

6.0 COMPREHENSIVE ENVIRONMENTAL MONITORING PROGRAM

As called for in the MEPA Scope, an outline of the anticipated Comprehensive Environmental Monitoring Program (CEMP) components is provided below. A detailed CEMP will be developed and implemented, after consultations with appropriate agency staff, to assess pre-construction and post-construction conditions in the Project Area. Detailed specifications regarding methods, monitoring locations, monitoring frequency and duration, schedules, and reporting will be developed based on comments received in response to this DEIS/DEIR/DRI. Because of the jurisdictional overlap for some of the resources discussed, this CEMP outline covers monitoring of resources both within and outside of the state territorial limit.

Resource types and conditions that have been identified for monitoring in the Project Area include: seabed conditions, noise, submerged aquatic vegetation, benthic invertebrate community and habitat conditions, shellfish and fisheries, birds, sea turtles and marine mammals. Some of these environmental conditions and resources will also be monitored during construction of the Project. Preliminary guidance for development of this outline was provided during meetings and consultations with cooperating agencies (see Section 10.0).

6.1 Pre-Construction Monitoring

Extensive literature review, agency consultations, and field sampling and survey programs have been conducted for the Project to assess existing conditions within and in the vicinity of the Proposed Alternative and other alternative sites. This information has been used to document pre-construction conditions. Extensive pre-construction field monitoring and/or literature review of seabed conditions, sediment quality, noise, benthic invertebrates, sea turtles and marine mammals, and birds has been conducted. The Applicant has installed a Scientific Measurement Devices Station (SMDS) on the southern edge of the Proposed Alternative Site, in the center of Nantucket Sound. The SMDS contains an array of instrumentation which will continually monitor meteorological and oceanographic conditions in Nantucket Sound for the following: (1) Wind; (2) Waves; (3) Currents; (4) Air and Water Temperature; and (5) Sea level variations.

The SMDS will assist in establishing baseline conditions and will remain in place for a period of at least 5 years, allowing for continued monitoring of hydrographic and meteorological conditions during construction.

6.1.1 Seabed Conditions Monitoring

Bathymetric surveys have been conducted to assess pre-construction seabed elevations and surface features, as described and presented in Section 5.2. In addition, marine geophysical and geologic/sediment sampling surveys were conducted to further evaluate seafloor and sub-seafloor conditions as described in Section 5.1. These existing survey data may be supplemented with additional surveys, as needed, based on the final siting of the Project.

Scour control mats have been placed on the seabed at the SMDS to provide a demonstration of the effectiveness of scour protection technology. This location is being periodically monitored during the preconstruction period and will continue to be evaluated during construction. Further information regarding the preconstruction scour protection installation at the SMDS can be found in Section 5.2.

6.1.2 Noise Monitoring

A comprehensive survey of existing noise levels within and in the vicinity of the Project Area has been conducted, as described and presented in Section 5.11. The study included above water and underwater sound measurements during the SMDS pile driving, baseline sound level monitoring and acoustic modeling, short-term existing daytime sound level measurements at two locations in the vicinity of the Project Area where recreational boaters travel, and above water sound measurements at three representative coastal sites (as required by MEPA). Noise studies for other comparable projects were also reviewed and compared to data collected for the proposed Project.

6.1.3 Biological Monitoring

Pre-construction conditions were assessed for biological resources within and adjacent to the Project Area. These assessments will be supplemented with additional monitoring, as needed, based on the final siting of the Project.

6.1.3.1 Submerged Aquatic Vegetation

Maps of submerged aquatic vegetation (SAV) within and in the vicinity of the Proposed project site were reviewed to assess the presence of this resource in the Project Area. The mapped resources were then reviewed relative to the bathymetric survey results to document pre-construction SAV conditions, as described and presented in Section 5.8. To supplement this existing information, a diver survey was conducted (WHG July 2003) to locate SAV limits and densities for representative areas. Prior to the start of installation of the submarine cable system, an additional pre-construction SAV survey will be conducted to verify the limits of SAV previously surveyed in July of 2003.

