DRAFT

Hashamomuck Cove
Southold, New York
Coastal Storm Risk Management
Integrated Feasibility Study/EA

Appendix A1

Environmental Appendices

Essential Fish Habitat

Draft Essential Fish Habitat Assessment Hashamomuck Cove

Coastal Storm Risk Management Project

Southold, New York

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ABBREVIATIONS AND ACRONYMS

A	adults
°C	degrees Celsius
cm	centimeter
District	U.S. Army Corps of Engineers, New York District
DO	dissolved oxygen
E	eggs
EFH	Essential Fish Habitat
EJ	early juveniles
F	fall
ft	feet
J	juveniles
L	larvae
LJ	late juveniles
m	meters
MAB	Mid-Atlantic Bight
MLW	Mean Low Water Mark
mm	millimeters
MSFCMA	Magnuson-Stevens Fishery Conservation and Management Act of 1976
NEFMC	New England Fisheries Management Council
NGVD	National Geodetic Vertical
Datum NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NOS	National Ocean Services
ppt	parts per thousand
S	summer
SNE	southern New England
Sp	spring
TL	total length
W	winter
YOY	young-of-the-year

1.0 Introduction

In accordance with the Magnuson-Stevens Fishery Conservation and Management Act, this assessment identifies the potential impacts of the United States Army Corps of Engineers (USACE), New England District's (District), proposed Hashamomuck Cove storm damage reduction project on essential fish habitat (EFH) in the Town of Southold, Suffolk County, New York. The Magnuson-Stevens Act as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267) set forth a number of new mandates for the National Marine Fisheries Service (NMFS), regional fishery management councils, and other federal agencies to identify and protect important marine and anadromous fish habitat.

EFH is defined as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." The regulations further clarify EFH by defining "waters" to include aquatic areas that are used by fish (either currently or historically) and their associated physical, chemical, and biological properties; "substrate" to include sediment, hard bottom, and structures underlying the water; and, areas used for "spawning, breeding, feeding, and growth to maturity" to cover a species' full life cycle.

2.0 Project Description

The Hashamomuck Cove study area is in Southold, New York on the north fork of Long Island on Long Island Sound (LIS). The study area extends from Soundview Road near the Southold Town Beach west about 1.5 miles (Figure 1). The beach is narrow in width, ranging from about 20 to 100 feet. The majority of the properties within the Study Area are residential, with a restaurant and motel on the eastern end. There is a Town Beach within the Central Cove. There are a number of existing bulkheads and groins located within the Study Area. They were built mainly for the purpose of shoreline erosion management. The existing bulkheads, generally either wooden or vinyl sheeting driven into the ground, were installed by individual property owners. The bulkheads vary in height depending on the upland height and in many cases, the bulkheads are located seaward of mean high water.

The study area includes three coves separated by headlands; West Cove, Center Cove, and East Cove (Figure 2). County Route 48 parallels the beach in most of the study area. The properties, utilities, and County Route 48 are most susceptible to damage within the concave portions of these three coves.

The preferred project involves the initial placement of sand; the project profile details for each cove are provided in the following paragraphs. Beach nourishment (sand placement) represents a near natural, reversible soft solution for reducing damages on the open coast. After the initial placement of sand, renourishment is required at periodic cycles to counteract long term and storm-induced erosion, and erosion from sea level change. The Beach-fx model used to evaluate the effectiveness of beach nourishment in reducing coastal storm risk assumed a 5 year periodic check to assess the need for renourishment.

Beach renourishment placement frequency will vary by individual reach and sea level rise assumptions. Initial modeling indicated that, the range of placement frequencies varied from an average of about 10-years at the low rate of sea level rise to about 5-years at a high rate of sea level rise.

The actual implementation of a renourishment event will be dependent on future storm events and sea level rise. From a beach management perspective, only areas that demonstrate significant erosion would be renourished. Historically, the area at the concave portions of the three coves have demonstrated the greatest degree of erosion. The beach berm will be evaluated periodically, and when a sufficient amount of berm loss is observed, a renourishment event would be scheduled. It should be noted that there would also be operational considerations of a minimum quantity required to trigger placement of additional sand at the project. It doesn't make economic sense to mobilize equipment for sand placement for small quantities of sand.

Based on the above discussion, we are assuming an average renourishment rate of once every ten years for sand placement for the purposes of assessing environmental impacts of the project.

West Cove: The proposed work in the West Cove involves the placement of a 25 foot (ft) berm beach fill with a top elevation of 6 ft NAVD88. Sand will be placed on the beach and graded seaward on a slope of 1 Vertical (V) to 10 Horizontal (H). The footprint of the berm will encompass 164,000 square feet (sf) of intertidal habitat and 69,000 sf of subtidal habitat. Sand of a similar grain size to existing conditions shall be purchased from an upland sand source, trucked to the site, and spread to the Mean Low Water (MLW) line on the beach using earth moving equipment (sand will be redistributed during the tidal cycle). This construction sequence will continue until the authorized design profile is achieved. It is estimated 33,630 cubic yards (cy) of sand will be used initially. The project will need to be renourished periodically average renourishment quantity is estimated to be 27,916 cy on average to renourish the beach to the design profile over the 50-year project life (see Figure 3a).

Central Cove: The proposed work in the Central Cove involves the placement of a 25 ft berm beach fill with a 75 ft berm in the economic reaches with the highest damages. The top elevation of the berm will be 6 ft NAVD88. Sand will be placed on the beach and graded seaward on a slope of 1 V: 10 H. The footprint of the berm will encompass 149,000 sq of intertidal habitat and 249,000 sf of subtidal habitat. Sand of similar grain size to existing conditions shall be purchased from an upland sand source, trucked to the site, and spread to the MLW line on the beach using earth moving equipment (sand will be redistructued during the tidal cycle). This construction sequence will continue until the authorized design profile is achieved. It is estimated 55,850 cy of sand will be used initially. The project will need to be renourished periodically average renourishment quantity is estimated to be 17,470 cy on average on average will be needed to renourish the beach to the design profile over the 50-year project life (see Figure 3b).

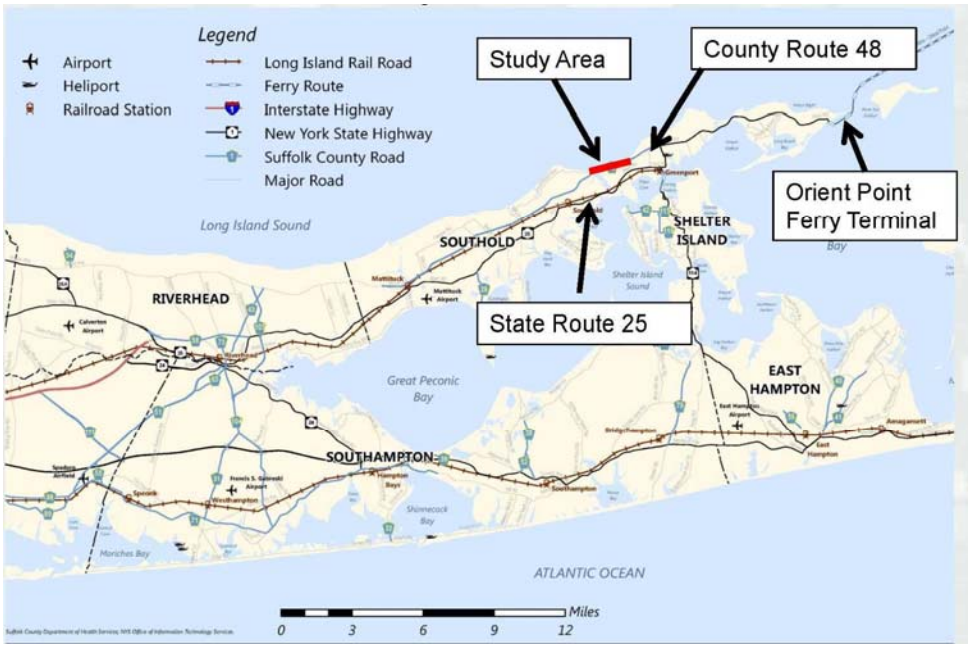

Figure 1 – Project Location Map

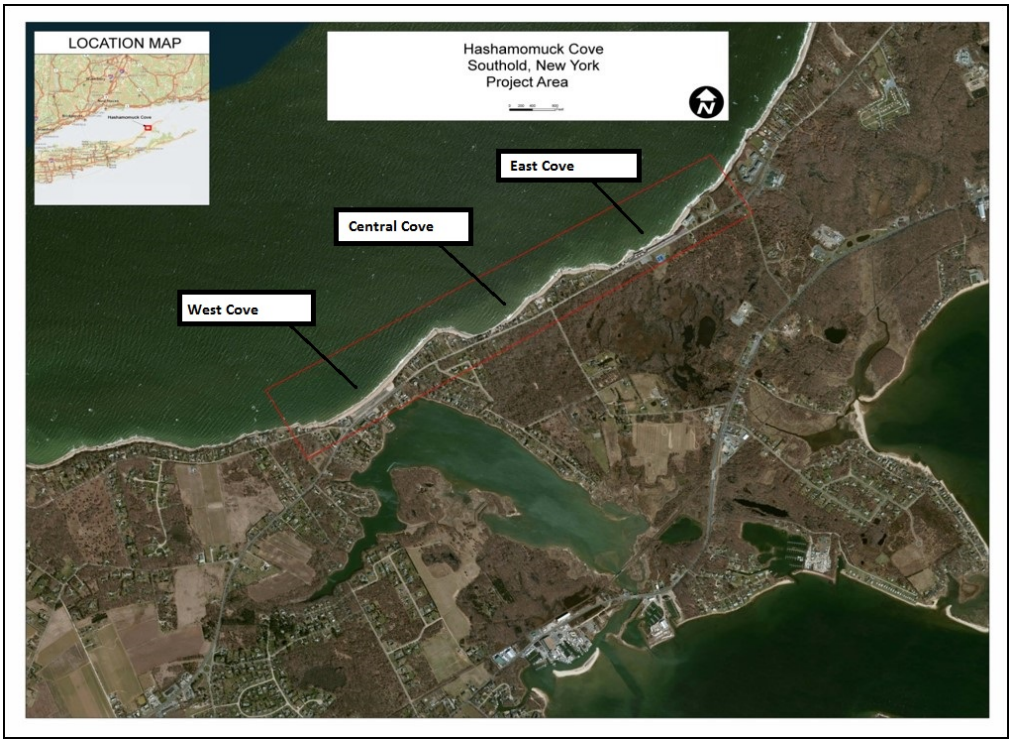

Figure 2 – Project Area

East Cove: The proposed work in the East Cove involves the placement of a 25 ft berm beach fill. The top elevation of the berm will be 6 ft NAVD88. Sand will be placed on the beach and graded seaward on a slope of 1 V: 10 H. The footprint of the berm will encompass 151,000 sq of intertidal habitat and 198,000 sf of subtidal habitat. Sand of similar grain size to existing conditions shall be purchased from an upland sand source, trucked to the site, and spread to the MLW line on the beach using earth moving equipment (sand will be redistructued during the tidal cycle). This construction sequence will continue until the authorized design profile is achieved. It is estimated 70,253 cy of sand will be used initially. The project will need to be renourished periodically (average renourishment quantity is estimated to be 19,875 cy on average to renourish the beach to the design profile over the 50-year project life (see Figure 3c).

3.0 Existing Environment

The project study area encompasses a dynamic marine environment that includes characteristic north shore of Long Island features consisting of sand/cobble beaches and intertidal zones, and gently sloping near-shore littoral and sub-littoral areas. Upland vegetation within the study area is limited to maintained landscaped areas associated with residential and commercial buildings, stabilized areas landward of bulkheads, and narrow beach.

3.1 Physical Setting

The topography of the Hashamomuck Cove project area has undergone significant change over the last 50 years or more as a result of long-shore and cross-shore sediment transport resulting from both typical and storm induced wave conditions. In some cases, the storm-induced erosion component of beach change may be short-term in nature as the coastline tends to reshape itself into its former configuration, and some of sand displaced from the beach is returned by wave action. The beach shape then conforms to the prevailing wave climate and littoral processes. However, over time, portions of the beach may experience permanent land loss.

The Long Island Sound estuary is unique in that it is open to the ocean at both ends (through Block Island Sound to the east and the lower Hudson River estuary to the west) and most of its fresh water input is located at the higher salinity eastern end (through the Connecticut and Thames River). Salinity at the western boundary of the Sound ranges from around 22 ppt in the spring to 27 ppt in the fall, increasing eastward to 30 to 31 ppt at the western end of the Sound. The project area is located approximately at the mid-point of the geographic range. Salinity in the project area and vicinity has been recorded at approximately 27.5 ppt in the spring. Thermal stratification in the Sound develops in the spring and breaks down in the fall. The surface temperatures in the open Sound range from 2 to 5°C in the winter and from 20 to 25°C in late summer.

Figure 3a – West Cove 25-foot Beach Berm

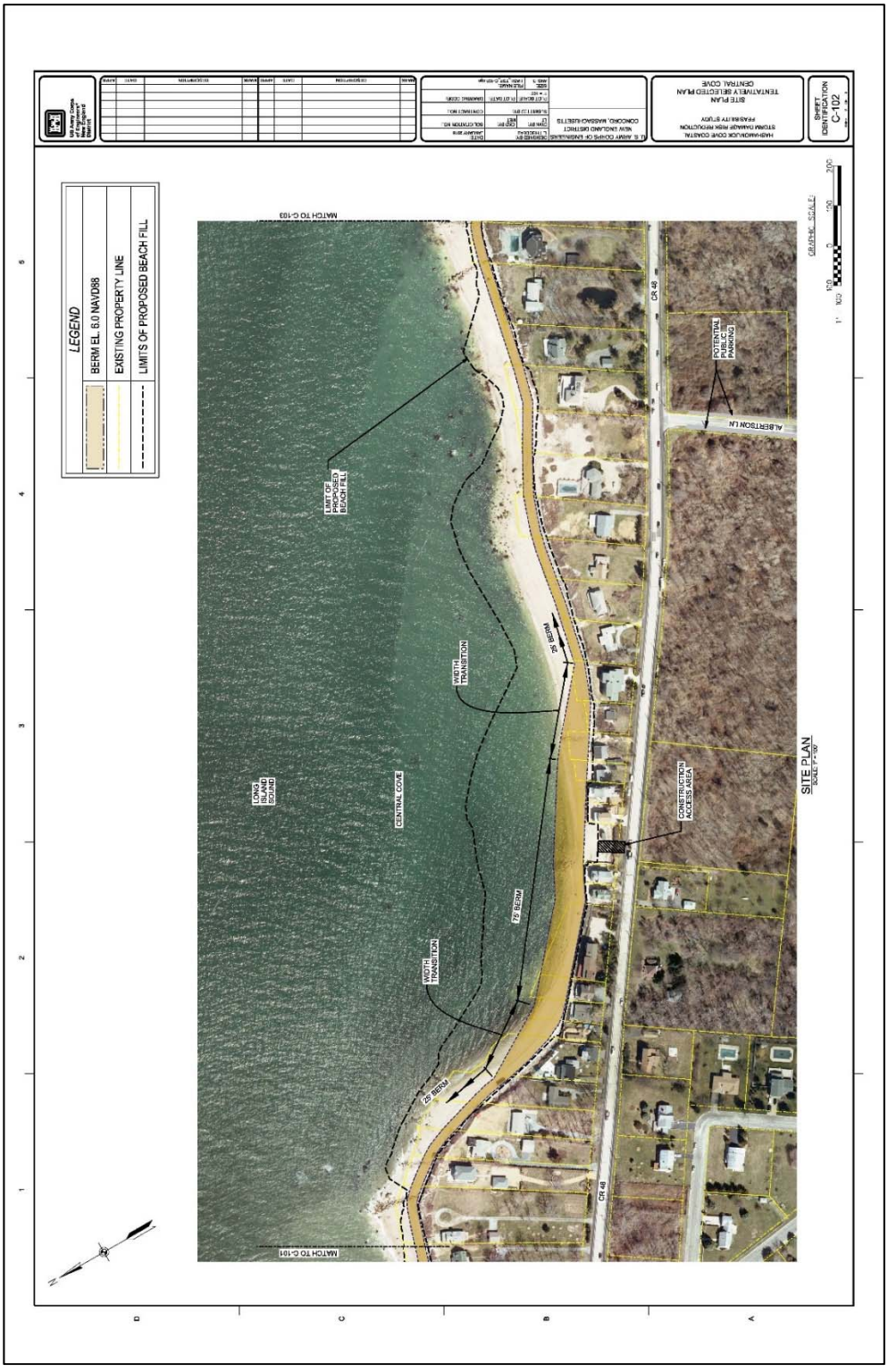

Figure 3b – Central Cove Variable Width (25-foot and 75-foot) Beach Berm

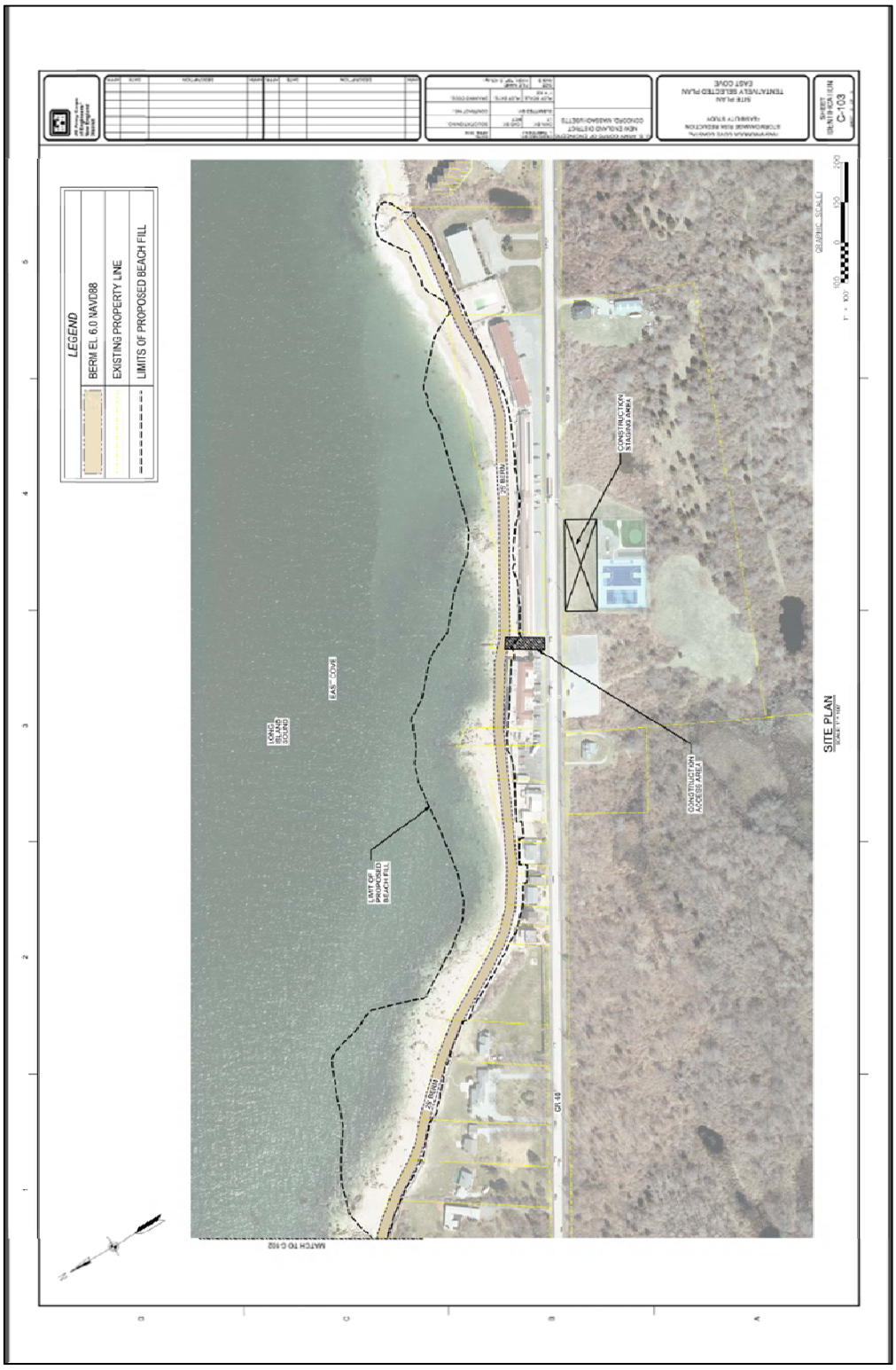

Figure 3c – East Cove

Tides along Hashamomuck Cove are semidiurnal (twice daily) with a spring tide range estimated at 4.81 feet and the mean tide range estimated at 4.21 feet. Table 1 provided below summarizes the estimated tidal datums at the Hashamomuck study area.

Table 1. Estimated Tidal Datums, Hashamomuck Cove Southold, NY

Southold, NY	
Condition	Elevation in feet, NAVD
Mean spring high water	2.16
Mean higher high water	2.12
Mean high water	1.86
NAVD88	0.00
Mean tide level	-0.25
Mean low water	-2.35
Mean lower low water	-2.61
Mean spring low water	-2.65

4.0 Essential Fish Habitat

4.1 Designated Species

Based on the NOAA Guide to EFH Designations in the Northeastern United States, designated EFH occurs in the greater Project Area as identified by a 10-minute by 10-minute areas of latitude and longitude bounded on the north, west, south, and east as follows: 41 degrees (°) 00 minutes (′) N latitude, 73° 20′ W longitude, 40° 50′ N latitude, and 73° 30′ W longitude.
http://www.greateratlantic.fisheries.noaa.gov/hcd/webintro.html

EFH designations for the project area were based on information compiled by the NOAA/National Ocean Services (NOS) Estuarine Living Marine Resources (ELMR) Program (Stone *et al.* 1994), the New England Fisheries Management Council (NEFMC 1999), and the National Marine Fisheries Service (USDOC 1999b). A total of 14 finfish, one shark, and two skate are currently designated as EFH species in the area (Table 2). Table 3 summarizes the EFH life history and habitat parameters for each species.

4.2 Benthic, Eelgrass and Sediment Survey

In September 2015, field studies were conducted by the U.S. Army Corps of Engineers, New England District to provide baseline information on biological resources (i.e., benthos and eelgrass) of the study area as well as document the existing physical properties (grain size) of the beach sediments in the study area. The study area extends about 1.5 miles west from Soundview Road near the Southold Town Beach and includes three coves: Southold Town Beach Cove, Hashamomuck Cove, and Pebble Beach Cove separated by slightly protruding headlands.

Ten transects were established within the project area to collect samples for benthic community analysis and sediment grain size. Samples were collected on September 21, 2015 at low tide. A sample for benthic community analysis and a sediment sample for grain size analysis were taken at the high-intertidal level, the mid-intertidal level, and the low-intertidal tide level along all transects with the exception of Transect 5. No high-intertidal or mid-intertidal samples were collected on Transect 5 as the area was a bulkhead with large armor stone. Organisms identified during sampling were identified to the lowest taxon possible and enumerated.

Twenty-eight cores for benthic community analysis were processed at the New England District's Environmental Laboratory. A total of fifteen different taxa were observed in the 28 samples.

Table 2. EFH-Designated Fish and Shark Species and Life History Stages

Square Description (i.e. habitat, landmarks, coastline markers): Atlantic Ocean waters within the square within Long Island Sound affecting the following: northeast Long Island from east of Duck Pond Pt. to just east of Rocky Pt. on the north, north of Greenport, NY., and Southold, NY., including water affecting Horton Lane Beach, Goldsmith Inlet, Horton Pt., Horton Neck, Shelter I. Sound, northern Little Peconic Bay, and Noyack Bay. Also, these waters are within Gardiners Bay, and affect the following: northern Cutchogue Harbor, Hog Neck Bay, Great Hog Neck, Cedar Beach Pt., NY, Paradise Pt., NY, Southold Bay. In addition, these waters affect the western half of Shelter I. from Hay Beach Pt. to east of West Neck Harbor, around West Neck, Jennings Neck, NY., Shelter I. Heights, NY., Dering Harbor, Dering Harbor, NY., and Shelter I., NY., and Jessup Heck from the north half of Nassau Pt. to just east of Cleaves Pt., south of Greenport, NY.

Fish Species	**Life History Stage**			
	E	**L**	**J**	**A**
Atlantic Herring (*Clupea harengus)*			X	X
Atlantic Mackerel (*Scomber scombrus*)	X	X	X	X
Atlantic Salmon (Salmo salar)			X	X
Black Sea Bass (*Centropristis striata*)			X	
Bluefish (*Pomatomus saltatrix*)			X	X
Cobia (*Rachycentron canadum)*	X	X	X	X
King Mackerel (*Scomberomorus cavalla*)	X	X	X	X
Pollock (*Pollachius virens)*			X	X
Red Hake (*Urophycis chuss*)	X	X	X	X
Scup (*Stenotomus chrysops)*	X	X	X	X
Spanish mackerel (*Scomberomorus maculatus*)	X	X	X	X
Summer Flounder (*Paralichthys dentatus)*			X	
Windowpane (*Scopthalmus aquosus)*	X	X	X	X
Winter flounder (*Pseudopleuronectes americanus)*	X	X	X	X
Shark Species				
Sand tiger shark (*Odontaspis taurus)*		X		
Skate Species			**J**	**A**
Little (*Leucoraja erinacea)*			X	X
Winter (*Leucoraja ocellata)*			X	X

E – Eggs **L**- Larvae **J**- Juveniles **A**- Adults

Descriptions of the benthic communities in the High, Mid and Low-Intertidal stations are as follows:

High-intertidal Stations - The benthic communities in the high-intertidal area were generally azoic or consisted of typical opportunistic annelid species. Six of the nine stations sampled did not have species present. In the 3 stations where species were present, they were represented by a single polychaetes species, *Capitella capitata*, which is a known opportunistic annelid.

Mid-intertidal Stations - The benthic communities in the mid-intertidal areas were also dominated by typical opportunistic annelid species (*Capitella capitata* and *Scalibregma inflatum*) commonly found along Long Island Sound beaches. Of note at the mid-intertidal stations are blue mussels found at station T10-M (i.e., Transect 10 - mid-intertidal). These mussels were juvenile and were attached to large gravel-sized sediments.

Low-intertidal Stations - The low-intertidal communities were also dominated by typical opportunistic annelid species (*Capitella capitata* and oligochaetes), but also contained a varied mix of other typical sandy shore species. These species included various crustacean isopods, amphipods, and decapods as well some typical intertidal gastropods species (*Crepidula plana* and *Nassarius trivitatus*). A lone blue mussel was found at station T4-L (i.e., Transect 4 - low-intertidal).

A survey of field activities was also conducted on September 21, 2015 by the U.S. Army Corps of Engineers, New England District in the project area to document the presence or absence of eelgrass (*Zostera marina*) in the subtidal nearshore environment. Three transects paralleling the Hashamomuck Beach shoreline were established for the eelgrass survey prior to the start of field activities. Transect 1 was located 50' from the shoreline, Transect 2 was located 100' from the shoreline, and Transect 3 was located 200' from the shoreline.

Transects were traversed at low speeds by a boat operator while visual observations of the bottom were made by a marine ecologist through a viewing bucket. No eelgrass was observed in the survey area. Additionally, no eelgrass blades were observed within the beach wrack along the entire Hashamomuck Cove project area. The subtidal survey area was dominated by sandy expanses interspersed with areas of cobble and large boulders extending beyond the offshore transect. Sparse patches of various macroalgal species typical of a nearshore environment were present on both bottom types.

The grain size data showed that the sediments in the high-, mid-, and low-intertidal areas were predominately a mix of cobble-gravel-sand. The benthic communities in the high-intertidal area were generally azoic or consisted of typical opportunistic annelid species, while the communities in the mid-intertidal areas were dominated by typical opportunistic annelid species. The low-intertidal communities were also dominated by typical opportunistic annelid species, but also contained a varied mix of other typical sandy shore species such as isopod and decapod crustaceans and a few gastropod species.

Full details of the sampling effort can be found in the Appendix A2 – 2015 Sediment Sampling, Benthic Community Analysis and Eel Grass Survey in the 2016 Hashamomuck Cove EA.

4.3 Individual Species Assessments

Atlantic Herring (*Clupea harengus*): Juveniles and Adults

Life History Information: Adult Atlantic sea herring migrate south into southern New England and mid-Atlantic shelf waters in the winter after spawning in the Gulf of Maine, on Georges Bank, and Nantucket Shoals. Juveniles and young of the year are abundant in LIS during the fall at depths of 30-60 m and preferred salinities of 30-32 ppt.

Occurrence in Project Area and Impacts: Juvenile and adult Atlantic herring are not expected to be within the project area in great numbers as their preferable depths are deeper than those found within the project areas and their preferred salinities area higher. Also these fish area highly mobile filter feeders and not closely associated with the benthos where potential impacts would be greatest. Constructing the proposed project is not expected to significantly impact this species.

Atlantic Mackerel (*Scomber scombrus*): All Life Stages

Life History Information: Atlantic mackerel overwinter in deep water on the continental shelf from Sable Island Bank (Canada) to Chesapeake Bay and in spring move inshore and northeast. This pattern in reversed in the fall. In spring, adults form two spawning aggregations; the southern group spawns off New Jersey and New York and in the Gulf of Maine from mid-April to June. Most spawning occurs in the shoreward half of the continental shelf. The eggs are pelagic, occurring at depths ranging from 10-325 m and at salinities greater than 34 ppt. Larvae inhabit open bays and estuaries at depths ranging from 5-10 m. Juvenile and adult Atlantic mackerel are reported to be common in the LIS during the months of April through November, with adults being more abundant in the spring into midsummer and the juveniles abundant primarily in September through October. Atlantic mackerel prefer salinities greater than 25 ppt, depths 10 – 70m and are intolerant of temperatures below 5–6°C or above 15–16°C.

Occurrence in Project Area and Impacts: Given salinities that are at the lower threshold level for Atlantic mackerel, this species is not expected to be common at the project area. This species is highly mobile and not associated with the benthos of the near-shore area where impacts are potentially greatest. Also these fish area highly mobile and would be expected to avoid the area during construction. Constructing the proposed project is not expected to significantly impact this species.

Atlantic Salmon (Salmo salar): Juveniles and Adults

This species is not expected to occur within the project area as there are no known native spawning streams/rivers in the vicinity of Hashamomuck Cove. The presence of this species (any life stage) is considered extremely rare. Constructing the proposed project is not expected to significantly impact this species.

Black Sea Bass (*Centropristis striata*): Juveniles

Life History Information: This species is usually strongly associated with structured, sheltering habitats such as reefs and wrecks. Spawning occurs on the continental shelf, beginning in the spring off Cape Hatteras and progressing into the fall in the New York Bight and off southern New England. In general, juvenile black sea bass utilize various substrates such as rough bottom shellfish, sponge and eelgrass beds, and man-made objects found in depths ranging from 1-38 m, and can withstand a wide range of salinity levels (8-33 ppt) although they prefer 18-20 ppt. Within LIS, juveniles were uncommon until September and October where they were collected at bottom temperatures of 14-19 ^{o}C, depths of 5-50m, and salinities of 23-32 ppt. Black sea bass do not tolerate cold inshore winter conditions and as such were primarily collected along outer continental shelf south of Long Island during winter.

Occurrence in Project Area and Impacts: Juveniles may occur within the project area in the nearshore. However, because the nearshore area generally lacks significant benthic structure, the preference for this type of habitat in the Hashamomuck Cove project area by black sea bass juveniles is expected to be low. Temporary impacts to black sea bass from increased turbidity could include displacement and a reduction in visibility for feeding. However, these potential impacts would be localized and short term. Constructing the proposed project is not expected to significantly impact this species.

