NANTASKET BEACH
HULL, MASSACHUSETTS

CONTINUING AUTHORITIES PROGRAM
Section 103
Coastal Storm Damage Reduction

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ENVIRONMENTAL ASSESSMENT
FINDING OF NO SIGNIFICANT IMPACT
AND
CLEAN WATER ACT SECTION 404 (B)(1) EVALUATION

U.S. ARMY CORPS OF ENGINEERS
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Concord, Massachusetts 01742-2751
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NANTASKET BEACH ENVIRONMENTAL ASSESSMENT
Continuing Authority Program
Section 103 Coastal Storm Damage Reduction

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FINDING OF NO SIGNIFICANT IMPACT

The proposed Nantasket Federal coastal storm damage reduction project is intended to provide protection for the backshore areas of Nantasket Beach, Hull, Massachusetts. Protection from coastal storms and their associated tidal surges is required to protect public and private backshore properties along Nantasket Beach. Currently, considerable damages are sustained by the Town of Hull, private property owners, and the Massachusetts Department of Conservation and Recreation (DCR) from flooding and wind and wave action. The screening of several alternatives resulted in the selection of an action plan consisting of the construction of a rock revetment along 2,200 feet of the Nantasket Beach Reservation. The rock revetment is being built adjacent to an existing seawall and will displace approximately 129,800 square feet of cobble-sand beach.

Work is authorized under the continuing authority of Section 103 of the River and Harbor Act of 1962, as amended. I find that based on the evaluation of environmental effects discussed in this document, the decision on this application is not a major federal action significantly affecting the quality of the human environment. Under the Council on Environmental Quality ("CEQ") NEPA regulations, "NEPA significance" is a concept dependent upon context and intensity (40 C.F.R. § 1508.27.) When considering a site-specific action like the proposed project, significance is measured by the impacts felt at a local scale, as opposed to a regional or nationwide context. The CEQ regulations identify a number of factors to measure the intensity of impact. These factors are discussed below, and none are implicated here to warrant a finding of NEPA significance. A review of these NEPA "intensity" factors reveals that the proposed action would not result in a significant impact—neither beneficial nor detrimental--to the human environment.

Impacts on public health or safety: The project is expected to have no adverse effect on public health and safety.

Unique characteristics: The project is located on a typical high-energy sand-cobble beach.

Controversy: The proposed project is not controversial as this term is understood in the NEPA context. State and federal resource agencies agree with the Corps impact assessment. Public support for the project has been noted.

Uncertain impacts: The impacts of the proposed project are not uncertain, they are readily understood based on past experiences the Corps has had with similar projects.

Precedent for future actions: The proposed project is authorized under an existing federal law and will not establish a precedent for future actions.

Cumulative significance: As discussed in the EA, to the extent that other actions are expected to be related to the project as proposed, these actions will provide little measurable cumulative impact.

Historic resources: Coordination with the State Historic Preservation Office and Board of Underwater Archaeological Resources has determined that no impacts to historic or archaeological resources will occur as a result of this project.

Endangered species: The project will have no known positive or negative impacts on any State or Federal threatened or endangered species.

Potential violation of state or federal law: This action will not violate federal law. The local sponsor will be responsible for obtaining necessary state and local permits.

Measures to minimize adverse environmental effects of the proposed action are discussed in the EA. These measures include using avoidance, minimization, and best management practices.

Based on my review and evaluation of the environmental effects as presented in the Environmental Assessment, I have determined that implementation of the proposed coastal storm damage reduction project will have no significant direct, indirect, or cumulative impacts on the quality of the human or natural environment. Because no significant environmental impacts will result, an Environmental Impact Statement is not required and will not be prepared.

15 DEC 14
DATE

Christopher J. Barron
Colonel, Corps of Engineers
District Engineer

NANTASKET BEACH
HULL, MASSACHUSETTS
CONTINUING AUTHORITIES PROGRAM
Section 103
Coastal Storm Damage Reduction
ENVIRONMENTAL ASSESSMENT

1.0 INTRODUCTION

Nantasket Beach is located in the town of Hull along the southeast coast of Massachusetts on a peninsula forming the southern boundary of Boston Harbor, about four miles southeast of the main entrance to Boston Harbor and 12 miles southeast of the city of Boston. The project area is part of a long narrow peninsula projecting into Boston Harbor, along a southeast-northwest axis from the Atlantic Hill section of Hull to Point Allerton. It is within the Massachusetts Department of Conservation and Recreation's (DCR) Nantasket Beach Reservation. The project area is approximately 6,800 feet long, and is bordered by commercial and residential areas along the backshore (Figure 1). The DCR Reservation extends from its southern limit at Atlantic Hill north to Phipps Street. DCR Reservations are regional park systems that protect land and water resources and preserve the natural and cultural resource legacies of an area while providing recreational opportunities.

2.0 PURPOSE AND NEED

The purpose of the project is to reduce damage in the project area caused by coastal storms. The concrete seawall along the DCR's Nantasket Beach Reservation was substantially damaged and undermined during the "Halloween Storm" of October 1991. A large volume of the sand beach was lost during the storm. In addition, overtopping of the seawall caused flooding of the commercial and residential backshore buildings. The most severe damages in the past 20 years occurred during the northeast storms of October 1991 and December 1992 when a 650-foot section of the concrete seawall collapsed.

The seawalls in the project area protect backshore parking areas, a recreation pavilion, and a bathhouse. Hull Shore Drive and Nantasket Avenue, which parallel the beach front, provide the sole access to the northern two-thirds of the Town of Hull and about 80 percent of its population. Approximately 65 structures including commercial, public, and residential buildings are located within the study area. Of these structures, 53 are projected to be subject to first floor flooding during a 100-year storm event.

The flooding of public, commercial, and residential properties has historically occurred and will continue if protective measures are not taken. Additionally, should no action occur, storm damage to the concrete seawall and the sidewalks adjacent to the beach will continue.

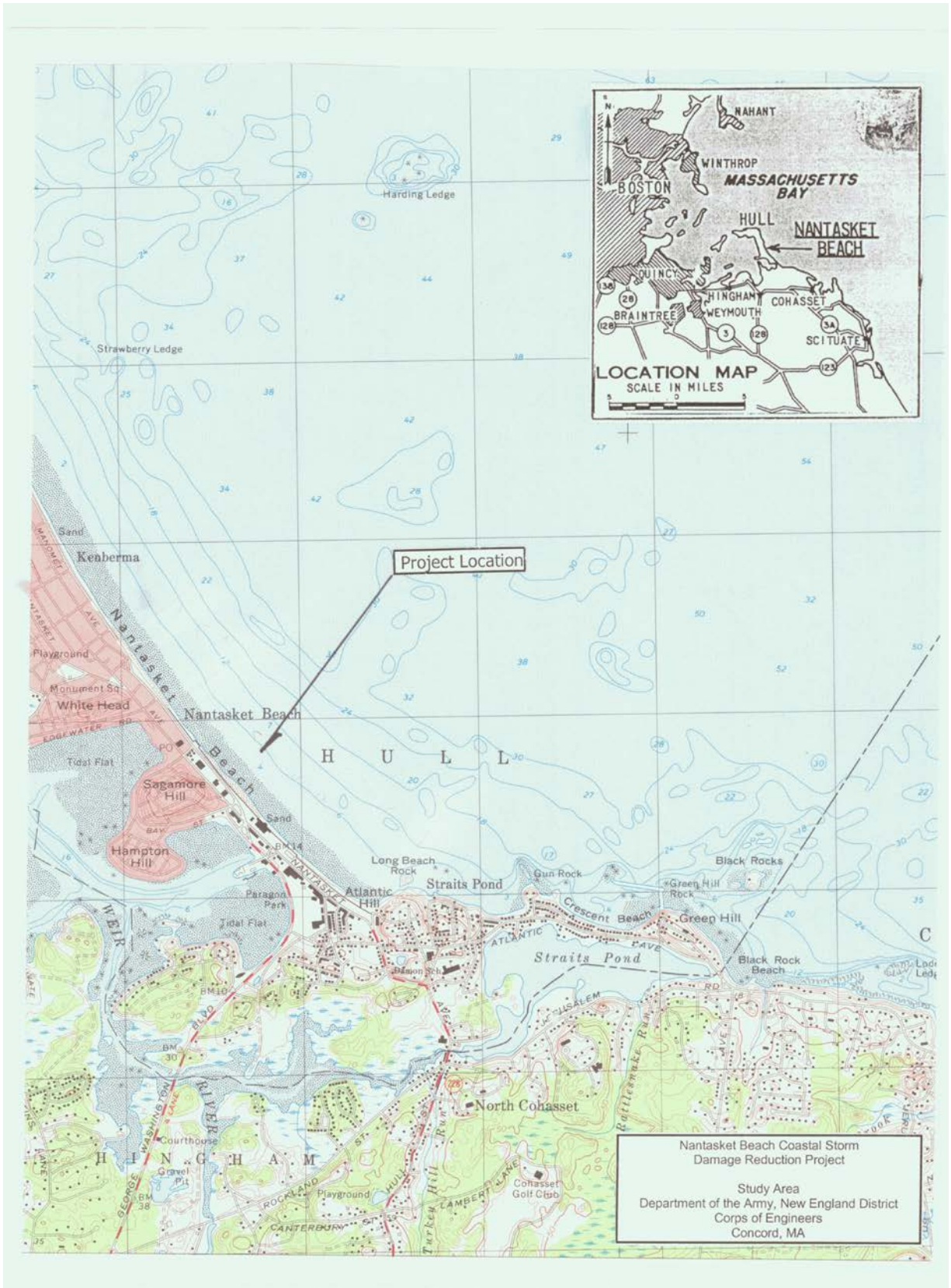


Figure 1. Nantasket Beach, Hull, Massachusetts

3.0 PROJECT HISTORY AND AUTHORITY

In March 1968, a beach erosion control report for Nantasket Beach was issued in cooperation with the DCR (formerly the Metropolitan District Commission). The report recommended that a beach erosion control project be adopted that involved beach widening by placing suitable sand fill along 6,800 feet of beach fronting the DCR Reservation. The report recommended a general backshore elevation of 17 feet above mean low water (MLW) that would furnish a recreational and protective beach averaging about 190 feet in width behind the mean high water (MHW) line.

