds and bats from the operation of the BIWF. (The US Fish and Wildlife Service reviewed and provided comments on the initial draft of Deepwater's ABMP in a letter dated August 24, 2012.)

**F. Ocean SAMP Regulatory Standard Matrix with Staff Evaluation Comments:** The following matrix of Ocean SAMP regulatory standards has been prepared by CRMC Staff to address these standards in a manner consistent with the matrix provided by Deepwater Wind in their Environmental Report/Construction and Operation Plan (Volume 1). Following each regulatory standard, CRMC Staff's evaluation is provided in the right hand column of the matrix.

OSAMP Section	Regulatory Standard	CRMC Staff Evaluation
270.2.1	Ocean SAMP sea duck foraging habitats in water depths less than or equal to 20 meters [65.6 feet] (as shown in Figure 11.7) are designated as Areas Designated for Preservation	The proposed location is in the renewable energy zone defined in the OSAMP which is protective of the Sea Duck foraging habitat. A more complete analysis of the avian resources is included in this report.
270.2.2	The Council shall designate glacial moraines as identified in Chapter 11, Figures 11.3 and 11.4, as Areas of Particular Concern.	The proposed location is in the renewable energy zone defined in the OSAMP which is protective of the glacial moraines.
270.2.3	The Council shall require, for Large -Scale Projects, modeling of circulation and stratification to ensure that water flow patterns and velocities are not altered in ways that would lead to major ecosystem change	Section 4.1.2.1 states that due to the small diameter of the pile foundations and the spacing of the turbines that there will not be a significant effect on the circulation, stratification or water flow patterns. While Staff concurs with this conclusion, the Council will need to determine if this requirement has been met.
270.2.5	The Council in coordination with the Joint Agency Working Group, as described in Chapter 11, The Policies of the Ocean SAMP, shall determine requirements for monitoring prior to, during and post-construction	These meetings have been ongoing throughout the review.
270.2.6	Large-Scale Offshore Development, as defined in Chapter 11 in section 1160.1.1, shall require a meeting between the HAB, the applicant, and the Council staff to discuss potential marine resource and habitat-related issues	The applicant has met this requirement by having meetings with the HAB and CRMC staff on 12/19/2011 and 5/3/2012.
350.2.1	Public infrastructure projects shall provide an analysis of historic and projected (medium and high) rates of sea level rise and shall at minimum assess the risks for each alternative on public safety and environmental impacts resulting from the project	Section 4.1.1.1 The applicant details what the CMRC has adopted as SLR policy but does not assess the risks on public safety or environmental impacts resulting from the project. The BITS section has some minor discussion. Staff concurs that there is little SLR impacts associated with buried submarine cables.
440.4	Project reviews will follow the policies outlined in "Section 220: Areas of Historic and Archaeological Significance" and in "Section 330: Guidelines for the Protection and Enhancement of the Scenic Value of the Coastal Region" of the State of Rhode Island Coastal Resources Management Program, As Amended ("Red Book"). The standards for the identification of cultural resources and the assessment of potential effects on cultural resources will be in accordance with the National Historic Preservation Act Section 106 regulations, 36 CFR Part 800, Protection of Historic Properties.	Section 4.7 details the work conducted as part of the application. The CRMC typically relies upon the expertise of the RIHPHC. The attached letter dated May 28, 2013 from the HPHC to the Army Corps of Engineers outline the review findings and the need/requirement for a MOA.  *No MOA as of Report Date* There have been several interagency letters addressing historical and archeological issues with the latest being November 20, 2013 to Grover Fugate. These letters are contained in the agenda package. These issues have been addressed in C.1.k and C.1.t of this report.
440.6	Archaeological surveys shall be required as part of the permitting process for projects which may pose a threat to Rhode Island's archaeological and historic resources	Surveys were performed the details of which are in Section 4.7 of the application. The adequacies of the surveys are outlined in the attached HPHC letter. The staff review of the letters and other correspondence indicate that the applicant has met the requirements of this section of the Ocean SAMP.
440.2.1	The potential non-physical impacts of a proposed project on cultural and historic resources shall be evaluated in accordance with 36 CFR 800.5, Assessment of Adverse Effects, (v) Introduction of visual, atmospheric, or audible elements that diminish the integrity of the property's significant historic features.	The non-physical impacts are detailed in Sect 4.7.3 and extensively in Appendix S & R. The completeness of the evaluation and proposed mitigation as applicable shall be determined by the RIHPHC and are incorporated into this report by reference.
560.2.1	Large-Scale Offshore Development, as defined in section 1160.1.1, shall require a meeting between the Fisherman's Advisory Board (FAB), the applicant, and the Council staff to discuss potential fishery-related impacts	The applicant has met this requirement by having meetings on 1/4/2012 and 5/3/2012.
560.2.3	The Council shall require that the potential adverse impacts of Offshore Developments and other uses on commercial or recreational fisheries be evaluated, considered, and mitigated as described in section 560.2.4.	The application details the potential adverse impacts on commercial and recreational fisheries in Section4.5.