Bluefish (*Pomatomus saltatrix*): Juveniles and Adults

Life History Information: Adults and juvenile bluefish can occur in the LIS from June until November. Their temperature preferences are 9-18 ^{o}C. Abundance is highest during mid-summer on the Connecticut side of the sound in depths less than 18m. Peak abundance occurred during September when they are found throughout the Sound. Abundance decreases rapidly after September and juveniles appear to depart before adults. Juvenile bluefish usually occur at salinities of 23 to 33 ppt, but can tolerate salinities as low as 3 ppt. Adults often occur near shore as well as offshore. Adults usually prefer warm water (at least 14 to 16°C).

Occurrence in Project Area and Impacts: Juvenile bluefish would be common in the nearshore especially around structures such as jetties or groins in the project area from July through September. Adults would be expected to occur in the project area in the nearshore area. Both juvenile and adult blue fish are highly mobile fast swimming fish and are not generally associated with the bottom. Turbidity may affect visual predation in the near shore and blue fish may be displaced. Only short- term insignificant negative impacts to adult or juvenile bluefish are expected. Constructing the proposed project is not expected significantly impact this species.

Cobia (*Rachycentron canadum*): All Life Stages.

Life History Information: This is a southern species that overwinters near the Florida Keys and migrates in the spring and summer to the Mid-Atlantic States to spawn. Adults are rarely found as far north as Massachusetts, and their presence in LIS is also considered very rare.

Occurrence in Project Area and Impacts: Long Island Sound is near the northern extent of their range, Cobia (any life stage) are not likely to occur in the project area in significant numbers, if at all. No significant impacts are expected to Cobia.

King Mackerel (*Scomberomorus cavalla*): All Stages

Life History Information: These highly migratory species migrate north from Florida as far as the Gulf of Maine in the summer and fall. King mackerel spawn in coastal waters of the Gulf of Mexico and southern Atlantic coast. Adults are usually found in waters associated with Oceanic salinities ranging from 32 to 35 ppt. King Mackerel are highly mobile fast swimming fish and are not generally associated with the bottom. If any individuals were in the vicinity of the project it is expected that they would move away from any disturbance.

Occurrence in Project Area and Impacts: Since the LIS is near the northern extent of King Mackerel's range and the salinity of the Sound is lower than preferred, no life history stages this species are likely to be common in the project area. Therefore the project is not expected to have any significant impacts to the King Mackerel.

Pollock (*Pollachius virens*): Juveniles and Adults

Pollock are not commonly caught in the surveys of LIS. In surveys conducted by the Connecticut Fisheries Division from 1984-2014 throughout LIS, only 68 adults were caught. Generally, juvenile pollock have been reported over a wide variety of substrates including sand, mud, or rocky bottom and vegetation and prefer salinities of 29-32 ppt, temperatures from 0-16 ^{o}C and depths of ranging from 5-150 m. Inshore subtidal and intertidal zones serve as an important nursery area for age 0 - 1 juveniles while juveniles aged 2+ move offshore, inhabiting depths of 130-150 m.

Adults exhibited little preference for bottom types and were found at salinities 31-34 ppt, temperatures of 0-14 ^{o}C and depths ranging from 35-36 m. Adults tend to inhabit deeper waters in spring and summer than in winter and are found further offshore than juveniles.

Occurrence in Project Area and Impacts: The possibility exists that the juvenile life stage of this species may occur within the project area but would not be expected to occur in significant numbers within the project area due to preferred higher salinities. However, because Pollack is a benthic species, juveniles might be susceptible to nearshore project impacts such as turbidity and burial of prey species during project construction.

Because of the Pollock's mobility, impacts are not expected to be common and juvenile Pollock can feed at other nearby off-shore areas. Pollack are not expected to be common in the project area and therefore, significant short term or long term adverse impacts to this species are not expected from project implementation.

Red Hake (*Urophycis chuss*): All Life Stages

Life History Information: This species spawns along the continental shelf off southern New England and eastern Long Island. Larvae dominate the summer ichthyoplankton in the Mid Atlantic Bight and are most abundant on the mid-and outer continental shelf. Eggs and larvae are pelagic with demersal settlement beginning in the juvenile stage generally occurring in the fall. Juveniles seek shelter and commonly associate with scallops, surf clam shells, and seabed depressions. Juveniles were found in LIS in the spring although they were most abundant during the summer. Their preferred substrate was mud, water depths ranged between 5- 50 m, salinities were between 24-32 ppt, and temperatures 2-22 ^{o}C.

Adults were generally found in abundance within the Sound from spring to fall in water depths greater than 25 m, salinities between 20-33 ppt, and on mud substrates. Both juveniles and adults make offshore migrations during the winter months.

Occurrence in Project Area and Impacts: Juvenile and adult Red Hake could be in the project area but would not be expected to be present in significant numbers. The depth and structure of benthic habitat in the project is not preferred by Red Hake, a demersal fish which spends most of its time on or very close to the bottom with scallops, surf clam shells, or seabed depressions. There would be temporary increases in turbidity at the project site which would be expected to displace individuals of this species at the project sites. Insignificant short term impacts may occur. Relative long term (minimal) impacts would include a loss of habitat with the conversion of part of the intertidal zone to an area above high tide. This impact is expected to be insignificant since the project area is small relative to the availability of common similar intertidal/nearshore habitat.

Sand Tiger Shark *(Odontaspis taurus): Larvae*

The sand tiger shark is found in sandy coastal waters, shallow bays, estuaries and rocky or tropical reefs. The sand tiger shark (adults) can occur from Gulf of Maine to Argentina. This species is somewhat benthic in its habits and preys on small fish, crabs and squid.

Occurrence in Project Area and Impacts: EFH is designated within the project area grid for sand tiger shark larvae. EFH for neonates/early juveniles (≤ 125-cm total length) is shallow coastal waters from Barnegat Inlet, NJ to Cape Canaveral, FL out to the 25-meterisobath, outside of the project area. Due to this species known distribution and little data suggesting that it may be present in the project area, no more than minimal impact on sand tiger shark EFH is anticipated with the proposed project.

Scup (*Stenotomus chrysops*): All Life Stages

Life History Information: Scup spawn along the inner continental shelf from Delaware Bay to Southern New England between May and August, mainly in bays and sounds in and near Southern New England. Spawning occurs in May and June during the morning over weedy or sandy areas. Scup eggs are commonly found in the water column less than 30 m deep in larger coastal bays and sounds in and near Southern New England during spring and summer. Larval scup are pelagic and occur in coastal waters during the warmer months and have been collected in the more saline parts of LIS and eastern Long Island bays from May through September at water temperatures of 14-22^{o} C. Young of the year juveniles are commonly found from the intertidal zone to depths of about 30 m in portions of bays and estuaries where salinities are above 15 ppt. In general, juvenile scup appear to use a variety of coastal intertidal and subtidal sedimentary habitats during their seasonal inshore residency, including sand, mud, mussel beds, and eel grass beds. A review of LIS 1984-2014 fishery data indicate that juvenile scup were more abundant in the fall. Their preferred bottom temperatures range 7-18 ^{o} C in spring 15-22 in fall salinities of 25-31 ppt.

Occurrence in Project Area and Impacts: Scup juveniles or adults may occupy the project area spring through fall. Scup are a benthic feeding species but juvenile and adult life stages are highly mobile. Impacts other than temporary displacement are not expected. No significant impact to scup are expected due to the construction of this project.

Spanish Mackerel *(Scomberomorus maculatas):* All Life Stages

Spanish mackerel spawn as far north as Sandy Hook and off of Long Island in late August to late September. All life stages of this species usually inhabit fully saline waters (32+), although juvenile Spanish mackerel have been collected in lower salinities.

A review of LIS 1984-2014 fishery data reveals that Spanish mackerel eggs, larvae, juveniles, or adults have not been captured in the vicinity of the project area. Because the salinity of the Sound is lower than preferred, no life history stages this species are likely to be common in the project area. Therefore the project is not expected to have any significant impacts to the Spanish Mackerel.

Summer Flounder (*Paralichthys dentatus*): Juveniles

Life History Information: Summer flounder spawn offshore in fall and winter migrating inshore entering coastal and estuarine nursery areas to complete transformation. Juveniles are distributed inshore and occupy many estuaries during spring, summer, and fall. Some juveniles remain inshore for an entire year before migrating offshore, whereas others move offshore in the fall and return the following spring. Juvenile summer flounder utilize several different estuarine habitats such as marsh creeks, seagrass beds, mud flats, and open bay areas. Some studies indicate that juveniles prefer mixed or sandy substrates, whereas others show that mud and vegetated habitats are used.

Adult summer flounder inhabit shallow, inshore, coastal and estuarine waters during warmer months and migrate offshore in the fall. Adults are reported to prefer sandy habitats, but can be found in a variety of benthic habitats.

Occurrence in Project Area and Impacts: According to the EFH quadrant only juveniles are expected to occur within the project area. Construction activities would result in a temporary increase in turbidity near the fill zone. It is likely that some displacement away from construction activities would occur. Construction activities that result in a temporary increase in turbidity may have an adverse impact on the summer flounder because of this species' dependence on sight for foraging. However, high turbidity is expected to be very localized and short lived due to the nature of the fill sand. Summer flounder juveniles are highly mobile and under disturbance conditions juveniles are expected to temporarily relocate. Small juveniles will be found in the nearshore shallow and may be susceptible to burial or other high suspended sediment impacts.

Relative long term impacts would include a loss of existing intertidal foraging habitat with the conversion of part of the intertidal zone to an area above high tide. This impact is expected to be minor since new intertidal area will develop rapidly and the area affected is small in comparison to similar available intertidal/nearshore habitat. No significant impact to summer flounder are expected due to the construction of this project.

Windowpane (*Scophthalmus aquosus*): All Stages

Life History Information: This is a mid and inner-shelf species found primarily between Georges Bank and Cape Hatteras on fine sandy sediment. Spawning begins in February and March in inner shelf waters, and peaks in spring and autumn within the LIS. Spawning occurs in inner shelf waters, including many coastal bays and sounds, and on Georges Bank. In the Mid Atlantic Blight, eggs and larvae are planktonic, found in waters less than 70m deep from February- July and again in September- November.

Juveniles and adults are similarly distributed. They are found in most bays and estuaries south of Cape Cod throughout the year at a wide range of depths (1 to 110 m), bottom temperatures (3–12°C in the spring and 9–12°C in the fall), and salinities 15-33ppt. Juveniles that settle in shallow inshore waters move to deeper offshore waters as they grow. Adults occur primarily on sand substrates off Southern New England and Mid Atlantic Bight.

Bottom trawl surveys during the period 1992-1997 in Long Island Sound found that juvenile and adult windowpane were most abundant in spring (April-June). In spring, they were caught at bottom temperatures of 3-18 ^{o}C and at salinities 21-31 ppt and depths less than 60 m. The distribution pattern in autumn (September-November) was similar to the pattern in the spring, but abundance was reduced. In autumn, windowpane adults were caught at bottom temperatures of 8-23 ^{o}C, salinities of 18-32 ppt and depths less than 50m.

Occurrence in Project Area and Impacts: All life history stages may occur within the immediate project area. If spawning does occur around the project area there is a low potential for adverse impacts to early life history stages because both larvae and eggs tend to occur closer to the surface than to the bottom. Construction activities that result in a temporary increase in turbidity may have an adverse impact on the windowpane because of this species' dependence on sight for foraging. This adverse effect is expected to be short term and localized. It is expected that juvenile and adults will avoid highly turbid conditions. Relative long term (minimal) impacts would include a loss of habitat with the conversion of part of the intertidal zone to an area above high tide. This impact is expected to be insignificant since the project area is small relative to the availability of common similar intertidal/nearshore habitat and new intertidal habitat will develop. No significant impact to windowpane are expected due to the construction of this project.

Winter Flounder (*Pseudopleuronectes americanus*): All Stages

Life History Information: Winter flounder spawning occurs from mid-winter through early spring, peaking south of Cape Cod in February and March at depths of less than 5 m – 45 m. Eggs are found inshore in depths of .3–4.5 m and salinities ranging from 10–30 ppt. Eggs are adhesive and demersal and are deposited on a variety of substrates, but sand is the most common; they have been found attached to vegetation and on mud and gravel. Larvae are negatively buoyant and non-dispersive; they sink when they stop swimming. Thus, recently settled YOY juveniles are found close to spawning grounds and in high concentrations in depositional areas with low current speeds.

YOY juveniles migrate very little in the first summer, move to deeper water in the fall, and remain in deeper cooler water for much of the year. Habitat utilization by YOY is not consistent across habitat types and is highly variable among systems and from year to year. Several field and lab studies suggest a "preference" for muddy/fine sediment substrates where they are most likely to have been deposited by currents. Adult winter flounder utilize a variety of substrates and prefer temperatures of 12-15 ^{o}C, and salinities above 22 ppt, although they have been shown to survive at salinities as low as 15 ppt. Mature adults are found in very shallow waters during the spawning season.

Occurrence in Project Area and Impacts: All life history stages may occur within the immediate project area. If spawning does occur around the project area there is the potential for adverse impacts to eggs due to burial at the project site because they are demersal. This same situation is true for newly settled juveniles which may settle in deeper areas. Eventually early juveniles will move into shallow water. Construction activities that result in a temporary increase in turbidity may have a small adverse impact on the winter flounder's foraging ability. The winter flounder is not as dependent on visual cues during foraging as other flounders. It is expected that more mobile juveniles and adults will avoid highly turbid conditions.

Temporary EFH impacts would include a loss of habitat with the conversion of part of the intertidal zone to an area above high tide. This impact is expected to be insignificant since the project area is small relative to the availability of common similar intertidal/nearshore habitat and new intertidal habitat will develop rapidly. No significant impact to winter flounder is expected during or after construction of this project.

Little Skate (*Leucoraja erinacea*): Juveniles and Adults

Life History Information: This species ranges from Nova Scotia, Canada to Cape Hatteras. It is most abundant in the northern section of the Mid-Atlantic Bight (MAB) and on the northeastern part of Georges Bank. Little skate exhibit seasonal movements. Adult and juvenile little skate move inshore during spring and autumn, and offshore in mid to late summer, and midwinter. They also move north and south with seasonal temperature changes along the southern fringe of their range. They may leave some estuaries for deeper water during warmer months. Little skates are common on sandy or gravelly substrates, but may occur on mud as well. They tend to bury themselves in depressions during the day and become active at night. Data is unavailable about the specific spawning habits of little skate along the New Jersey and New York shoreline, but it is known that they spawn biannually; typically in October and May.

Trawl surveys conducted from 1984-1994 in LIS found both adults and juveniles in spring and fall on transitional and sand bottoms at depths less than 9 m. Their preferred summer and fall depths were less than 27 m.

Occurrence in Project Area and Impacts: Both juveniles and adult skates may occur within the project area during those periods in which they are expected to move inshore. As both life stages of this species are motile, during construction they can avoid the area during periods of disturbance. Therefore, no significant impact to little skate is expected due to the construction of this project.

Winter Skate (*Leucoraja ocellata*): Juveniles and Adults

Life History Information: Winter skates are found over a wide range extending from southern New England and the Mid-Atlantic Bight (MAB) to North Carolina. They exhibit seasonal movements by moving offshore in the summer and nearshore in the autumn. Egg deposition of winter skate occurs during the summer and fall off Nova Scotia and the Gulf of Maine. It continues into the winter (December and January) off southern New England. The preferred substrate of this species is sand and gravel bottoms although they have been documented in areas with mud bottoms. Winter skates are most active at nights and remain buried in depressions during the day. General depths at which they are found range from the shoreline to 111m. Adults are

typically found in most abundance on sand bottoms of LIS during the spring. Trawl surveys conducted from 1984-1994 report juveniles most abundant during the spring on sand bottom in LIS. Abundance increased again in for both juveniles and adults in October and November in depths ranging from 0-9 m and then in depths greater than 18 m in April-May.

Occurrence in Project Area and Impacts: Both juveniles and adult skates may occur within the project area during those periods in which they are expected to move inshore. As both life stages of this species are motile, they can avoid the area during periods of disturbance due to construction by moving to adjacent non- disturbed areas. Relative long term (minimal) impacts would include a loss of habitat consisting of conversion of part of the intertidal zone to an area above high tide. No significant impact to winter skate is expected during or after construction of this project.

4.3 Prey Species

The abundance and/or distribution of prey species for fish, for which EFH has been designated, may be impacted from placement activities. Many of these fish feed on organisms that live in or on the sediment and have the potential to be buried by the direct placement and/or movement of placed sand on the beach. However, following project completion, the substrate type at the beach will be similar to what is currently on the beach, thus promoting rapid recolonization by organisms from adjacent areas. Therefore, any impacts to fish species using these areas for forage, would be expected to be temporary.

5.0 Impact Assessments

Placement of sand along the Hashamomuck Cove shoreline is not expected to have any significant or long-term lasting effects on the "spawning, breeding, feeding, or growth to maturity" of the designated EFH species that occupy the nearshore area. However, proposed activities would have immediate, short-term, direct and indirect impacts on EFH for some of the designated fish species and life history stages that occur in the immediate project area and vicinity. This section identifies direct and indirect effects that could result from beach nourishment as well as potential species-specific impacts and recommendations for minimizing these impacts.

5.1 Direct Impacts

Sand (of similar grain size to the existing beach) shall be purchased from an upland sand source, trucked to the site, and spread on the beach using earth moving equipment to the mean low water line. The material to be placed is of similar physical characteristics and grain size to the existing and therefore, will not result in changes to the existing habitat type. The sand will be redistributed during the tidal cycle until the authorized design profile is achieved. Direct placement of sand into the water does not generally occur. Thus, mortalities of small flounder and other juveniles will be minimize as the

accumulation of material distributed by the tidal cycle will be gradual allowing time for less mobile individuals to leave the area. Highly mobile juveniles and adults of other designated species can easily avoid any direct impacts caused by placement activity.

Placement of large amounts of sand will temporarily increase turbidity in the intertidal and nearshore zones on the order of 100's of meters. This increase in turbidity is not expected to cause significant impacts do to its localized nature and the mobility of species of concern and the fact that near shore environments are often very turbid because of storms or wind events. Species that utilize these areas are adapted to these conditions and have the ability to survive such events. Impacts to dissolved oxygen are also not expected to be of concern because of the naturally low organic content of the placement sand and the shallow nature of the LIS nearshore which is well oxygenated from wind mixing and wave action.

Beach restoration at the Hashamomuck Cove shoreline would result in the placement of large quantities of sand on the beach causing portions of intertidal and subtidal zones and their associated benthic communities to be initially buried. Re-colonization is expected to be rapid but duration of recovery will be dependent on the time of placement. Diversity and abundance is expected to be similar to preconstruction conditions since the new substrate will be of similar grain size to the existing conditions.

5.2 Indirect Impacts

Beach nourishment will have a temporary indirect effect on EFH by burying infauna and epi-fauna prey organisms underneath new sand in the intertidal and the nearshore subtidal zone. Mortality and/or burial of benthic prey organisms is not expected to have a significant impact on the feeding success of EFH species since they will re-locate to nearby undisturbed areas.

Benthic communities in the construction site will recover, probably within a year's time, depending on the season of completion. If beach nourishment occurs prior to the spring recruitment of benthic organisms to intertidal and adjacent sub-tidal habitats, recovery would be quicker. Species composition is expected to be similar to existing conditions since the sand to be used will be of similar grain size to existing conditions. A temporal reduction in abundance of the benthic community is not likely to significantly affect the quality of EFH in the LIS nearshore zone since common bottom-feeding species like winter flounder, summer flounder, windowpane, and scup are opportunistic predators and will switch from less abundant to more abundant species. Pelagic-feeding species will not be affected.

In addition, due to the increased slope of the new beach front, the intertidal zone will become significantly narrower. This is not likely to affect bottom-feeding EFH species since they feed on a wide variety of intertidal and sub-tidal prey species and the amount of area changed by the project is only a fraction of the available forage habitat. Eventually, this slope will level out under the influence of tidal action, waves and

storms. Similarly, offshore displacement of the subtidal zone will not affect EFH since fish that utilize the sub-tidal habitat for feeding or spawning will move seaward following beach nourishment.

Impacts related to renourishment cycles, estimated to be approximately every 10 years, will be similar to those resulting from the initial fill but will occur to lesser degree in terms of both changes in diversity and scale. It is anticipated that sand will be trucked in so there will be no dredging impacts. For all proposed Hashamomuck Cove beach protection projects each renourishment cycle consists of a significantly smaller volume of fill than the initial fill, thus a smaller zone of the intertidal and littoral benthos will be affected.

5.3 Cumulative Impacts

Cumulative impacts are those resulting from the incremental impact of the proposed action when added to other past, present, and reasonably foreseeable future actions. Past actions include the construction of bulkheads, rock revetments and groins within the project area by private landowners primarily for the purpose of shoreline erosion management. Bulkheads are located along approximately 40% of beach front properties and small rock revetments are located along approximately 15% of the beach front properties. There are also numerous groins observed in the project area, most in relatively poor condition. In addition, there was a project in 2011 which involved the placement and grading of 6,400 cy of sand on the Southold Public Beach (Hashamomuck West Cove) following a damaging storm in December 2010.

There are no concurrent Federal or State projects being constructed in the project area or projects slated to occur in the near future. Reasonably foreseeable future actions include the continuation of maintenance if needed and public use activities. The effects of these previous and existing actions are generally limited to infrequent disturbances of the benthic communities in the sand from mean high water and below. Water quality, air quality, hydrology, and other biological resources are generally not significantly affected by these actions. The direct effects of this project are not anticipated to add to impacts from other actions in the area. Therefore, no significant cumulative impacts to EFH or EFH species are expected as a result of implementing the proposed action.

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Appendix A: Essential Fish Habitat Worksheet

Action: Hashamomuck Cove Storm Protection Project

1. INITIAL CONSIDERATIONS			
EFH Designations	Y	N	Species
Is it located in or adjacent to EFH	X		Study area experiences transient EFH designated species along with forage species of EFH designated species.
Is EFH designated for eggs?	X		Red hake, winter flounder, windowpane, Atlantic mackerel, scup, king mackerel, Spanish mackerel and cobia
Is EFH designated for larvae?	X		Red hake, winter flounder, windowpane, Atlantic mackerel, scup, king mackerel, Spanish mackerel, cobia and sand tiger shark
Is EFH designated for juveniles?	X		Atlantic salmon, pollock, red hake, winter flounder, windowpane, Atlantic sea herring, bluefish, Atlantic mackerel, summer flounder, scup, black sea bass, king mackerel, Spanish mackerel, cobia, winter skate and little skate
Is EFH designated for adults?	X		Atlantic salmon, pollock, red hake, winter flounder, windowpane, Atlantic sea herring, bluefish, Atlantic mackerel, scup, king mackerel, Spanish mackerel, cobia, winter skate and little skate
Is there HAPC at or near project site?		X	
Does action have the potential to adversely affect EFH of species or life stages checked above to any degree?		X	

2. SITE CHARACTERISTICS	
Site Characteristics	Description
Is the site intertidal/sub-tidal/water column?	Site is intertidal;
What are the sediment characteristics?	The sediment characteristics are primarily sand, cobble and gravel.
Is there HAPC at the site, if so what type, size, characteristics?	No HAPC at the site.
What is typical salinity and temperature regime?	Salinity is approximately 27-28 ppt in the project site. Temperature ranges from 2 to 5°C in the winter and from 20 to 25°C in late summer
What is the normal frequency of site disturbance?	Irregular - shoreline erosion through storm events and tidal action.
What is the area of impact (work footprint & far afield)?	1.5 mi. of shoreline

3. ASSESSMENT OF IMPACTS			
Impacts	Y	N	Description
Nature and duration of activity (s)			Beach nourishment. Action 5 months
Will benthic community be disturbed?	X		Benthic community immediately along the shoreline will be buried during fill activities. Recolonization of species will occur following construction completion. Similar grain size will be used so recolonization is expected to be similar in structure to the existing benthic community.
Will SAV be impacted?		X	No SAV in project area.
Will sediments be altered and/or sediment rates changed?	X		Similar sized material will be used to nourishe the beach. Coastal geomorphological process will not be altered.
Will turbidity increase?	X		Localized increased turbidity during construction.
Will water depth change?	X		Intertidal zone will initially be pushed seaward into the subtidal zone (i.e., subtidal will become shallower). However, the beach will continue to change overtime due to dynamic processes and renourishment activities.
Will contaminants be released into sediments or water column?		X	Most of the material is inorganic. Contaminants have not been found in the area.
Will tidal flow, currents or wave patterns be altered?		X	MHW tide will be extended seaward. Wave patterns may change.

Will ambient salinity or temperature regime change?		X	
Will water quality be altered?		X	
Will functions of EFH be impacted for:			If yes, list species, Life State and Habitat to be Impacted
Spawning		X	
Nursery		X	
Forage		X	
Shelter		X	
Will impacts be temporary or permanent?			Adverse impacts from placing fill will be temporary, lasting for period of construction and benthic recolonization.
Will compensatory mitigation be used?		X	

4. DETERMINATION OF IMPACT		
		EFH Determination
Overall degree of adverse effects on EFH (not including compensatory mitigation) will be: (check the appropriate statement)		No more than minimal adverse effect on EFH- there is no need for further assessment. This worksheet is sufficient for consultation.
	X	Adverse effect on EFH is not substantial-use contents of this form to develop written assessment
		Adverse effect on EFH substantial-a written assessment and methods to avoid or minimize impacts must be provided expanding upon the impacts revealed in this form. Typically, this degree of impact will require an expanded consultation

DRAFT

Hashamomuck Cove
Southold, New York
Coastal Storm Risk Management
Integrated Feasibility Study/EA

Appendix A2

Environmental Appendices

Benthic Report

Sediment Sampling, Benthic Community Analysis, and
Submerged Aquatic Vegetation Survey
In Support of Feasibility Investigation Final

Hashamomuck Cove
Southold, NY

US Army Corps
of Engineers ®
New England District

December 2015

SEDIMENT SAMPLING, BENTHIC COMMUNITY ANALYSIS, AND EELGRASS SURVEY IN SUPPORT OF FEASIBILITY INVESTIGATION

HASHAMOMUCK COVE
SOUTHOLD, NEW YORK

December, 2015

Prepared by:

Engineering/Planning Division
Environmental Resources Section
U.S. Army Corps of Engineers
New England District
Concord, Massachusetts

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APPENDICES

APPENDIX A: GRAIN SIZE ANALYSIS

SUMMARY

Surveys to document the grain size and benthic communities of the Hashamomuck Cove project area were conducted on September 21, 2015. Additionally, a survey to document the presence or absence of eelgrass (*Zostera marina*) in the subtidal nearshore environments adjacent to the study area was conducted. The grain size data showed that the sediments in the high-, mid-, and low-intertidal areas were predominately a mix of cobble-gravel-sand. The benthic communities in the high-intertidal area were generally azoic or consisted of typical opportunistic annelid species, while the communities in the mid-intertidal areas were dominated by typical opportunistic annelid species. The low-intertidal communities were also dominated by typical opportunistic annelid species, but also contained a varied mix of other typical sandy shore species such as isopod and decapod crustaceans and a few gastropod species. No eelgrass was noted in the eelgrass survey.

1.0 INTRODUCTION

The Hashamomuck Cove study area is in Southold, New York on the north fork of Long Island on Long Island Sound (Figure 1). The study area extends about 1.5 miles west from Soundview Road near the Southold Town Beach. The beach is narrow in width, ranging from about 20 to 100 feet. The study area includes three coves: Southold Town Beach Cove, Hashamomuck Cove, and Pebble Beach Cove separated by slightly protruding headlands (Figure 2). The entire study area has been determined to be susceptible to erosion from coastal storms. The New England District (NAE) of the US Army Corps of Engineers (USACE) is currently conducting a feasibility study to identify coastal erosion protection alternatives that may be implemented to provide protection to the study area.

In September 2015, field studies were conducted to provide baseline information on biological resources (i.e., benthos and eelgrass) of the study area as well as document the existing physical properties (grain size) of the beach sediments in the study area. This report describes the field methods employed, site conditions encountered, and the results of grain size and benthic community analysis of sediment samples along with the interpretation of the eelgrass survey data from the area.

2.0 MATERIALS AND METHODS

Sediment and benthic sampling efforts, as well as an eelgrass survey, were conducted on September 21, 2015 by staff from the Environmental Resource Section of NAE. Work was carried out from shore and from the water using a 12-foot inflatable zodiac. Positioning was achieved using a Trimble GeoXM Differential Global Positioning System (DGPS) with an accuracy of 3 meters or less.

Benthic and Sediment Sampling

Ten transects (Figure 3) were established within the project area to collect samples for benthic community analysis and sediment grain size. General locations of the transects were selected prior to the start of field activities, however specific locations of the transects were established and recorded in the field. Samples were collected on September 21, 2015 at low tide. A sample for benthic community analysis and a sediment sample for grain size analysis were taken at the high-intertidal level, the mid-intertidal level, and the low-intertidal tide level along all transects with the exception of Transect 5. No high-intertidal or mid-intertidal samples were collected on Transect 5 as the area was a bulkhead with large armor stone. A 0.003 m^2 sized benthic core sampler was used to collect samples at each location.

Each sample for benthic community analysis was sieved with seawater thorough a 0.5 mm sieve and preserved in 10% formaldehyde with 0.1% rose Bengal stain. Samples were kept in formaldehyde solution until they were processed in the New England District's environmental laboratory. At the time of processing the samples were washed on a 0.5 mm sieve to remove the preservative and remaining fine sediment. The material

was then sorted under a low-power dissecting microscope where organisms were removed from the sediments and transferred to jars containing 70% ethanol. Organisms were identified to the lowest taxon possible and enumerated.

Grain size analysis was completed by the NAE environmental laboratory. Samples were prepared according to the guidance in ASTM D421-85 (Re-approved 2002), Dry Preparation of Soil Samples for Particle-Size Analysis and Determination of Soil Constants, and analyzed according to ASTM D422-63 (Re-approved 2002), Standard Test Method for Particle-Size Analysis of Soils using sieve nos. 4, 10, 40, 100, 200. There were no deviations from the established laboratory testing protocols.

Eelgrass survey

Three transects paralleling the shoreline of the study area were established for the eelgrass survey prior to the start of field activities. Transect 1 was located 50' from the shoreline, Transect 2 was located 100' from the shoreline, and Transect 3 was located 200' from the shoreline (Figure 3). Using a 12-foot inflatable zodiac, the transects were traversed at low speeds by a boat operator while visual observations of the bottom were made by a marine ecologist through a viewing bucket. The presence or absence of eelgrass as well as changes in bottom type were noted in a field logbook.

3.0 RESULTS AND DISCUSSION

This section summarizes results obtained from benthic community analysis of sediments, physical testing of sediments, and eelgrass survey from the vicinity of the Hashamomuck Beach feasibility study project area.

3.1 Benthic Community Analysis

Twenty-eight cores for benthic community analysis were processed at the New England District's Environmental Laboratory. Counts of invertebrate organisms by sample station are summarized in Tables 1, 2, and 3. A total of fifteen different taxa were observed in the 28 samples.

High-intertidal Stations

The benthic communities in the high-intertidal area were generally azoic or consisted of typical opportunistic annelid species. Six of the nine stations sampled did not have species present. In the 3 stations where species were present, they were represented by a single polychaetes species, *Capitella capitata*, which is a known opportunistic annelid. Data on the benthos collected at the high-intertidal stations are presented in Table 1.

Mid-intertidal Stations

The benthic communities in the mid-intertidal areas were also dominated by typical opportunistic annelid species (*Capitella capitata* and *Scalibregma inflatum*) commonly found along Long Island Sound beaches. Of note at the mid-intertidal stations are blue

mussels found at station T10-M (i.e., Transect 10 - mid-intertidal). These mussels were juvenile and were attached to large gravel-sized sediments. Data on the benthos collected at the mid-intertidal stations are presented in Table 2.