6.1.3.2 Benthic Invertebrate Community and Habitat Conditions

Pre-construction benthic invertebrate and shellfish resources have been assessed through field sampling within and adjacent to the Project Area. This field effort included grab sampling, identification, and characterization of benthic invertebrates and communities. The results were used to quantitatively assess the benthic invertebrate communities associated with the various benthic habitat areas or types, as described and presented in Section 5.3. A shellfish survey was conducted as part of the benthic organism survey during the summer of 2003 to describe shellfish occurring in Lewis Bay within the Town of Yarmouth recreational shellfish area that would be crossed by the proposed cable route (Appendix 5.3-C). No other quantitative benthic invertebrate or shellfish monitoring is proposed to document pre-construction resources in the Project Area.

6.1.3.3 Sea Turtles and Marine Mammals

An extensive literature review and series of agency consultations were conducted to assess sea turtle and marine mammal resources within and in the vicinity of the Project Area. The presence or absence of sea turtles and marine mammals in the Project Area was also documented during boat and aerial surveys that were conducted in the Project Area to collect benthic samples and/or avian data. Any further observations will be documented during other additional pre-construction field surveys that may be conducted for other reasons. No additional monitoring of sea turtles and marine mammals is proposed to document pre-construction resources in the Project Area.

6.1.3.4 Birds

In addition to an extensive literature review and series of agency and public interest group consultations, field surveys were conducted between July 2001 and February 2004 to quantitatively assess bird resources within and in the vicinity of the Project Area. These surveys are described and presented in Section 5.7.

6.1.3.5 State-listed Rare Species

As described in Section 5.6, portions of the upland transmission cable route are within mapped habitats of state-listed rare species. A pre-construction field survey was conducted to document the occurrence, abundance, and location of state-listed rare species within the NSTAR Electric ROW portion of the Project Area. Of the 10 rare species that NHESP has mapped along this portion of the NSTAR Electric ROW, all are water-dependent species and are typically found only in coastal plain ponds. Because the proposed transmission line in this area will be more than 100 feet from all wetland areas, it is highly unlikely that these species occur within the uplands that will be temporarily disturbed by installation of the proposed transmission line. Field surveys were performed during the time of year appropriate to the identification of the mapped state-listed rare species.

6.2 Construction Monitoring

Several environmental resources will be monitored during construction. Details of this monitoring will be determined in consultation with reviewing agencies based upon final siting, selection of construction equipment and methods, construction schedule, and pertinent permit/approval conditions. As discussed above, the SMDS will continue to monitor meteorological and oceanographic conditions in Nantucket Sound during construction. A preliminary description of the expected scope and components of other construction period monitoring are outlined below.

6.2.1 Noise Monitoring

Noise measurements comparable to those taken to assess pre-construction conditions will be conducted at representative locations to monitor Project noise during construction. This monitoring will be conducted in a manner sufficient to confirm that any noise limits imposed in permit conditions are met during construction.

Above Water Sound

Pile driving of the monopiles in the Wind Park is expected to be inaudible at all upland locations except in a few rare instances (see Section 5.11.4.2.1.1), and the most likely opportunity for any sound to be heard (though at a very low level) will be at Point Gammon, Yarmouth when the monopiles in the northeast corner of the Park (those closest to land) are being driven. Above water sound level measurements will be made at Point Gammon over a 7-day period during the time that these monopiles are being driven to document what, if any, sound levels were measurable and audible. The monitoring location will be identical to that used for baseline monitoring at Point Gammon (see Section 5.11.3.2).