In October 1991, a Nor'easter' storm caused extensive damage to the stone rip-rap, and concrete sea walls, sidewalks, stairs and ramps along the DCR Reservation at Nantasket Beach. The DCR requested the U.S. Army Corps of Engineers (Corps) to reactivate the previously authorized project because of the damages sustained to the seawall and backshore properties during the storm.

Due to the critical nature of this situation it was decided to conduct the reconnaissance study under the authority contained in Section 103 of the 1962 Rivers and Harbors Act, as amended, that is administered under the Corps Continuing Authorities Program. Section 103 allows the Corps to evaluate methods of protecting public facilities that have been threatened by beach erosion. While this authority allows the Corps of Engineers the ability to evaluate and construct a project, it requires the local, sponsoring agency to provide funding for future maintenance and renourishment of beaches.

The Reconnaissance Report, including a draft Feasibility Cost Sharing Agreement, was completed in August 1993 and approved by Headquarters, USACE in March 1994. In February 1995, the DCR and the Corps of Engineers entered into a Feasibility Cost Sharing Agreement to conduct the Feasibility Study. Input to the Environmental Assessment was compiled in 1996 and appeared in the draft Feasibility Report dated January 1997. The sponsor decided not to move forward with the storm damage reduction project at Nantasket Beach at that time. Subsequently, the sponsor elected to revive the project and applicable updates to the report and its economic and cost analyses were prepared by the New England District in 1999.

The Corps issued a public notice on the draft revisions in March 2003, however many of the comments received took issue with the recommendations for relatively coarse sandfill that was considered to be incompatible with Nantasket's fine grain sand. While the debate over what sand was appropriate continued, condition surveys revealed that the sea wall at the south end of the DCR reservation was severely at risk after the beach had eroded to the extent that no dry beach remained at high tide and footings were being exposed. The Corps assisted DCR by designing the Temporary Sea Wall Fortification (TSF) which was constructed as an emergency measure in 2004. DCR constructed the Northern Revetment in 2006 to replace the sea wall that was weakened and/or collapsed in 1992.

4.0 PROJECT DESCRIPTION

An overall “study area” of Nantasket Beach was initially proposed along the 6,800 foot long length of the DCR reservation (Figure 2). The study area was divided into three “zones” for study purposes. Zones 1 and 3 have been removed from the Corps Section 103 study as improvements in those areas have been completed by others.

The proposed project addressed by this document provides shore protection for Zone 2 in Figure 2. The proposed project involves constructing a 2,200 foot long stone revetment along the length of Zone 2. The revetment is proposed to be located directly in front of the existing sea wall. The revetment will consist of a layer of geotextile fabric, a 6'' thick filter layer of crushed stone, a 2'-6'' under layer of stone, W50 = 350 lbs (2 stones thick), and a 5'-6'' armor layer of stone, W50 = 3,000 lbs (2 stones thick). The revetment will displace approximately 129,800 square feet of cobble-sand beach.

Placement of the stone will occur seaward of the existing seawall. The construction of the revetment is anticipated to take approximately 2-3 months to complete and will be constructed in the year that funds become available. No seasonal restrictions for construction are anticipated.

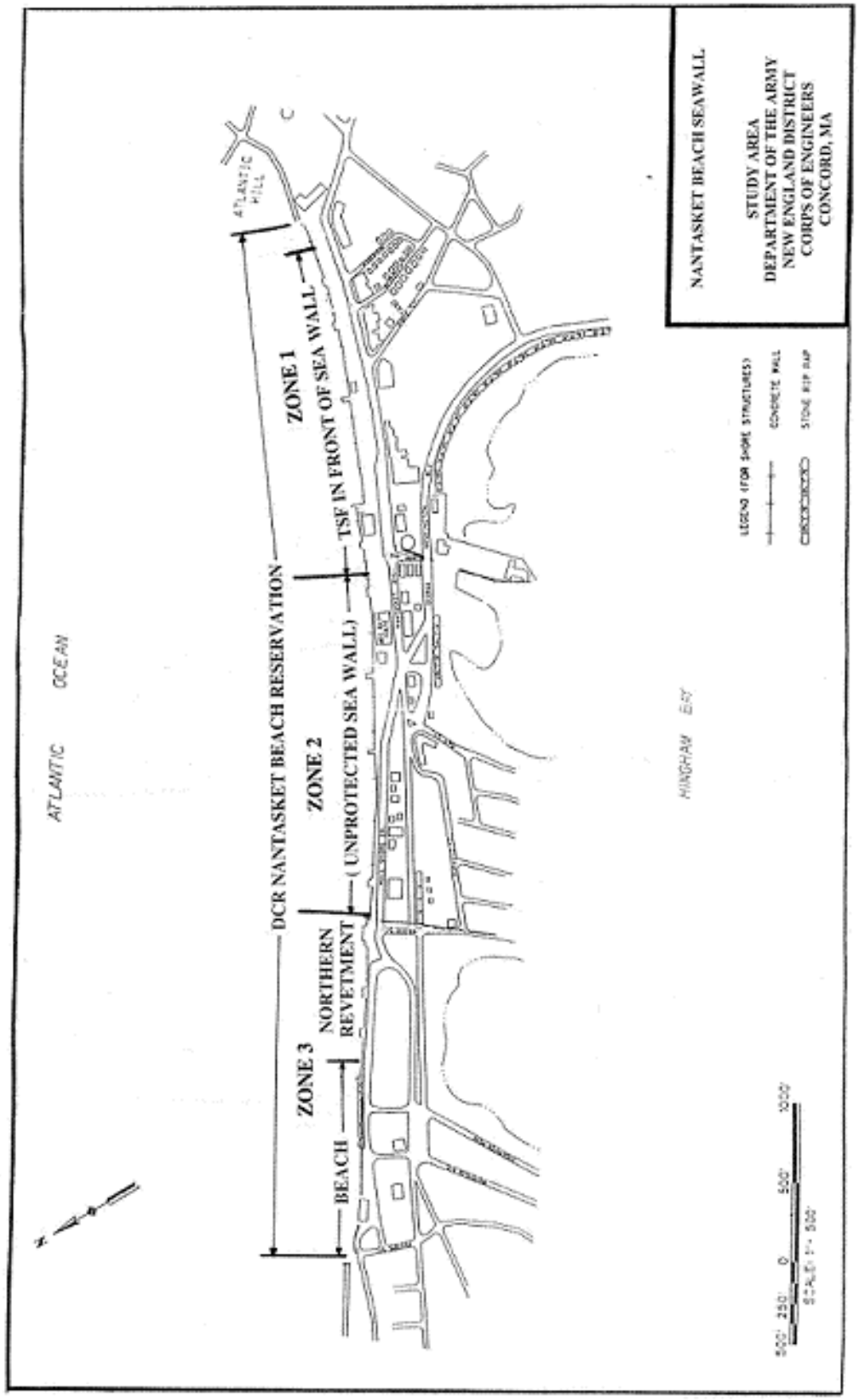


Figure 2. Nantasket Beach Reservation study zones.

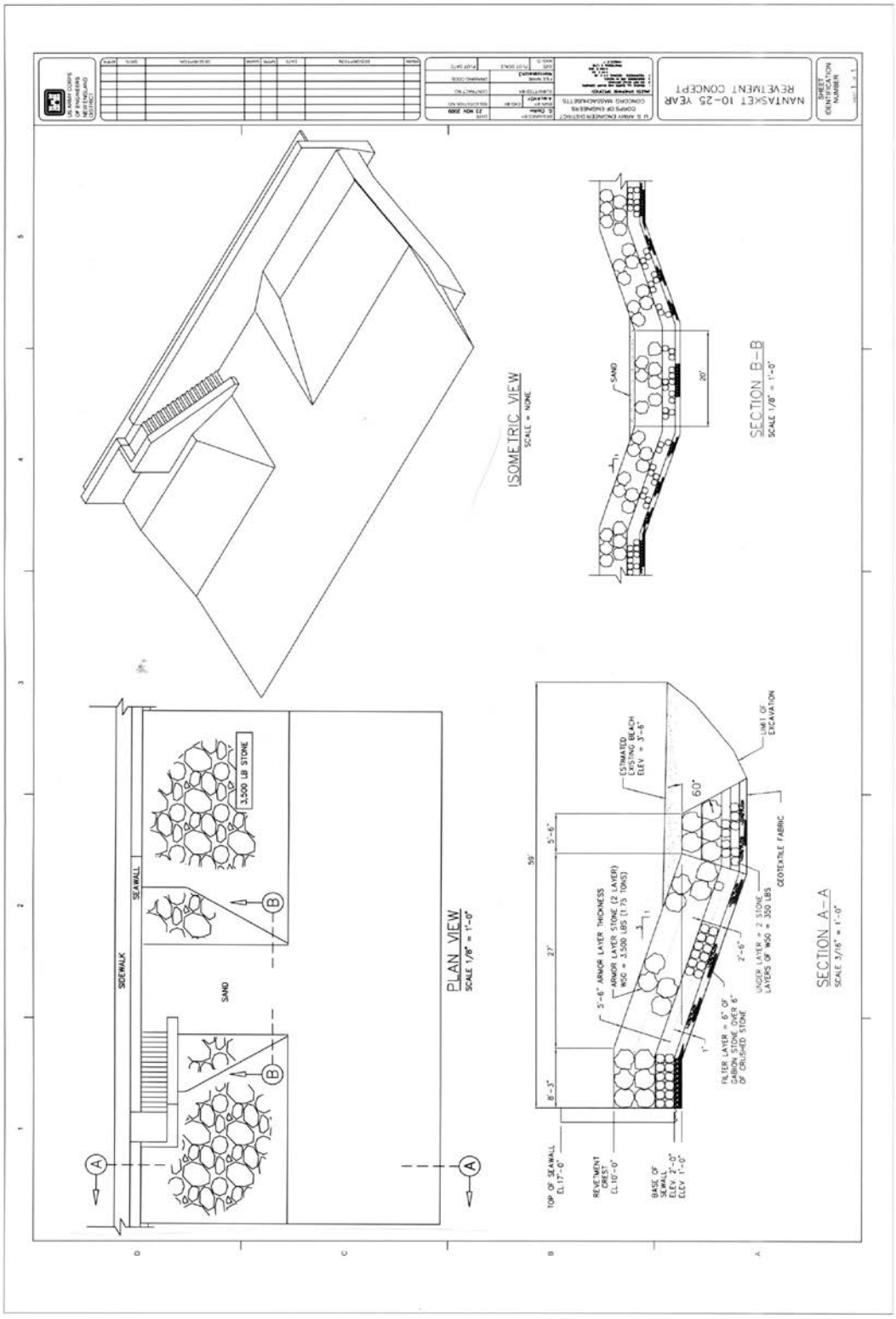


Figure 3. Proposed Nantasket Beach Reservation revetment.