Low-intertidal Stations

The low-intertidal communities were also dominated by typical opportunistic annelid species (*Capitella capitata* and oligochaetes), but also contained a varied mix of other typical sandy shore species. These species included various crustacean isopods, amphipods, and decapods as well some typical intertidal gastropods species (*Crepidula plana* and *Nassarius trivitatus*). A lone blue mussel was found at station T4-L (i.e., Transect 4 - low-intertidal). Data on the benthos collected at the low-intertidal stations are presented in Table 3.

3.2 Grain Size Analysis

Twenty-eight sediment samples were analyzed for grain size distribution (ASTM D 422-63, reapproved 2002) in the New England District's Environmental Laboratory. The results of the grain size analysis are summarized in Table 4. Complete testing results are provided in the grain size data presented as Appendix A.

The sediments collected from all stations were generally represented by various fractions of gravel and sand. The data show that 10 stations were dominated by gravels, 5 stations were dominated by sands, 12 stations had a similar mix of sands and gravels, and 1 station was dominated by cobble. The presence of cobble at all stations may be under-represented due to the nature of the sediment sampling device used (a 0.003 m^2 core), however it is noted that cobble was not specifically avoided during sampling.

3.3 Eelgrass Survey

No eelgrass was observed in the vicinity of the survey transects. Additionally, no eelgrass blades were observed within the beach wrack along the entire Hashamomuck Cove study area. The sub-tidal survey area was dominated by sandy expanses interspersed with areas of cobble and large boulders extending beyond the offshore transect. Sparse patches of various macroalgal species typical of a nearshore environment were present on both bottom types.

Figure 1. Location Map

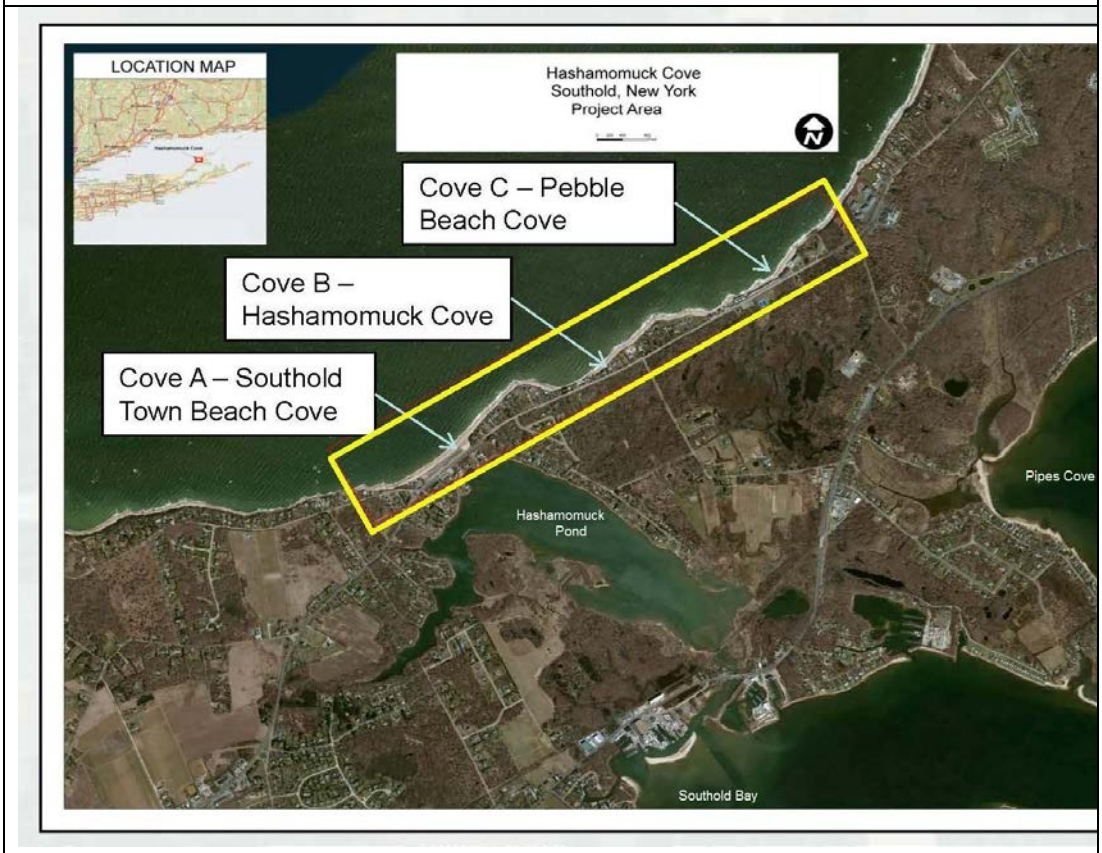


Figure 2. Study Area Map

Figure 3 Sediment Sampling Locations and Eelgrass Survey Transect Locations

72°25'0"W 72°24'30"W 72°24'0"W 72°23'30"W

41°5'30"N

LEGEND

- Beach Transect Station
- 50 ft SAV Transect
- 100 ft SAV Transect
- 200 ft SAV Transect

T1 T2 T3 T4 T5 T6 T7 T8 T9 T10

US Army Corps
of Engineers
New England District

HASHAMOMUCK COVE, SOUTHOLD, NY
SEPTEMBER 2015 SURVEY TRANSECTS

N W E S

0 100 200 300 400 Meters

0 250 500 750 1,000 Feet

1:6,000

NAIP 2014 AERIAL IMAGERY

GCS NAD 1983

72°25'0"W 72°24'30"W 72°24'0"W 72°23'30"W

Table 1. Benthic invertebrates collected from the high-intertidal locations at Hashamomuck Beach Study Area on Sept. 21, 2015. No high intertidal sample was collected at Transect 5. Numbers are per 0.003 m^2

	HIGH-INTERTIDAL									
TRANSECT NUMBER	**T1**	**T2**	**T3**	**T4**	**T5**	**T6**	**T7**	**T8**	**T9**	**T10**
ANNELIDA										
POLYCHAETA										
Capitella capitata	3	*	1	*	-	*	2	*	*	*
INDIVIDUALS / SAMPLE	3	0	1	0	-	0	2	0	0	0
SPECIES / SAMPLE	1	0	1	0	-	0	1	0	0	0

Table 2. Benthic invertebrates collected from the mid-intertidal locations at Hashamomuck Beach Study Area on Sept. 21, 2015. No mid-intertidal sample was collected at Transect 5. Numbers are per 0.003 m^2

	MID-INTERTIDAL									
TRANSECT NUMBER	**T1**	**T2**	**T3**	**T4**	**T5**	**T6**	**T7**	**T8**	**T9**	**T10**
ANNELIDA										
POLYCHAETA										
Capitella capitata	111	*	7	*	-	17	4	*	11	*
Scalibregma inflatum	*	3	1	*	-	*	6	*	13	34
OLIGOCHAETA										
Unidentified Oligochaete sp.	10	*	*	*	-	9	*	*	1	*
MOLLUSCA										
BIVALVIA										
Mytilus edulis	*	*	*	*	*	*	*	*	*	2
GASTROPODA										
Nassarius trivitatus	*	*	1	*	-	*	*	*	*	2
INDIVIDUALS / SAMPLE	121	3	9	0	-	26	10	0	25	38
SPECIES / SAMPLE	2	1	3	0	-	2	2	0	3	3

Table 3. Benthic invertebrates collected from the low-intertidal locations at Hashamomuck Beach Study Area on Sept. 21, 2015. Numbers are per 0.003 m^2

	LOW-INTERTIDAL									
TRANSECT NUMBER	**T1**	**T2**	**T3**	**T4**	**T5**	**T6**	**T7**	**T8**	**T9**	**T10**
ANNELIDA										
POLYCHAETA										
Capitella capitata	*	25	67	25	72	91	6	*	*	3
Exogone sp.	*	*	*	*	*	*	1	*	1	*
Leitoscoloplos robustus	*	5	19	*	*	*	*	*	*	*
Scalibregma inflatum	*	3	*	*	*	1	*	*	*	*
Streblospio benedicti	*	*	1	*	*	*	*	*	*	*
OLIGOCHAETA										
Unidentified Oligochaete sp.	*	1	3	*	27	15	10	1	*	17
ARTHROPODA										
CRUSTACEA										
ISOPODA										
Sphaeroma quadridentata	*	*	*	14	*	*	*	*	5	*
AMPHIPODA										
Unidentified Amphithoidae	*	*	*	2	*	*	*	*	*	*
CUMACEA										
Unidentified Cumacean	1	*	*	1	*	*	*	*	*	*
DECAPODA										
Pagurus longicarpus	1	*	*	*	*	*	*	1	*	*
Hemigrapsus sanguineus	*	*	*	4	*	*	*	*	*	*
MOLLUSCA										
BIVALVIA										
Mytilus edulis	*	*	*	1	*	*	*	*	*	*
GASTROPODA										
Mitrella lunata	*	1	*	*	*	*	*	2	*	*
Crepidula plana	*	*	*	*	*	*	*	5	1	*
Nassarius trivitatus	*	*	*	*	*	*	*	*	2	*
INDIVIDUALS / SAMPLE	**2**	**35**	**90**	**42**	**99**	**107**	**17**	**9**	**9**	**20**
SPECIES / SAMPLE	**2**	**5**	**4**	**6**	**2**	**3**	**3**	**4**	**4**	**2**

Table 4: Summary of Grain Size Results

Sample ID	%Cobble	%Gravel		%Sand			%Fines
		Coarse	Fine	Coarse	Medium	Fine	
T1-H	0.0	11.0	35.6	13.6	33.3	2.7	3.8
T2-H	0.0	64.5	0.4	0.4	22.9	11.8	0.0
T3-H	0.0	53.2	16.1	0.5	26.3	4.0	0.0
T4-H	0.0	15.1	62.8	6.4	15.3	0.4	0.0
T6-H	0.0	34.8	2.5	1.1	26.6	35.0	0.0
T7-H	0.0	52.1	10.1	0.1	22.8	14.8	0.0
T8-H	0.0	28.6	24.4	4.0	41.2	1.8	0.0
T9-H	0.0	35.2	18.0	0.5	40.3	6.0	0.0
T10-H	0.0	24.3	48.0	6.4	18.0	3.4	0.0
T1-M	0.0	6.2	38.7	24.1	29.8	1.2	0.0
T2-M	0.0	7.0	22.0	32.6	36.2	2.2	0.0
T3-M	0.0	19.7	39.4	19.7	19.8	1.4	0.0
T4-M	0.0	35.9	44.0	9.8	9.8	0.4	0.0
T6-M	0.0	9.2	17.7	8.3	49.3	15.4	0.0
T7-M	0.0	17.0	25.8	14.8	39.8	2.5	0.0
T8-M	0.0	44.8	31.3	8.0	14.5	1.5	0.0
T9-M	0.0	31.3	22.5	9.2	36.1	0.8	0.0
T10-M	0.0	39.8	45.4	10.6	4.1	0.1	0.0
T1-L	0.0	15.5	77.0	6.7	0.9	0.0	0.0
T2-L	0.0	7.1	40.9	24.7	24.5	2.7	0.0
T3-L	0.0	14.0	31.9	34.4	19.3	0.5	0.0
T4-L	78.3	15.6	3.3	1.3	1.4	0.1	0.0
T5-L	0.0	3.5	17.2	13.9	63.3	2.0	0.0
T6-L	0.0	27.3	31.6	9.5	26.5	5.1	0.0
T7-L	0.0	7.5	24.2	12.3	45.1	10.9	0.0
T8-L	0.0	28.4	31.2	13.3	22.5	4.6	0.0
T9-L	59.7	51.7	5.0	1.8	1.2	0.0	0.0
T10-L	0.0	13.0	63.1	5.7	15.3	2.9	0.0

APPENDIX A

GRAIN SIZE DATA

US Army Corps of Engineers®
New England District

NAE ENVIRONMENTAL LABORATORY
Project Name: Hashamomuck
Project Location: Southold, NY

Date Collected: 09/21/15
Date Recieved: 09/23/15
Date Analyzed: 11/30/15

Preparation Method: ASTM D421-85 (reapproved 2002)

Analysis Method: ASTM D 422-63 (reapproved 2002) - Sieve Nos. 4, 10, 40, 100, 200

Lab SOP: Particle Size Analysis of Sediments - Without Hydrometer (October 2011)

Received By: RBL **Analyzed By:** LAJ **Checked By:** RBL

Discussion: Twenty-eight samples were received by the lab upon completion of field activities. There were no deviations from the established laboratory testing protocols during preparation or analysis.

Summary of Results:

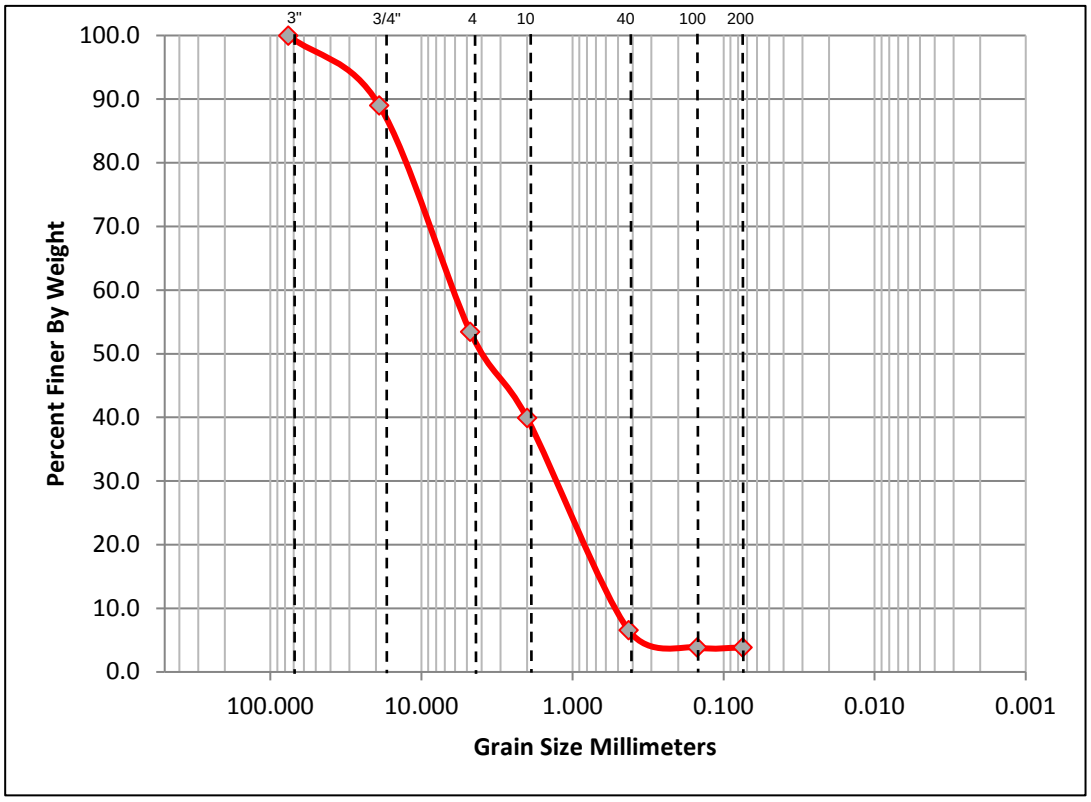
Sample ID	%Cobble	%Gravel		%Sand			%Fines
		Coarse	Fine	Coarse	Medium	Fine	
T1-H	0.0	11.0	35.6	13.6	33.3	2.7	3.8
T2-H	0.0	64.5	0.4	0.4	22.9	11.8	0.0
T3-H	0.0	53.2	16.1	0.5	26.3	4.0	0.0
T4-H	0.0	15.1	62.8	6.4	15.3	0.4	0.0
T6-H	0.0	34.8	2.5	1.1	26.6	35.0	0.0
T7-H	0.0	52.1	10.1	0.1	22.8	14.8	0.0
T8-H	0.0	28.6	24.4	4.0	41.2	1.8	0.0
T9-H	0.0	35.2	18.0	0.5	40.3	6.0	0.0
T10-H	0.0	24.3	48.0	6.4	18.0	3.4	0.0
T1-M	0.0	6.2	38.7	24.1	29.8	1.2	0.0
T2-M	0.0	7.0	22.0	32.6	36.2	2.2	0.0
T3-M	0.0	19.7	39.4	19.7	19.8	1.4	0.0
T4-M	0.0	35.9	44.0	9.8	9.8	0.4	0.0
T6-M	0.0	9.2	17.7	8.3	49.3	15.4	0.0
T7-M	0.0	17.0	25.8	14.8	39.8	2.5	0.0
T8-M	0.0	44.8	31.3	8.0	14.5	1.5	0.0
T9-M	0.0	31.3	22.5	9.2	36.1	0.8	0.0
T10-M	0.0	39.8	45.4	10.6	4.1	0.1	0.0
T1-L	0.0	15.5	77.0	6.7	0.9	0.0	0.0
T2-L	0.0	7.1	40.9	24.7	24.5	2.7	0.0
T3-L	0.0	14.0	31.9	34.4	19.3	0.5	0.0
T4-L	78.3	15.6	3.3	1.3	1.4	0.1	0.0
T5-L	0.0	3.5	17.2	13.9	63.3	2.0	0.0
T6-L	0.0	27.3	31.6	9.5	26.5	5.1	0.0
T7-L	0.0	7.5	24.2	12.3	45.1	10.9	0.0
T8-L	0.0	28.4	31.2	13.3	22.5	4.6	0.0
T9-L	59.7	51.7	5.0	1.8	1.2	0.0	0.0
T10-L	0.0	13.0	63.1	5.7	15.3	2.9	0.0

US Army Corps of Engineers®
New England District

Project Name: Hashamomuck
Project Location: Southold, NY
Sample ID: T1-H

Date: 11/30/15

Particle Size Analysis - ASTM D 422-63 (reapproved 2002)



%Cobble	%Gravel		%Sand			%Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	11.0	35.6	13.6	33.3	2.7	3.8	

D10	D15	D30	D50	D60	D85	Cc	Cu
0.5875	0.8237	1.5323	4.0491	7.3731	17.3929	0.71	12.55

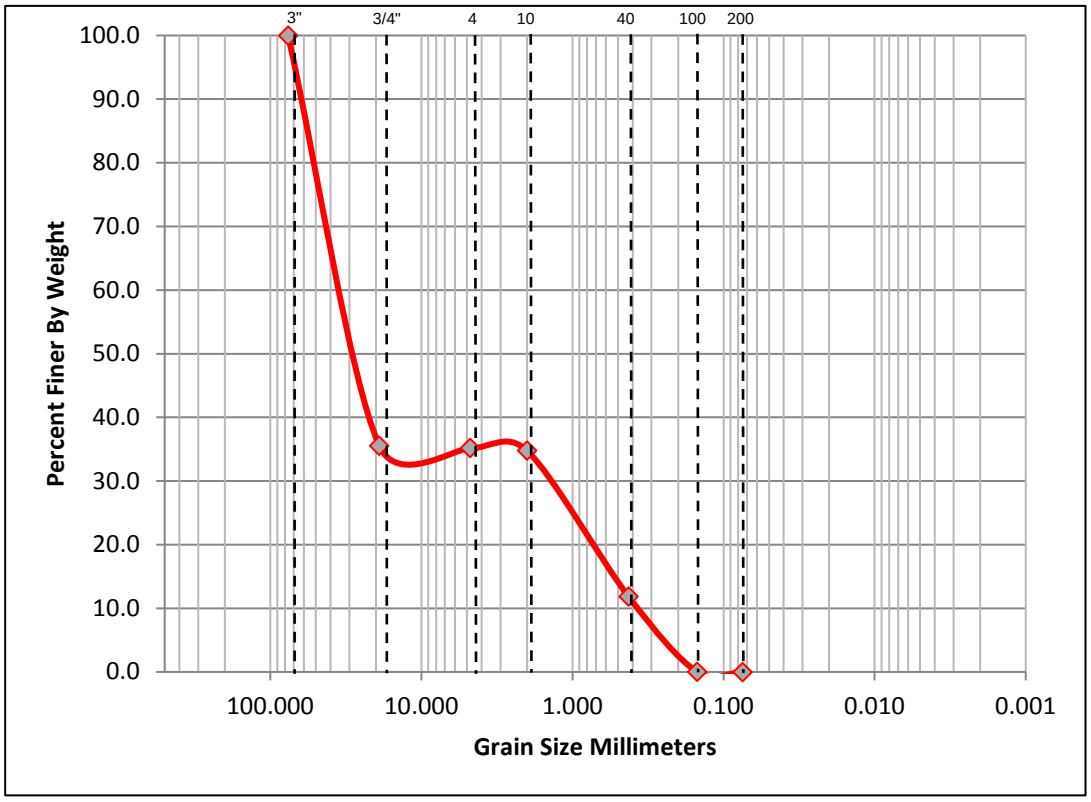
Original Sample Weight (g)			1056.4	Post Wash Weight (g)			-
Sieve	Sieve Size (mm)	Sieve Weight (g)	Shaken Weight (g)	Weight Retained (g)	Percent Retained	Cum. Percent Retained	Percent Finer
3"	76.200	0.0	0.0	0.0	0.0	0.0	100.0
3/4"	19.000	542.8	658.9	116.1	11.0	11.0	89.0
#4	4.750	493.9	869.5	375.6	35.6	46.5	53.5
#10	2.000	470.6	613.8	143.2	13.6	60.1	39.9
#40	0.425	352.9	705.1	352.2	33.3	93.4	6.6
#100	0.150	328.8	357.3	28.5	2.7	96.1	3.9
#200	0.075	316.6	316.9	0.3	0.0	96.2	3.8
Sample Notes:							

US Army Corps of Engineers®
New England District

Project Name: Hashamomuck
Project Location: Southold, NY
Sample ID: T2-H

Date: 11/30/15

Particle Size Analysis - ASTM D 422-63 (reapproved 2002)



%Cobble	%Gravel		%Sand			%Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	64.5	0.4	0.4	22.9	11.8	0.0	

D10	D15	D30	D50	D60	D85	Cc	Cu
0.3825	0.6429	1.6726	31.8255	40.7004	62.8876	0.21	106.42

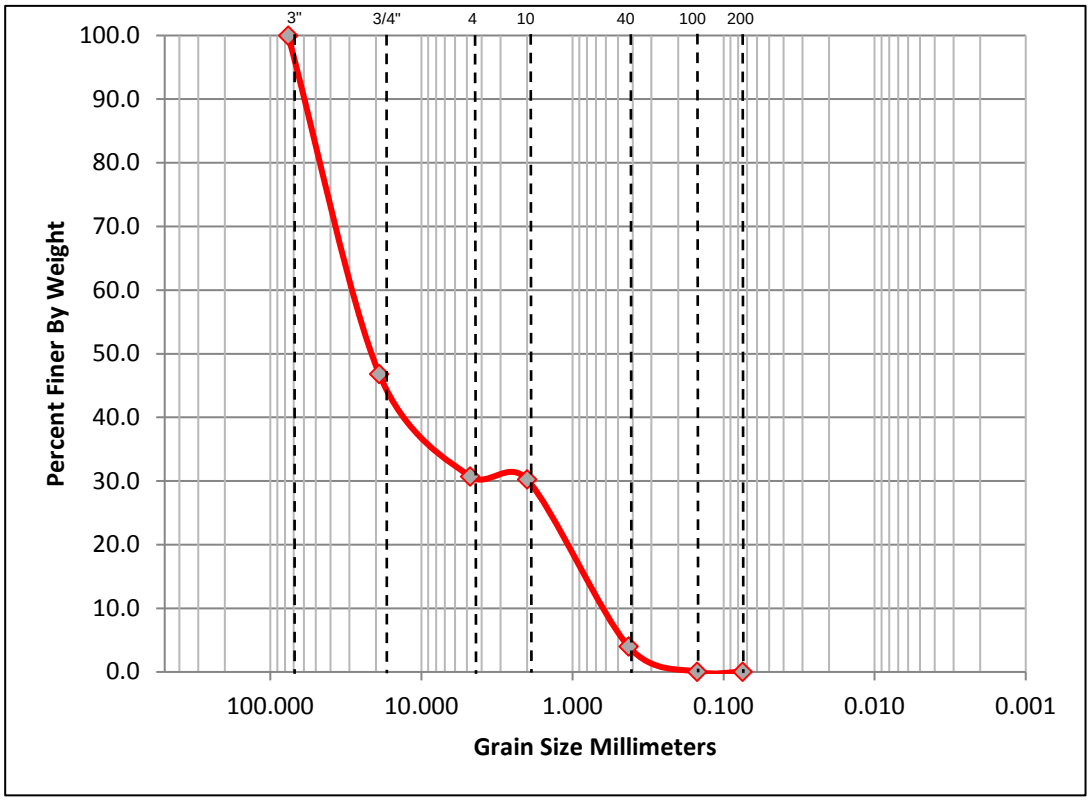
Original Sample Weight (g)			1090.9	Post Wash Weight (g)			*
Sieve	Sieve Size (mm)	Sieve Weight (g)	Shaken Weight (g)	Weight Retained (g)	Percent Retained	Cum. Percent Retained	Percent Finer
3"	76.200	0.0	0.0	0.0	0.0	0.0	100.0
3/4"	19.000	542.9	1246.0	703.1	64.5	64.5	35.5
#4	4.750	489.1	493.3	4.2	0.4	64.8	35.2
#10	2.000	463.4	467.7	4.3	0.4	65.2	34.8
#40	0.425	354.7	605.0	250.3	22.9	88.2	11.8
#100	0.150	325.4	454.1	128.7	11.8	100.0	0.0
#200	0.075	313.5	313.8	0.3	0.0	100.0	0.0
Sample Notes:							

US Army Corps of Engineers®
New England District

Project Name: Hashamomuck
Project Location: Southold, NY
Sample ID: T3-H

Date: 11/30/15

Particle Size Analysis - ASTM D 422-63 (reapproved 2002)



%Cobble	%Gravel		%Sand			%Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	53.2	16.1	0.5	26.3	4.0	0.0	

D10	D15	D30	D50	D60	D85	Cc	Cu
0.7855	1.0851	1.9839	22.4458	33.1967	60.0738	0.15	42.26

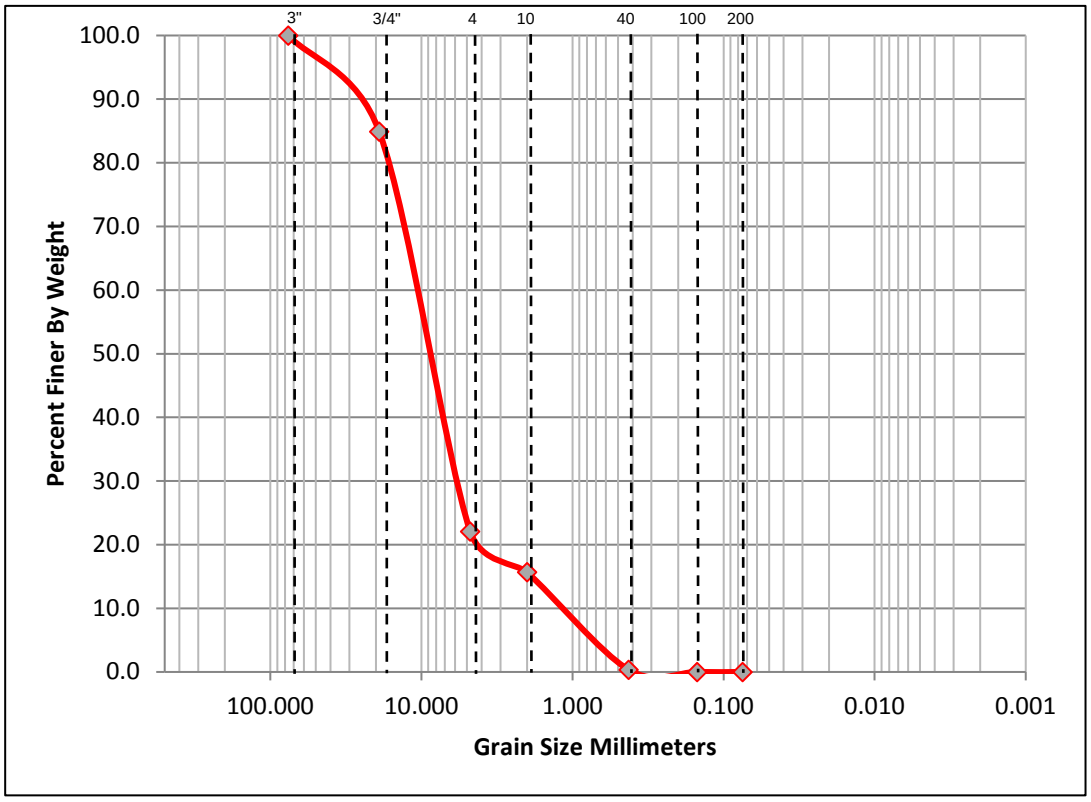
Original Sample Weight (g)			1009.3	Post Wash Weight (g)			
Sieve	Sieve Size (mm)	Sieve Weight (g)	Shaken Weight (g)	Weight Retained (g)	Percent Retained	Cum. Percent Retained	Percent Finer
3"	76.200	0.0	0.0	0.0	0.0	0.0	100.0
3/4"	19.000	542.8	1079.8	537.0	53.2	53.2	46.8
#4	4.750	489.1	651.3	162.2	16.1	69.3	30.7
#10	2.000	463.6	468.2	4.6	0.5	69.7	30.3
#40	0.425	354.6	619.9	265.3	26.3	96.0	4.0
#100	0.150	325.5	365.2	39.7	3.9	100.0	0.0
#200	0.075	313.4	313.6	0.2	0.0	100.0	0.0
Sample Notes:							

US Army Corps of Engineers®
New England District

Project Name: Hashamomuck
Project Location: Southold, NY
Sample ID: T4-H

Date: 11/30/15

Particle Size Analysis - ASTM D 422-63 (reapproved 2002)



%Cobble	%Gravel		%Sand			%Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	15.1	62.8	6.4	15.3	0.4	0.0	

D10	D15	D30	D50	D60	D85	Cc	Cu
1.4181	1.9327	6.5526	11.0888	13.3569	19.4517	0.69	9.42