Underwater Sound

During initial monopile installation at the Wind Park, underwater sound monitoring will be performed identical to that done to protect marine mammals during the installation of the Scientific Measurement Devices Station foundation piles for the Project (see Section 5.11.2.1). For the pile driving of the first monopile, underwater sound pressure level measurements will be made at an Initial Safety Zone radius of 500 meters to determine compliance with the 180 dB NMFS threshold for protecting marine mammals. Hydrophone measurements will use the Lmax RMS "fast" setting, and data will be analyzed on a real-time basis to ensure compliance. If measured levels exceed the threshold, an activity-specific Safety Zone radius corresponding to the 180 dB threshold will be established for pile driving of all the monopiles and the NMFS approved observer will be advised of the expanded action area for observation of marine animals. The NMFS observer will be present during the initial pile driving activities to ensure that no listed species are within the Safety Zone radius during construction.

6.2.2 Biological Monitoring

6.2.2.1 Protected Marine Species

A NMFS-approved observer will be posted on-site during initial pile driving activities to monitor the area. If listed species are observed within the Safety Zone by the NMFS-approved observer, the observer will ensure that work will cease until the animal is clear of the work area and safety zone (see Section 5.11.2).

6.2.2.2 State-Listed Rare Species

In the event that a state-listed rare species is identified within the footprint of the upland transmission cable route, a Conservation Plan will be developed that includes construction monitoring to avoid or minimize mortality and habitat disturbance.

6.2.3 Erosion Controls

Erosion and sedimentation controls will be inspected immediately prior to and periodically during construction.

6.3 Post-Construction Monitoring

Monitoring will be conducted to document post-construction conditions for several environmental resources. The methods and locations of this monitoring activity will be consistent with those used for pre-construction monitoring to allow for comparison between pre- and post-construction conditions. Additional details related to the frequency, duration, schedule, and reporting for post-construction monitoring will be determined in consultation with reviewing agencies.

A preliminary description of the expected scope and components of post-construction monitoring are outlined below.

6.3.1 Seabed Conditions Monitoring

A bathymetric survey of limited portions of the same representative reaches used to document pre-construction conditions within the Project Area as described in Section 6.1.1 will be conducted, following construction, to assess post-construction seabed elevation and surface conditions. Sediment profile images will be taken at a representative sub-set of the sample stations used to document pre-construction conditions, as described in Section 6.1.1, in order to assess post-construction seabed conditions and benthic habitat quality.

Post-construction inspection for scour and erosion will be conducted during the first year following construction.

6.3.2 Noise Monitoring

Noise measurements comparable to those conducted to assess pre-construction conditions will be conducted at representative locations to monitor Project noise during operation. This monitoring will be conducted in a manner sufficient to confirm that any noise limits imposed in permit conditions are met during operation.

6.3.3 Biological Monitoring

Post-construction monitoring of biological resources will be conducted, as needed based on the final siting of the Project. Detailed specification of the resources to be monitored, methods to be employed, and monitoring locations will be developed based, as appropriate, on comments received in response to this DEIS/DEIR. Post-construction monitoring will likely include the following elements:

6.3.3.1 Submerged Aquatic Vegetation

Should SAV beds be identified in the vicinity of the proposed submarine cable system route, a post-construction monitoring plan will be developed to document potential indirect impacts from cable embedment and subsequent habitat recovery. Habitat recovery would be considered successful if it is found that SAV has migrated back to the site of disturbance. Should the habitat not recover naturally, the disturbance will be mitigated by replanting.

6.3.3.2 Benthic Invertebrate Community and Habitat Conditions

Shellfish beds disturbed by project activities in Lewis Bay will be re-seeded as discussed with the shellfish constable for the Town of Yarmouth.

6.3.3.3 Sea Turtles and Marine Mammals

The presence of sea turtles and marine mammals in the Project Area and observed reactions of these animals to the Project will be documented during post-construction field surveys of bird resources.

6.3.3.4 Birds

Field surveys will be conducted to quantitatively assess bird resources and patterns of use in the Project Area post-construction. These surveys will span a 12-month period to capture variability in seasonal use.

6.3.3.5 State-Listed Rare Species

In the event that a state-listed rare species is identified within the footprint of the upland transmission cable route, post-construction monitoring of these species will be conducted according to a Conservation Plan developed to document habitat disturbance and recovery.

These monitoring efforts may be repeated periodically on an on-going basis to determine that recovery has occurred.