560.2.8	The Council shall consult with the U.S. Coast Guard, the U.S. Navy, marine pilots, the FAB, fishermen's organizations, and recreational boating organizations when scheduling offshore marine construction or dredging activities.	This section is a requirement for the CRMC not for the applicant. Also Ocean SAMP 660.2. The USCG is part of the Joint Agency working group and have provided comments to the ACOE as part of their review.
560.2.9	The Council shall require the assent holder to provide for communication with commercial and recreational fishermen, mariners, and recreational boaters regarding offshore marine construction or dredging activities. Communication shall be facilitated through a project website and shall complement standard U.S. Coast Guard procedures such as Notices to Mariners for notifying mariners of obstructions to navigation	The communication requirement is detailed in Section 3.3.4 and addresses the methods of communication and the target audience.
560.2.10	For all Large-Scale Offshore Developments, underwater cables, and other development projects as determined by the Council, the assent holder shall designate and fund a third party fisheries liaison	Deepwater addresses the requirement for the designated fisheries liaison in Section 3.3.4 Offshore Construction and in Section 4.9.2.1 Potential Impacts and Mitigation. A third party fisheries liaison will be designated if and when an assent is received.
560.2.12.i	A biological assessment of commercially and recreationally targeted species shall be required within the project area for all Offshore Developments	Deepwater Wind has committed to a 2 year pre-construction and 3 year post construction trawl survey as described in Section 4.5.2. The monthly trawl survey began on 9/13/2012. Survey results are available. A 2 year ventless trap survey began in May 2013. Reports will be available as completed
560.2.12.ii	An assessment of commercial and recreational fisheries effort, landings, and landings value shall be required for all Offshore Developments. Assessment shall focus on the proposed project area and alternatives. This assessment shall evaluate commercial and recreational fishing effort, landings, and landings value at three different stages: pre-construction (to assess baseline conditions); during construction; and during operation	From Ocean SAMP 560.2.12.ii:  The Council will not require this assessment for proposed projects within the Renewable Energy Zone that are proposed within 2 years of the adoption of the Ocean SAMP. Adoption date 10-19-2010; application date 10-05-2012
660.2.7	The Council shall require where appropriate that project developers perform systematic observations of recreational boating intensity at the project area at least three times: preconstruction; during construction; and post-construction	This requirement includes the June Block Island Race week and Fourth of July Holiday
770.2.1	Navigation, military, and infrastructure areas including: designated shipping lanes, precautionary areas, recommended vessel routes, ferry routes, dredge disposal sites, military testing areas, unexploded ordnance, pilot boarding areas, and anchorages, as shown in Figures 7.1, 7.2, 7.8, and 7.9, have been designated as Areas of Particular Concern.	These areas have been avoided as part of this application which proposes to use the renewable energy zone for the turbine locations. The cable will transit shipping lanes however it is below grade and other than temporary construction impacts will not interfere with these navigation areas.
770.2.4	Where possible, Offshore Developments should be designed in a configuration to minimize adverse impacts on other user groups, which include but are not limited to: recreational boaters and fishermen, commercial fishermen, commercial ship operators, or other vessel operators in the project area. Configurations which may minimize adverse impacts on vessel traffic include, but are not limited to, the incorporation of a traffic lane through a development to facilitate safe and direct navigation through, rather than around, an Offshore Development	Section 3.3.4 details the offshore construction activities. The location and configuration potential adverse impacts are addressed in Sections 4.9.2.1 and 4.9.2.2. The proposal is located within the Renewable Energy Zone (REZ) and there are no limits proposed for access except during certain phases of construction for safety.
770.2.7	Applications for projects proposed to be sited in state waters pursuant to the Ocean SAMP shall not have a significant impact on marine transportation, navigation, and existing infrastructure. Where the Council, in consultation with the U.S. Coast Guard, the U.S. Navy, NOAA, the U.S. Bureau of Ocean Energy Management, Regulation and Enforcement, the U.S. Army Corps of Engineers, marine pilots, the R.I. Port Safety and Security Forums	The proposal is within the REZ and avoids navigation channels, existing marine infrastructure and precautionary areas.