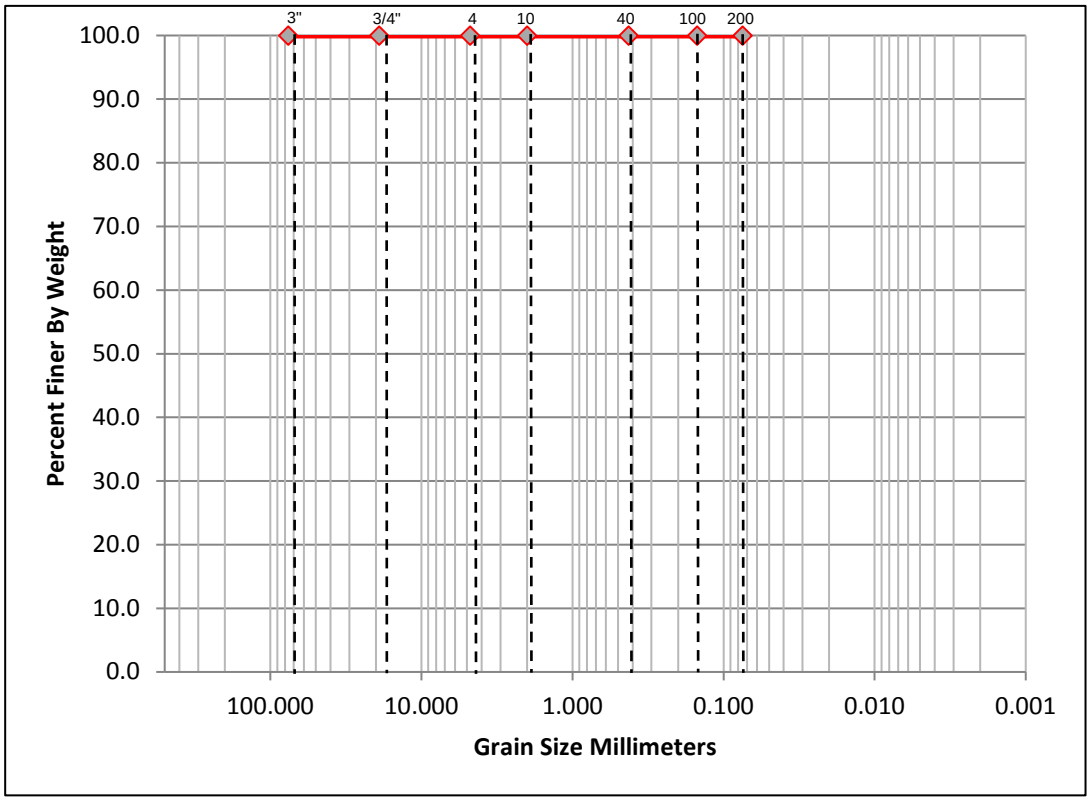
Original Sample Weight (g)			1084.7	Post Wash Weight (g)			0
Sieve	Sieve Size (mm)	Sieve Weight (g)	Shaken Weight (g)	Weight Retained (g)	Percent Retained	Cum. Percent Retained	Percent Finer
3"	76.200	0.0	0.0	0.0	0.0	0.0	100.0
3/4"	19.000	541.7	705.7	164.0	15.1	15.1	84.9
#4	4.750	493.7	1175.2	681.5	62.8	77.9	22.1
#10	2.000	470.3	539.7	69.4	6.4	84.3	15.7
#40	0.425	353.3	519.3	166.0	15.3	99.6	0.4
#100	0.150	328.7	332.5	3.8	0.4	100.0	0.0
#200	0.075	316.6	316.6	0.0	0.0	100.0	0.0
Sample Notes:							

US Army Corps of Engineers®
New England District

Project Name: Hashamomuck
Project Location: Southold, NY
Sample ID: T5-H

Date: 11/30/15

Particle Size Analysis - ASTM D 422-63 (reapproved 2002)



%Cobble	%Gravel		%Sand			%Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.0	0.0	100.0	

D10	D15	D30	D50	D60	D85	Cc	Cu
#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	-	-

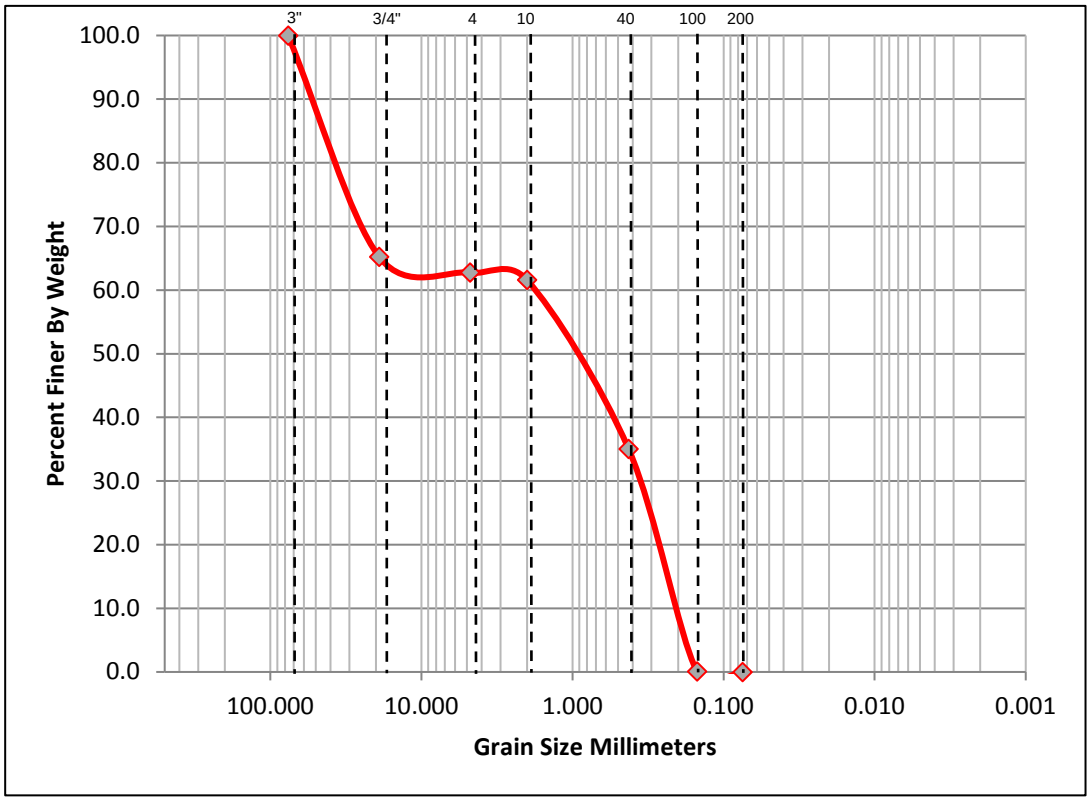
Original Sample Weight (g)				Post Wash Weight (g)			0
Sieve	Sieve Size (mm)	Sieve Weight (g)	Shaken Weight (g)	Weight Retained (g)	Percent Retained	Cum. Percent Retained	Percent Finer
3"	76.200			0.0	0.0	0.0	100.0
3/4"	19.000			0.0	0.0	0.0	100.0
#4	4.750			0.0	0.0	0.0	100.0
#10	2.000			0.0	0.0	0.0	100.0
#40	0.425			0.0	0.0	0.0	100.0
#100	0.150			0.0	0.0	0.0	100.0
#200	0.075			0.0	0.0	0.0	100.0
Sample Notes: no station T5-H bulkhead							

US Army Corps of Engineers®
New England District

Project Name: Hashamomuck
Project Location: Southold, NY
Sample ID: T6-H

Date: 11/30/15

Particle Size Analysis - ASTM D 422-63 (reapproved 2002)



%Cobble	%Gravel		%Sand			%Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	34.8	2.5	1.1	26.6	35.0	0.0	

D10	D15	D30	D50	D60	D85	Cc	Cu
0.2282	0.2675	0.3855	1.3128	1.9057	51.5474	1.77	8.35

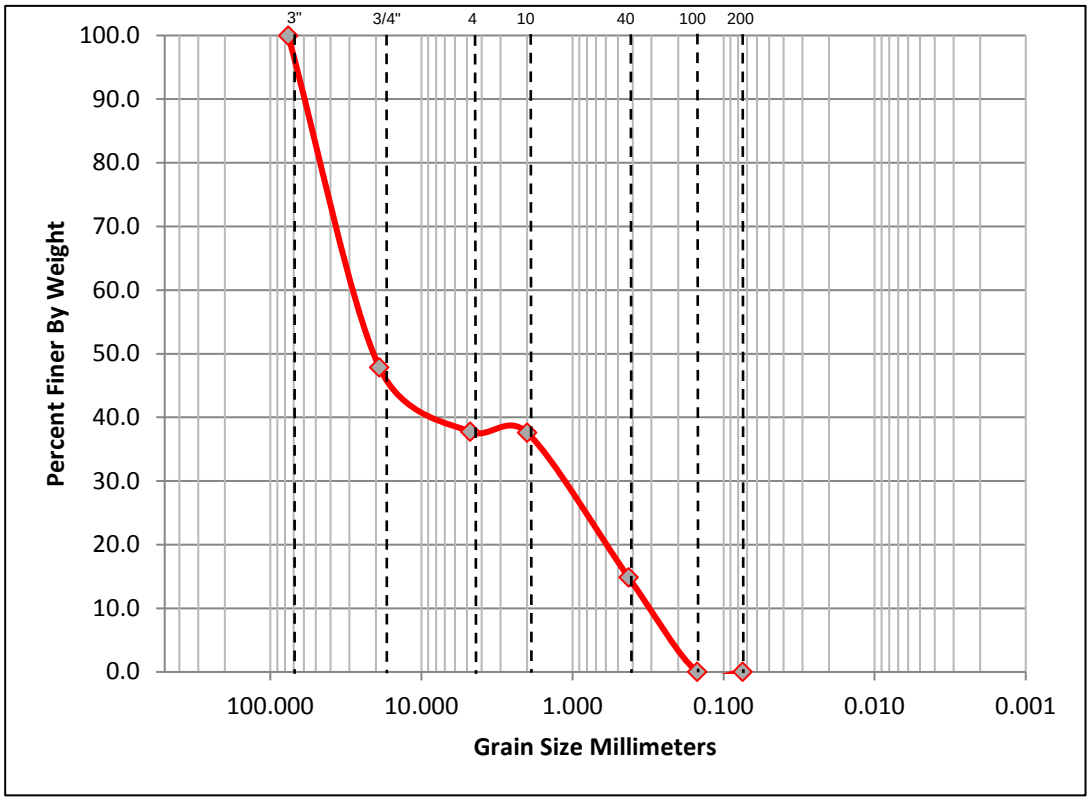
Original Sample Weight (g)			1178.9	Post Wash Weight (g)			0
Sieve	Sieve Size (mm)	Sieve Weight (g)	Shaken Weight (g)	Weight Retained (g)	Percent Retained	Cum. Percent Retained	Percent Finer
3"	76.200	0.0	0.0	0.0	0.0	0.0	100.0
3/4"	19.000	542.7	953.0	410.3	34.8	34.8	65.2
#4	4.750	493.7	522.7	29.0	2.5	37.3	62.7
#10	2.000	470.4	483.9	13.5	1.1	38.4	61.6
#40	0.425	353.3	666.5	313.2	26.6	65.0	35.0
#100	0.150	328.7	740.9	412.2	35.0	99.9	0.1
#200	0.075	316.6	317.3	0.7	0.1	100.0	0.0
Sample Notes:							

US Army Corps of Engineers®
New England District

Project Name: Hashamomuck
Project Location: Southold, NY
Sample ID: T7-H

Date: 11/30/15

Particle Size Analysis - ASTM D 422-63 (reapproved 2002)



%Cobble	%Gravel		%Sand			%Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	52.1	10.1	0.1	22.8	14.8	0.0	

D10	D15	D30	D50	D60	D85	Cc	Cu
0.3350	0.4356	1.4729	21.3313	32.3050	59.7394	0.27	96.44

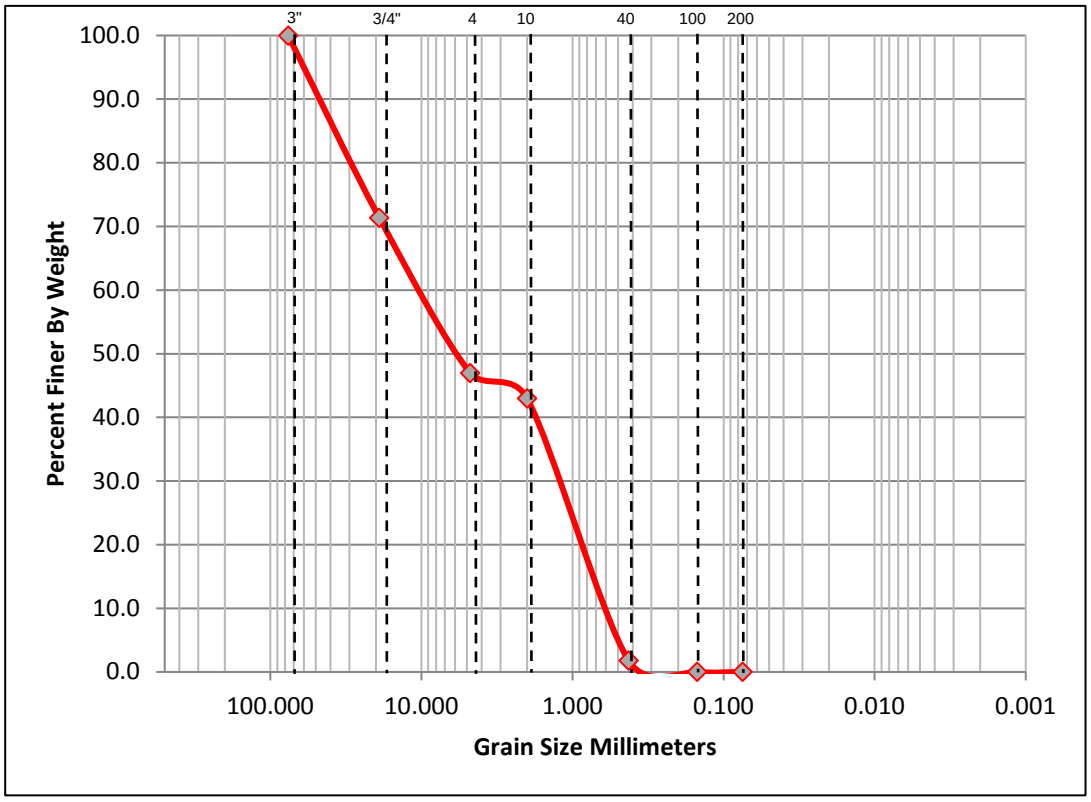
Original Sample Weight (g)			1019.1	Post Wash Weight (g)			0
Sieve	Sieve Size (mm)	Sieve Weight (g)	Shaken Weight (g)	Weight Retained (g)	Percent Retained	Cum. Percent Retained	Percent Finer
3"	76.200	0.0	0.0	0.0	0.0	0.0	100.0
3/4"	19.000	542.8	1074.0	531.2	52.1	52.1	47.9
#4	4.750	493.7	596.9	103.2	10.1	62.3	37.7
#10	2.000	470.3	471.6	1.3	0.1	62.4	37.6
#40	0.425	353.1	585.2	232.1	22.8	85.2	14.8
#100	0.150	328.7	479.6	150.9	14.8	100.0	0.0
#200	0.075	316.5	316.8	0.3	0.0	100.0	0.0
Sample Notes:							

US Army Corps of Engineers®
New England District

Project Name: Hashamomuck
Project Location: Southold, NY
Sample ID: T8-H

Date: 11/30/15

Particle Size Analysis - ASTM D 422-63 (reapproved 2002)



%Cobble	%Gravel		%Sand			%Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	28.6	24.4	4.0	41.2	1.8	0.0	

D10	D15	D30	D50	D60	D85	Cc	Cu
0.7392	0.9302	1.5033	6.5157	12.3593	46.2378	0.33	16.72

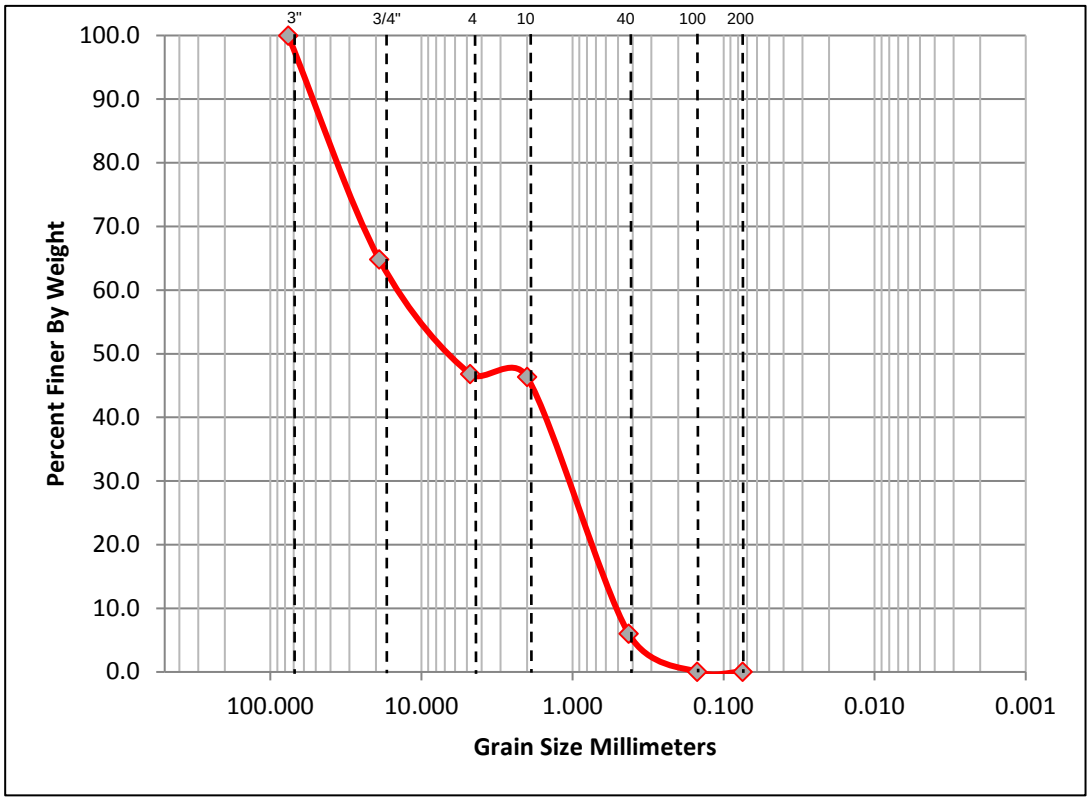
Original Sample Weight (g)			1126.9	Post Wash Weight (g)			0
Sieve	Sieve Size (mm)	Sieve Weight (g)	Shaken Weight (g)	Weight Retained (g)	Percent Retained	Cum. Percent Retained	Percent Finer
3"	76.200	0.0	0.0	0.0	0.0	0.0	100.0
3/4"	19.000	542.8	865.5	322.7	28.6	28.6	71.4
#4	4.750	493.7	768.5	274.8	24.4	53.0	47.0
#10	2.000	470.3	515.1	44.8	4.0	57.0	43.0
#40	0.425	353.1	817.7	464.6	41.2	98.2	1.8
#100	0.150	328.7	348.5	19.8	1.8	100.0	0.0
#200	0.075	316.5	316.5	0.0	0.0	100.0	0.0
Sample Notes:							

US Army Corps of Engineers®
New England District

Project Name: Hashamomuck
Project Location: Southold, NY
Sample ID: T9-H

Date: 11/30/15

Particle Size Analysis - ASTM D 422-63 (reapproved 2002)



%Cobble	%Gravel		%Sand			%Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	35.2	18.0	0.5	40.3	6.0	0.0	

D10	D15	D30	D50	D60	D85	Cc	Cu
0.5800	0.7754	1.3614	7.2667	15.1818	51.8084	0.31	26.17

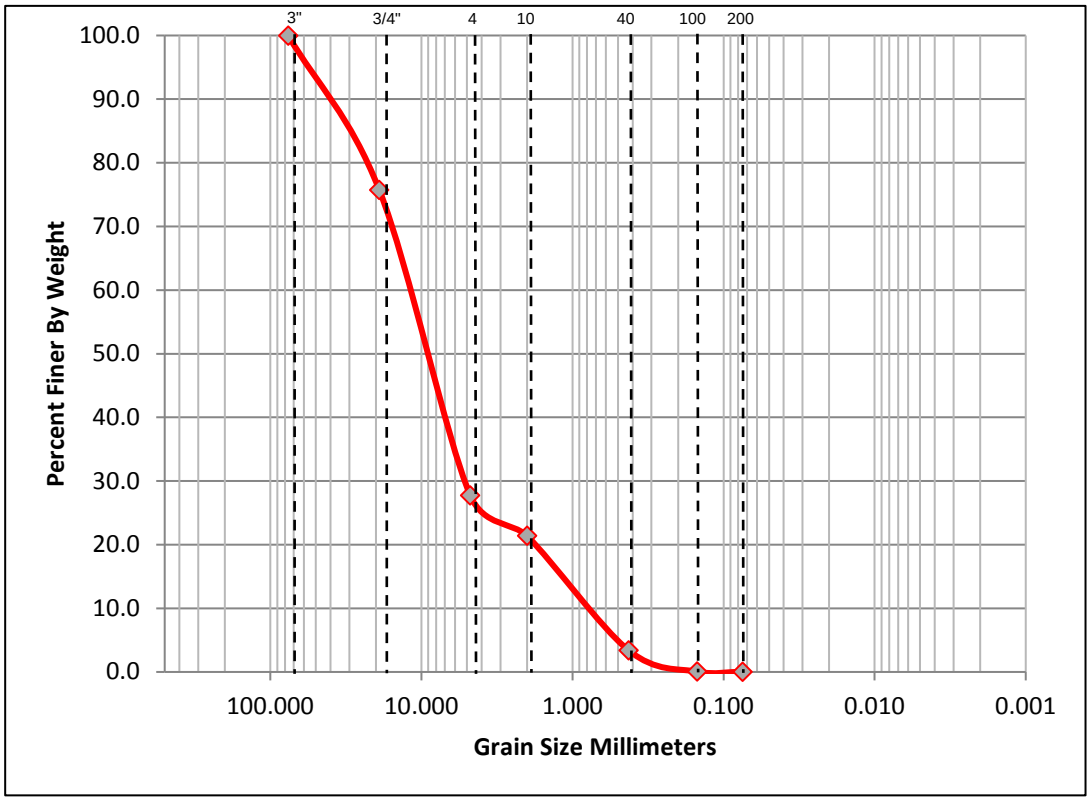
Original Sample Weight (g)			1070.9	Post Wash Weight (g)			0
Sieve	Sieve Size (mm)	Sieve Weight (g)	Shaken Weight (g)	Weight Retained (g)	Percent Retained	Cum. Percent Retained	Percent Finer
3"	76.200	0.0	0.0	0.0	0.0	0.0	100.0
3/4"	19.000	542.8	919.5	376.7	35.2	35.2	64.8
#4	4.750	493.7	686.5	192.8	18.0	53.2	46.8
#10	2.000	470.3	475.4	5.1	0.5	53.7	46.3
#40	0.425	353.1	784.8	431.7	40.3	94.0	6.0
#100	0.150	328.7	392.8	64.1	6.0	100.0	0.0
#200	0.075	316.5	316.7	0.2	0.0	100.0	0.0
Sample Notes:							

US Army Corps of Engineers®
New England District

Project Name: Hashamomuck
Project Location: Southold, NY
Sample ID: T10-H

Date: 11/30/15

Particle Size Analysis - ASTM D 422-63 (reapproved 2002)



%Cobble	%Gravel		%Sand			%Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	24.3	48.0	6.4	18.0	3.4	0.0	

D10	D15	D30	D50	D60	D85	Cc	Cu
1.0033	1.4411	5.4192	11.3583	14.3278	40.8426	0.75	14.28

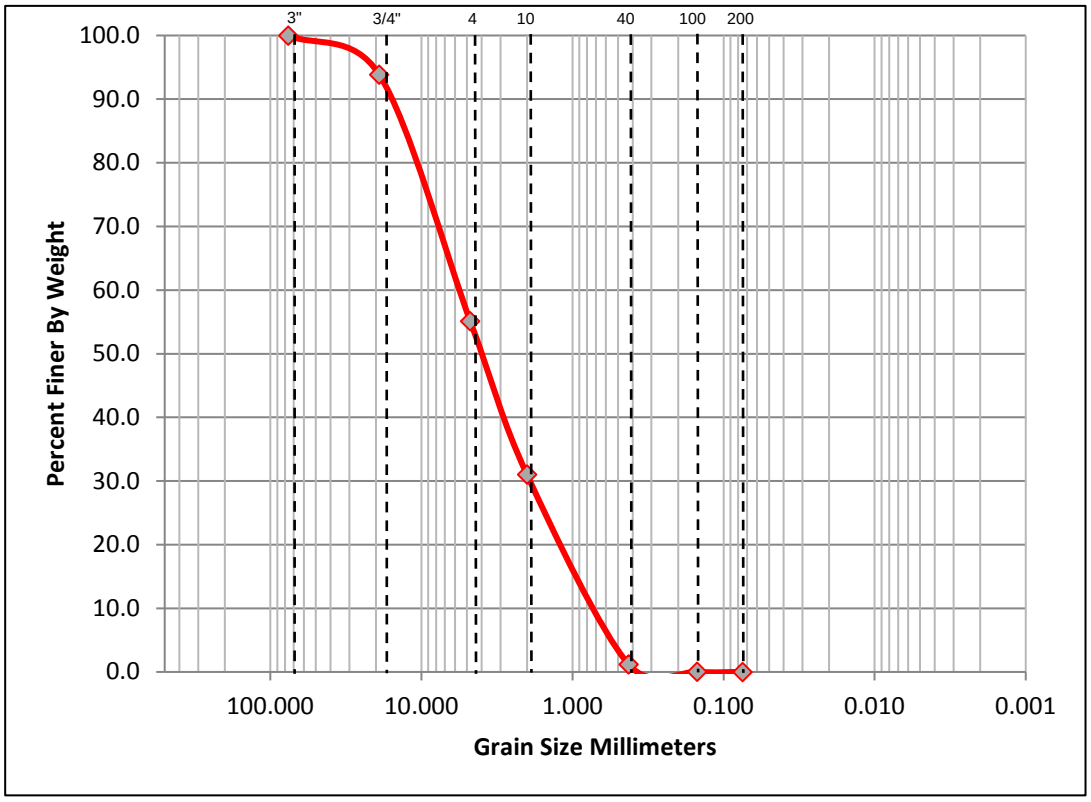
Original Sample Weight (g)			1172.4	Post Wash Weight (g)			0
Sieve	Sieve Size (mm)	Sieve Weight (g)	Shaken Weight (g)	Weight Retained (g)	Percent Retained	Cum. Percent Retained	Percent Finer
3"	76.200	0.0	0.0	0.0	0.0	0.0	100.0
3/4"	19.000	542.9	827.4	284.5	24.3	24.3	75.7
#4	4.750	493.6	1056.2	562.6	48.0	72.3	27.7
#10	2.000	470.3	544.9	74.6	6.4	78.6	21.4
#40	0.425	353.7	564.6	210.9	18.0	96.6	3.4
#100	0.150	328.6	367.7	39.1	3.3	99.9	0.1
#200	0.075	316.6	316.9	0.3	0.0	100.0	0.0
Sample Notes:							

US Army Corps of Engineers®
New England District

Project Name: Hashamomuck
Project Location: Southold, NY
Sample ID: T1-M

Date: 11/30/15

Particle Size Analysis - ASTM D 422-63 (reapproved 2002)



%Cobble	%Gravel		%Sand			%Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	6.2	38.7	24.1	29.8	1.2	0.0	

D10	D15	D30	D50	D60	D85	Cc	Cu
0.8908	1.1549	1.9473	4.1665	6.5466	15.7464	0.67	7.35

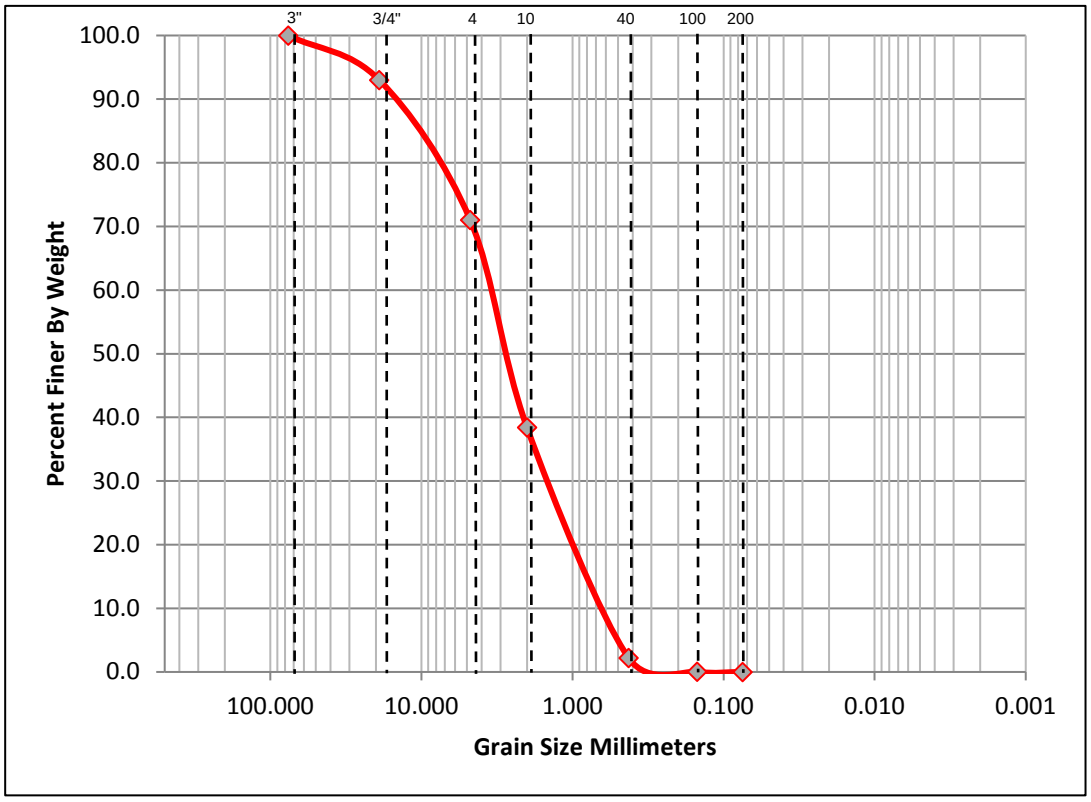
Original Sample Weight (g)			1167.5	Post Wash Weight (g)			0
Sieve	Sieve Size (mm)	Sieve Weight (g)	Shaken Weight (g)	Weight Retained (g)	Percent Retained	Cum. Percent Retained	Percent Finer
3"	76.200	0.0	0.0	0.0	0.0	0.0	100.0
3/4"	19.000	542.9	614.8	71.9	6.2	6.2	93.8
#4	4.750	489.0	941.1	452.1	38.7	44.9	55.1
#10	2.000	463.4	745.0	281.6	24.1	69.0	31.0
#40	0.425	354.8	702.9	348.1	29.8	98.8	1.2
#100	0.150	325.5	338.9	13.4	1.1	100.0	0.0
#200	0.075	313.5	313.9	0.4	0.0	100.0	0.0
Sample Notes:							

US Army Corps of Engineers®
New England District

Project Name: Hashamomuck
Project Location: Southold, NY
Sample ID: T2-M

Date: 11/30/15

Particle Size Analysis - ASTM D 422-63 (reapproved 2002)



%Cobble	%Gravel		%Sand			%Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	7.0	22.0	32.6	36.2	2.2	0.0	

D10	D15	D30	D50	D60	D85	Cc	Cu
0.7641	0.9817	1.6343	2.9778	3.8212	13.8130	1.12	5.00