5.0 ALTERNATIVES

In addition to the no-action alternative described in Section 5.1, four action alternatives were evaluated to reduce coastal storm damage along the proposed study area. The objective in identifying and evaluating project alternatives is to avoid or reduce the potential impact associated with construction and operation of the proposed facility. Potential impact factors considered may include land use effects, marine and terrestrial ecosystem disturbance, and impacts on endangered and threatened species.

The selected alternative for construction (preferred plan) must be able to comply with the Corps responsibilities associated with Section 404 of the Clean Water Act, and all other applicable laws and regulations, such as the Clean Water Act Section 401 Water Quality Certification and Coastal Zone Management consistency for the Commonwealth of Massachusetts.

5.1 No Action Alternative

Under the No Action Alternative (providing no additional protection in the project area), flooding will continue to occur along the Nantasket Beach backshore areas. Considerable damage to the concrete seawall, stairs, riprap, and sidewalks as well as flooding damages to commercial, residential, and public properties will continue without action. Seawall failure would dramatically exacerbate storm damages in the backshore. Inclusion of a no action alternative is prescribed by CEQ regulations to serve as a benchmark against which proposed Federal actions can be evaluated. The no action alternative refers to the continuation of existing conditions of the affected environment, without implementation of the proposed action. Flooding of the backshore occurs when coastal storms and their associated tidal surges and wave action undermine and overtop the seawall along Nantasket Beach.

5.2 Offshore Breakwater Alternative

An offshore breakwater in the waters adjacent to Nantasket Beach was considered. However, the cost estimates to construct a breakwater structure exceed the potential benefits gained from having the structure in place. The Corps of Engineers cannot become involved in a continuing authorities project unless the benefit to cost ratio exceeds one. Therefore, this alternative is not economically viable and was dropped from consideration.

5.3 Relocation or Raising of Structures Alternative

Non-structural measures do not control flooding but reduce the property damages from flooding. The relocation or raising of affected structures in the project area was considered. By moving vulnerable properties from the flood prone areas, some damages can be minimized and avoided. Structures may be relocated from the flood plain (a very expensive option), or flood proofed or raised above the floodplain. The relocation of structures was considered impractical due to economic considerations.

An elevation alternative was also evaluated. About 65 structures are subject to first floor flooding in the Nantasket Beach backshore from a 100-year flood. Past experience has shown it makes economic sense to raise a structure if that structure receives recurring flood damages from one foot or more of water above its first floor elevation. Elevating the first floor of 13 structures that receive one foot or more of flooding above the first floor was considered and found to be economically feasible. However, small fraction of properties would benefit from this

alternative. Flooding would still occur at most properties and therefore residual damages in the study area would be high.

5.4 Revetment Alternative

The construction of a revetment along all the "zones" of the project area was considered. This alternative was reduced to the construction of a revetment along Zone 2 only following improvements in Zones 1 and 3 by DCR. The revetment in Zone 2 would be built adjacent to the existing seawall and would displace approximately 129,800 square feet of cobble-sand beach. Prior to construction of the proposed project, the local sponsor would be responsible to complete repairs of any damaged existing seawall including the replacement of any damaged ramps and stairs. This alternative is considered feasible.

5.5 Sand Fill Nourishment Alternative

Sand fill nourishment alternatives along the entire 6,800-foot shoreline was initially considered. Sand fill berms that are 50-, 75-, and 100-foot wide having elevations of 12 feet NGVD and slopes of 1V:15V slope to the existing beach were analyzed. This alternative was considered feasible. Since that alternative was formulated, the TSF and Northern Revetment were constructed, thus changing the without project conditions. As a result, the portion of the beach considered for protection from storms became solely the area along Zone 2. Our beach characterization study revealed that a compatible beachfill design would be much flatter than what the Corps had proposed in 2003, and, as a consequence, fill volumes were higher and so were the costs for the material. While sand fill remains a feasible option, the costs associated with this alternative are far in excess of the limits that Section 103 provides.

6.0 AFFECTED ENVIRONMENT

6.1 Physical and Chemical Environment

Nantasket Beach is in the town of Hull, Plymouth County, Massachusetts. The study area is part of a peninsula extending along a NW-SE axis into Massachusetts Bay, running from the southern limit to the northern limit of the DCR Reservation (Figure 1). This beach lies on the Atlantic Ocean, facing a northeasterly direction. Swells from ocean storms directly affect this section of coast and are the cause of the coastal erosion that is being experienced. The Massachusetts Coastal Zone Management Plan area designates this area as a public beach (CZM 1977). The beach is composed primarily of sand and stone cobble running the length of the project area.

The development and existence of Nantasket Beach is derived from a number of drumlin islands located north of Atlantic Hill. Five of these drumlins were once located east of Nantasket Beach, but are now completely eroded away. It is estimated that more than 90 percent of the material in Nantasket Beach was derived from these drumlins. Strawberry Hill, Sagamore Head, and Whitehead are now protected from marine erosion by the beaches in front of them. Point Allerton and Allerton Hill are protected in most places by seawalls. Minimal amounts of material are currently being added to Nantasket Beach from these drumlins and it does not appear likely that a significant amount of material is being added from the sites of the destroyed drumlins (COE, 1968).

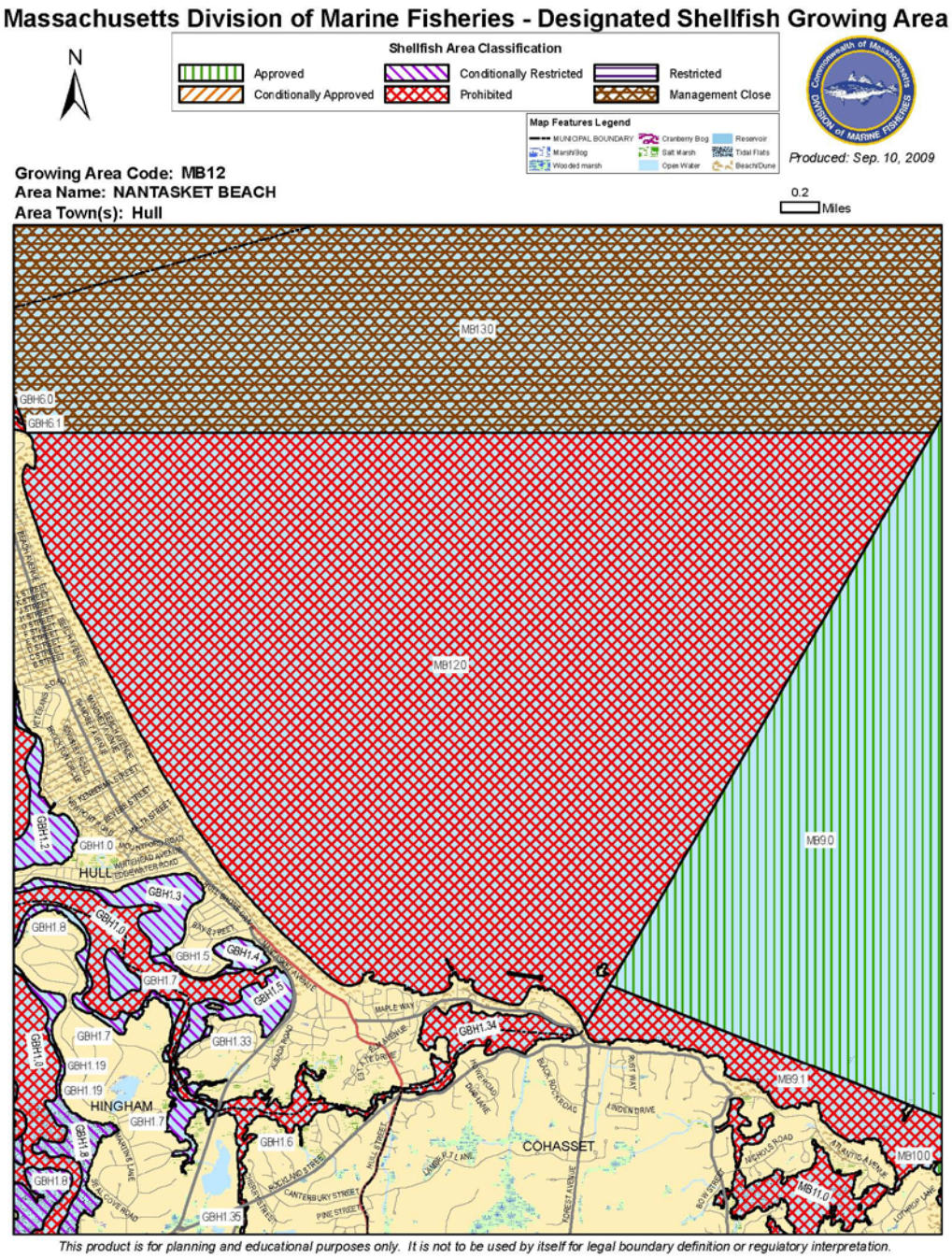
The dominant direction of wave travel during most of the year is generally straight onto the beach. As a result, there is no strongly developed longshore drift direction. However, it appears that some material moves from the south to the north (Appendix B of the Main Report). Beach profiles taken for this study indicate that the shoreline has been moving inland (USACE, 2006). The slope of the beach is very shallow (1:73 at the north end to 1:45 slope of the beach on the south end). At low tide, the beach is about 400 to 600 feet wide. At high tide, the entire beach in front of the seawall is inundated. The beach sediments are composed of fine to medium-grained brown/gray colored sand in the intertidal areas and beach slopes, while the upper beach cobble is composed of cobble and a mix of sands (USACE, 2006).

The sediment in the project area was not chemically tested as it is sand and cobble and not likely to contain contaminants.

6.2 Biological Resources

The upper beach areas of Nantasket Beach are unstable shifting sand –cobble habitats which are mostly underwater during the higher portions of the tidal cycle. These shifting sands provide little, if any, suitable substrate for biota to colonize. No dunes or sea grasses or significant environmental resources were observed from the subtidal to supratidal area during a site inspection. There are no known eelgrass beds (*Zostera marina*) located off Nantasket Beach (U.S. Fish and Wildlife, 1996; MASS-GIS, 2010).