860.1.2	CRMC supports the policy of increasing renewable energy production in Rhode Island.	In Section 1.2 the applicant details how this proposal meets the goal/policy of increasing renewable energy in the State
860.1.4	CRMC may require applicant to fund a program to mitigate potential impacts.	A mitigation plan was submitted on November 8, 2013. The plan requires Council approval
860.1.5	Offshore development structures and projects shall be made available for research into the effects of large-scale installations in the marine environmental and for the purpose of educating the public.	The Council/Staff will stipulate that the structures shall be made available for research should the Council chose to issue an assent.
860.1.7	CMRC will work with marine safety agencies and organizations to promote safe navigation, fishing, and recreational activity.	The application material details the applicants work to date and proposed coordination with the various agencies and user groups in Section 4.9, Section 4.11, and Appendix U. It is likely that stipulations to insure proposed items may be prudent.
860.1.8	Maintenance of access around offshore structures. USCG, BOEM, and USACE have indicated that no vessel restrictions are planned for waters around and through offshore structures and developments, or along cable routes, except those necessary for navigational safety.	The applicant does not propose any vessel restrictions or access constraints other than during construction and decommissioning which is outlined in Section 4.9 and Section 4.11.
860.1.9	CRMC information requirements are similar to BOEM requirements to support coordinated review of projects.	The application material submitted appears to have been prepared as outlined in the OSAMP and was provided to BOEM for review, no comments from BOEM concerning the adequacy of the submittal have been received.
860.1.10	CRMC will coordinate with appropriate agencies to establish project specific requirements. CRMC will work with a Joint Agency Working Group.	This coordination has been done at the staff level with RIDEM, the ACOE (along with its Federal Partners) and the RIHPC. This type of coordination is typical for all large projects as part of the GP process.
860.1.11	Industry goals for noise.	The requirements of 860.1.11 are goals only, not standards. The applicant has outlined the models used to show that the project will meet the goals in Section 4.6 with back up data in Appendix N, Acoustic Assessment.
860.2.1.1	Offshore developments in state waters are subject to policies and standards outlined in Sections 1150 and 1160.	Each of the polices are addressed in various locations in this report and will not be repeated here.
860.2.1.2	CRMC finds that the Renewable Energy Zone is most suitable area for offshore renewable energy development and designates this area as Type 4E waters to show that this is the preferred site for large scale renewable energy projects in state waters. CRMC may approve projects elsewhere also.	The proposed wind turbines are proposed to be located within the Renewable Energy Zone.
860.2.1.3	Offshore developments shall not have a significant adverse impact on the natural resources or existing human uses of the Rhode Island coastal zone. If project pre-construction, construction, operation, or decommissioning phases constitute significant adverse impacts, CRMC can require modification or mitigation.	The application materials detail the impacts and if appropriate mitigation in Section 4.0, the OSAMP standards for each section are detailed in this report. The construction /operations plan (COP) was submitted as part of the ER as allowed in the OSAMP for projects submitted within 24 months of adoption.
860.2.1.4	Requirements for assent holders to design and conduct all activities in a manner consistent with RICRMP, RI Ocean SAMP, and other relevant laws, regulations and policies that ensures safety and shall not cause undue harm or damage to natural resources and take measures to prevent unauthorized discharge of pollutants. Reporting compliance requirements for assent holders.	The applicant has followed the outline of the OSAMP which describes each of these requirements. The responses are outlined in the report. Each policy/regulation appears to have been addressed by the applicant – areas of specific concern are outlined in this report in the appropriate section.
860.2.1.5	Pre-application FAB meeting required for large-scale offshore development in state waters.	The applicant has met this requirement by having meetings on: 1/4/2012 and 5/3/2012.