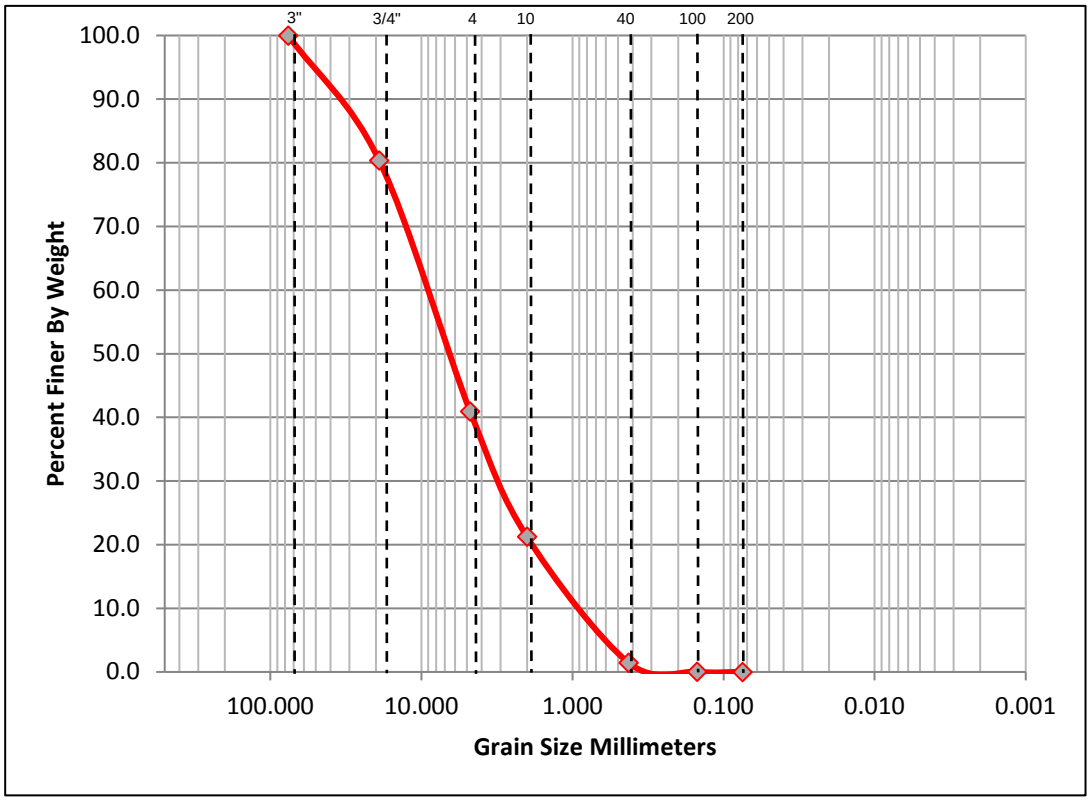
Original Sample Weight (g)			1052.2	Post Wash Weight (g)			0
Sieve	Sieve Size (mm)	Sieve Weight (g)	Shaken Weight (g)	Weight Retained (g)	Percent Retained	Cum. Percent Retained	Percent Finer
3"	76.200	0.0	0.0	0.0	0.0	0.0	100.0
3/4"	19.000	542.7	616.3	73.6	7.0	7.0	93.0
#4	4.750	493.7	725.1	231.4	22.0	29.0	71.0
#10	2.000	470.3	813.4	343.1	32.6	61.6	38.4
#40	0.425	353.4	734.3	380.9	36.2	97.8	2.2
#100	0.150	328.8	351.7	22.9	2.2	100.0	0.0
#200	0.075	316.7	317.0	0.3	0.0	100.0	0.0
Sample Notes:							

US Army Corps of Engineers®
New England District

Project Name: Hashamomuck
Project Location: Southold, NY
Sample ID: T3-M

Date: 11/30/15

Particle Size Analysis - ASTM D 422-63 (reapproved 2002)



%Cobble	%Gravel		%Sand			%Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	19.7	39.4	19.7	19.8	1.4	0.0	

D10	D15	D30	D50	D60	D85	Cc	Cu
1.1060	1.5037	3.2251	8.0371	11.6511	32.5699	0.50	10.53

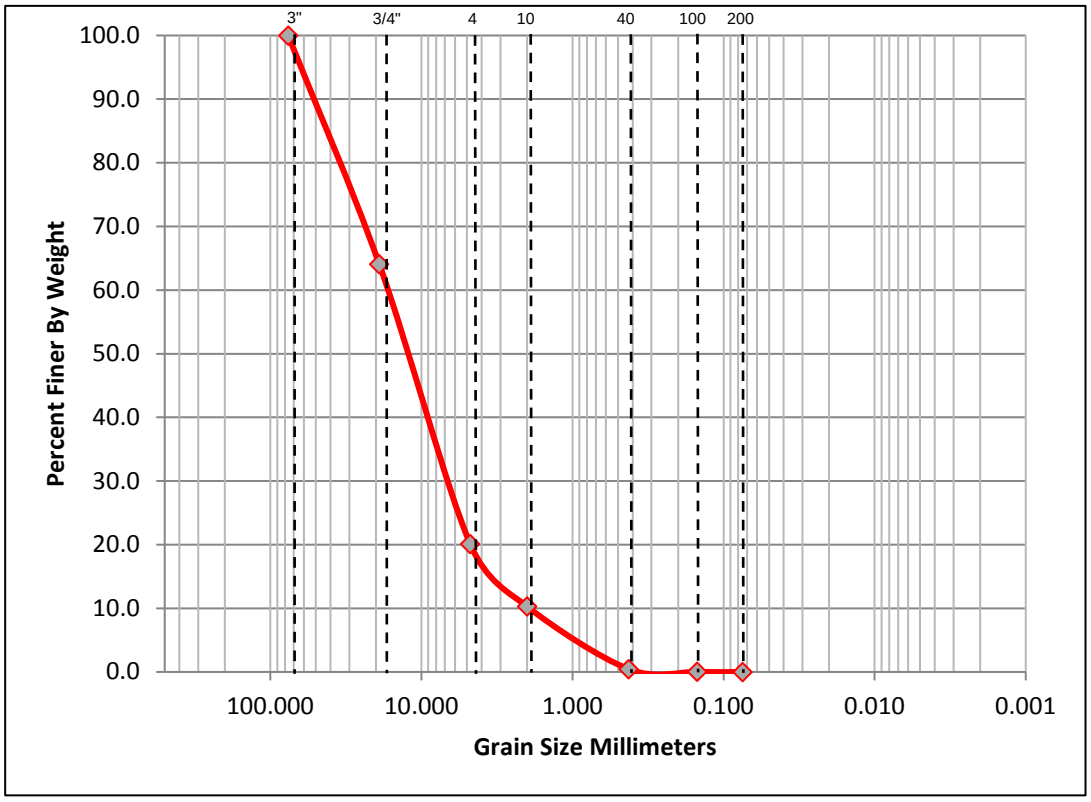
Original Sample Weight (g)			1105.5	Post Wash Weight (g)			0
Sieve	Sieve Size (mm)	Sieve Weight (g)	Shaken Weight (g)	Weight Retained (g)	Percent Retained	Cum. Percent Retained	Percent Finer
3"	76.200	0.0	0.0	0.0	0.0	0.0	100.0
3/4"	19.000	542.9	760.3	217.4	19.7	19.7	80.3
#4	4.750	493.8	929.7	435.9	39.4	59.1	40.9
#10	2.000	470.6	688.0	217.4	19.7	78.8	21.2
#40	0.425	353.2	572.1	218.9	19.8	98.6	1.4
#100	0.150	328.7	344.3	15.6	1.4	100.0	0.0
#200	0.075	316.6	316.9	0.3	0.0	100.0	0.0
Sample Notes:							

US Army Corps of Engineers®
New England District

Project Name: Hashamomuck
Project Location: Southold, NY
Sample ID: T4-M

Date: 11/30/15

Particle Size Analysis - ASTM D 422-63 (reapproved 2002)



%Cobble	%Gravel		%Sand			%Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	35.9	44.0	9.8	9.8	0.4	0.0	

D10	D15	D30	D50	D60	D85	Cc	Cu
1.9524	3.3196	7.9591	14.4406	17.6813	52.3208	0.46	9.06

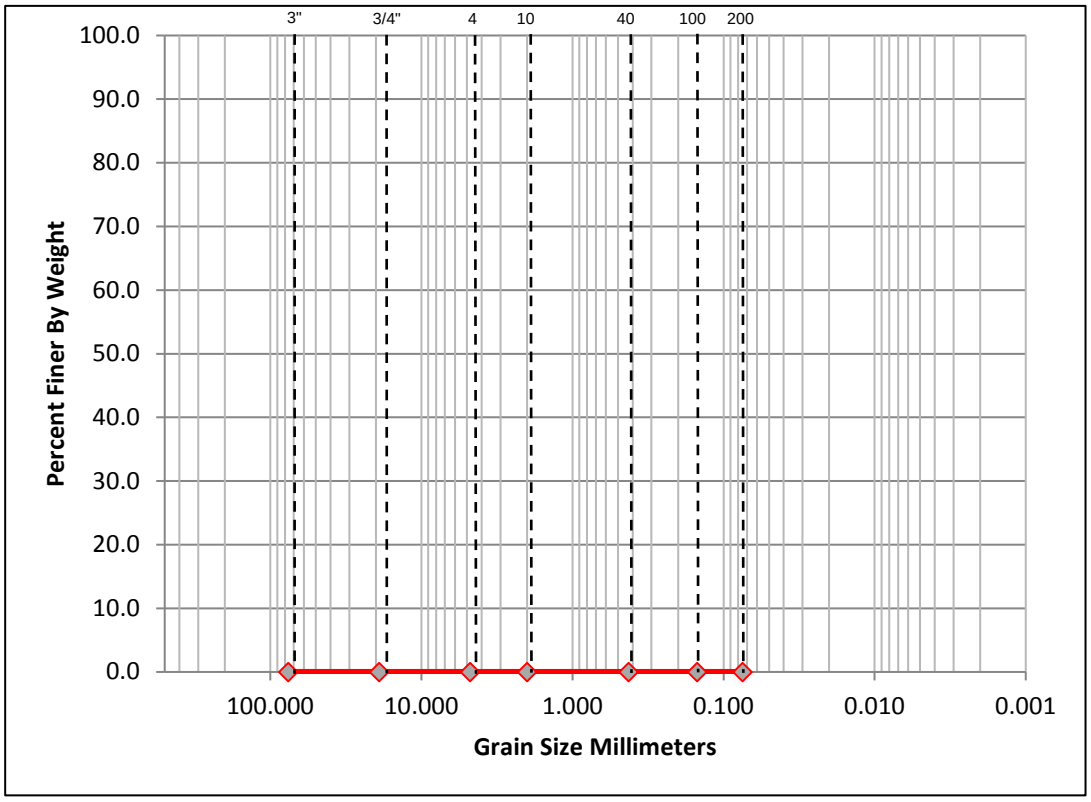
Original Sample Weight (g)			1045.9	Post Wash Weight (g)			0
Sieve	Sieve Size (mm)	Sieve Weight (g)	Shaken Weight (g)	Weight Retained (g)	Percent Retained	Cum. Percent Retained	Percent Finer
3"	76.200	0.0	0.0	0.0	0.0	0.0	100.0
3/4"	19.000	542.8	918.6	375.8	35.9	35.9	64.1
#4	4.750	489.2	949.1	459.9	44.0	79.9	20.1
#10	2.000	464.2	566.7	102.5	9.8	89.7	10.3
#40	0.425	354.5	457.5	103.0	9.8	99.6	0.4
#100	0.150	325.5	330.1	4.6	0.4	100.0	0.0
#200	0.075	313.6	313.7	0.1	0.0	100.0	0.0
Sample Notes:							

US Army Corps of Engineers®
New England District

Project Name: Hashamomuck
Project Location: Southold, NY
Sample ID: T5-M

Date: 11/30/15

Particle Size Analysis - ASTM D 422-63 (reapproved 2002)



%Cobble	%Gravel		%Sand			%Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.0	0.0	0.0	

D10	D15	D30	D50	D60	D85	Cc	Cu
#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	-	-

Original Sample Weight (g)			0.0	Post Wash Weight (g)			0
Sieve	Sieve Size (mm)	Sieve Weight (g)	Shaken Weight (g)	Weight Retained (g)	Percent Retained	Cum. Percent Retained	Percent Finer
3"	76.200			0.0	0.0	0.0	0.0
3/4"	19.000			0.0	0.0	0.0	0.0
#4	4.750			0.0	0.0	0.0	0.0
#10	2.000			0.0	0.0	0.0	0.0
#40	0.425			0.0	0.0	0.0	0.0
#100	0.150			0.0	0.0	0.0	0.0
#200	0.075			0.0	0.0	0.0	0.0

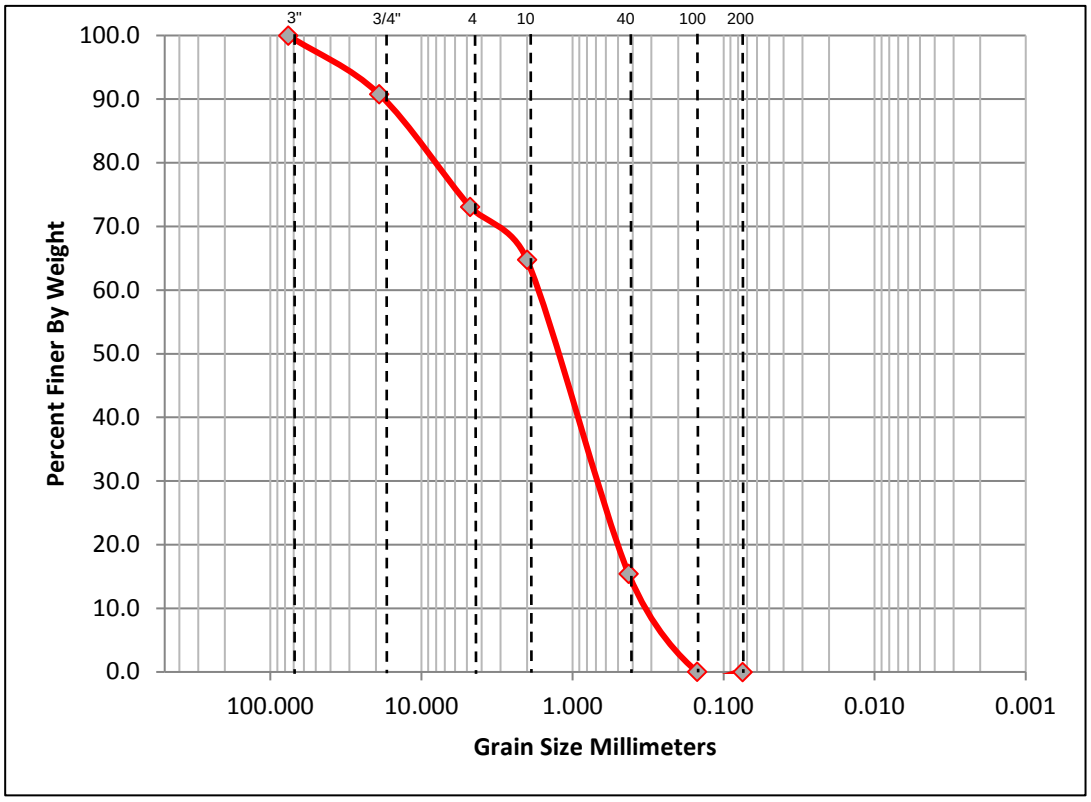
Sample Notes: NO SAMPLE - ARMORSTONE

US Army Corps of Engineers®
New England District

Project Name: Hashamomuck
Project Location: Southold, NY
Sample ID: T6-M

Date: 11/30/15

Particle Size Analysis - ASTM D 422-63 (reapproved 2002)



%Cobble	%Gravel		%Sand			%Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	9.2	17.7	8.3	49.3	15.4	0.0	

D10	D15	D30	D50	D60	D85	Cc	Cu
0.3282	0.4176	0.8907	1.5291	1.8484	14.3570	2.94	5.63

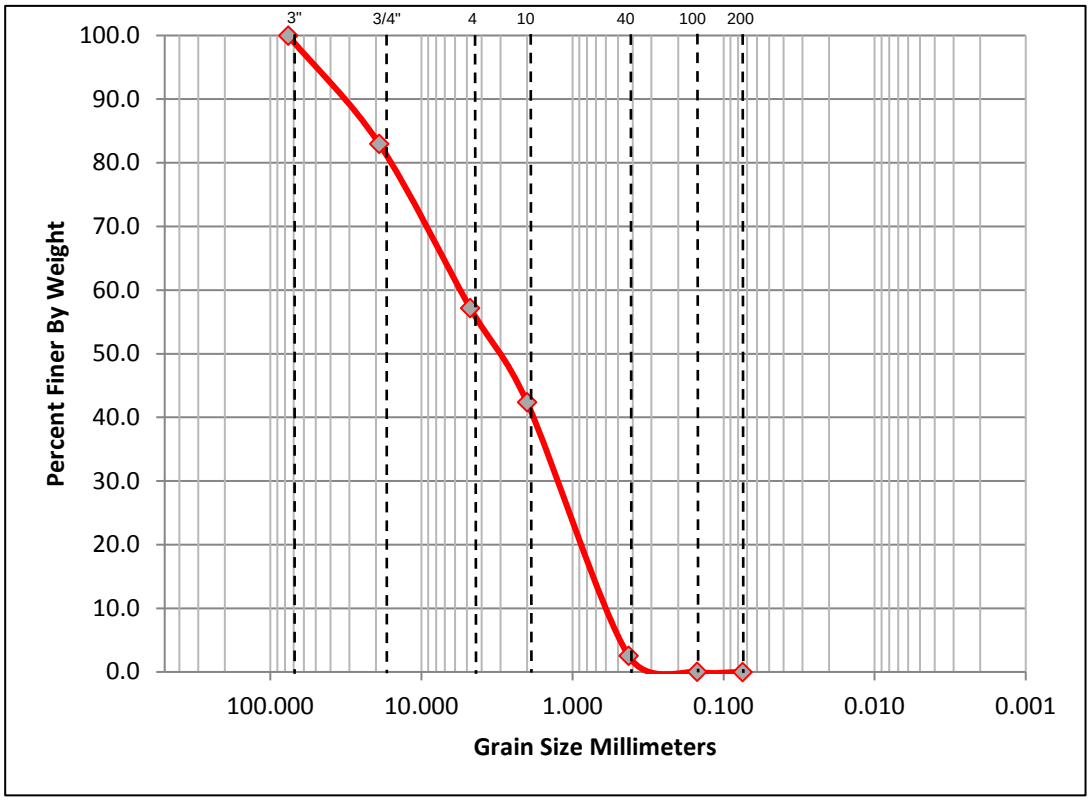
Original Sample Weight (g)			1046.5	Post Wash Weight (g)			0
Sieve	Sieve Size (mm)	Sieve Weight (g)	Shaken Weight (g)	Weight Retained (g)	Percent Retained	Cum. Percent Retained	Percent Finer
3"	76.200	0.0	0.0	0.0	0.0	0.0	100.0
3/4"	19.000	542.8	639.4	96.6	9.2	9.2	90.8
#4	4.750	489.0	674.3	185.3	17.7	26.9	73.1
#10	2.000	463.5	550.5	87.0	8.3	35.3	64.7
#40	0.425	354.6	870.9	516.3	49.3	84.6	15.4
#100	0.150	325.5	486.4	160.9	15.4	100.0	0.0
#200	0.075	313.5	313.9	0.4	0.0	100.0	0.0
Sample Notes:							

US Army Corps of Engineers®
New England District

Project Name: Hashamomuck
Project Location: Southold, NY
Sample ID: T7-M

Date: 11/30/15

Particle Size Analysis - ASTM D 422-63 (reapproved 2002)



%Cobble	%Gravel		%Sand			%Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	17.0	25.8	14.8	39.8	2.5	0.0	

D10	D15	D30	D50	D60	D85	Cc	Cu
0.7199	0.9176	1.5106	3.4168	6.3124	25.8560	0.66	8.77

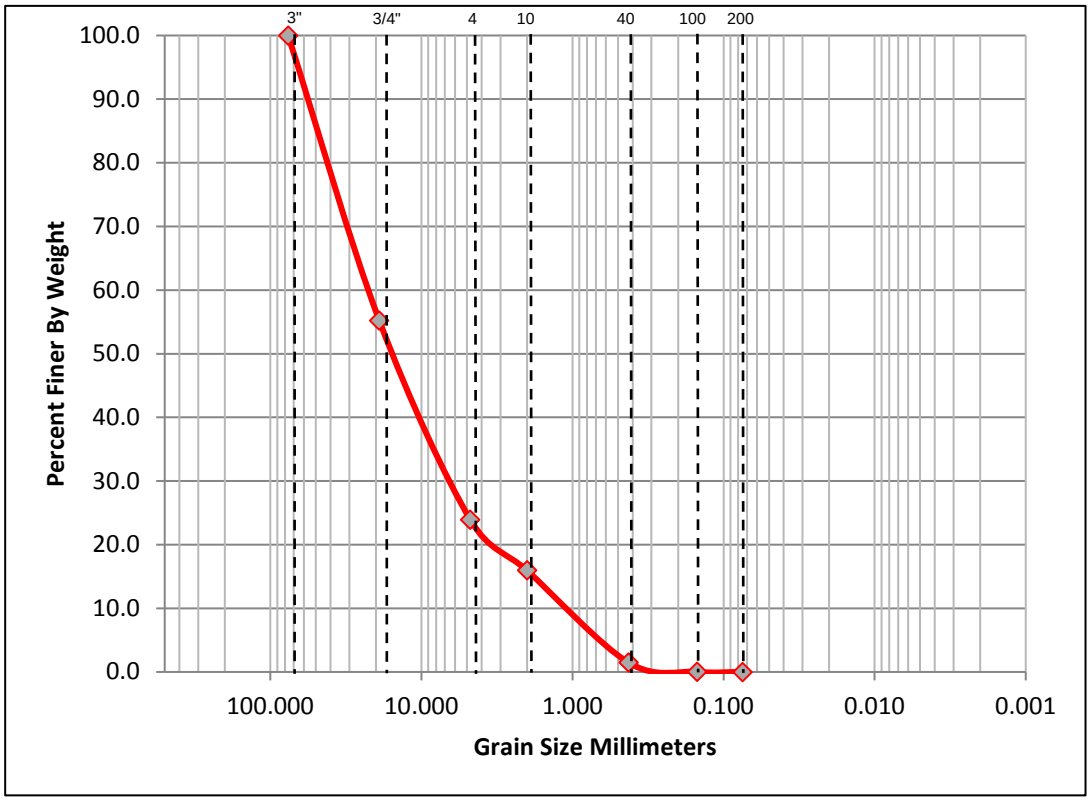
Original Sample Weight (g)			1090.2	Post Wash Weight (g)			0
Sieve	Sieve Size (mm)	Sieve Weight (g)	Shaken Weight (g)	Weight Retained (g)	Percent Retained	Cum. Percent Retained	Percent Finer
3"	76.200	0.0	0.0	0.0	0.0	0.0	100.0
3/4"	19.000	542.9	728.7	185.8	17.0	17.0	83.0
#4	4.750	489.1	770.2	281.1	25.8	42.8	57.2
#10	2.000	463.4	624.7	161.3	14.8	57.6	42.4
#40	0.425	354.7	789.0	434.3	39.8	97.5	2.5
#100	0.150	325.4	353.0	27.6	2.5	100.0	0.0
#200	0.075	313.5	313.6	0.1	0.0	100.0	0.0
Sample Notes:							

US Army Corps of Engineers®
New England District

Project Name: Hashamomuck
Project Location: Southold, NY
Sample ID: T8-M

Date: 11/30/15

Particle Size Analysis - ASTM D 422-63 (reapproved 2002)



%Cobble	%Gravel		%Sand			%Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	44.8	31.3	8.0	14.5	1.5	0.0	

D10	D15	D30	D50	D60	D85	Cc	Cu
1.3530	1.8968	7.5116	16.6235	25.1101	57.0413	0.44	18.56

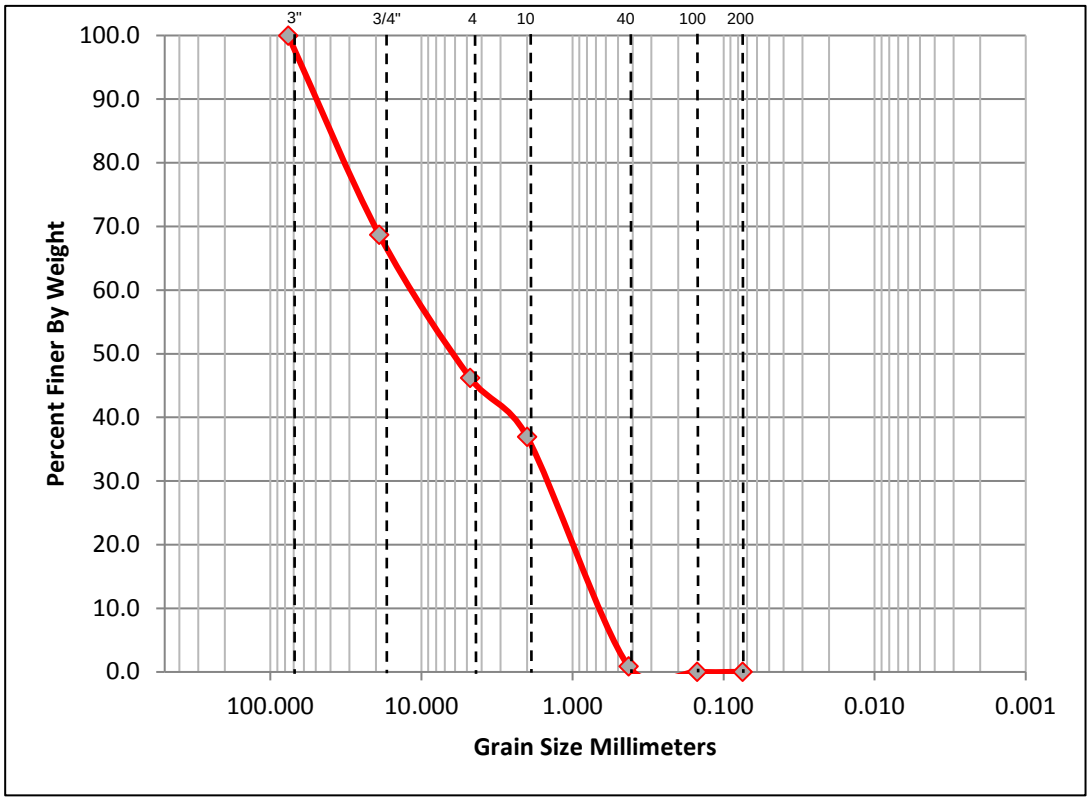
Original Sample Weight (g)			1015.1	Post Wash Weight (g)			
Sieve	Sieve Size (mm)	Sieve Weight (g)	Shaken Weight (g)	Weight Retained (g)	Percent Retained	Cum. Percent Retained	Percent Finer
3"	76.200	0	0.0	0.0	0.0	0.0	100.0
3/4"	19.000	542.9	997.5	454.6	44.8	44.8	55.2
#4	4.750	488.9	806.4	317.5	31.3	76.1	23.9
#10	2.000	463.4	544.5	81.1	8.0	84.1	15.9
#40	0.425	354.8	501.8	147.0	14.5	98.5	1.5
#100	0.150	325.5	340.2	14.7	1.4	100.0	0.0
#200	0.075	313.5	313.7	0.2	0.0	100.0	0.0
Sample Notes:							

US Army Corps of Engineers®
New England District

Project Name: Hashamomuck
Project Location: Southold, NY
Sample ID: T9-M

Date: 11/30/15

Particle Size Analysis - ASTM D 422-63 (reapproved 2002)



%Cobble	%Gravel		%Sand			%Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	31.3	22.5	9.2	36.1	0.8	0.0	

D10	D15	D30	D50	D60	D85	Cc	Cu
0.8237	1.0418	1.6963	7.1682	13.4989	48.7969	0.31	16.39

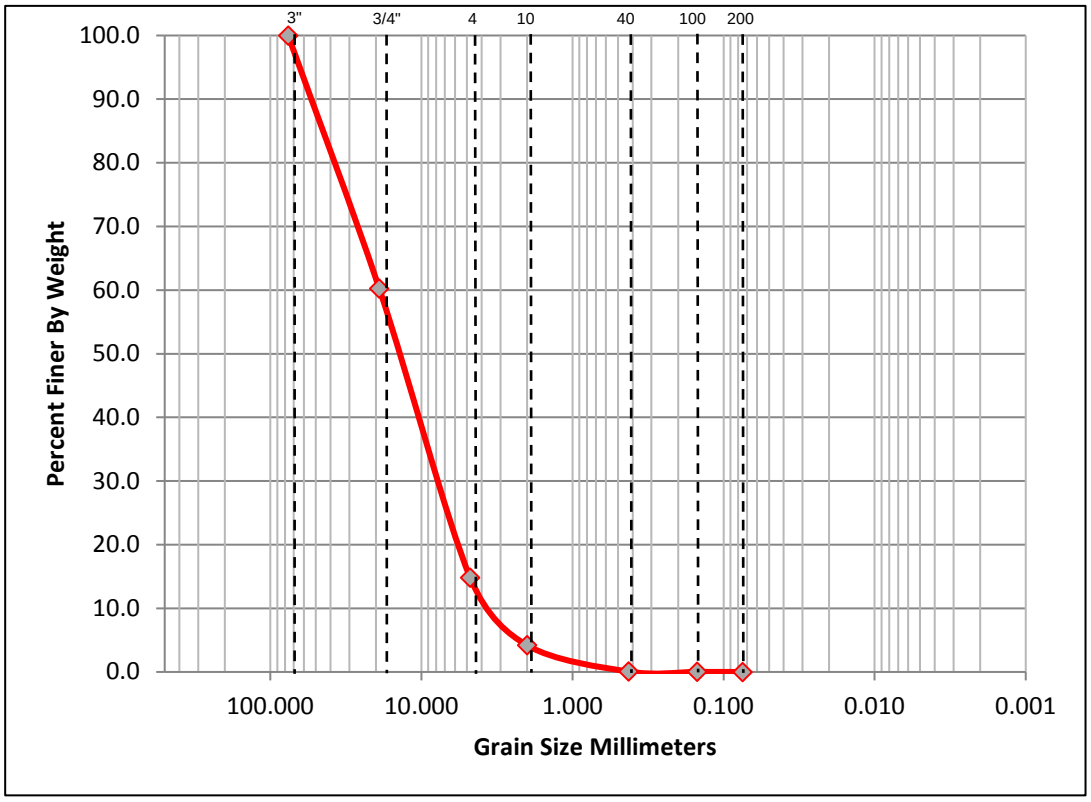
Original Sample Weight (g)			1171.5	Post Wash Weight (g)			
Sieve	Sieve Size (mm)	Sieve Weight (g)	Shaken Weight (g)	Weight Retained (g)	Percent Retained	Cum. Percent Retained	Percent Finer
3"	76.200	0.0	0.0	0.0	0.0	0.0	100.0
3/4"	19.000	542.9	909.7	366.8	31.3	31.3	68.7
#4	4.750	493.8	757.5	263.7	22.5	53.8	46.2
#10	2.000	470.5	578.5	108.0	9.2	63.0	37.0
#40	0.425	353.5	776.4	422.9	36.1	99.1	0.9
#100	0.150	328.7	338.4	9.7	0.8	100.0	0.0
#200	0.075	316.6	316.8	0.2	0.0	100.0	0.0
Sample Notes:							

US Army Corps of Engineers®
New England District

Project Name: Hashamomuck
Project Location: Southold, NY
Sample ID: T10-M

Date: 11/30/15

Particle Size Analysis - ASTM D 422-63 (reapproved 2002)



%Cobble	%Gravel		%Sand			%Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	39.8	45.4	10.6	4.1	0.1	0.0	

D10	D15	D30	D50	D60	D85	Cc	Cu
3.5052	4.8140	9.5175	15.7889	18.9246	54.6202	0.29	5.40