Figure 3. Shellfish designation areas along Nantasket Beach, Hull, MA.



6.2.2 Benthic Community

Benthic communities in the vicinity of the project area are typical intertidal sandy shore assemblages. These assemblages tend to have few species and few individuals and are represented by organisms adapted for life in shifting sand habitats. Some representative organisms in the Nantasket Beach study area identified by Pratt (1996) include haustorid amphipods *(Amphiporeia virginana, Haustorius canadensis,* and *Parahaustorius longimerus),* and some species of polychaetes such as *Paraonis fulgens* and *Nephtys picta.*

6.2.1 Shellfish

A shellfish survey to assess populations of surf clams in the vicinity of the project area was performed in December of 2006 (Battelle, 2007). A hydraulic dredge was towed over 53 transects (transects were 100 meters in length) between the 30' contour and mean lower low water (mllw) contour. The survey showed that there is a population of surf clams within the subtidal areas adjacent to the project area. Surf clams were most abundant in the nearshore areas to depths of approximately 7 feet (mllw). Nantasket Beach is closed to shellfish harvesting due to bacterial contamination from the sewage treatment plant on Nut Island. However, surf clams may be harvested as bait for the cod fishery. Figure 3 details the shellfish closure areas in the project area

No lobsters (*Homarus americanus*) were collected during the shellfish survey and there was no evidence of lobster fishing (i.e., lobster traps) in the project area during the course of the survey. Lobsters are known to be harvested in the deeper offshore waters adjacent to the survey area.

6.2.3 Fishery Resources

Nantasket Beach supports a typical New England sandy beach assemblage of fish including such species as killifish, silversides, and sand lances. A number of managed fishery species, those species that are deemed recreationally and commercially important and thus have management plans developed for them, have the potential to occur in the nearshore and offshore waters adjacent to the project area. The managed species are listed in Section 6.3.

6.3 Essential Fish Habitat

The 1996 amendments to the Magnuson-Stevens Fishery Conservation and Management Act strengthened the ability of the National Marine Fisheries Service (NMFS) and Fishery Management Councils to protect and conserve the habitat of marine, estuarine, and anadromous finfish, mollusks, and crustaceans. This habitat is termed "essential fish habitat" and is broadly defined to include "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." The Act establishes measures to protect EFH. Federal agencies must consult with NMFS on all actions or proposed actions authorized, funded, or undertaken by the agency that may adversely affect EFH. The NMFS must coordinate with other federal agencies to conserve and enhance EFH, and in turn NMFS must provide recommendations to federal and state agencies on such activities to conserve EFH. These recommendations may include measures to avoid, minimize, mitigate, or otherwise offset adverse effects on EFH resulting from actions or proposed actions authorized, funded, or undertaken by that agency. This EFH assessment has been prepared for use in determining the potential impact to the existing fish resources from the proposed revetment construction for the project area.

All of Nantasket Beach has been designated to be within EFH waters. The managed EFH species that may occur in the project area include: pollock (juveniles), red hake (eggs, larvae, and adults), white hake (all life stages), winter flounder (all life stages), windowpane flounder (all life stages), American plaice (adults), Atlantic halibut (eggs and adults), bluefish (juveniles and adults), long finned squid (juveniles and adults), short finned squid (juveniles and adults), Atlantic butterfish (eggs), Atlantic mackerel (eggs, juveniles, and adults), summer flounder (adults), scup (juveniles and adults).

6.4 Endangered and Threatened Species

It has been determined that threatened and endangered species are unlikely to occur within the project area. Piping plover (*Charadrius melodus*), a State and Federally listed threatened bird species, are generally a concern in coastal areas of Massachusetts. However the beach areas along the DCR reservation are generally inundated with tidal surge during high tides making the area inappropriate for nesting shorebirds. Additionally, the area serves as a public beach, making it inappropriate for shorebird feeding during periods of exposure.

Nantasket Beach does not provide habitat for any threatened and/or endangered species that are exclusively marine in New England waters, such as marine mammals and sea turtles, as the area is intertidal.

Coordination with the National Marine Fisheries Service (NMFS) and U.S. Fish and Wildlife Service can be found in Appendix A.

6.5 Historic and Archaeological Resources

Hull, Massachusetts was originally called Nantascot by the Wampanoag Indians. The town dates from 1644 when the town was named for a seaport town in Yorkshire, England. It is now known as Nantasket, but its official name is Hull (Bergan 1972:18).

Originally a fishing and agricultural town, the Town of Hull entered its golden age in the late 19th Century and the era of the big hotel. From the early 1880's to the First World War, several palatial inns and resorts transformed the town into a popular summer resort on the Eastern seaboard. Names such as the Rockland House, Atlantic House, Nantasket House, Ville Napoli, Pacific House and Pemberton Hotel dominated the scene. During World War I, however, the growth of the automobile had a destructive effect on the hotels, steamboats, and trolleys that serviced the area. Most of the inns and hotels from this era are now gone (ibid., 18,24,65).

At about the same time as the rise of the hotel industry, the rise of cottages, primarily as vacation homes, became dominant in the town (Sweetser 1888:76-77). These homes ranging from bungalow-sized to mansion are the late 19th-early 20th Century historic homes that occur near the project. Many examples of the Queen Anne, Victorian Gothic, neo-Tudor and Bungalow styles were built on hillsides in town. Typically, ocean front lots contained larger homes than those further inland. Many buildings of this period (1870-1915) remain in altered condition. Areas which have seen the least alteration of domestic architecture from this period include Hull Village, Allerton Hill and to a degree Atlantic Hill (Massachusetts Historical Commission (MHC) Survey Report 1979). At about the same time in 1905, Paragon Park was constructed in the southern portion of town. All vestiges of this popular amusement park are also gone with the exception of the carousel that is preserved on Nantasket Avenue.

The DCR, formerly known as the Metropolitan Parks Commission, took over control of some recreational areas in town, including Nantasket Beach in 1899 (Bergan 1972:72), and has controlled the popular beach resort since that time. DCR bathing pavilions located on Nantasket Avenue were built in a variation of the Spanish Mission style circa 1905-1915.

During the Modern period of 1915-1940, bungalow style homes were dominant while the widespread demolition and alteration of existing commercial structures after World War II became apparent as other resort areas rose in popularity. The rise of strip development along Nantasket Avenue had also become prevalent during this period (MHC 1979).

The Town of Hull published a Community Development Plan (CDP) (http://www.town.hull.ma.us/Public_Documents/HullMA_BComm/planningboard/econdevelplan.pdf) in 2004 for the Nantasket Beach area. The intent of the document was to outline potential development opportunities for the Nantasket Beach area. The CDP encouraged mixed-use development consisting of offices, cultural destinations, and retail outlets. The CDP was drafted with the intent of stimulating economic development and reconnecting the area to its history.

Properties listed on the National Register of Historic Places within Hull include the Point Allerton Life Saving Station, Telegraph Hill Historic and Archaeological District and the Hull Village Historic District. Properties eligible for inclusion on the National Register include the Metropolitan Park System of Greater Boston that includes the Nantasket Beach Reservation.

6.6 Socioeconomics

The town of Hull has a median annual wage of $70,053.00. The primary employers include the government, trade, and service industries (Commonwealth of Massachusetts, 2012). Population density, which is an indicator of the extent of development for Hull, was approximately 10,293 in 2010 (US Census, 2010).

A wide range of public services are offered by the town of Hull including full service fire departments, law enforcement, public schools, water and sewer services, recreation, and libraries. The form of government for the Town of Hull is by a Board of Selectmen, a Town Manager, and open town meetings.

The backshore of Nantasket Beach is occupied by commercial and residential properties. The beach itself is used by residents and visitors for various recreational activities.

6.7 Air Quality & Noise

Ambient air quality is protected by Federal and state regulations. The U.S. EPA has developed National Ambient Air Quality Standards (NAAQS) for certain air pollutants and air quality standards for each state cannot be less stringent than the NAAQS. The NAAQS determined by the EPA set the concentration limits that determine the attainment status for each criteria pollutant. Massachusetts has met attainment standards for ozone (with the exception of Dukes County) and for carbon monoxide (CO).

The Nantasket Beach Reservation is bounded to the east by the Atlantic Ocean and to the North, South, and West by residential communities. The noise environment is typical of a seaside, residential community with the majority of noise coming from motor vehicles and domestic activities.

6.8 Coastal Processes and Floodplains

Coastal Processes

The proposed project area of Nantasket Beach is subject to various coastal processes such as exposure to ocean waves, sediment transport, erosion, sea level rise, and flooding. The Woods Hole Group and Louis Berger Group (2010) prepared a report documenting the various coastal processes that occur within the project area. Additionally, a Coastal Engineering report was prepared for this project which details the coastal processes as they relate to the alternatives selected for this project. The Coastal Engineering Report is included as Appendix B of the Main Report.

Floodplain

The proposed project area occurs along a coastal barrier island.

7.0 ENVIRONMENTAL EFFECTS

7.1 Physical and Chemical Effects

The construction of the proposed revetment is anticipated to alter the physical environment of Nantasket Beach within the direct footprint of the structure. The revetment in being built adjacent to an existing seawall and will displace approximately 129,800 square feet of cobble-sand beach (Figure 3). The revetment is not likely to affect the physical environment outside of the direct footprint. Impacts to the physical environment from construction equipment accessing the beach areas and excavating the footprint of the revetment during low tide are anticipated to be minimal and limited to sand displacement. During periods of high tide, the suspension of sandy sediments in the water column may occur while placing or repositioning stones. However, any elevated levels should be short–term and localized as sandy material settles rapidly.

The construction of a revetment in the project area is not anticipated to alter the chemical environment of Nantasket Beach. The revetment will be composed of clean stone from a local quarry.

7.2 Biological Effects

7.2.1 Shellfish

Areas containing significant shellfish populations are not anticipated to present in the upper intertidal zone, i.e., the proposed project footprint. The shellfish resources documented adjacent to the project area (Battelle, 2007) should not be significantly affected by the construction of the proposed project. As discussed in section 7.1, the suspension of sandy sediments in the water column may occur in the construction area. However, any elevated levels should be short–term and localized.