860.2.1.6	Uses or activities that would result in significant long-term (more than one or two seasons) negative impacts to Rhode Island's commercial or recreational fisheries are prohibited.	The applicant addresses this requirement in Section 4.5.2.2. The previously mentioned trawl surveys and ventless trap surveys will support the evaluation of impact.
860.2.1.7	Potential adverse impacts of offshore developments and other uses on commercial or recreational fisheries be evaluated, considered, and mitigated.	The potential impacts and mitigation are addressed in Sections 4.9.2.1 for the BIWF and 4.9.2.2 for the BITS
860.2.1.8	For the purposes of Sections 560.1-560.2, mitigation is defined as a process to make whole those fisheries user groups that are adversely affected by proposals in the RI Ocean SAMP area. Mitigation is required for potential impacts. This policy applies to all large-scale offshore developments and underwater cables.	Mitigation terms were negotiated between the applicant and the RI Commercial Fisheries Center. Details were provided at a FAB meeting on October 9, 2013 and reviewed by board members and CRMC staff. The FAB completed their approval of the MOA language on November 19, 2013. CRMC staff agrees that the MOA may be part of the mitigation package.
860.2.1.9	Moraine edges and other areas identified by FAB are important for commercial and recreational fishermen. Impacts to these areas should be minimized.	The Deepwater project will occur in the Renewable Energy Zone defined by the Ocean SAMP which was established to minimize potential impacts on important fishing areas. Application Section 4.5.1.2
860.2.1.10	Protection of habitats for finfish, shellfish, and crustacean species targeted by commercial and recreational fishermen.	Sections 4.5.2 and 4.5.3 address the BIWF and BITS affected environments and mitigation measures for the targeted fish species of commercial and recreational fishermen.
860.2.1.11	Pre-application HAB meeting required for large-scale offshore development in state waters.	The applicant has met this requirement by having meetings on 12/19/2011 and 5/3/2012.
860.2.1.12	Potential impacts on cultural and historic resources must be evaluated in accordance with the National Historic Preservation Act and Rhode Island Historic Preservation Act.	The applicant has completed a significant effort in order to evaluate these resources and the CRMC will incorporate the RIHPHC and the Advisory Council on Historic Preservation comments / recommendations as part of the Assent Stipulations. The items provided are Section 4.7, Appendix P, Marine Cultural Report, Appendix Q Terrestrial Archeology Report and Appendix R, Historic Properties Report HPHC letter: March 1, 2013, May 28, 2013, October 28, 2013 November 20, 2013; ACOE letters July 29, 2013; ACHP letters; August 29, 2013, November 21, 2013.
860.2.1.13	RIHPHC and lead federal agency guidelines for marine archeology assessment.	See above.
860.2.1.14	Visual impact assessment may be required to evaluate potential non-physical impacts on cultural and historic resources.	In addition to the above data and information, the applicant provided Appendix S, Visual Impact Assessment to the RIHPHC which was part of their review. The project was found to have a visual impact that will be mitigated
860.2.1.15	Visual impact assessment may require detailed visual simulations of views from National Historic Landmarks, sites listed in the National Register of Historic Places.	The applicant has provided visual simulations in Appendix S, the adequacy and level of detail will be determined by RIHPHC. CRMC staff have also addressed this in Section C.1.t of this report.
860.2.1.16	A visual impact assessment may require description and images illustrating the potential impacts of the proposed project.	This is provided in Appendix S
860.2.1.17	Guidelines for landscape and visual impact assessment in the RI Ocean SAMP area can be obtained through the lead federal agency responsible for reviewing the proposed development.	These guidelines appear to have been followed and are included in Appendix S, the CRMC will defer to the HPHC&ACOE for the compliance, which is outlined in HPHC's and ACOE's correspondence.