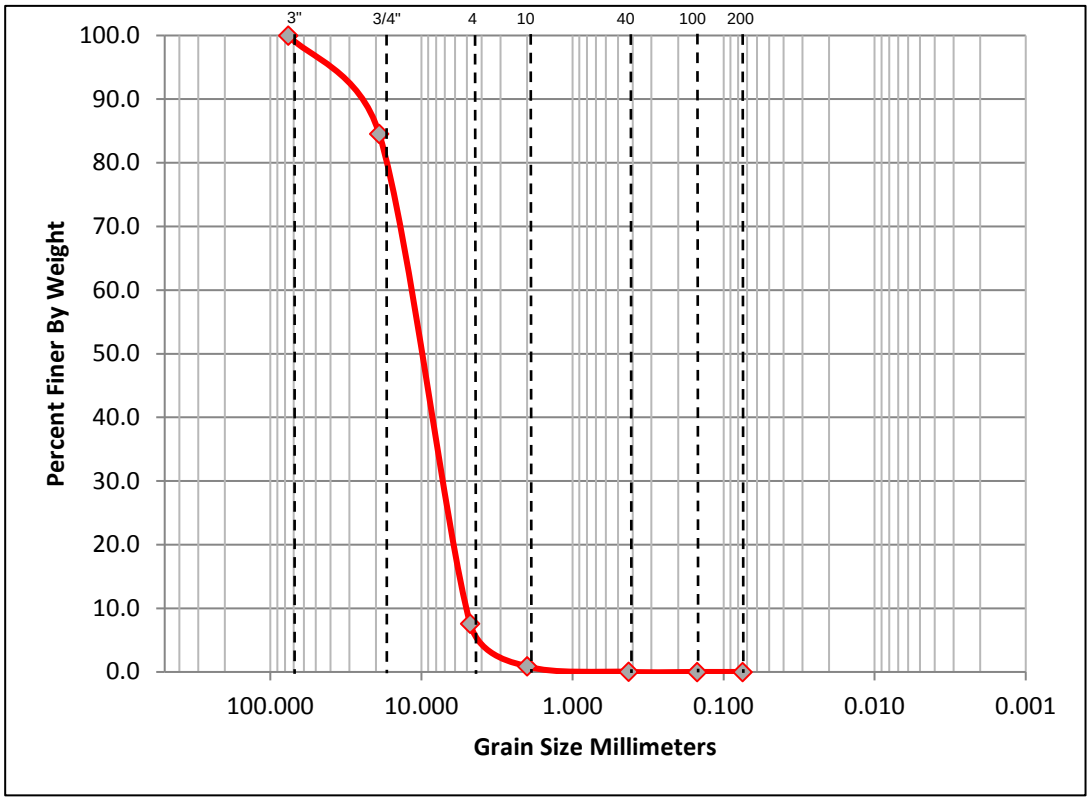
Original Sample Weight (g)			1030.7	Post Wash Weight (g)			0
Sieve	Sieve Size (mm)	Sieve Weight (g)	Shaken Weight (g)	Weight Retained (g)	Percent Retained	Cum. Percent Retained	Percent Finer
3"	76.200	0.0	0.0	0.0	0.0	0.0	100.0
3/4"	19.000	542.9	952.7	409.8	39.8	39.8	60.2
#4	4.750	489.0	957.4	468.4	45.4	85.2	14.8
#10	2.000	463.5	572.7	109.2	10.6	95.8	4.2
#40	0.425	354.8	397.5	42.7	4.1	99.9	0.1
#100	0.150	325.6	326.1	0.5	0.0	100.0	0.0
#200	0.075	313.6	313.7	0.1	0.0	100.0	0.0
Sample Notes:							

US Army Corps of Engineers®
New England District

Project Name: Hashamomuck
Project Location: Southold, NY
Sample ID: T1-L

Date: 11/30/15

Particle Size Analysis - ASTM D 422-63 (reapproved 2002)



%Cobble	%Gravel		%Sand			%Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	15.5	77.0	6.7	0.9	0.0	0.0	

D10	D15	D30	D50	D60	D85	Cc	Cu
5.2023	6.1282	8.9058	12.6092	14.4609	20.8003	0.24	2.78

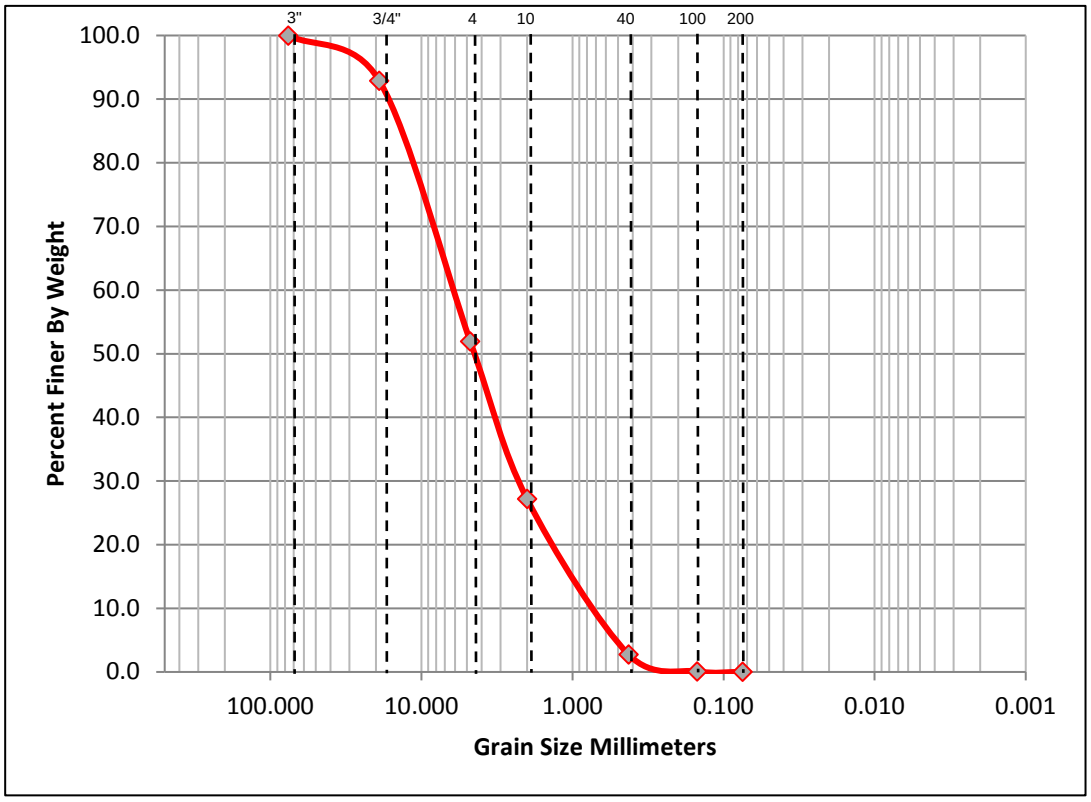
Original Sample Weight (g)			1099.6	Post Wash Weight (g)			
Sieve	Sieve Size (mm)	Sieve Weight (g)	Shaken Weight (g)	Weight Retained (g)	Percent Retained	Cum. Percent Retained	Percent Finer
3"	76.200	0.0	0.0	0.0	0.0	0.0	100.0
3/4"	19.000	542.9	713.2	170.3	15.5	15.5	84.5
#4	4.750	489.0	1335.2	846.2	77.0	92.4	7.6
#10	2.000	463.5	536.9	73.4	6.7	99.1	0.9
#40	0.425	354.7	364.2	9.5	0.9	100.0	0.0
#100	0.150	325.4	325.6	0.2	0.0	100.0	0.0
#200	0.075	313.5	313.5	0.0	0.0	100.0	0.0
Sample Notes:							

US Army Corps of Engineers®
New England District

Project Name: Hashamomuck
Project Location: Southold, NY
Sample ID: T2-L

Date: 11/30/15

Particle Size Analysis - ASTM D 422-63 (reapproved 2002)



%Cobble	%Gravel		%Sand			%Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	7.1	40.9	24.7	24.5	2.7	0.0	

D10	D15	D30	D50	D60	D85	Cc	Cu
0.8928	1.2146	2.3109	4.5336	7.5524	16.2530	0.69	8.46

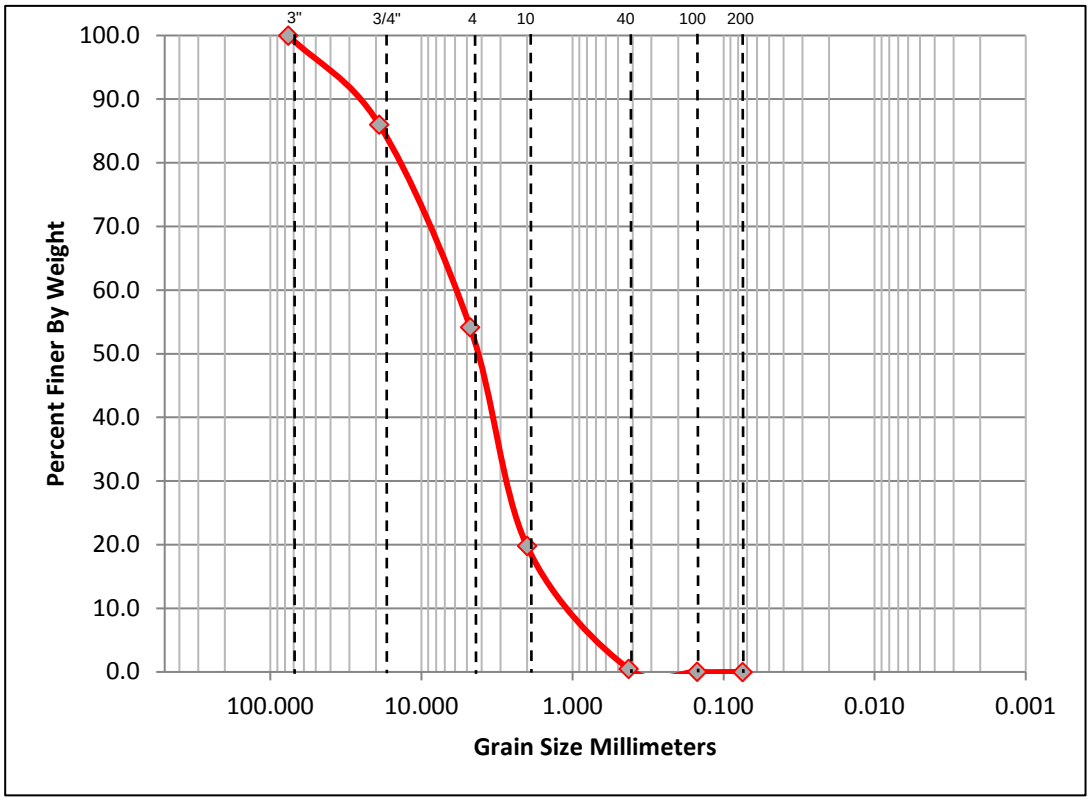
Original Sample Weight (g)			1127.1	Post Wash Weight (g)			
Sieve	Sieve Size (mm)	Sieve Weight (g)	Shaken Weight (g)	Weight Retained (g)	Percent Retained	Cum. Percent Retained	Percent Finer
3"	76.200	0.0	0.0	0.0	0.0	0.0	100.0
3/4"	19.000	542.8	622.9	80.1	7.1	7.1	92.9
#4	4.750	493.8	955.3	461.5	40.9	48.1	51.9
#10	2.000	470.3	749.2	278.9	24.7	72.8	27.2
#40	0.425	353.3	629.1	275.8	24.5	97.3	2.7
#100	0.150	328.6	358.3	29.7	2.6	99.9	0.1
#200	0.075	316.6	317.6	1.0	0.1	100.0	0.0
Sample Notes:							

US Army Corps of Engineers®
New England District

Project Name: Hashamomuck
Project Location: Southold, NY
Sample ID: T3-L

Date: 11/30/15

Particle Size Analysis - ASTM D 422-63 (reapproved 2002)



%Cobble	%Gravel		%Sand			%Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	14.0	31.9	34.4	19.3	0.5	0.0	

D10	D15	D30	D50	D60	D85	Cc	Cu
1.2013	1.6099	2.8186	4.4196	7.3768	18.5590	0.64	6.14

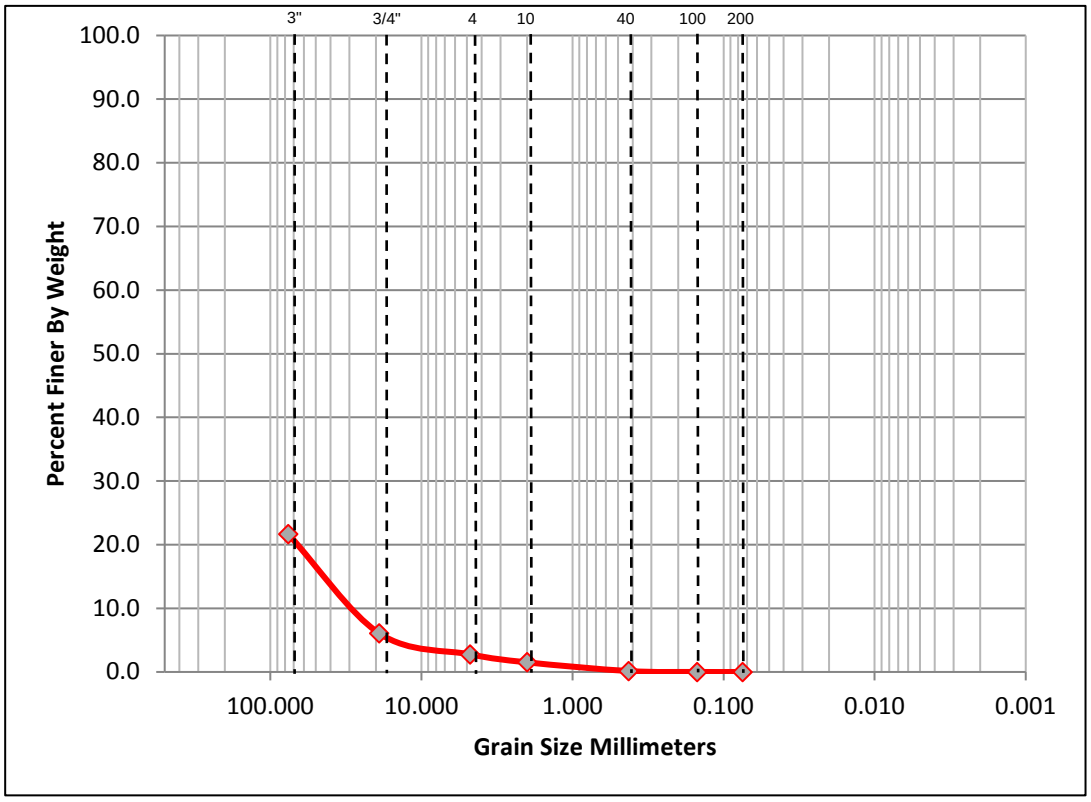
Original Sample Weight (g)			1078.2	Post Wash Weight (g)			
Sieve	Sieve Size (mm)	Sieve Weight (g)	Shaken Weight (g)	Weight Retained (g)	Percent Retained	Cum. Percent Retained	Percent Finer
3"	76.200	0.0	0.0	0.0	0.0	0.0	100.0
3/4"	19.000	542.8	693.9	151.1	14.0	14.0	86.0
#4	4.750	489.0	832.5	343.5	31.9	45.9	54.1
#10	2.000	463.5	833.9	370.4	34.4	80.2	19.8
#40	0.425	354.7	562.5	207.8	19.3	99.5	0.5
#100	0.150	325.5	330.8	5.3	0.5	100.0	0.0
#200	0.075	313.5	313.6	0.1	0.0	100.0	0.0
Sample Notes:							

US Army Corps of Engineers®
New England District

Project Name: Hashamomuck
Project Location: Southold, NY
Sample ID: T4-L

Date: 11/30/15

Particle Size Analysis - ASTM D 422-63 (reapproved 2002)



%Cobble	%Gravel		%Sand			%Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
78.3	15.6	3.3	1.3	1.4	0.1	0.0	

D10	D15	D30	D50	D60	D85	Cc	Cu
33.4199	51.7400	-	-	-	-	-	-

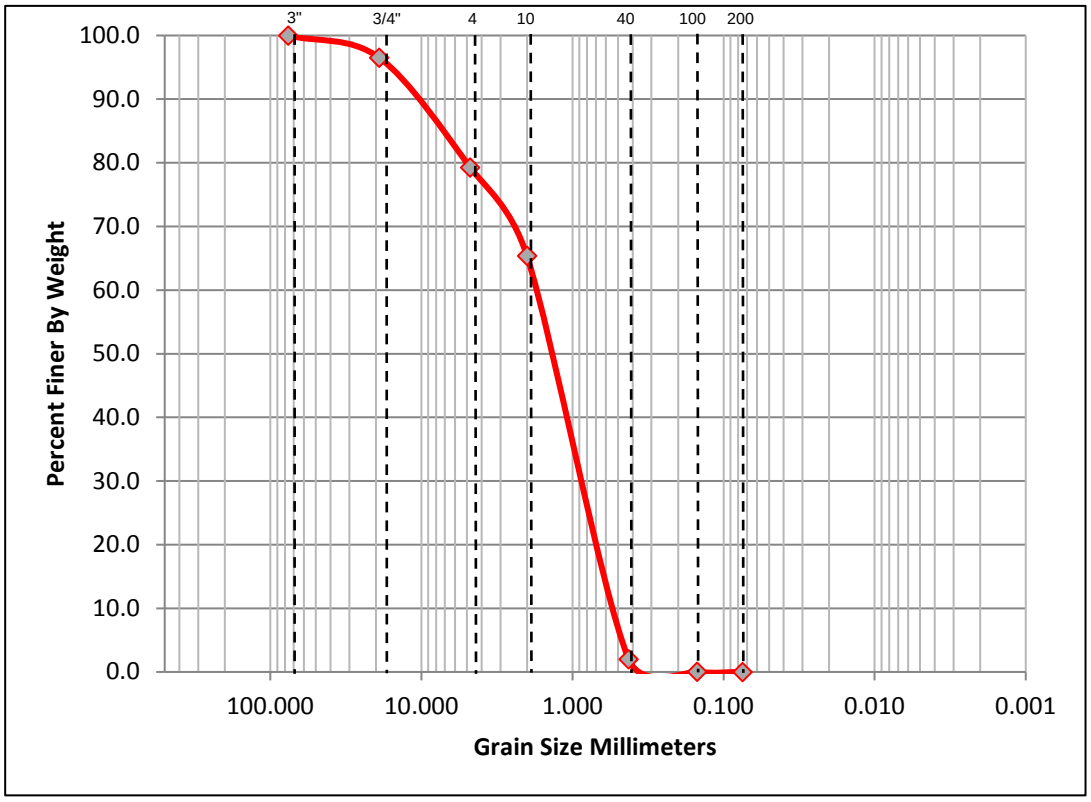
Original Sample Weight (g)			2277.2	Post Wash Weight (g)			
Sieve	Sieve Size (mm)	Sieve Weight (g)	Shaken Weight (g)	Weight Retained (g)	Percent Retained	Cum. Percent Retained	Percent Finer
3"	76.200	506.9	2290.5	1783.6	78.3	78.3	21.7
3/4"	19.000	542.9	898.4	355.5	15.6	93.9	6.1
#4	4.750	493.6	568.7	75.1	3.3	97.2	2.8
#10	2.000	470.3	498.9	28.6	1.3	98.5	1.5
#40	0.425	353.7	384.8	31.1	1.4	99.9	0.1
#100	0.150	328.6	331.9	3.3	0.1	100.0	0.0
#200	0.075	316.6	316.6	0.0	0.0	100.0	0.0
Sample Notes:							

US Army Corps of Engineers®
New England District

Project Name: Hashamomuck
Project Location: Southold, NY
Sample ID: T5-L

Date: 11/30/15

Particle Size Analysis - ASTM D 422-63 (reapproved 2002)



%Cobble	%Gravel		%Sand			%Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	3.5	17.2	13.9	63.3	2.0	0.0	

D10	D15	D30	D50	D60	D85	Cc	Cu
0.6236	0.7479	1.1209	1.6183	1.8670	9.4881	1.93	2.99

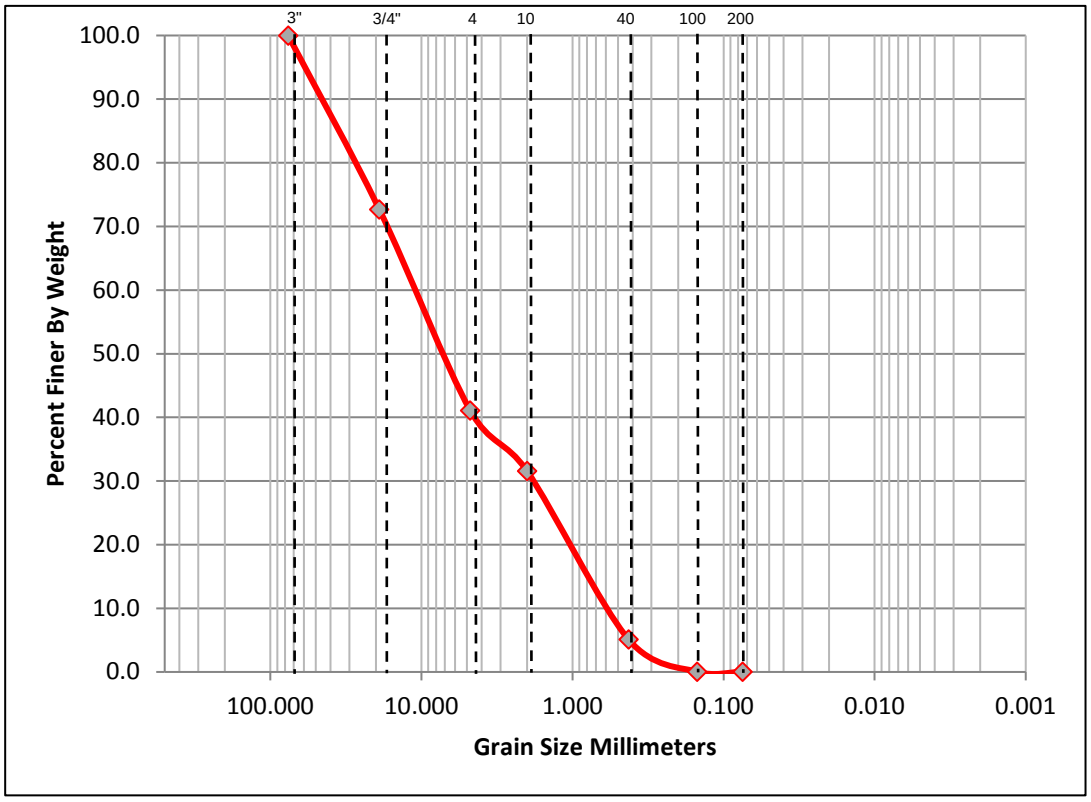
Original Sample Weight (g)			1043.0	Post Wash Weight (g)			
Sieve	Sieve Size (mm)	Sieve Weight (g)	Shaken Weight (g)	Weight Retained (g)	Percent Retained	Cum. Percent Retained	Percent Finer
3"	76.200	0.0	0.0	0.0	0.0	0.0	100.0
3/4"	19.000	542.9	579.4	36.5	3.5	3.5	96.5
#4	4.750	493.7	673.4	179.7	17.2	20.7	79.3
#10	2.000	470.3	615.5	145.2	13.9	34.7	65.3
#40	0.425	353.3	1013.9	660.6	63.3	98.0	2.0
#100	0.150	328.7	349.4	20.7	2.0	100.0	0.0
#200	0.075	316.6	316.9	0.3	0.0	100.0	0.0
Sample Notes:							

US Army Corps of Engineers®
New England District

Project Name: Hashamomuck
Project Location: Southold, NY
Sample ID: T6-L

Date: 11/30/15

Particle Size Analysis - ASTM D 422-63 (reapproved 2002)



%Cobble	%Gravel		%Sand			%Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	27.3	31.6	9.5	26.5	5.1	0.0	

D10	D15	D30	D50	D60	D85	Cc	Cu
0.7169	1.0142	1.9062	8.7681	13.2797	44.7951	0.40	18.52

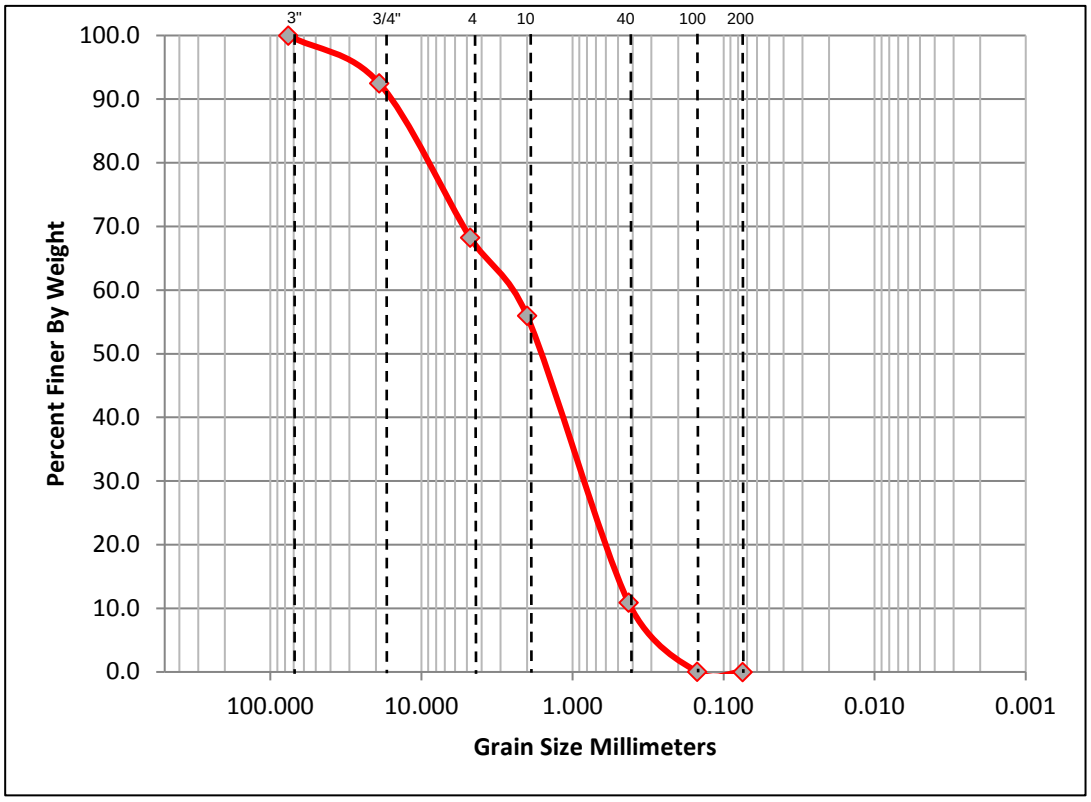
Original Sample Weight (g)			1064.4	Post Wash Weight (g)			
Sieve	Sieve Size (mm)	Sieve Weight (g)	Shaken Weight (g)	Weight Retained (g)	Percent Retained	Cum. Percent Retained	Percent Finer
3"	76.200	0.0	0.0	0.0	0.0	0.0	100.0
3/4"	19.000	542.8	833.6	290.8	27.3	27.3	72.7
#4	4.750	493.9	830.1	336.2	31.6	58.9	41.1
#10	2.000	470.5	571.8	101.3	9.5	68.4	31.6
#40	0.425	353.3	635.2	281.9	26.5	94.9	5.1
#100	0.150	328.8	382.5	53.7	5.0	100.0	0.0
#200	0.075	316.6	316.9	0.3	0.0	100.0	0.0
Sample Notes:							

US Army Corps of Engineers®
New England District

Project Name: Hashamomuck
Project Location: Southold, NY
Sample ID: T7-L

Date: 11/30/15

Particle Size Analysis - ASTM D 422-63 (reapproved 2002)



%Cobble	%Gravel		%Sand			%Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	7.5	24.2	12.3	45.1	10.9	0.0	

D10	D15	D30	D50	D60	D85	Cc	Cu
0.4030	0.5693	1.0932	1.7917	2.9043	14.6048	1.87	7.21

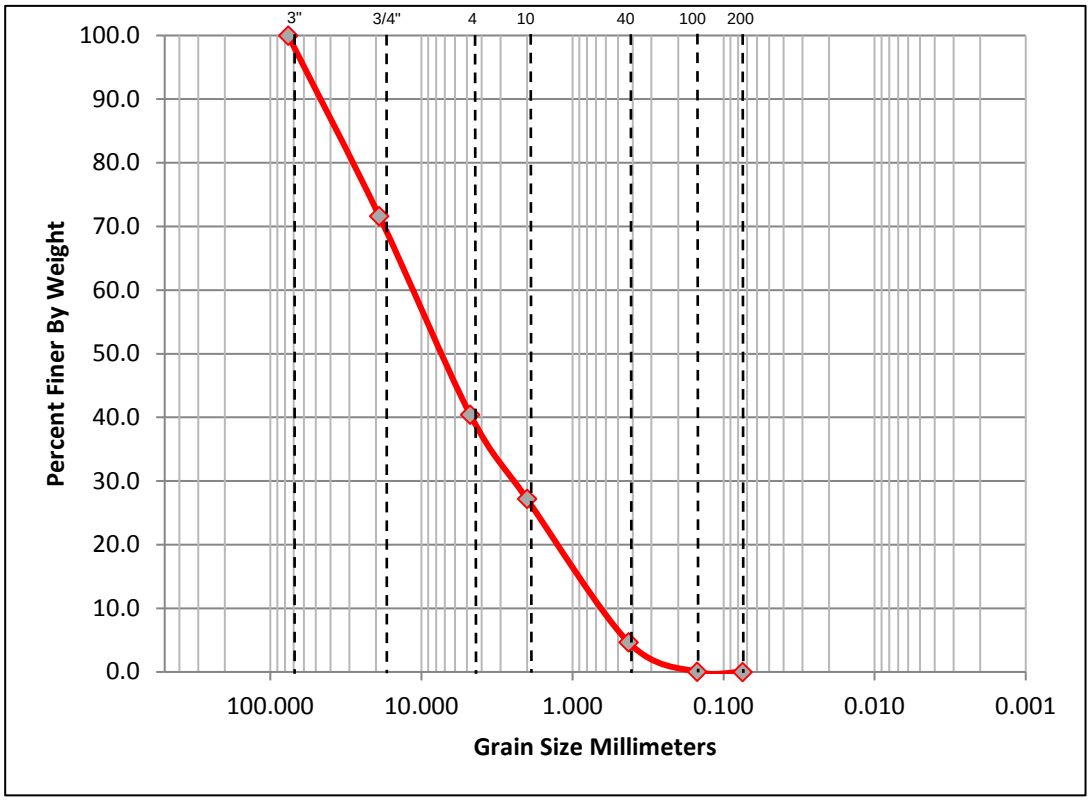
Original Sample Weight (g)			1073.9	Post Wash Weight (g)			
Sieve	Sieve Size (mm)	Sieve Weight (g)	Shaken Weight (g)	Weight Retained (g)	Percent Retained	Cum. Percent Retained	Percent Finer
3"	76.200	0.0	0.0	0.0	0.0	0.0	100.0
3/4"	19.000	542.9	623.7	80.8	7.5	7.5	92.5
#4	4.750	489.0	749.3	260.3	24.2	31.8	68.2
#10	2.000	463.4	595.2	131.8	12.3	44.0	56.0
#40	0.425	354.6	838.9	484.3	45.1	89.1	10.9
#100	0.150	325.4	441.6	116.2	10.8	100.0	0.0
#200	0.075	313.5	314.0	0.5	0.0	100.0	0.0
Sample Notes:							

US Army Corps of Engineers®
New England District

Project Name: Hashamomuck
Project Location: Southold, NY
Sample ID: T8-L

Date: 11/30/15

Particle Size Analysis - ASTM D 422-63 (reapproved 2002)



%Cobble	%Gravel		%Sand			%Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	28.4	31.2	13.3	22.5	4.6	0.0	

D10	D15	D30	D50	D60	D85	Cc	Cu
0.7995	1.1491	2.5873	9.1222	13.6903	45.9639	0.47	17.12