7.2.2 Benthos

The most obvious and direct effect of revetment construction is the burial of benthic communities in the direct footprint of the project. Direct burial of motile and nonmotile forms would be lethal. Most motile species should be able to evacuate the project area at the onset of

the construction period. The project will displace approximately 129,800 square feet of cobble-sand beach and its associated benthic fauna. Benthic communities located adjacent to the project area may experience minor impacts associated with suspended sediments in the water column during construction as discussed in Section 7.1. However, these impacts would be localized to the project area and short-term, limited to the construction period.

The benthic communities located offshore of the project area are not anticipated to be affected by this project.

7.2.3 Fishery Resources

Approximately 129,800 square feet of cobble-sand beach (located in the upper intertidal zone) will be displaced by the revetment. Fishery resources would lose the ability to access the sandy bottom in the footprint of the revetment. Since the location of the displaced habitat is in an intertidal area of low benthic productivity, significant impacts to fisheries resources are not expected. Some non-significant impacts from elevated turbidity levels may be seen during construction as equipment access the site or manipulates stone during placement activities. However, since the material in the project area is sand any turbidity impacts will be short-term and localized, and not unlike conditions to be found in storm conditions. No direct or indirect significant impacts to fishery resources adjacent to the proposed project area are anticipated.

7.3 Essential Fish Habitat

In general, the placement of a revetment in the project area will alter approximately 129,800 square feet of beach from cobble-sand habitat to rock revetment habitat. Additionally, temporary increases in suspended sediments may occur in the vicinity of the construction area as a result of construction equipment accessing intertidal areas during low tides and manipulating or placing stone during low tide and high tide.

The alteration of habitat will be permanent while the increases in suspended sediments will be short-term and localized. Since the displaced habitat is in an intertidal area of low benthic productivity, the permanent loss of habitat is not anticipated to significantly alter the function of EFH for any of the managed species in the vicinity of the project area. Likewise, short-term increases in suspended sediments should not significantly alter the function of EFH for any of the managed species in the project area.

The following paragraphs represent the required Essential Fish Habitat assessment, which lists the managed species in the project area and describes specific impacts to their EFH:

Atlantic cod *(Gadus morhua)*

Essential Fish Habitat for eggs, larvae, juveniles, and adult life stages of Atlantic cod is designated within the project area. All life stages of cod are generally found in deeper waters than the intertidal zone associated with Nantasket Beach. Therefore, no impacts to Atlantic cod EFH are anticipated.

Haddock *(Melanogrammus aeglefinus)*

Essential Fish Habitat for eggs and larval haddock are designated in this area. However, the life stages of haddock are generally found in deeper waters than the intertidal zone of Nantasket Beach. Therefore, no impacts to haddock EFH are anticipated.

Pollock *(Pollachius virens)*

Essential Fish Habitat is designated within the project area for the life stages of Pollock. Eggs and larvae of pollock are generally found offshore. Juvenile pollock can be found from depths of 0 – 250 meters in high salinity waters (29- 32 ppt) with temperatures below 18^{o}C. Adult pollock are found from depths of 15 – 365 meters in high salinity waters (31-34 ppt) with temperatures below 14^{o}C. Spawning occurs in similar conditions to that of the adults, however, water temperature for spawning is generally below 8^{o}C. This project is expected to have no effects to EFH for pollock.

Whiting *(Merluccius bilinearis)*

Essential Fish Habitat is designated for all life stages of whiting in the project area; however, the life stages of whiting are generally found in deeper waters than the intertidal zone of Nantasket Beach. Therefore, no impacts to whiting EFH are expected.

Red hake *(Urophycis chuss)*

Essential Fish Habitat is designated in the project area for all life stages of red hake. Eggs and larvae of red hake are generally found offshore. Juvenile red hake are most often observed in low temperature (<16^{o}), high salinity waters (31-33 ppt), while adult red hake are generally observed in waters between 10 and 130 meters deep. This project is expected to have no effects on EFH for red hake as it is in the intertidal zone of the project area.

White hake *(Urophycis tenuis)*

Essential Fish Habitat is designated for all life stages of white hake in the project area. Eggs and larvae are generally found in pelagic waters offshore. Juveniles and adults can be found in waters as shallow as 5 meters and as deep as 225 meters. No impact to white hake EFH is expected from this project.

Winter flounder *(Pleuronectes americanus)*

Essential Fish Habitat is designated in the project area for all life stages of the winter flounder. The eggs of winter flounder, which are demersal, are typically found at depths of less than 5 meters in bottom waters in a broad range of salinities (10-30 ppt). Spawning, and therefore the eggs, occurs from February to June. EFH for larvae, juveniles, and adults includes bottom habitats of mud and fine-grained sandy substrate in waters ranging from 0.1 to 100 meters in depth. Spawning adults are typically associated with similar substrates in less than 6 meters of water.

Winter flounder EFH is located within the project area. The building of a revetment will alter the intertidal sandy beach habitat to a rock habitat. Some sediments in shallow intertidal areas may become suspended if construction machinery needs to access the sea-side of the revetment during high tide periods. However, every effort will be made to access the sea-side of the revetment during periods of low tide. Therefore, this project is anticipated to have only minimal impacts upon winter flounder EFH.

Yellowtail flounder *(Pleuronectes ferruginea)*

Essential Fish Habitat for all life stages of yellowtail flounder is located in the project area; however, all life stages of yellowtail flounder are generally found in deeper waters than those found in the project area. No impacts to yellowtail flounder EFH are anticipated.

Windowpane flounder *(Scopthalmus aquosus)*

Essential Fish Habitat is designated within the project area for all life stages of the windowpane flounder. Eggs are buoyant and typically found in the water column in water depths of 1 meter to 70 meters. Larvae are found in pelagic waters. Juveniles and adults prefer bottom habitats of mud or fine-grained sand and can be found in salinities ranging from 5.5 ppt to 36 ppt. Seasonal occurrences in the project area are generally from February to November, with peaks in occurring May and October.

Although windowpane flounder EFH is located within the project area, the building of a revetment will not destroy or damage any potential EFH. Some sediments in shallow intertidal areas may become suspended if construction machinery needs to access the sea-side of the revetment during high tide periods. However, every effort will be made to access the sea-side of the revetment during periods of low tide. Therefore, this project is anticipated to have no significant impact upon winter flounder EFH.

American plaice *(Hippoglossoides platessoides)*

Essential Fish Habitat is designated within the project area for American plaice eggs, larvae, juveniles, and adults. All life stages of American plaice are generally found in waters with depths of over 30 meters. This project is not expected to affect EFH for plaice.

Ocean pout *(Macrozoarces americanus)*

Essential Fish Habitat is designated in the project area for all life stages of ocean pout. This species is a nearshore species that inhabits hard bottom substrates with salinities greater than 30 ppt. This project is not anticipated to have impacts to ocean pout EFH as it is located in the sandy intertidal zone.

Atlantic halibut *(Hippoglossus hippoglossus)*

Essential Fish Habitat for all life stages of Atlantic halibut is designated in the project area; however, all life stages of Atlantic halibut are generally found in deeper waters than in the nearshore zone of Nantasket Beach. No impacts to Atlantic halibut EFH are expected.

Atlantic sea scallop *(Placopecten magellanicus)*

Essential Fish Habitat for all life stages of Atlantic sea scallop is designated in the project area. Atlantic sea scallop ranges in North America from Labrador to North Carolina. Eggs of the Atlantic sea scallop are found in both nearshore and offshore waters, but are usually taken commercially from offshore waters. Eggs remain on the sea floor until they develop into free-swimming larvae. Eggs are reported from areas where water temperatures are generally below 63ºF (17^{o} C). Larvae of the sea scallops are sessile typically found attached to bottom habitats consisting of gravelly sand, shell fragments and pebbles; and on various other sessile marine organisms such as red algae, hydroids, amphipods tubes, and bryozoans. Juvenile Atlantic sea

scallops are found in bottom habitats consisting of cobble, shells and silt substrates in water depths between 59 and 361 feet. Adult Atlantic sea scallops are found in bottom habitats consisting of cobble, shells and coarse to gravelly sand substrates in water depths between 59 and 361 feet. There are have been no identified populations of sea scallops occurring in the project area and the project is not anticipated to affect scallop EFH.

Atlantic sea herring *(Clupea harengus)*

Essential Fish Habitat for larval, juveniles and adult Atlantic sea herring is designated in the project area. Larvae, juvenile and adults typically prefer depths of 15 to 130 meters. These are depths that are generally deeper than those found in the project area. Therefore, no impact is expected to occur to Atlantic sea herring EFH.

Bluefish *(Pomatomus saltatrix)*

Essential Fish Habitat is designated within the project area for bluefish juveniles and adults. Although juveniles and adults are found in the surface waters of mid-Atlantic estuaries from May through October, EFH for this species is mostly pelagic waters over the Continental Shelf. Bluefish adults are highly migratory and are generally found in salinities greater than 25 ppt. The proposed project will not have significant impacts to bluefish EFH.

Long finned squid (*Loligo pealei)*

Essential Fish Habitat is designated in the project area for juvenile and adult long finned squid. This species is common inshore in warm weather months. No impacts to EFH for this species are anticipated to occur.

Short finned squid *(Illex illecebrosus)*

Essential Fish Habitat is designated in the project area for juvenile and adult short finned squid. These species are common inshore in warm weather months. No impacts to EFH for this species are anticipated to occur as the impacts will occur intertidally.

Atlantic butterfish *(Peprilus triacanthus)*

Essential Fish Habitat is designated in the project area for all life stages of Atlantic butterfish; however, all life stages of this species are generally found in deeper waters than the intertidal zone of Nantasket Beach. Therefore, no impacts to Atlantic butterfish EFH are anticipated.

Atlantic mackerel *(Scomber scombrus)*

Essential Fish Habitat is designated in the project area for all life stages of Atlantic mackerel. Since all life stages of Atlantic mackerel are generally found offshore, no impacts to Atlantic mackerel EFH are expected.

Summer flounder *(Paralicthys dentatus)*

Essential Fish Habitat is designated in the project area for adult summer flounder. Adults migrate into shallow coastal and estuarine systems during the warm summer months and then move offshore during colder months. No impacts to summer flounder EFH are anticipated from construction of the project.

Scup *(Stenotomus chrysops)*

Essential Fish Habitat is designated in the project area for juvenile and adult scup. Scup juveniles and adults have the potential to occur in estuarine systems during the spring and summer months. All life stages of scup prefer salinities greater than 15 ppt. No impacts to scup EFH are anticipated from construction of the project.