<b>860.2.2</b>	<b>Areas of Particular Concern</b>	
860.2.2.1	Areas of Particular Concern (APCs) have been designated in state waters through the RI Ocean SAMP process with the goal of protecting areas that have high conservation value, cultural and historic value, or human use value.	The application material submitted demonstrates that engineering constraints force the BITS submarine cable through glacial moraines (APC). It does appear that the proposal minimizes the disturbance in the APC as the actual turbines are outside of any APC.
860.2.2.2	Offshore development is not allowed in APCs unless there are no practicable alternatives that are less damaging in areas outside of the APC or the project will not result in significant alteration to the values and resources of the APC.	While it is the Council who will decide if the cable route has no practical alternative the significant limitations and competing elements in the offshore area make the proposed route which has a cable being buried in APCs (a one time disturbance). It appears to staff that there are no practicable alternatives.

860.2.3.1	The RI Ocean SAMP designates Areas Designated for Preservation in state waters for the purpose of preserving them for their ecological value. Large-scale offshore development is prohibited in these areas. Underwater cables are exempt from this prohibition. Areas designated for preservation include: i. Sea duck foraging habitat (water depths less than or equal to 20 m [65.6 ft] until CRMC and other agencies make a more refined determination)	The BITS traverses sea duck foraging habitat which is the entire area around Block Island within a 20-meter depth contour. However, the RI Ocean SAMP specifically states that underwater cables are exempt. All other portions of the project are outside of ADP.
860.2.3.3	Offshore development is prohibited in areas identified as Critical Habitat under the Endangered Species Act.	The project is not proposed within or adjacent to areas identified as Critical Habitat.
860.2.3.4	Dredged material disposal, as defined in RICRMP Section 300.0 and subject to the regulations of RICRMP Section 300.9, is prohibited in APCs.	The proposal has two options so it is likely to involve dredging since it is material removal below mean low water as part of the cofferdams or open excavations that are needed for the cable landfalls. The proposal provided indicates that the cofferdams will not be located within an APC. RICRMP standards will apply – See Section 300.9.
<b>860.2.4</b>	<b>Other Areas</b>	
860.2.4.1	Large-scale projects or other development which is found to be a hazard to commercial navigation shall avoid Areas of High Intensity Commercial Marine Traffic in state waters (50 or vessel counts within a 1 km by 1 km grid).	The only portion of the project that is within and adjacent to the high intensity commercial marine traffic areas is the cable which is not a hazard to navigation. It is proposed to be buried deep enough to not pose a hazard to emergency anchorages.
1160	The regulatory standards in Section 1160 are enforceable policies for the purposes of Federal CZMA Federal Consistency.	The applicant is applying for a Category B Assent.
1160	The Federal offshore renewable energy leasing process is under the jurisdiction of BOEMRE	The portions of the cable are under BOEMRE jurisdiction and the lease process is underway at the time of the review.
1160.1.1	All offshore developments in State waters are subject to policies and standards in Section 1150 and 1160	This project meets the definition of a Large Scale project.
1160.1.2	The assessment of natural resources and human uses that is part of the OSAMP created a Renewable Energy Zone	The wind turbine generators proposed in this project are located in the renewable energy zone, the export cables are located below the seafloor outside of the zone.
1160.1.3	Offshore developments shall not have a significant adverse impact on the natural resources or existing human uses	Section 4 outlines the Affected Environment including the Potential impacts and proposed mitigation. The Council will need to determine if it is adequate – each section is detailed in other areas of the report and won't be repeated here.
1160.1.4	Any Assent holder of an approved Offshore Development shall: Design the project to no cause undue harm or damage to natural resources, submit requests notices etc as required, follow up any request made by the Council within 3 business days, Comply with the terms and conditions of all reports, make all payments on time, conduct all activities authorized consistent with the provisions, compile and make available in a timely manner requests made by the Council	While the Council shall decide if the project was designed to cause no undue harm, the data and narratives submitted by the applicant seem to support the contention that the project will not have any undue harm to natural resources (see RICRMP portion of the report). The applicant has responded within the 3 days required but has taken up to 5 weeks to actually provide the information requested.