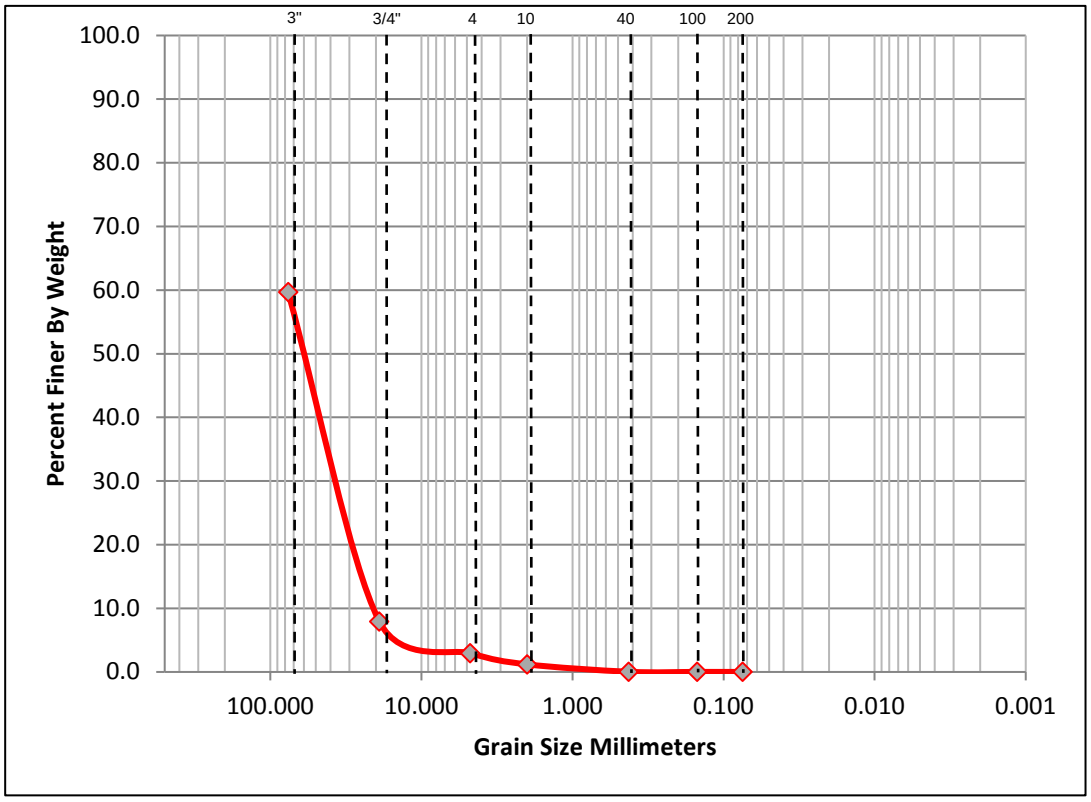
Original Sample Weight (g)			1100.2	Post Wash Weight (g)			
Sieve	Sieve Size (mm)	Sieve Weight (g)	Shaken Weight (g)	Weight Retained (g)	Percent Retained	Cum. Percent Retained	Percent Finer
3"	76.200	0.0	0.0	0.0	0.0	0.0	100.0
3/4"	19.000	542.7	854.9	312.2	28.4	28.4	71.6
#4	4.750	493.7	836.9	343.2	31.2	59.6	40.4
#10	2.000	470.2	616.1	145.9	13.3	72.8	27.2
#40	0.425	353.3	601.1	247.8	22.5	95.4	4.6
#100	0.150	328.8	379.6	50.8	4.6	100.0	0.0
#200	0.075	316.6	316.9	0.3	0.0	100.0	0.0
Sample Notes:							

US Army Corps of Engineers®
New England District

Project Name: Hashamomuck
Project Location: Southold, NY
Sample ID: T9-L

Date: 11/30/15

Particle Size Analysis - ASTM D 422-63 (reapproved 2002)



%Cobble	%Gravel		%Sand			%Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
59.7	51.7	5.0	1.8	1.2	0.0	0.0	

D10	D15	D30	D50	D60	D85	Cc	Cu
21.2760	26.8042	43.3886	65.5013	-	-	-	-

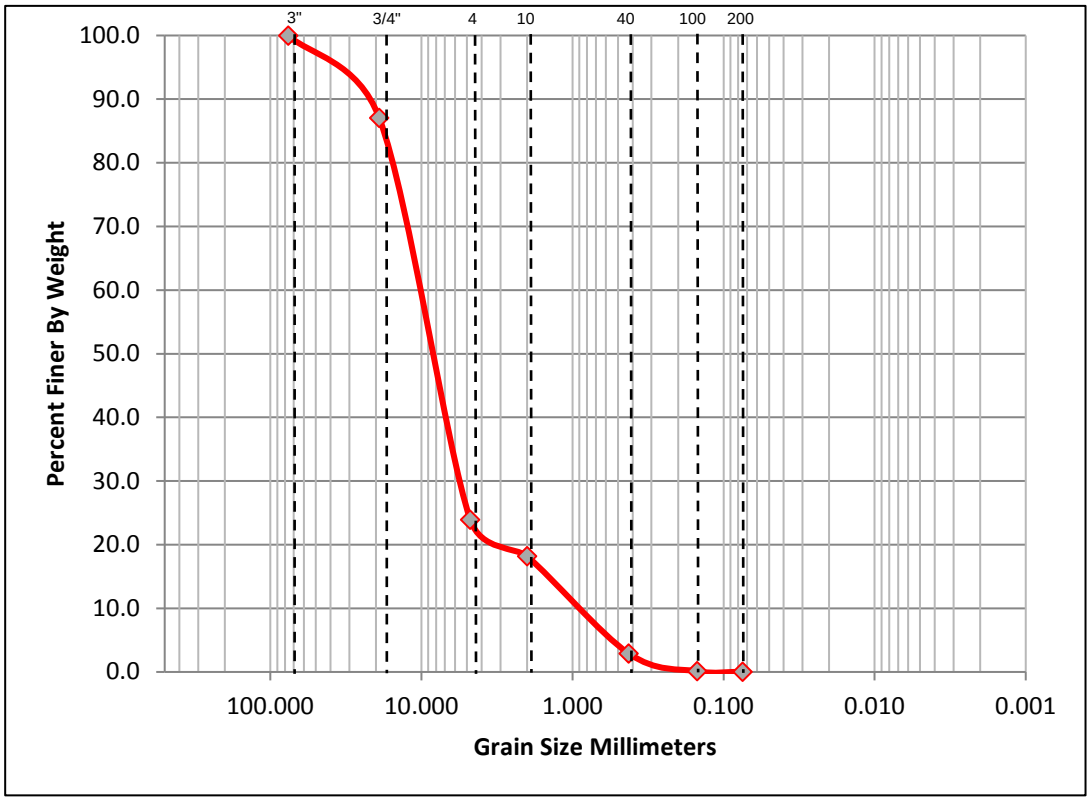
Original Sample Weight (g)			2158.3	Post Wash Weight (g)			
Sieve	Sieve Size (mm)	Sieve Weight (g)	Shaken Weight (g)	Weight Retained (g)	Percent Retained	Cum. Percent Retained	Percent Finer
3"	76.200	506.7	1377.0	870.3	40.3	40.3	59.7
3/4"	19.000	542.8	1659.4	1116.6	51.7	92.1	7.9
#4	4.750	488.9	596.4	107.5	5.0	97.0	3.0
#10	2.000	463.3	501.4	38.1	1.8	98.8	1.2
#40	0.425	354.5	379.6	25.1	1.2	100.0	0.0
#100	0.150	325.3	325.8	0.5	0.0	100.0	0.0
#200	0.075	313.4	313.5	0.1	0.0	100.0	0.0
Sample Notes:							

US Army Corps of Engineers®
New England District

Project Name: Hashamomuck
Project Location: Southold, NY
Sample ID: T10-L

Date: 11/30/15

Particle Size Analysis - ASTM D 422-63 (reapproved 2002)



%Cobble	%Gravel		%Sand			%Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	13.0	63.1	5.7	15.3	2.9	0.0	

D10	D15	D30	D50	D60	D85	Cc	Cu
1.1559	1.6713	6.1215	10.6375	12.8955	18.5404	0.82	11.16

Original Sample Weight (g)			1068.3	Post Wash Weight (g)			
Sieve	Sieve Size (mm)	Sieve Weight (g)	Shaken Weight (g)	Weight Retained (g)	Percent Retained	Cum. Percent Retained	Percent Finer
3"	76.200	0.0	0.0	0.0	0.0	0.0	100.0
3/4"	19.000	542.7	681.2	138.5	13.0	13.0	87.0
#4	4.750	493.7	1167.9	674.2	63.1	76.1	23.9
#10	2.000	470.4	531.7	61.3	5.7	81.8	18.2
#40	0.425	353.3	516.5	163.2	15.3	97.1	2.9
#100	0.150	328.7	358.6	29.9	2.8	99.9	0.1
#200	0.075	316.6	317.5	0.9	0.1	100.0	0.0
Sample Notes:							

DRAFT

Hashamomuck Cove
Southold, New York
Coastal Storm Risk Management
Integrated Feasibility Study/EA

Appendix A3

Environmental Appendices

Coastal Zone Management Consistency

NEW YORK STATE COASTAL MANAGEMENT PROGRAM

DRAFT CONSISTENCY DETERMINATION

Project: Town of Southold, New York, Hashamomuck Cove Coastal Storm Damage Reduction Project.

The proposed plan for Hashamomuck Cove includes the placement of fill material at the West, Central, and East Coves to rebuild the beaches with a 25' to 75' wide berm and beachfill. The source of the initial sand for the beach fill will be from an upland off-site source. Periodic renourishment is anticipated to be approximately every 10 years (range 5 to 10 years) over the 50 year period of analysis to maintain the project design profile. It is anticipated that renourishment sand be trucked in from a certified upland source. The West Cove will involve 164,000 square feet (SF) of intertidal disturbance and 69,000 (SF) of subtidal disturbance; the Central Cove will have 149,000 SF of intertidal disturbance and 249,000 SF of subtidal disturbance; and the East Cove will result in 151,000 SF of intertidal disturbance and 198,000 SF of subtidal disturbance.

Applicant: U.S. Army Corps of Engineers, New York District.

Applicable Policies: Based on a review of the Coastal Management Program policies for New York, 19 were found to be applicable to the proposed project. These policies are listed below.

Consistency Determination: All of the applicable policies were evaluated with respect to the Project's consistency with their stated goals. The Project has been found to be consistent with each policy.

The construction of this coastal storm risk management project will serve to protect one of the two roadways to Orient Point and thus the community and allows the existing commercial uses and public infrastructure to continue to function within a safer and more secure environment. The nourishment of the beach will also improve the recreational opportunities of the beach as well as improve safety in regard to beach usage in areas that front previously constructed bulkheads/seawalls. Therefore, the New England District has determined that the proposed project would be consistent with the 19 policies that were deemed applicable and evaluated with respect to the project's consistency with the stated goals.

POLICY 2 FACILITATE THE SITING OF WATER-DEPENDENT USES AND FACILITIES ON OR ADJACENT TO COASTAL WATERS.

Determination: The Hashamomuck Cove project is water dependent, as it involves the construction of a storm risk reduction project, the design of which is dependent on tidal and wave influences. As the use of the project site will not change with construction,

existing facilities or services will be sufficient to support this project and the proposed activities are compatible with adjacent properties. The project may improve the overall environmental quality of the site over the long-term through reduced erosion and the potential use of the widened beach by rare species (e.g., piping plover). Construction of the project will not have a significant adverse impact to water quality or biota, however short term localized impacts to these resources are anticipated. It is therefore determined that this project is consistent with this policy.

POLICY 7 SIGNIFICANT COASTAL FISH AND WILDLIFE HABITATS WILL BE PROTECTED, PRESERVED, AND WHERE PRACTICAL, RESTORED SO AS TO MAINTAIN THEIR VIABILITY AS HABITATS.

Determination: The project site consists of beach, intertidal and subtidal areas along the southern shoreline of Long Island Sound, and is adjacent to residential and commercial development. The project area includes the three crescent beaches West, Central and East Coves. The project beach/shoreline has been regularly disturbed by various construction activities built to protect the shoreline, adjacent property, infrastructure and natural areas from erosion and storm damage.

The purpose of this project is to restore eroded coastal beach and berm habitat, and protect two commercial properties, plus the roadway and infrastructure, which is in direct accord with this policy. Filling and grading will be the major activities at the project site. It is estimated that the project will take approximately 7 to 10 months with construction of approximately 7.5 months. It is estimated that construction will begin in the late winter at the West Cove (Southold Town Beach) and proceed eastward until project completion.

This policy requires that a narrative for each significant habitat be provided to aid in consistency determination. The following is a narrative for the project site, noting the five required items.

(1) The project site is located along the shoreline of Long Island Sound at Hashamomuck Cove in Southold, New York. (2) Many different species of fish, birds, and other wildlife may utilize the project site and vicinity. These species are described in the existing conditions of the integrated feasibility report and environmental assessment accompanying this determination. (3) Filling and grading will be implemented and will impact the existing intertidal and subtidal habitat. Any construction related adverse impacts to terrestrial and aquatic species are expected to be minor and short term. 4) The results of the completed project are expected to be beneficial to both species and habitat functions of the site. Prevention of future erosion will decrease potential threats to property, human safety and natural areas. 5) Existing conditions, including the fish and wildlife communities, tidal patterns, and human use patterns at the project sites were observed, and assessed and incorporated into the selection process of the recommended plan.

The selected plan will not have significant adverse impacts to species within the project area. Turbidity and activity from construction activities will displace resident fish to localities elsewhere in Long Island Sound. The temporary impacts to fish and benthic organisms will be localized. Habitat would be temporarily affected during beach fill placement as elevated suspended sediment levels may impact visual feeding efficiency, and may also affect respiratory efficiency likely causing displacement of mobile individuals. Sessile benthic invertebrates will be buried or entrained and ultimately lost during construction. These areas will recover within a relatively short period of time. Placement activities will provide a certain level of benefit to those species able to feed on the organisms dispersed into the water column and exposed on the surface during construction activities.

According to an on-going monitoring program, piping plovers, a federally threatened species, nested at Southold Town Beach in 2004 but the habitat is currently rated as unsuitable due to the reduced width of the beach and anthropomorphic disturbances. The restored, enlarged beach area may be beneficial to this species. The existing monitoring program in the West Cove will be expanded to include the Central and East Cove to assure protection of the species. Initial placement of sand will not affect piping plover since the beach is currently unsuitable however, subsequent renourishment will be conducted outside the piping plover nesting season (April 1 – August 31). This project is compatible with this policy.

POLICY 9 EXPAND RECREATIONAL USE OF FISH AND WILDLIFE RESOURCES IN COASTAL AREAS BY INCREASING ACCESS TO EXISTING RESOURCES, SUPPLEMENTING EXISTING STOCKS, AND DEVELOPING NEW RESOURCES.

Determination: Construction of the project will augment the use of the project site as a water oriented community resource and expand recreational use and access as well as enhance the habitat of the project site, promoting productivity and use by various aquatic and terrestrial species. The West Cove includes the Town Beach and will benefit from the addition of beach fill; the Central and East Coves (currently privately owned) will also be available for public use following project construction. The post-construction project will support the use of the site as a water oriented recreational area which includes fishing and boating, as well as non consumptive activities such as swimming, walking, sun bathing and wildlife/ bird watching. The project is consistent with this policy.

POLICY 11 BUILDINGS AND OTHER STRUCTURES WILL BE SITED IN THE COASTAL AREA SO AS TO MINIMIZE DAMAGE TO PROPERTY AND THE ENDANGERING OF HUMAN LIVES CAUSED BY FLOODING AND EROSION.

Determination: There are no structures to be constructed as part of this project. The project involves only beach fill. The increase in the area of beach will serve to protect adjacent property and decrease hazards to humans by helping to decrease erosion

damage caused by storm surge and waves and threats to human life by protecting the roadway and infrastructure. The project is consistent with this policy.

POLICY 12 ACTIVITIES OR DEVELOPMENT IN THE COASTAL AREA WILL BE UNDERTAKEN SO AS TO MINIMIZE DAMAGE TO NATURAL RESOURCES AND PROPERTY FROM FLOODING AND EROSION BY PROTECTING NATURAL PROTECTIVE FEATURES INCLUDING BEACHES, DUNES, BARRIER ISLANDS AND BLUFFS.

Determination: The purpose of constructing this project is to restore natural barriers (beach) such that these restored features once again provide inherent levels of protection to inland habitats and residential properties from erosion. Construction of the project will help to maintain the coastal area. While portions of the Hashamomuck Cove project area are located within the 100 foot buffer zone for state-regulated freshwater wetlands and within the one half mile buffer zone of designated Significant Natural Communities, the current erosion rate for the project area of 1-2 feet per year will have no impact on these inland natural habitats within the 50 year life of the project.

Temporary impacts to both terrestrial and aquatic habitats and associated biota are anticipated with full recovery within one to two years. The project is consistent with this policy.

POLICY 13 THE CONSTRUCTION OR RECONSTRUCTION OF EROSION PROTECTION STRUCTURES SHALL BE UNDERTAKEN ONLY IF THEY HAVE A REASONABLE PROBABILITY OF CONTROLLING EROSION FOR AT LEAST THIRTY YEARS AS DEMONSTRATED IN DESIGN AND CONSTRUCTION STANDARDS AND/OR ASSURED MAINTENANCE OR REPLACEMENT PROGRAMS.

Determination: The project has an engineered period of analysis of 50 years and provides for regular project renourishment estimated to occur approximately every 10 years (range 5 to 10 years) during that lifetime depending on severity of coastal storms to ensure effectiveness. The project is consistent with this policy.

POLICY 14 ACTIVITIES AND DEVELOPMENT, INCLUDING THE CONSTRUCTION OR RECONSTRUCTION OF EROSION PROTECTION STRUCTURES, SHALL BE UNDERTAKEN SO THAT THERE WILL BE NO MEASURABLE INCREASE IN EROSION OR FLOODING AT THE SITE OF SUCH ACTIVITIES OR DEVELOPMENT, OR AT OTHER LOCATIONS.

Determination: The erosion protection structures have been designed to prevent/minimize erosion and flooding at the project site and construction/existence of this project will not increase flooding or erosion at the project site or at any other areas at other locations. This project is consistent with this policy.

POLICY 16 PUBLIC FUNDS SHALL ONLY BE USED FOR EROSION PROTECTIVE STRUCTURES WHERE NECESSARY TO PROTECT HUMAN LIFE, AND NEW DEVELOPMENT WHICH REQUIRES A LOCATION WITHIN OR ADJACENT TO AN EROSION HAZARD AREA TO BE ABLE TO FUNCTION, OR EXISTING DEVELOPMENT; AND ONLY WHERE THE PUBLIC BENEFITS OUTWEIGH THE LONG TERM MONETARY AND OTHER COSTS INCLUDING THE POTENTIAL FOR INCREASING EROSION AND ADVERSE EFFECTS ON NATURAL PROTECTIVE FEATURES.

Determination: The erosion protection project is necessary to support protection of essential infrastructure, residences, coastal features and habitats located adjacent to the Long Island Sound. Without the beach fill it is expected that the current rates of erosion will continue to cause significant damage to vital roadways and property and includes serious threats to human safety. The public benefits outweigh the costs in that there will be a significant reduction in the potential threat to human life and property by permitting continued access and egress to and from Orient Point by the residents as well as emergency and public service vehicles. This project is consistent with this policy.

POLICY 17 NON-STRUCTURAL MEASURES TO MINIMIZE DAMAGE TO NATURAL RESOURCES AND PROPERTY FROM FLOODING AND EROSION SHALL BE USED WHENEVER POSSIBLE.

Determination: Non-structural measures evaluated as part of the project included Elevating Buildings, Relocations and Buyouts. Building elevation would raise the buildings at risk by placing them on piles which is a relatively low cost measure and does not alter the natural processes of sand movement. While the pilings would reduce the damages from storm flooding, it is a temporary solution as the shoreline continues to erode and therefore, was not considered a viable measure. The relocation of roads and structures was also not a viable measure as the amount of buildable land along the shoreline is limited and cost for land is very expensive.

Under the Buyout alternative, properties at high risk of damage were evaluated for removal from the coastal hazard area. USACE appraised the properties by valuing a universe of properties (eighty parcels) as of 16 November 2015 based on recent sales data within the Southold, New York area. While this alternative does not alter the natural processes of sand movement, there would continue to be a loss of shorefront land under this measure and this alternative would not be protective of the Town Beach or County Road 48. In addition, the cost analysis showed the annual net benefits for this alternative to be negative and therefore, this alternative was not considered to be viable.

The selected shore protection project consists of beach fill, which is a structural measure, but considered a soft structural measure. This alternative provides the highest level of protection while minimizing adverse environmental impacts. The

alternative analysis determine that non-structural measures were not feasible for this project and therefore, this project is consistent with this policy.

POLICY 19 PROTECT, MAINTAIN, AND INCREASE THE LEVEL AND TYPES OF ACCESS TO PUBLIC WATER-RELATED RECREATION RESOURCES AND FACILITIES.
Determination: The project is restoration of beach and berm. Restoring the beach to increase storm and erosion protection also creates an expanded area for recreational activities. A portion of the West Cove is the Town Beach and will have 25' of berm added as well as beach fill. The Central and East Cove (currently privately owned) will be available for public use following construction. This project is consistent with this policy.

POLICY 20 ACCESS TO THE PUBLICLY-OWNED FORESHORE AND TO LANDS IMMEDIATELY ADJACENT TO THE FORESHORE OR THE WATER'S EDGE THAT ARE PUBLICLY-OWNED SHALL BE PROVIDED AND IT SHALL BE PROVIDED IN A MANNER COMPATIBLE WITH ADJOINING USES.
Determination: Where best suited, public access accommodations will be provided in a manner compatible with adjoining uses. Access to publicly owned lands will be safeguarded. This project is consistent with this policy.

POLICY 21 WATER-DEPENDENT AND WATER-ENHANCED RECREATION WILL BE ENCOURAGED AND FACILITATED, AND WILL BE GIVEN PRIORITY OVER NON-WATER-RELATED USES ALONG THE COAST.
Determination: The project will restore the beach and protect and enhance access to it. Water related recreational use is consistent with the project's purpose of preserving, enhancing, and restoring coastal resources. No boat launching facilities are located within project sites, however kayaks and canoes can access the water from the site and restoration of the beach will enhance this activity. No accepted water related uses are expected to be adversely affected. The project is consistent with this policy.

POLICY 22 DEVELOPMENT, WHEN LOCATED ADJACENT TO THE SHORE, WILL PROVIDE FOR WATER-RELATED RECREATION, WHENEVER SUCH USE IS COMPATIBLE WITH REASONABLY ANTICIPATED DEMAND FOR SUCH ACTIVITIES, AND IS COMPATIBLE WITH THE PRIMARY PURPOSE OF THE DEVELOPMENT.
Determination: The project may be considered "development" of the shoreline and in doing so provides for active and passive water-related recreational use of the site which is compatible with the project's purpose. The project is consistent with this policy.

POLICY 25 PROTECT, RESTORE OR ENHANCE NATURAL AND MAN-MADE RESOURCES WHICH ARE NOT IDENTIFIED AS BEING OF STATEWIDE SIGNIFICANCE, BUT WHICH CONTRIBUTE TO THE OVERALL SCENIC QUALITY OF THE COASTAL AREA.
Determination: The project will preserve and restore shorefront beach habitat, enhancing a highly eroded area that includes sections of damaged bulkhead, seawalls and groins. The scenic coastal environment of Hashamomuck Cove is important to all

who reside or visit there. Its restoration and protection maintains this essential natural resource. The project will enhance and maintain these scenic resources of this section of Long Island Sound shoreline. This project is consistent with this policy.

POLICY 30 MUNICIPAL, INDUSTRIAL, AND COMMERCIAL DISCHARGE OF POLLUTANTS, INCLUDING BUT NOT LIMITED TO, TOXIC AND HAZARDOUS SUBSTANCES, INTO COASTAL WATERS WILL CONFORM TO STATE AND NATIONAL WATER QUALITY STANDARDS.

Determination: Pollutant discharge is not anticipated as a result of this project. Best management practices including an environmental protection plan regarding construction equipment, fueling sources etc will be implemented to prevent leakage, spills and contaminations etc. The District has prepared an Environmental Assessment that contains the appropriate analysis and regulatory documentation as required by NEPA including a NY state water quality certificate, an HTRW report/investigation and Clean Air Act State Implementation Plan. No significant discharges of HTRW are anticipated via this project. Therefore the project is consistent with this policy.

POLICY 35 DREDGING AND FILLING IN COASTAL WATERS AND DISPOSAL OF DREDGED MATERIAL WILL BE UNDERTAKEN IN A MANNER THAT MEETS EXISTING STATE PERMIT REQUIREMENTS AND PROTECTS SIGNIFICANT FISH AND WILDLIFE HABITATS, SCENIC RESOURCES, NATURAL PROTECTIVE FEATURES, IMPORTANT AGRICULTURAL LANDS, AND WETLANDS.

Determination: The Hashamomuck Cove project consists of beach fill which will cover areas of the intertidal and subtidal zone. These operations will temporarily impact fish and wildlife and their habitats, localized to the immediate project site and vicinity. All construction actions will be in compliance with state and federal regulations including NEPA and NYSDEC permit conditions. This includes clean, compatible sand to be used as fill and as needed, best management plans to minimize all impacts to significant habitats, flora, fauna, scenic resources and protective features. All construction related adverse impacts are expected to be localized and short term, and full recovery to preconstruction conditions is expected. The project is consistent with this policy.

POLICY 38 THE QUALITY AND QUANTITY OF SURFACE WATER AND GROUNDWATER SUPPLIES WILL BE CONSERVED AND PROTECTED, PARTICULARLY WHERE SUCH WATERS CONSTITUTE THE PRIMARY OR SOLE SOURCE OF WATER SUPPLY.

Determination: The project will not impact ground water. Surface waters do not constitute primary or sole source water supplies. However Long Island Sound surface waters will be temporarily affected on a localized scale by construction measures. Sand fill will not significantly impact any surface water or ground water resources in the long term. Impacts such as localized increases in turbidity will be minimized by strictly adhering to all best management practices such as maximizing construction actions during low tide. These impacts created by construction of the project are similar to

those naturally occurring through coastal storms and in fact are of a much smaller magnitude because they are so localized. The project is consistent with this policy.

POLICY 41 LAND USE OR DEVELOPMENT IN THE COASTAL AREA WILL NOT CAUSE NATIONAL OR STATE AIR QUALITY STANDARDS TO BE VIOLATED.

Determination: No State Air Quality Standards will be violated with the construction of this project. Final emissions calculations will be computed when the construction plans are finalized. However, due to the fact that Suffolk County NY is a severe non-attainment area there is no anticipated exceedence of deminimus trigger levels from any of the controlled pollutants. With the final emissions, construction plans will be coordinated with the State and configured so as not to violate State Laws. There are no long-term emissions expected from this project. The project is consistent with this policy.

POLICY 44 PRESERVE AND PROTECT TIDAL AND FRESHWATER WETLANDS AND PRESERVE THE BENEFITS DERIVED FROM THESE AREAS.

Determination: Construction of the project will be conducted in such a way using best management practices to minimize impacts to coastal resources during construction. These practices will include restrictive, protective covenants for storage of equipment and fuel together with regulations preventing damage to wetlands by vehicle activity, runoff from the project site or any other kind of contaminant or pollutant input. While portions of the Hashamomuck Cove project area are located within the 100 foot buffer zone for state-regulated freshwater wetlands and within the one half mile buffer zone of designated Significant Natural Communities, the current erosion rate for the project area of 1-2 feet per year will have no impact on these inland natural habitats within the 50 year life of the project. The project is consistent with this policy.

TOWN OF SOUTHOLD, NEW YORK LOCAL WATERFRONT REVITALIZATION POLICIES

Project: Town of Southold, New York, Hashamomuck Cove Coastal Storm Damage Reduction Project.

The proposed plan for Hashamomuck Cove includes the placement of fill material at the West, Central, and East Coves to rebuild the beaches with a 25’ to 75’ wide berm and beachfill. The source of the initial sand for the beach fill will be from an upland off-site source. Periodic renourishment is anticipated to be approximately every 10 years (range 5 to 10 years) over the 50 year period of analysis to maintain the project design profile. It is anticipated that renourishment sand be trucked in from a certified upland source. The West Cove will involve 164,000 square feet (SF) of intertidal disturbance and 69,000 (SF) of subtidal disturbance; the Central Cove will have 149,000 SF of intertidal disturbance and 249,000 SF of subtidal disturbance; and the East Cove will result in 151,000 SF of intertidal disturbance and 198,000 SF of subtidal disturbance.

Applicant: U.S. Army Corps of Engineers, New York District.

Applicable Policies: Based on a review of the Town of Southold, New York Local Waterfront Revitalization Policies (LWRP), 11 policies and their sub-policies were found to be applicable to the proposed project. These policies are listed below.

Consistency Determination: All of the applicable policies were evaluated with respect to the Project's consistency with their stated goals. The Project has been found to be consistent with each policy and the proposal will be conducted in a manner consistent to the maximum extent practicable with the LWRP. Only the policies applicable to this project are presented here.

Policy 1: Foster a pattern of development in the Town of Southold area that enhances community character, preserves open space, makes efficient use of infrastructure, makes beneficial use of a coastal location, and minimizes diverse effects of development.

Determination: The project will serve to stabilize the existing infrastructure including protection of residential property within the community of Hashamomuck Cove. Without the beach fill at West, Central, and East Coves, the erosion will continue to cause accelerated land losses, which would increase the risk of damage to nearby residences and reduce community character, open space and recreational use of the beach. The preferred project alternative will protect existing homes and the essential roadway and utilities. The proposed alternative will decrease beach/berm erosion and help rebuild the beach, maintain the natural areas including the beach and recreational open space. By restoring the beach the project will also enhance the aesthetics of the site. The project will incorporate Best Management Practices during all phases of construction minimizing any impacts related to redevelopment. Also, the completed project will significantly decrease erosion and buffer impacts from episodic storms etc. and resulting loss of natural resources and possibly residences, commercial structures and the roadway. Therefore, the project is consistent with this policy.

Policy 2: Preserve historic resources of the Town of Southold.

2.1 Maximize preservation and retention of historic resources

D. ***Avoid potential adverse impacts of new development on nearby historic resources.***
Determination: The project will be using beach fill on an existing beach to minimize erosion and widen an existing beach to protect residences, two commercial structures and the roadway. The area is already highly developed. There are no historic resources in the vicinity of the project area. Thus the project is consistent with this sub-policy.

2.3 Protect and enhance resources that are significant to the coastal culture of the Long Island Sound.

C. ***Where present, protect underwater historic, archaeological and cultural resources.***

Determination: The project area is a highly dynamic area that is subject to wave action and erosion. The area possesses no sensitivity for historic, archaeological or cultural resources. The project is consistent with this sub-policy.

Policy 3: Enhance visual quality and protect scenic resources throughout the Town of Southold.

3.1 Enhance visual quality and protect scenic resources throughout the Town of Southold.

H.*Protect the visual interest provided by active water-dependent uses.*
Determination: The eroding beaches and failing bulkheads have impaired the visual quality of the project area by active water-dependent users. The proposed project will improve the visual interest of the shore front as a wide beach is generally perceived as scenic by the public. The project is consistent with this sub-policy.

K. *Protect visual quality associated with agricultural land, open space and natural resources.*
Determination: The proposed alternative will decrease beach erosion and help rebuild the beach, maintain the natural area (e.g., the beach) and recreational open space. By restoring the beach, the project will also enhance the aesthetics of the site. The project is consistent with this sub-policy.

Policy 4 Minimize loss of life, structures and natural resources from flooding and erosion.