Black sea bass *(Centropristus striata)*

Essential Fish Habitat is designated for black sea bass juveniles and adults in the project area. EFH for the juveniles and adults of this species is predominantly within estuarine systems with oceanic salinities. Juveniles and adults are found in estuaries during spring and summer months in water temperatures above 6^{o}C and salinities greater than 18 ppt. Black sea bass prefer rough, shelly substrates and can be found in natural and man-made structured habitats. No impacts to black sea bass EFH is anticipated from the project.

Surf clam *(Spisula solidissima)*

Essential Fish Habitat is designated for juvenile and adult surf clams (*Spisula solidissima*) in the project area. A commercially harvestable surf clam population exists offshore, especially between the -12 to -20 foot contours and surf clams can be found at the extreme low tide mark. The surf clam population along Nantasket Beach occurs in a habitat that is highly dynamic and subject to significant impact from seasonal storms.

Although surf calm EFH is located within the project area, the building of a revetment will not destroy or damage any potential surf clam habitat. Some suspended sediments in shallow intertidal areas may be created if construction machinery needs to access the sea-side of the revetment during high tide periods. However, these effects should be short-term and localized. Therefore, this project is anticipated to have no significant impact upon surf clam EFH.

Bluefin tuna *(Thunnus thynnus)*

Essential Fish Habitat for juvenile and adult bluefin tuna are designated in the project area; however, these life stages are generally found in deeper waters than the intertidal zone of Nantasket Beach. Therefore, no impacts to tuna EFH are anticipated.

7.4 THREATENED AND ENDANGERED SPECEIS

No threatened or endangered species are expected to be impacted from this project as the project area does not provide habitat for these species. Therefore, the Corps has made the determination that this project is not likely to affect any threatened or endangered species.

7.5 HISTORIC AND ARCHAEOLOGICAL RESOURCES

An examination of the site files at the MHC indicated that no prehistoric archaeological sites are located within the proposed project area. Two sites, 19-PL-265 and 266, were located north of the project area in the Allerton section of town. Both sites have been destroyed by urban development in the area. No historic archaeological (HA) sites are located within the project area. HA-1 is located well south of the study area in the Straits Pond area and consists of a protohistoric cemetery whose exact location is unknown. This site is also referenced as the

Atlantic Hill Site or 19-PL-268. HA-2 is located to the northwest of the study location within the Telegraph Hill section and the Telegraph Hill Archaeological District.

This project was previously coordinated with the Massachusetts State Historic Preservation Officer (MA SHPO), the Massachusetts Board of Underwater Archaeological Resources (MA BUAR), and the Wampanoag Tribe of Gay Head (Aquinnah) by letter dated March 25, 1996. At that time, the preferred alternative consisted of the placement of sand fill with periodic beach nourishment along the Nantasket Beach Reservation. We found that this alternative would have no effect upon significant historic properties due to the extensive erosion and development at this location. Repairs or rehabilitation of the existing seawall as well as construction of a revetment at this location, if selected for implementation, would also have no impact upon cultural resources as any sites that may have been present were likely previously disturbed or destroyed during construction of the original wall. The MA SHPO concurred with these determinations via letter dated April 24, 1996.

Since that time, changes to the without project condition have caused the study to be reformulated. It has now been determined that construction of a stone revetment protecting Zone 2 of the DCR Nantasket Beach Reservation is economically feasible and the preferred plan. However, as stated above, due to the disturbed nature of the present seawall and extensive erosion at this location, impacts to cultural resources are not expected. Construction of a stone revetment at this location will not impact upon the National Register eligibility of the DCR Nantasket Beach Reservation as a component of the Metropolitan Park System of Greater Boston. Coordination with the MA SHPO was initiated by letter dated February 24, 2010 and we expect their concurrence with this determination.

7.6 SOCIOECONOMIC RESOURCES

No significant impacts to socioeconomic resources are anticipated.

7.6.1 Environmental Justice

Executive Order 12898, on Environmental Justice requires the environmental analysis of proposed Federal actions address any disproportionately high and adverse health or environmental effects on minority and low-income communities. Federal agencies' responsibilities under this order also apply equally to Native American programs. Additionally, each Federal agency must ensure that public documents, notices, and hearings are readily accessible to the public.

This action would not have disproportionately high and adverse effects on any low-, or minority income communities as there are no in the project area. Therefore, this project complies with EO 12898.

7.6.2 Protection of Children from Environmental Health Risks and Safety Risks

Executive Order 13045, Protection of Children from Environmental Health Risks and Safety Risks requires each Federal agency to identify and assess environmental health risks and safety risks that may disproportionately affect children; and ensure that its policies, programs, activities, and standards address disproportionate risks to children that result from environmental health risks or safety risks. Environmental health risks and safety risks includes risks to health or to safety that are attributable to products or substances that the child is likely

to come in contact with or ingest (such as the air we breathe, the food we eat, the water we drink or use for recreation, the soil we live on, and the products we use or are exposed to). Revetment construction includes the strict use of clean material that is free of contaminants that could potentially prove to be a health risk to the general population and to children. Therefore, this project complies with EO 1305.

7.7 AIR QUALITY AND NOISE

7.7.1 AIR QUALITY

The proposed project is subject to Clean Air Act requirements. An air quality conformity analysis (Appendix C) was completed to demonstrate compliance. The conformity analysis details projected emissions that would result from the construction of the proposed project. These data are then compared to Federal and State air quality standards to determine impacts to air quality. It was determined that the direct and indirect ozone emissions from this project were considerably less than the conformity threshold value for ozone creation (which is 100 tons of mono-nitrogen oxides (NOx) per year).

The project would have no long-term impacts on air quality. During construction equipment operating on the site would emit pollutants including nitrogen oxides that can lead to the formation of ozone. In order to minimize air quality effects during construction, construction activities would comply with applicable provisions of the Massachusetts Air Quality Control Regulations pertaining to dust, odors, construction, noise, and motor vehicle emissions. This project therefore conforms to the Federal requirements for activities under the Clean Air Act within the Massachusetts State Implementation Plan.

7.7.2 Noise

Construction activities would occur along the coast and high intertidal zone along Nantasket Beach. The beach is located about 10' below the existing seawall. Stone will be placed by equipment operating from upland (above the beach) and by equipment on the beach. Construction would be intermittent and noise levels would vary depending on the equipment in use, the number of trucks transporting stone, and time of day. Nighttime noise levels would be unaffected since operation of construction equipment would be confined to daylight hours. Neighbors would hear construction equipment, particularly the hauling of material by trucks, but this noise would be similar in nature to noise generated by local construction projects. Overall, impacts would be temporary and not expected to be significant.

7.8 COASTAL PROCESSES AND FLOODPLAINS

The Coastal Processes report for this project (WHG & LBG, 2010) concludes that the proposed alternative is effective for shoreline protection in the project area. The Coastal Engineering Analysis (Appendix B of the Main Report) concludes that the project as proposed, is designed with an amply deep, buried toe, and, due to its stone construction, the revetment will, with proper maintenance, be effective over its design life regardless of any anticipated sea level rise or climate variation.

Executive Order 11988, Floodplain Management (1977) emphasizes the environmental aspects of flood plain management and requires Federal agencies to recognize the significant values of flood plains and to consider the public benefits that would be realized from restoring and

preserving flood plains. The conceptual framework of flood plain management is incorporated in agency procedures. EO 11988 identifies restoration and preservation of the natural and beneficial values of the base flood plain, wetlands, marshes, and related natural habitat as one of its objectives and for agencies to implement measures that will enhance fish and wildlife values.

The proposed project area occurs along a coastal barrier island. There will not be loss of floodplain area associated with the proposed project; therefore, the project complies with the substantial requirements outlined in EO 11988.

8.0 CUMULATIVE EFFECTS

Cumulative impact is defined by NEPA as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time." Past and current activities in the Nantasket Beach project area include recreational use of the beach for swimming, walking, fishing, and other coastal recreational activities. Reasonably foreseeable future actions include the continuation of current recreational uses.

Past activities within the project area include the construction of storm damage reduction structures in Zones 1 and 3 of the project area (Figure 2). These activities coupled with the proposed project are not anticipated to change to public access to the project area and therefore should not interfere with future use of the project area. Past construction actions in the project area have not significantly altered environmental resources in the project's ecosystem and , as discussed in this EA, the proposed project is anticipated to have only minimal impacts on the resources.

To the extent that other actions are expected to be related to the project as proposed, these actions will provide little measurable cumulative impact.

9.0 COORDINATION

On March 25, 1996, a public notice for Federal, State and local agencies and the public was distributed soliciting comments on the proposed project (see Appendix B). A public hearing was requested by the Town of Hull and was held at the Hull High School on June 27, 1996 (see also Appendix F, Feasibility Report).

In response to the public notice, we received 7 letters and comments from Federal, State, and local agencies. The primary concern was scope of the EA and an evaluation of alternatives, primarily the evaluation of nonstructural solutions. The draft report was revised and a second public notice was issued in March 2003.

Upon change in project scope, a revised public notice detailing the change in project description and noticing the availability of a revised Feasibility Report and Environmental Assessment was issued on May 13, 2014. Four (4) sets of comments were received in response to the public notice. The comments and response to comments can be found in Appendix I of the 2014 Feasibility Report.

New England District staff met with our sponsor, Massachusetts Department of Conservation and Recreation (MA DCR), and the Massachusetts Department of Coastal Zone Management (MA CZM) on 21 July 2014 at the MA DCR's office in Boston to discuss the Nantasket Beach project. MA CZM had requested the meeting to discuss their coastal zone management consistency concerns prior to submitting their official response. The concerns focused on (1) the design of the recommended revetment, (2) the loss available dry beach and the impacts to recreation and (3) why a beach nourishment project was not considered. We explained the rationale behind the design and the fact that we had minimized the size to the extent possible while providing the necessary level of protection. We explained that the loss of dry beach was unavoidable. We discussed the funding limits of the Section 103 program and the fact that a beach nourishment project of the size and scale appropriate for Nantasket was not possible with a $5 million Federal limit. We explained that the focus of the recommended plan was to protect the wall and acknowledged that the project would not prevent flooding damages from wave or surge overtopping the wall. We stressed that the construction of the revetment would not preclude the future construction of the beach and said we would work with them toward that goal either through our Regulatory program or as part of a possible future project. Following the meeting, MA CZM submitted their comments. New England District staff also met with MA DCR and Town of Hull officials on 27 August 2014 in Hull to discuss the project. The Town's concerns were similar to those of MA CZM concerning the loss of dry beach and the desire for the construction of a beach to provide shore protection benefits. The Corps explained the rationale for the revetment project and the fact that loss of dry beach could not be avoided if a project was constructed to protect the existing wall. The Corps agreed that a beach nourishment project would benefit the Nantasket Beach area and expressed a willingness to work with all parties on any future initiatives.