1160.1.5	The Council shall appoint a standing Fishermen's Advisory Board (FAB).	The FAB members were appointed on June 16, 2011. The initial FAB meeting was September 19, 2011. CRMC received applications for the RI positions on the FAB. Staff recommended the appointments to the Council based upon the applications.
1160.1.6	The Council shall prohibit any other uses or activities that would result in significant long-term negative impacts to Rhode Islands commercial or recreational fisheries	The Council shall make this determination as part of the deliberations and the public process. The proposed site is within the Renewable Energy Zone. All other uses and activities in the REZ that will negatively affect fisheries shall be prohibited by the Council. Uses and activities that negatively affect fisheries along the BITS will be prohibited. There are no other uses or activities proposed in this application for assent.
1160.1.7	The Council shall require potential adverse impacts of Offshore development on fisheries to be evaluated, considered and mitigated.	This is outlined in Section 4.5.2 & 3, Section 4.9 and Section 4.12. Deepwater Wind has initiated a demersal fish trawl survey and a ventless trap survey to determine pre-construction species composition and relative abundance. The above surveys will continue post construction to determine changes in species and abundance that may occur from wind turbines. The surveys will help to determine fisheries impacts but are not a mitigation measure. Mitigation may be variable depending upon the potential effects of wind turbines and transmission lines. The Council must approve any mitigation methods that are proposed.
1160.1.8	Fisheries mitigation is defined as a process to make whole those fisheries user groups that are adversely affected by the projects	Please see the description for 1160.1.7. Mitigation terms were negotiated between the applicant and the RI Commercial Fisheries Center. Details were provided at a FAB meeting on October 9, 2013 and reviewed by board members and CRMC staff. A mitigation plan was submitted to CRMC staff on November 8, 2013 and requires Council approval. The FAB completed their approval of the MOA language on November 19, 2013. CRMC staff agrees that the MOA may be part of the mitigation package. Please note that the some of the mitigation methods should be determined after the trawl survey and ventless trap survey have been completed post construction. Any negative long term effects will need to be addressed. A stipulation to review the mitigation policies after the research surveys are completed is warranted.
1160.1.9	The Council recognizes moraine edges are important to commercial and recreational fisheries and that Offshore developments shall employ micro-siting techniques.	The moraine edges are impacted in one area within the REZ. The proposal appears to minimize the impact to the resource keeping in mind that the REZ includes this resource.
1160.1.10	The Council shall protect sensitive marine habitat identified through the Site Assessment Plan	The Council shall make the determination that the sensitive marine habitats are protected via the SAP (application material) but it doe appear that the applicant tried to meet the intent of the OSAMP.
1160.1.11	Large Offshore Developments are required to have a meeting between the Habitat Advisory Board (HAB)	These meetings were held on 12/19/2011 and 5/3/2012.
1160.1.12	The potential impacts on cultural and historic resources will be evaluated in accordance with the National Historic Preservation and Antiquities Act.	See HPHC correspondence last November 20, 2013 & sections C.1.k and c.1.t of this report.
1160.1.13	Guidelines for the Marine Archaeology Assessment can be obtained through the RIHPC.	See HPHC correspondence last November 20, 2013 & sections C.1.k and c.1.t of this report..
1160.1.14	The potential non-physical impact of the project on cultural and historic resources shall be evaluated in accordance with 36 CFR 800.5.	See HPHC correspondence last November 20, 2013 & sections C.1.k and c.1.t of this report.
1160.1.15	The visual impact assessment may require the development of detailed visual simulations showing the relation to onshore National Historic properties	See HPHC correspondence last November 20, 2013 & sections C.1.k and c.1.t of this report..
1160.1.16	The visual impact assessment may require description and images illustrating potential impacts	See HPHC correspondence last November 20, 2013 & sections C.1.k and c.1.t of this report..