The proposed project has been coordinated with the following Federal, State, and Local agencies:

Federal Agencies

- U.S. Environmental Protection Agency, Region 1,
- U.S. Fish and Wildlife Service, New England Field Office.
- National Marine Fisheries Service, Habitat Conservation Division & Protected Resources Division

State and Local Governments

- Massachusetts Office of Coastal Zone Management.
- Massachusetts Department of Environmental Protection
- Massachusetts Department of Conservation and Recreation
- Massachusetts Natural Heritage Program
- Massachusetts Department of Marine Fisheries
- Massachusetts Historical Commission.
- Town of Hull, Board of Selectmen.
- Town of Hull, Conservation Commission

10.0 COMPLIANCE WITH FEDERAL ENVIRONMENTAL STATUTES, EXECUTIVE ORDERS AND EXECUTIVE MEMORANDUM

10.1 Federal Statutes

1. Archaeological Resources Protection Act of 1979, as amended, 16 USC 470 et seq.

Compliance: Not applicable; Issuance of a permit from the Federal land manager to excavate or remove archaeological resources located on public or Indian lands signifies compliance.

2. Preservation of Historic and Archeological Data Act of 1974, as amended, 16 U.S.C. 469 et seq.

Compliance: Not applicable; the project does not require mitigation of historic or archaeological resources.

3. American Indian Religious Freedom Act of 1978, 42 U.S.C. 1996.

Compliance: Not applicable. The site does not include areas considered by Native Americans to be sacred sites, prevent possession of sacred objects, or prevent the freedom to worship through ceremonials and traditional rites.

4. National Historic Preservation Act of 1966, as amended, 16 U.S.C. 470 et seq.

Compliance: The project has been coordinated with the State Historic Preservation Office as to determine whether historic or archaeological resources listed or eligible for listing on the National Register of Historic Places would be affected by the proposed project.

5. Native American Graves Protection and Repatriation Act (NAGPRA), 25 U.S.C. 3000-3013, 18 U.S.C. 1170

Compliance: Regulations implementing NAGPRA will be followed if discovery of human remains and/or funerary items occur during implementation of this project.

6. Clean Air Act, as amended, 42 U.S.C. 7401 et seq.

Compliance: Public notice of the availability of this report to the Environmental Protection Agency is required for compliance pursuant to Sections 176c and 309 of the Clean Air Act. Sections 6.7, 7.7, and Appendix C of the EA address impacts to air quality during and following construction.

7. Clean Water Act of 1977 (Federal Water Pollution Control Act Amendments of 1972) 33 U.S.C. 1251 et seq.

Compliance: A Clean Water Act Section 404 (b) (1) Evaluation and Compliance Review has been incorporated into the Environmental Assessment. An application will be filed for State Water Quality Certification pursuant to Section 401 of the Clean Water Act.

8. Coastal Zone Management Act of 1972, as amended, 16 U.S.C. 1451 et seq.

Compliance: NAE has reviewed the Massachusetts Office of Coastal Zone Management program policies for Coastal Hazards, Energy, Growth Management, Habitat, Ocean Resources, Ports and Harbors, Protected Areas, Public Access, and Water Quality and made the preliminary determination that the proposed project is fully consistent with each policy. A Coastal Zone Management consistency determination shall be provided to the Commonwealth for review and concurrence that the proposed project is consistent with the maximum extent practical with the approved state CZM program during the design phase.

9. Endangered Species Act of 1973, as amended, 16 U.S.C. 1531 et seq.

Compliance: The project is being coordinated with the U.S. Fish and Wildlife Service and National Marine Fisheries Service. The Corps has made the preliminary determination that the proposed project is not likely to affect any threatened or endangered species or affect critical habitat.

10. Estuarine Areas Act, 16 U.S.C. 1221 et seq.

Compliance: Not Applicable; coastal storm damage reduction projects are authorized by the Rivers and Harbors Act, and are not submitted to Congress.

11. Federal Water Project Recreation Act, as amended, 16 U.S.C. 4601-12 et seq.

Compliance: Public notice of availability to the project report to the National Park Service (NPS) and Office of Statewide Planning relative to the Federal and State comprehensive outdoor recreation plans signifies compliance with this Act.

12. Fish and Wildlife Coordination Act, as amended, 16 U.S.C. 661 et seq.

Compliance: This project is being coordinated with the U.S. Fish and Wildlife Service, the National Marine Fisheries Service, the Massachusetts Division of Marine Fisheries, and the Massachusetts Office of Coastal Zone Management. This coordination signifies compliance with the Fish and Wildlife Coordination Act. The District Engineer has given full consideration to fish and wildlife conservation in evaluating this project.

13. Land and Water Conservation Fund Act of 1965, as amended, 16 U.S.C. 4601-4 et seq.

Compliance: Public notice of the availability of this report to the National Park Service (NPS) and the Office of Statewide Planning relative to the Federal and State comprehensive outdoor recreation plans signifies compliance with this Act.

14. Marine Protection, Research, and Sanctuaries Act of 1971, as amended, 33 U.S.C. 1401 et seq.

Compliance: Not Applicable.

15. National Environmental Policy Act of 1969, as amended, 42 U.S.C 4321 et seq.

Compliance: Preparation of the Environmental Assessment signifies partial compliance with NEPA. Full compliance shall be noted at the time the Finding of No Significant Impact is issued.

16. Rivers and Harbors Act of 1899, as amended, 33 U.S.C. 401 et seq.

Compliance: No requirements for projects or programs authorized by Congress. The proposed coastal damage reduction has been Congressionally approved by the Continuing Authority program of the Rivers and Harbors Act.

17. Watershed Protection and Flood Prevention Act as amended, 16 U.S.C 1001 et seq.

Compliance: Floodplain impacts have been considered in project planning and are discussed in the Environmental Assessment.

18. Wild and Scenic Rivers Act, as amended, 16 U.S.C 1271 et seq.

Compliance: Not Applicable. The project is not located in a listed water-body or proposed for inclusion as a Wild and Scenic River by the Department of the Interior.

19. Magnuson-Stevens Act, as amended, 16 U.S.C. 1801 et seq.

Compliance: Coordination with the National Marine Fisheries Service and inclusion of a discussion of impacts to Essential Fish Habitat in the Environmental Assessment signifies compliance.

10.2 EXECUTIVE ORDERS

1. Executive Order 11593, Protection and Enhancement of the Cultural Environment, 13 May 1971.

Compliance: Coordination with the State Historic Preservation Officer signifies compliance.

2. Executive Order 11988, Floodplain Management, 24 May 1977 amended by Executive Order 12148, 20 July 1979.

Compliance: Public notice of the availability of this report or public review fulfills the requirements of Executive Order 11988, Section 2(a)(2).

3. Executive Order 11990, Protection of Wetlands, 24 May 1977.

Compliance: Public notice of the availability if this report for public review fulfills the requirements of Executive Order 11990, Section 2 (b).

4. Executive Order 12114, Environmental Effects Abroad of Major Federal Actions, 4 January 1979.

Compliance: Not applicable to projects located in the United States geographical boundaries.

5. Executive Order 12898, Environmental Justice, 11 February 1994.

Compliance: The project will not have a disproportionate impact on minority or low-income population, or any other population in the United States. Therefore, the proposed project is compliant with this Order.

6. Executive Order 13007, Accommodation of Sacred Sites, 24 May 1996

Compliance: Not applicable. The project is not on Federal lands. The New England District has no obligation for accommodating access to and ceremonial use of Indian sacred sites by Indian religious practitioners, and avoids adversely affecting the physical integrity of such sacred sites.

7. Executive Order 13045, Protection of Children from Environmental Health Risks and Safety Risks. 21 April, 1997.

Compliance: The project would not create a disproportionate environmental health or safety risk for children. Therefore, the proposed project is compliant with this Order.

8. Executive Order 13061, and Amendments – Federal Support of Community Efforts Along American Heritage Rivers

Compliance: Not applicable. The project is not connected to an American Heritage River.

9. Executive Order 13175, Consultation and Coordination with Indian Tribal Governments, 6 November 2000.

Compliance: Consultation with Indian Tribal Governments, where applicable, and consistent with executive memoranda, Department of Defense Indian policy, and USACE Tribal Policy Principles signifies compliance.

10.3 EXECUTIVE MEMORANDUM

1. Analysis of Impacts on Prime or Unique Agricultural Lands in Implementing NEPA, 11 August 1980.

Compliance: Not applicable. There are no prime agricultural lands in the project area.

2. White House Memorandum, Government-to-Government Relations with Indian Tribes, 29 April 1994.

Compliance: Consultation with federally-recognized Indian Tribes, where appropriate, signifies compliance.

11.0 REFERENCES

Bergan, Doctor William M. 1972. Old Nantasket. The Christopher Publishing Company, North Quincy, Massachusetts.

Commonwealth of Massachusetts, 2012. Cities & towns, comprehensive information: Town of Hull. Website accessed December 2012. < http://www.mass.gov/portal/cities-towns/hull.html >

Commonwealth of Massachusetts Historical Commission (MHC). 1979. MHC Survey Report - Hull. Boston, Massachusetts.

Sweetser, M.F. 1888. King's Handbook of Boston Harbor. Moses King Corporation, Boston, Massachusetts. U.S. Army Corps of Engineers (COE), New England Division. 1968. Beach Erosion Control Report on Cooperative Study of Revere and Nantasket Beaches, Massachusetts.

USACE. 2006. Nantasket Beach Characterization Study 2005. US Army Corps of Engineers, 696 Virginia Road, Concord, MA 01742. 56 pp.

Woods Hole Group and Louis Berger Group (WHG & LBG). 2010. Coastal Engineering and Shore Protection Alternatives Assessment. Prepared for Massachusetts Department of Conservation and Recreation, February 2010. 185 pp.

Environmental Assessment

APPENDIX A

Coordination

Environmental Assessment

APPENDIX B

Public Notice

Environmental Assessment

APPENDIX C

Air Quality Conformity

RECORD OF NON-APPLICABILITY (RONA)

Emissions Calculations for:

Nantasket Beach Section 103 Project
Hull, Massachusetts

GENERAL CONFORMITY - RECORD OF NON-APPLICABILITY

Project/Action Name:	**Nantasket Beach Section 103Coastal Storm Damage Reduction** *Hull, Massachusetts*
Project/Action Point of Contact:	*Joseph B. MacKay, Chief, Environmental Resources Section* *phone: 978-318-8142*

General Conformity under the Clean Air Act, Section 176 has been evaluated for the project described above according to the requirements of 40 CFR 93, Subpart B. The requirements of this rule are not applicable to this project/action because:

Total direct and indirect emission from this project/action are estimated at less than 100 tons for Ozone, and are below the conformity threshold value established at 40 CFR 93.153(b) of 100 tons/year of Ozone;

AND

The project/action is not considered regionally significant under 40 CFR 93.153(i).

Supporting documentation and emissions estimates are:

(X) ATTACHED
(X) APPEAR IN THE NEPA DOCUMENTATION (Section 7.7)
( ) OTHER

SIGNED_____
Jay MacKay, Chief, Environmental Resources Section

General Conformity Review and Emission Inventory for the Nantasket Beach Section 103 Project (Hull, Ma)

Estimates from Project Manager

15-Jan-13

1	2	3	4	5	6	7	8	9	10	11
	Project Emission Sources and Estimated Power						**NOx Emission Estimates**		**VOC Emission Estimates**	
Equipment/Engine Category	**# of Engines**	**hp**	**LF**	**hrs/day**	**Days of Operation**	**hp-hr**	**NOx EF (g/hp-hr)**	**NOx Emissions (tons)**	**VOC EF (g/hp-hr)**	**VOC Emissions (tons)**
TRK, HWY 50,000GVW 6x4 3 Axel	1	330	1.00	10	91	300,300	9.200	3.05	1.300	0.43
TRK, HWY 21,000GVW 4x2 2 Axel	1	175	1.00	10	91	159,250	9.200	1.61	1.300	0.23
LDR, BH, WH 1.25CY FE Bkt	1	86	1.00	10	91	78,260	9.200	0.79	1.300	0.11
LDR, BH, WH 0.80CY FE Bkt	1	60	1.00	10	91	54,600	9.200	0.55	1.300	0.08
Roller, VIB, DD, SP 12.0 T	1	300	1.00	10	91	273,000	9.200	2.77	1.300	0.39
TRK, HWY 21,000GVW 4x2 2 Axel	1	175	1.00	10	91	159,250	9.200	1.61	1.300	0.23
	0									
Total Emissions							**NOx Total**	**7.35**	**VOC Total**	**1.04**

Horsepower Hours

hp-hr = # of engines*hp*LF*hrs/day*days of operation

Load Factors

Load Factor (LF) represents the average percentage of rated horsepower used during a source's operational profile. For this worst case estimate, LF is held at 1 for all equipment. Typical is 0.4 to 0.6

Emission Factors

NOx Emissions Factor for Off-Road Construction Equipment is 9.20 g/hp-hr

VOC Emissions Factor for Off-Road Construction Equipment is 1.30 g/hp-hr

Emissions (g) = Power Demand (hp-hr) * Emission Factor (g/hp-hr)

Emissions (tons) = Emissions (g) * (1 ton/907200 g)

Environmental Assessment

APPENDIX D

CWA 404b(1) Evaluation

CLEAN WATER ACT SECTION 404 (b)(1) EVALUATION

NEW ENGLAND DISTRICT
US ARMY CORPS OF ENGINEERS, CONCORD, MA
CLEAN WATER ACT
SECTION 404(b)(1) EVALUATION

PROJECT: Nantasket Beach, Hull, Massachusetts Coastal Storm Damage Reduction Project

PROJECT MANAGER: Mr. David Larsen **TELEPHONE NUMBER:** (978) 318-8113

COMPLETED BY: Mr. Todd Randall **TELEPHONE NUMBER:** (978) 318-8518

PROJECT DESCRIPTION

The proposed project to provide shore protection at Nantasket Beach is a stone revetment approximately 2,200 feet long. The proposed project is proposed to be constructed directly in front of the existing sea wall once DCR has performed repairs to all cracks and wall deficiencies that are identified prior to new construction. The revetment will consist of a layer of geotextile fabric, a 6" thick filter layer of crushed stone, a 2'-6" under layer of stone, W50 = 350 lbs (2 stones thick), and a 5'-6" armor layer of stone, W50 = 3,000 lbs (2 stones thick). The revetment is being built adjacent to an existing seawall and will displace approximately 129,800 square feet of cobble-sand beach.

NEW ENGLAND DISTRICT
U.S. ARMY CORPS OF ENGINEERS, CONCORD, MA
EVALUATION OF CLEAN WATER ACT SECTION 404(b)(1) GUIDELINES

PROJECT: Nantasket Beach, Hull, Massachusetts Coastal Storm Damage Reduction Project

1. Review of Compliance (Section 230.10(a)-(d)).

a. The discharge represents the least environmentally damaging practicable alternative and if in a special aquatic site, the activity associated with the discharge must have direct access or proximity to, or be located in the aquatic ecosystem to fulfill its basic purpose;

X	
YES	NO

b. The activity does not appear to:
1) violate applicable state water quality standards or effluent standards prohibited under Section 307 of the CWA; 2) jeopardize the existence of Federally listed threatened and endangered species or their critical habitat; and 3) violate requirements of any Federally designated marine sanctuary (if no, see section 2b and check responses from resource and water quality certifying agencies);

X	
YES	NO

c. The activity will not cause or contribute to significant degradation of waters of the U.S. including adverse effects on human health, life stages of organisms dependent on the aquatic ecosystem, ecosystem diversity, productivity and stability, and recreational, aesthetic, and economic values (if no, see section 2);

X	
YES	NO

d. Appropriate and practicable steps have been taken to minimize potential adverse impacts of the discharge on the aquatic ecosystem (if no, see section 5).

X	
YES	NO

2. Technical Evaluation Factors (Subparts C-F).

	N/A	Not Significant	Significant
a. Potential Impacts on Physical and Chemical Characteristics of the Aquatic Ecosystem (Subpart C).			
1) Substrate		X	
2) Suspended particulates/turbidity		X	
3) Water		X	
4) Current patterns and water circulation		X	
5) Normal water fluctuations	X		
6) Salinity gradients		X	
b. Potential Impacts on Biological Characteristics of the Aquatic Ecosystem (Subpart D).			
1) Threatened/ endangered species	X		
2) Fish, crustaceans, mollusks and other aquatic organisms in the food web		X	
3) Other wildlife		X	
c. Potential Impacts on Special Aquatic Sites (Subpart E).			
1) Sanctuaries and refuges	X		
2) Wetlands	X		
3) Mud flats		X	
4) Vegetated shallows	X		
5) Coral reefs	X		
6) Riffle and pool complexes	X		
d. Potential Effects on Human Use Characteristics (Subpart F).			
1) Municipal and private water supplies	X		
2) Recreational and commercial fisheries		X	
3) Water-related recreation		X	

4) Aesthetics		X	
5) Parks, national and historic monuments, national seashores, wilderness areas, research sites, and similar preserves		X	

3. Evaluation and Testing (Subpart G).

a. The following information has been considered in evaluating the biological availability of possible contaminants in dredged or fill material. (Check only those appropriate.)

1) Physical characteristics.....… X
2) Hydrography in relation to known or anticipated sources of contaminants.....…. X
3) Results from previous testing of the material or similar material in the vicinity of the project.....……. ____
4) Known, significant sources of persistent pesticides from land runoff or percolation.....… ____
5) Spill records for petroleum products or designated hazardous substances (Section 311 of CWA)..... ____
6) Public records of significant introduction of contaminants from industries, municipalities, or other sources...…… ____
7) Known existence of substantial material deposits of substances which could be released in harmful quantities to the aquatic environment by man-induced discharge activities.. ____
8) Other sources (specify).....… ____

List appropriate references.

Environmental Assessment

b. An evaluation of the appropriate information in 3a above indicates that there is reason to believe the proposed dredge or fill material is not a carrier of contaminants, or that levels of contaminants are substantively similar at extraction and disposal sites and not likely to require constraints. The material meets the testing exclusion criteria.

X	
YES	NO

4. Disposal Site Delineation (Section 230.11(f)).

a. The following factors, as appropriate, have been considered in evaluating the disposal site.

1) Depth of water at disposal site..... X
2) Current velocity, direction, and variability at disposal site..... X
3) Degree of turbulence..... X
4) Water column stratification..... X
5) Discharge vessel speed and direction..... ____
6) Rate of discharge..... X
7) Dredged material characteristics (constituents, amount, and type of material, settling velocities)..... X
8) Number of discharges per unit of time..... X
9) Other factors affecting rates and patterns of mixing (specify)..... ____

List appropriate references.

Environmental Assessment

b. An evaluation of the appropriate factors in 4a above indicates that the disposal site and/or size of mixing zone are acceptable.

X	
YES	NO

5. Actions To Minimize Adverse Effects (Subpart H).

All appropriate and practicable steps have been taken, through application of recommendation of Section 230.70-230.77 to ensure minimal adverse effects of the proposed discharge.

X	
YES	NO

6. Factual Determination (Section 230.11).

A review of appropriate information as identified in items 2 - 5 above indicates that there is minimal potential for short or long term environmental effects of the proposed discharge as related to:

a. Physical substrate (review sections 2a, 3, 4, and 5 above).	X	
	YES	NO
b. Water circulation, fluctuation and salinity (review sections 2a, 3, 4, and 5).	X	
	YES	NO
c. Suspended particulates/turbidity (review sections 2a, 3, 4, and 5).	X	
	YES	NO
d. Contaminant availability (review sections 2a, 3, and 4).	X	
	YES	NO
e. Aquatic ecosystem structure, function and organisms(review sections 2b and c, 3, and 5)	X	
	YES	NO
f. Proposed disposal site (review sections 2, 4, and 5).	X	
	YES	NO
g. Cumulative effects on the aquatic ecosystem.	X	
	YES	NO

h. Secondary effects on the aquatic ecosystem.

X
YES

_____
NO

7. Findings of Compliance or Noncompliance.

a. The proposed disposal site for discharge of dredged or fill material complies with the Section 404(b)(1) guidelines.

X
YES

_____
NO

15 DEC 14
DATE

CHRISTOPHER J. BARRON
Colonel, Corps of Engineers
District Engineer