1160.1.17	Guidelines for visual impact assessment can be obtained through the lead federal agency	See HPHC correspondence last November 20, 2013 & sections C.1.k and c.1.t of this report.
1160.2.1	Areas of Particular concern (APC) have been designated through the OSAMP process	No Comment Needed
1160.2.2	All large scale development are presumptively excluded from APC's.	The proposal is not proposed in an APC – the cable which has been discussed previously does go through a section of an APC.
1160.2.3	Contains a list of the areas that are APC's	No comment needed – the OSAMP speaks for itself.
1160.2.4	Projects proposed within the Renewable Energy Zone shall adhere to the requirements outlined in 1160.2 regarding APC;s that overlap Renewable energy zones.	The project as previously discussed adheres to the requirements of Section 1160.2.
1160.3.1	Areas designated for Preservation are afforded additional protection above APC's – sea duck foraging areas (water depths less than or equal to 20 meters) are designated for preservation.	No work is proposed within Areas designated for preservation outside of the buried cable which is excluded from the requirement.
1160.3.2	Mining and extraction of minerals including sand is prohibited	There is no mining or extraction of minerals proposed in the applications.
1160.3.3	The Council shall prohibit any offshore development in areas identified as Critical Habitat.	There is development proposed in areas defined at Critical Habitat in this application. It is the buried cable as previously discussed.
1160.3.4	Dredge material disposal is subject to RICRMP Section 300.9 and limited in the OSAMP by prohibiting disposal in APC's	There is no dredge material disposal proposed in any APC as part of this application.
1160.4.1	Large scale projects shall avoid areas of high intensity marine traffic.	The proposed turbines avoid high intensity marine traffic, the buried cable will cross areas of high intensity marine traffic but they are buried and will not impact marine traffic.

## G: Staff Recommended Stipulations

- 1. North Atlantic Right Whales Impact Avoidance:** In order to avoid potential impacts to North Atlantic Right Whales, impact driving of wind turbine foundations shall not occur between November 1 and April 30<sup>th</sup> of any calendar year(s). If Long Distance Horizontal Directional Drilling (Long Distance HDD) is utilized for cable installation, impact driving of steel sheeting for coffer dam construction may also be restricted during this period.
- 2. Nearshore Transmission Cable Burial Depth:** The minimum transmission cable burial depth between minus 10 feet Mean Low Water (MLW) and Mean High Water (MHW) shall be 10 feet below the ocean bottom/sediment elevation at the time of installation. Transmission Cable installation depth below beaches and dunes at cable landing locations shall also achieve a minimum burial depth of 10' below the beach sediment surface. Burial depth below dunes shall be based on the elevation of the beach at the base of the dunes and shall not include the dune height in the burial depth measurement. Long Distance Horizontal Directional Drilling (Long Distance HDD) from offshore cofferdams is required to assure this minimal burial depth requirement is met. A post installation elevation survey shall be submitted to the CRMC to confirm this requirement has been met. This survey shall be submitted within 15 days of transmission cable installation at the beach landing locations.

3. **Transmission Cable installation in the vicinity of Freshwater Wetlands:** Transmission cable installation in the vicinity of Freshwater Wetlands (including coastal wetlands having contiguous freshwater wetlands) is hereby allowed beneath existing paved roadways and their existing cleared shoulders provided the following conditions are met:
- a. Existing culverts and the flow of water under bridges in roads or highways are not blocked or disrupted by going under or attaching to such structure;
  - b. The project does not cause any diversion of ground or surface water to or from any wetlands;
  - c. The preconstruction contours are restored immediately upon installation;
  - d. All disturbed areas are revegetated after restoring contours; and
  - e. The project design incorporates best management practices for dewatering from excavated areas.

Furthermore, as a condition of this permit there shall be no direct discharges of dewatering fluids to wetlands, catch basins, or stormwater conveyance systems that discharge to wetlands without proper treatment that effectively removes sediments and other visible contaminants (oil sheens, etc.).

4. **Post Construction Avian Monitoring:** Vertical oriented thermal imaging cameras sufficient to monitor the Rotor Swept Zone (RSZ) shall be installed and monitored on a permanent basis (through the life of the wind farm). A plan for installing and monitoring of the thermal imaging cameras shall be developed for CRMC review and approval prior to initiating wind turbine installation. Annual monitoring report summaries shall be provided to the CRMC by the end of each calendar year.
5. **Operational Adjustments:** An agreement shall be developed to implement operational adjustments should significant impacts to nocturnal migrants be documented during post construction operation of the wind farm. This plan shall be submitted for CRMC review and approval prior to initiating wind turbine installation.
6. **Environmental Compliance Monitor:** Pursuant to Ocean SAMP Section 860.2.8, Deepwater shall employ an Environmental Compliance Monitor (ECM) to monitor environmental compliance during all construction activities associated with the BIWF and BITS. The ECM shall be a third-party entity hired by Deepwater (assent holder) who is approved by and reports directly to the CRMC. The person/firm chosen to be the ECM shall require prior CRMC approval. The ECM shall be approved by the CRMC prior to the initiation of any work on the project herein approved.
7. **Cable Location and Scour Protection:** Within 15 days of completing the installation of the transmission cable between Block Island and Narragansett, Deepwater shall submit a post construction survey of the actual cable location and the proposed cable easement with State Plane and LAT/LON coordinates for the cable angle points, easement corners/ angle points of all scour protection matting (concrete filled bags, concrete mats, stone, etc.) installed on the ocean floor to protect the transmission cable. If the area of the ocean bottom impacted by scour protection exceeds the 2 acres of total ocean bottom coverage estimated within the

Environmental Report/COP, the CRMC may require marine habitat compensation to be determined after submission of the post-installation survey.

- 8. Historic and Archaeological Preservation Memorandum:** Prior to Assent issuance, final Memorandums of Agreement shall be finalized between Deepwater and the RI Historical Preservation and Heritage Commission as needed to address/mitigate impacts on Historic properties and Archaeological Resources.
- 9. Prerequisite State and Federal Agency Approval Requirements:** Prior to Assent Issuance, Deepwater shall obtain all necessary State and Federal Approvals for the Project. These approvals shall include but not be limited to: RIDEM Water Quality Certificate, RIDEM Freshwater Wetlands approval, RIDEM RIPDES permit, NOAA National Marine Fisheries Service Concurrence, US Army Corps of Engineers Permit, and the BOEM Right of Way Grant Area. Copies of these approvals shall be submitted to the CRMC attention CRMC File No. 2012-09-065.
- 10. Fisheries Liaison:** A third party fisheries liaison shall be hired by the assent holder and approved by the Council before initiation of construction.
- 11. Scarborough Landing SAV Survey:** Prior to installation of the BITS transmission cable nearshore (12 meter depth or less) at the Scarborough Landing Alternative, Deepwater shall perform a Submerged Aquatic Vegetation Survey (SAV) utilizing a towed video sled or diver video survey of the cable route. The Survey shall be performed during July or August 2014. The results of this survey shall be forwarded to the CRMC prior to transmission cable installation. If SAV is located in the transmission cable route, avoidance and/or mitigation shall be required consistent with RICRMP Section 300.18. Avoidance and/or Mitigation measures shall require CRMC approval
- 12. CRMC Assent and Permit Transfers:** Deepwater shall transfer copies of the CRMC Assent including all relevant information and documentation upon which the Assent was based to any new owners or operators of the BIWF, BITS and associated facilities. Prior to any such transfer, Deepwater shall notify the CRMC in writing and shall provide a complete description of the facilities, operational responsibilities, project components including both material, intellectual and operational properties being transferred to a new owner or operator.
- 13. Unexpected Effects on Fisheries and Avian Resources:** A plan to address any unexpected effects caused by the installation or operation of the BIWF and BITS will be developed by the assent holder and approved by the Council.
- 14. Mitigation Re-Assessment:** Mitigation measures required by the OSAMP and/or required by the Council shall be re-assessed by the Council at regular intervals determined by the Council (the starting interval shall be 6 months).
- 15. Recreational Boating:** The assent holder shall conduct a survey of recreational boating intensity preconstruction, post-construction, and during construction to capture the periods including July 4th weekend and the June Block Island Race Week. Surveys must include weekdays and weekends. Survey results will be provided to the Council.

**16. Research:** The wind turbine support structures shall be available for approved research projects that do not affect turbine operation, maintenance or emergency access.

**17. Marine Habitat Protection:** The assent holder shall develop a plan to protect habitats for finfish, shellfish, and crustacean species impacted by the project that are targeted by commercial and recreational fishermen.