4.1 *Minimize losses of human life and structures from flooding and erosion hazards*.
Determination: The project provides erosion protection from storm events and waves to residences and utilities and infrastructure. The chosen alternative will provide the best level of protection for citizens and property while minimizing adverse environmental impacts. Thus the project complies with this sub-policy.

C. *Enhance existing natural protective features and processes, and use non-structural measures which have a reasonable probability of managing erosion.*
Determination: Non-structural measures evaluated as part of the project included Elevating Buildings, Relocations and Buyouts. These non-structure measures were determined to be infeasible (see Policy 17 for additional information). The selected shore protection project consists of beach fill, which is a structural measure, but considered a soft structural measure. This alternative provides the highest level of protection while minimizing adverse environmental impacts. The alternative analysis determine that non-structural measures were not feasible for this project and therefore, this project is consistent with this sub-policy.

4.2 Preserve and restore natural protective features.
Determination: The preferred alternative provides beach fill to help maintain a protective beach buffer. Periodic renourishment will maintain the beach and project property and infrastructure over the 50 year life of the project. Thus, the project is consistent with this sub-policy.

B. ***Maximize the protective capabilities of natural protective features by:***
Determination: The West, Central, and East Coves of the Hashamomuck Cove protection project will be enhanced by restoring the condition of impaired natural protective features by placing a berm and beach fill. Thus the project is consistent with this sub-policy.

4.5 Ensure that expenditure of public funds for flooding and erosion control projects results in a public benefit.
Determination: Implementation of the preferred alternative will protect an essential roadway and protect public utilities including emergency services. The project will also greatly improve the beach aesthetics and recreational functionality. Public access to the Central and East Coves will be available post-construction. Therefore this project is consistent with this sub-policy.

4.6 The siting and design of projects involving substantial public expenditure should factor in the trend of rising sea levels.
Determination: The project as formulated has a 50-year period of analysis and is designed to accommodate expected sea level rise. Therefore, the project is consistent with this sub-policy.

Policy 5: **Protect and improve water quality and supply in the Town of Southold.**

5.1 Prohibit direct or indirect discharges, which would cause or contribute to contravention of water quality standards.
Determination: Project construction processes, including storage and fueling procedures, will utilize agency mediated regulatory guidelines and Best Management Practices to minimize the potential for spills or exposure to any potential contaminants or other hazardous materials. The completed project will reduce erosion thus decreasing the input of surface or soil related pollutants or fine sediment material known to degrade near shore areas. The preferred alternative supports this policy.

5.2 Minimize non-point pollution of coastal waters and manage activities causing non-point pollution.
Determination: An erosion control plan will be developed and implemented during construction to minimize sedimentation to the sound. Additionally, an oil spill, HTRW contingency plan will be prepared for the construction equipment. Therefore, the project is consistent with this sub-policy.

A. *Minimize non-point pollution of coastal waters using the following approaches, which are presented in order of priority.*
Determination: An erosion control plan will be developed and implemented during construction to minimize sedimentation to the sound. Stormwater runoff will be controlled and avoided through the implementation of an oil spill and HTRW contingency plan for the construction equipment. Natural hydrologic conditions will be preserved. Appropriate best management practices will be utilized as determined by site characteristics, design standards, operational conditions, and maintenance programs. The project is consistent with sub-policy.

5.3 Protect and enhance quality of coastal waters.
Determination: The preferred alternative supports this sub-policy by decreasing erosion thus minimizing the introduction of soils and potential contaminants into the Sound from surrounding properties, including the potential for inputs of toxic household material that might occur from storm damage to residences.

Policy 6: Protect and restore the quality and function of the Town of Southold ecosystem.

6.1 Protect and restore ecological quality throughout the Town of Southold.
Determination: The project will contribute to improvements of local water quality by reducing the potential of upland soil erosion and ensuing sedimentation within the shallow surface waters of the project area. Native vegetation will be planted along the upland edge of berm in appropriate areas to provide some habitat. Storm damage protection also decreases the potential for input of pollutants from developed areas into the Sound that could result from flooding/damage of residences. The project is consistent with this sub-policy.

A. *Avoid adverse changes to the Long Island Sound and the Peconic Bay ecosystems that would result from impairment of ecological quality as indicated by:*
Determination: The project will protect from degradation the ecological quality of Long Island Sound through a reduction of upland soil erosion, sedimentation, and possible contamination input of pollutants from developed areas into the Sound from the adjacent residences. The project is consistent with this sub-policy.

6.3 Protect and restore tidal and freshwater wetlands.
Determination: The selected alternative is not expected to have any long term impacts to freshwater or tidal wetland areas. Freshwater wetlands are too far from the project area to be impacted. The total area of sand fill (footprint of the berm) for the initial construction of the project was estimated to be 516,000 square feet (sf) (11.8 acres) for intertidal habitat and 464,000 sf (10.6 acres) for subtidal habitat. However, erosion and coastal processes will continue to change and re-shape the beach over time. In general, it is expected that the amount of intertidal habitat will remain similar to existing conditions (intertidal habitat will move seaward) while subtidal habitat in the project

will be reduced; the amount of which will vary over time depending on future conditions (e.g., slope of the beach, amount of erosion, etc.). This reduction in subtidal habitat is not considered significant in comparison to the quantity of similar habitat in the surrounding area. Therefore, the project is consistent with this sub-policy.

B. ***Comply with statutory and regulatory requirements of the State's wetland laws.***
Determination: Portions of the Hashamomuck Cove project area are located within the 100 foot buffer zone for state-regulated freshwater wetlands and within the one half-mile buffer zone of designated Significant Natural Communities and there will be some temporary impacts to tidal wetlands (see 6.3 for additional information). The local sponsor for the project will complete all applicable state and local wetland permitting as required by statue or regulation. The project is consistent with this sub-policy.

E. ***Maintain buffers to ensure that adverse effects of adjacent or nearby development are avoided.***
Determination: No permanent or unnecessary disturbance will occur within existing buffer zones. The project is consistent with this sub-policy.

F. ***Restore tidal wetlands and freshwater wetlands, wherever practical, to foster their continued existence as natural systems by:***
Determination: The construction of the berms and beach fill will restore a more natural beach that has been lost to erosion. There will be no impact to the adjacent Arshamomoque Preserve or freshwater wetlands. The project is consistent with this sub-policy.

6.4 Protect vulnerable fish, wildlife and plant species, and rare ecological communities.
Determination: The selected plan will not have significant adverse impacts to species within the project area. Turbidity and activity from construction activities will displace resident fish to localities elsewhere in the Sound. The temporary impacts to fish and benthic organisms will be localized. Habitat would be temporarily affected during beach fill placement, as elevated suspended sediment levels may impact visual feeding efficiency, and may also affect respiratory efficiency likely causing displacement of mobile individuals. Sessile benthic invertebrates will be buried or entrained and ultimately lost during construction. These areas will recover within a relatively short period of time. Placement activities will provide a certain level of benefit to those species able to feed on the organisms dispersed into the water column and exposed on the surface during construction activities.

There will be no impact to the adjacent Arshamomoque Preserve or freshwater wetlands. According to an on-going monitoring program, piping plovers, a federally threatened species, nested at Southold Town Beach in 2004 but the habitat is currently rated as unsuitable due to the reduced width of the beach and anthropomorphic disturbances. The restored, enlarged beach area may be beneficial to this species. The

existing monitoring program in the West Cove will be expanded to include the Central and East Cove to assure protection of the species. Initial placement of sand will not affect piping plover since the beach is currently unsuitable however, subsequent renourishment will be conducted outside the piping plover nesting season (April 1 – August 31). This project is compatible with this policy. This project is compatible with this sub-policy.

Policy 7: **Protect and improve air quality in the Long Island Sound coastal area.**

7.1 Control or abate existing and prevent new air pollution.
Determination: An air quality analysis will be completed for the project. Based upon the completed analysis, the emissions from the project are considered to have an insignificant impact on the regional air quality, and according to 40 CFR 93.153 (f) and (g) the proposed project is presumed to conform to the State Implementation Plan. This project is compatible with this sub-policy.

7.4 Limit sources of atmospheric deposition of pollutants to the Town of Southold, particularly from nitrogen sources.
Determination: An air quality analysis was completed for the project. Based upon the completed analysis, the emissions from the project are considered to have an insignificant impact on the regional air quality, and according to 40 CFR 93.153 (f) and (g) the proposed project is presumed to conform to the State Implementation Plan. See Policy 7.1. This project is compatible with this sub-policy.

Policy 8: Minimize environmental degradation in the Town of Southold from solid waste and hazardous substances and wastes

8.2 Manage hazardous wastes to protect public health and control pollution.
See Policy 5. All project/construction activities will be governed by an environmental protection plan and standard operating procedures (SOP). This project is compatible with this sub-policy.

8.3 Protect the environment from degradation due to toxic pollutants and substances hazardous to the environment and public health. The environmental protection plan will have contingencies to cover any potential contamination contingencies as well as best management plans to minimize potential hazards, spills etc. This project is compatible with this sub-policy.

8.4 Prevent and remediate discharge of petroleum products.
Determination: An oil spill prevention plan outlining precautionary measures to be taken during construction and rapid responsiveness strategies should an accidental oil spill occur will be developed. Petroleum spills and clean up strategies will developed for the project and located in the Hazardous material plan. This project is compatible with this sub-policy.

8.5 Transport solid waste and hazardous substances and waste in a manner which protects the safety, well-being, and general welfare of the public; the environmental resources of the state; and the continued use of transportation facilities.
Determination: All hazardous materials will be regulated under the project HTRW guidelines and Best Management practices developed in the project SOP. This project is compatible with this sub-policy.

Policy 9*:* Provide for public access to, and recreation use of, coastal waters, public lands, and public resources of the Town of Southold.

9.1 Promote appropriate and adequate physical public access and recreation to coastal resources.
Determination: The Hashamomuck Cove project will prevent the ongoing erosion and expand the physical public area for recreation. . Public access to the project area is required by USACE public access requirements which are identified in ER 1165-2-130, and based upon U.S.C 426e(d). The Central and East Coves will be available for public use after construction. The USACE policy requires public access points every one half mile, so that a visitor is never more than a quarter mile away from an access point while on the beach. The public access plan would identify locations for shore perpendicular access points to the beach along 1.6 mile project area at approximately ½ mile intervals. The access plan would also identify the proposed parking that would be included across the project area. The project is consistent with this sub-policy

9.2 Protect and provide public visual access to coastal lands and waters from public sites and transportation routes where physically practical.

Determination: County Road is at 10 to 12 ft. NAVD88 and the proposed berm is at 6 ft. NAVD88, thus visual access to the shoreline from County Road will not be impacted.

9.4 Assure public access to public trust lands and navigable waters.

Determination: The tentatively selected plan (TSP) includes the requirement that a Public Access plan be developed and implemented by the non-Federal sponsor. The TSP does not require walkovers as the public would be allowed to walk on the berm. Access would be available at the Town Beach and at two additional locations to be developed by the non-Federal sponsor. The project is compatible with this sub-policy.

Policy 10*:* Protect Southold's water-dependent uses and promote siting of new water-dependent uses in suitable locations.

10.1(a) Protect existing water dependent uses.

Determination: The rebuilding and stabilizing of Hashamomuck Cove will protect/preserve all water dependent uses generally associated with the utilization of a residential recreational beach. The project is compatible with this sub-policy.

Policy 11 Promote sustainable use of living marine resources in Long Island Sound, the Peconic Estuary and Town waters

11.2 Provide for commercial and recreational use of the Town of Southold's finfish, shellfish, crustaceans and marine plants.

Determination: The rebuilding of the West Cove, Central Cove, and East Cove beaches with berm and beach fill of the Hashamomuck Cove project will cause temporary localized impacts to the benthic and finfish communities of the placement sites. The nearshore/intertidal/subtidal communities are anticipated to recover within 1 year. Once re-colonization has begun at the intertidal, subtidal, and nearshore areas, the overall diversity of the benthic community and of the finfish will increase. The restored beach will offer enhanced access to shoreline fishing under safer conditions promoting and enhancing recreational (surf) fishing. The project is compatible with this sub-policy.

11.4 Promote recreational use of marine resources.

Determination: The rebuilding and expansion of the Hashamomuck Cove project area will provide enhanced recreation opportunities and promote utilization of the beach for a variety of recreational activities including passive activities as sunbathing/walking, better and safer access to waterside activities such as fishing swimming, and personal watercraft usage (kayaks, canoes etc). The project is compatible with this sub-policy.

Hashamomuck Cove
Southold, New York
Coastal Storm Risk Management
Integrated Feasibility Study/EA

Draft Appendix A4
Environmental Documentation
United States Fish and Wildlife Service (USFWS)

1. USFWS-Planning Aid Letter

2. USFWS-Federal Coordination Act Report in progress, not included

United States Department of the Interior

FISH AND WILDLIFE SERVICE
3817 Luker Road
Cortland, NY 13045

August 13, 2015

Colonel David A. Caldwell
District Engineer, New York District
U.S. Army Corps of Engineers
26 Federal Plaza, Rm. 2109
New York, NY 10278-0090

Attention: Peter M. Weppler, Chief, Environmental Analysis Branch

Subject: Hashamomuck Cove, New York Coastal Storm Risk Management Feasibility Study, U.S. Fish and Wildlife Service Planning Aid Letter

Dear Colonel Caldwell:

This letter transmits the U.S. Fish and Wildlife Service's (Service) Planning Aid Letter (PAL) for the U.S. Army Corps of Engineers' (Corps) feasibility study entitled, "Hashamomuck Cove, Southold, New York Feasibility Study," (Project) for the north shore of Long Island within the incorporated Town of Southold, New York (NY). This report was developed in support of the Service's Fish and Wildlife Coordination Act (FWCA) responsibilities (48 Stat. 401, as amended; 16 U.S.C. 661 *et seq.*) in reviewing Corps' water resources development projects. This report does not constitute the report of the Secretary of Interior as required by section 2(b) of the FWCA.

In March of 2014, the Service received the Corps' initial request for a project PAL. In a June 2015 correspondence, the Corps indicated that appropriate project alternatives had not yet been completed. At that time, the Corps suggested the Service defer issuance of the PAL citing lack of plan development. In August of 2015, the Corps requested the Service prepare an abbreviated PAL, primarily for use in a status meeting related to the project's Environmental Assessment. This document represents the Services' response to the Corps' most recent request and only includes summary information, as requested by the Corps, regarding fish and wildlife resources within the Study Area (defined below). A subsequent Planning Aid Report (PAR) and FWCA 2(b) Report will be prepared as details of the feasibility study are finalized.

Introduction

Identification of Purpose, Scope, and Authority

The Corps' is preparing a Feasibility Study to investigate Coastal Storm Risk Management project alternatives for the Hashamomuck Cove Study Area (Study Area) within the Town of Southold, NY. The FWCA provides for the equal and integrated consideration of fish and wildlife conservation needs, and requires coordinated planning with other features of federal water resource development proposals. Pursuant to our authorities and shared responsibilities under the FWCA, the Service has prepared this PAL for the Corps' use and consideration in this phase of the Feasibility Study. As such, the PAL briefly summarizes and characterizes the existing environment, and identifies important fish and wildlife resources, including rare and declining habitats within the Study Area. The PAL will assist the Corps and the Service in better understanding the baseline environmental conditions within the Study Area.

The Study Area is located within the Town of Southold, Suffolk County, NY. The easternmost section of the Study Area is situated near Soundview Road and adjacent to Southold Town Beach and extends westerly for approximately 1.5 miles. The Study Area also includes Hashamomuck Cove, Southold Cove, Pebble Beach Cove, and is bordered by Long Island Sound to the north (U.S. Army Corps of Engineers 2014).

The Study Area is affected by both nor'easters and tropical storms. Storm driven surge and waves cause beach and bluff erosion and flooding. Erosion during storms results in the loss of land, damage to homes, businesses, and roads. The properties, utilities, and County Road 48 are most susceptible to damage within the concave portions of the above mentioned coves. In 2012, Hurricane Sandy impacted the Town of Southold with a storm surge of about 6 feet (ft) and flooding of low-laying areas (U.S. Army Corps of Engineers 2014).

Description of Study Area

Climate, Topography, and Ecology

The Township of Southold occupies the eastern 20 miles (mi.) of Long Island's northern peninsula and includes Robins, Plum, Great Gull, Little Gull, and Fishers Islands. Because of the Towns insular nature, its latitude, and the proximity of the Atlantic Ocean, Southold has a predominantly temperate marine climate. Temperatures are moderate, and precipitation is abundant during the fall, winter, and spring. Peninsular Southold is naturally subdivided by saltwater ponds, marshes, and inlets into six separate morphologic and hydrologic areas. Although the shoreline is generally smooth and regular, erosion by wave action and storm tides has created steep bluffs along the Long Island Sound waterfront. A ridgeline feature is present along most of the shoreline and is commonly 50 ft above sea level, reaching a maximum of slightly over 160 ft above sea level (U.S. Geological Survey 1964).

Freshwater wetlands are scattered throughout the Town of Southold. The largest concentration of freshwater wetlands, the Arshamomaque Preserve wetland complex, is located between Hashamomuck Pond and Chapel Lane. In March of 1987, the New York State Department of

State designated Hashamomuck Pond as a Significant Coastal Fish and Wildlife Habitat (New York State Department of State 2005). Hashamomuck Pond is located west of Conklin Point emptying through Mill Creek into Shelter Island Sound in the Town of Southold. There is moderate to high density residential development on the north and northwest sides of the pond and marina development at the mouth of Mill Creek. The southwest side of the pond remains largely undeveloped, and a large parcel on the eastern side of the pond has been preserved (New York State Department of Environmental Conservation 2002). See enclosed Figure 1 for a regional map of the Study Area.

Fish and Wildlife Resources within the Study Area

Trust Resources

The Service has legal responsibility for the welfare of Federal trust resources including migratory birds, anadromous fish, endangered animals and plants occurring in the United States, and Federal wildlife refuges. The Service has statutory authority and responsibility for enforcing the FWCA, the Endangered Species Act (ESA) of 1973, as amended (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.)*, the Migratory Bird Treaty Act (MBTA) of 1918 (16 U.S.C. 703–712), and the Bald and Golden Eagle Protection Act of 1940 (16 U.S.C. 668-668c). The following section discusses trust resources that may occur within the Study Area.

Federally-listed Threatened and Endangered Species

The piping plover (*Charadrius melodus;* threatened) is a small species of shorebird which breeds in the northeastern Atlantic coast. Plovers nest above the high tide line on coastal beaches, sand flats at the ends of sandspits and barrier islands, gently sloping fore dunes, blowout areas behind primary dunes, sparsely vegetated dunes, and wash over areas cut into or between dunes. Feeding areas include intertidal portions of ocean beaches, wash over areas, mudflats, sandflats, wrack lines, and shorelines of coastal ponds, lagoons, or salt marshes (U.S. Fish and Wildlife Service 1996). Plover broods prefer ephemeral pools and bay tidal flats over other habitat types due to higher arthropod abundance and relatively increased availability of escape cover (Elias *et al.* 2000). Breeding plovers on the Atlantic Coast are generally found at accreting ends of barrier islands, along sandy peninsulas, and near coastal inlets (U.S. Fish and Wildlife Service 1996). The Study Area's Long Island Sound coastline may support suitable nesting and foraging piping plover habitat.

The northern long-eared bat (*Myotis septentrionalis;* threatened) is a medium-sized bat found across much of the eastern and northcentral United States. White-nose syndrome is responsible for much of the species' recent population decline. Northern long-eared bat typically winters in caves and abandoned mines. There are approximately 90 hibernacula known to occur across the state (U.S. Fish and Wildlife Service 2015). During the summer months, northern long-eared bats roost in under loose bark, in cracks, crevices, and cavities within a variety of tree species. Other roosting habitat includes human made structures such as buildings, utility poles, and barns (U.S. Fish and Wildlife Service 2015). Within the Study Area, forested uplands may support summer roosting habitat for northern long-eared bat.

Migratory Birds

The primary statutory authority for *Birds of Conservation Concern 2008* (U.S. Fish and Wildlife Service 2008) is the Fish and Wildlife Conservation Act of 1980, as amended; other authorities include the Fish and Wildlife Act of 1956 (16 U.S.C. 742a–j), the ESA, and the MBTA. The BCC birds presented in Table 1of this PAL are protected under the MBTA, which prohibits the taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, and nests, except when specifically authorized by the Service. The word "take" is defined as "to pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to pursue, hunt, shoot, wound, kill, trap, capture, or collect." Unauthorized taking of birds is a violation of the MBTA. Neither the MBTA nor its implementing regulations, 50 CFR Part 21, provide for permitting of "incidental take" of migratory birds. Bald and golden eagles are afforded additional legal protection under the Bald and Golden Eagle Protection Act (16 U.S.C. 668-668d). We recommend that these lists be consulted in accordance with Executive Order 13186, "Responsibilities of Federal Agencies to Protect Migratory Birds."

Table 1.0 - BCR 30 (New England/Mid-Atlantic Coast) *BCC 2008* list: (a) ESA candidate, (b) ESA delisted, (c) non-listed subspecies or population of Threatened or Endangered species, (d) MBTA protection uncertain or lacking, (nb) non-breeding in this BCR.

Common Name	Scientific Name	Status	Common Name	Scientific Name	Status
Red-throated Loon		(nb)	Rusty Blackbird		(nb)
Pied-billed Grebe			Purple Sandpiper		(nb)
Horned Grebe		(nb)	Least Tern		(c)
American Bittern			Gull-billed Tern		
Least Bittern			Black Skimmer		
Snowy Egret			Short-eared Owl		(nb)
Bald Eagle		(b)	Whip-poor-will		
Peregrine Falcon		(b)	Red-headed Woodpecker		
Black Rail			Loggerhead Shrike		
Wilson's Plover			Brown-headed Nuthatch		
American Oystercatcher			Sedge Wren		
Solitary Sandpiper		(nb)	Wood Thrush		
Lesser Yellowlegs		(nb)	Blue-winged Warbler		
Upland Sandpiper			Golden-winged Warbler		
Whimbrel		(nb)	Prairie Warbler		
Hudsonian Godwit		(nb)	Cerulean Warbler		
Marbled Godwit		(nb)	Worm-eating Warbler		
Red Knot		(nb, a)	Kentucky Warbler		
Semipalmated Sandpiper		(nb)	Henslow's Sparrow		
Buff-breasted Sandpiper		(nb)	Nelson's Sharp-tailed Sparrow		
Short-billed Dowitcher		(nb)	Saltmarsh Sharp-tailed Sparrow		
Seaside Sparrow		(c)			

Wetlands

The Service defines wetlands as transitional lands between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered by shallow water. Intertidal and shallow subtidal habitats, such as those described above, provide a suite of ecosystem services, including primary production, provision of fish and shellfish habitat and nursery areas, biogeochemical cycling of nutrients, carbon sequestration, sediment trapping, and wave attenuation (Currin *et al.* 2010). According to the National Wetlands Inventory, the following wetland habitat types occur within the Study Area: estuarine and marine wetlands, estuarine and

marine deepwater, freshwater emergent wetland, freshwater pond, and freshwater forested/shrub wetland. See enclosed Figure 2 for a regional map of wetland habitats within the Study Area

Conclusion

The Service appreciates the opportunity to coordinate with the Corps on this study. As discussed above, a subsequent PAR and FWCA 2(b) Report will be prepared following the development of the feasibility study. If you have any questions or require additional information, please contact Mr. Chris Allen of the Long Island Field Office at (631) 286-0485.

Sincerely,

ACTING FOR David A. Stilwell
Field Supervisor

Literature Cited

Currin, C. A., Chappell, W.S., and A. Deaton. 2010. "Developing Alternative Shoreline Armoring Strategies: the Living Shoreline Approach in North Carolina." H. Shipman, M.N. Deithier, G. Gelfenbaum, K.L. Fresh, RS Dinicola, eds. (2010): 91-102.

Elias, S.P., Fraser, J.D., and P.A. Buckley. 2000. Piping Plover Brood Foraging Ecology on New York Barrier Islands. *The Journal of Wildlife Management* (2000): 346-354

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U.S. Fish and Wildlife Service. 2015. Endangered and Threatened Wildlife and Plants; Threatened Species Status for the Northern Long-Eared Bat With 4(d) Rule; Final Rule and Interim Rule. *Federal Register* (80), No. 63.

_____. 2008. Birds of Conservation Concern 2008. United States Department of Interior, Fish and Wildlife Service, Division of Migratory Bird Management, Arlington, VA. 85 pp. [Available online at http://www.fws.gov/migratorybirds/pdf/grants/BirdsofConservationConcern2008.pdf]

_____. 1996. Piping Plover (*Charadrius melodus*), Atlantic Coast Population, Revised Recovery Plan. Hadley, Massachusetts. 258 pp.

U.S. Geological Survey. 1964. Geology and Ground Water Resources of the Town of Southold, Suffolk County, New York. Geological Survey Water-Supply Paper 1619-GG.

Enclosures

cc: NYSDEC, Stony Brook, NY (R. Marsh)

Figure 1 – Hashamomuck Cove Study Area Boundary.

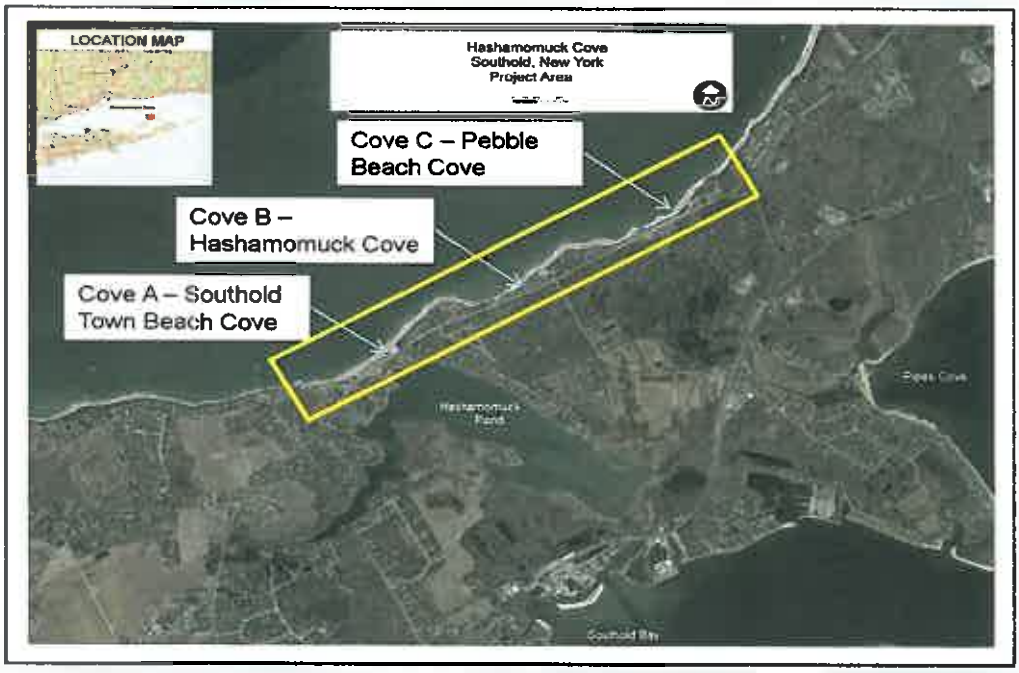
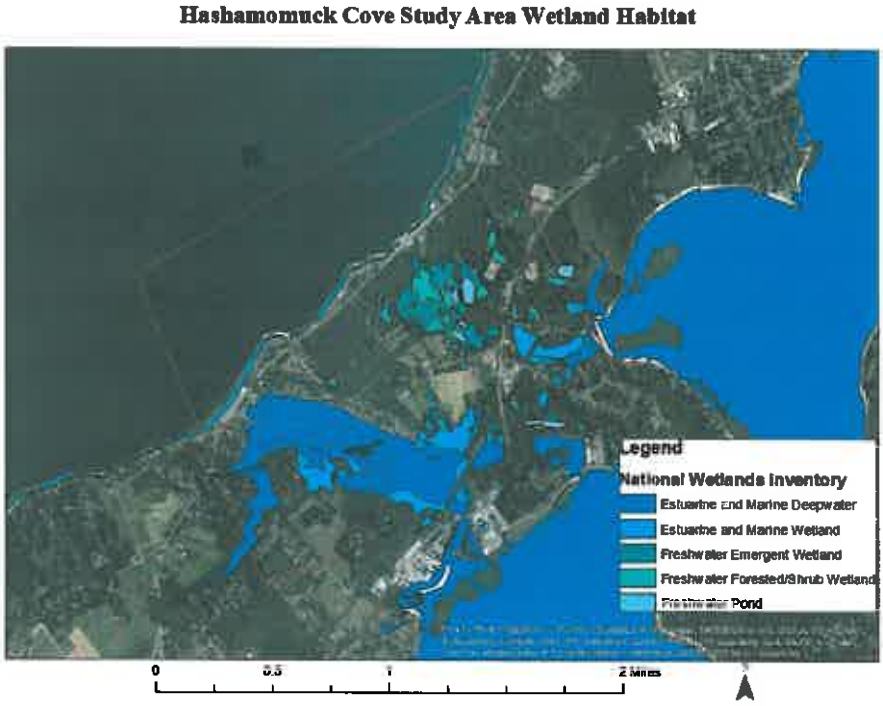


Figure 2 – Hashamomuck Cove Feasibility Study Area National Inventory Wetlands.



DRAFT

Hashamomuck Cove
Southold, New York
Coastal Storm Risk Management
Integrated Feasibility Study/EA

Appendix A5

Environmental Appendices

Piping Plover Management Plan

Plan is being coordinated with jurisdictional agencies, USFWS, NYSDEC, and Town of Southold, NY.

Draft

Hashamomuck Cove
Southold, New York
Coastal Storm Risk Management
Integrated Feasibility Study/EA

Appendix A6

Environmental Correspondence

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
Division of Fish, Wildlife & Marine Resources
New York Natural Heritage Program
625 Broadway, 5th Floor, Albany, New York 12233-4757
Phone: (518) 402-8935 • **Fax:** (518) 402-8925
Website: www.dec.ny.gov

January 13, 2016

Judith L. Johnson
U.S. Army Corps of Engineers, New England District
696 Virginia Road
Concord, MA 01742

Re: Coastal Storm Damage Risk Project for the Hashamomuck Cove area
Town/City: Southold County: Suffolk

Dear Judith L. Johnson:

In response to your recent request, we have reviewed the New York Natural Heritage Program database with respect to the above project.

The Natural Heritage database shows a record of nesting piping plover (*Charadrius melodus*, federally listed as Threatened and listed by New York State as Endangered) at Hasamomuck Beach. Our database has the most recent nesting as occurring in 2004, with no birds observed nesting in 2013. For the most recent information on nesting plovers at that site, whether habitat might still be suitable, and potential impacts of your project, I suggest contacting Michelle Gibbons, NYSDEC Region 1 Wildlife Manager, at michelle.gibbons@dec.ny.gov, (631) 444-0306.

For most sites, comprehensive field surveys have not been conducted. We cannot provide a definitive statement on the presence or absence of all rare or state-listed species or significant natural communities. Depending on the nature of the project and the conditions at the project site, further information from on-site surveys or other resources may be required to fully assess impacts on biological resources.

Sincerely,

Nicholas Conrad
Information Resources Coordinator
New York Natural Heritage Program

The following state-listed animals have been documented at your project site, or in its vicinity.

The following list includes animals that are listed by NYS as Endangered, Threatened, or Special Concern; and/or that are federally listed or are candidates for federal listing.

For information about any permit considerations for your project, contact the Permits staff at the NYSDEC Region 1 Office. For information about potential impacts of your project on these species, and how to avoid, minimize, or mitigate any impacts, contact the Wildlife Manager.

A listing of Regional Offices is at http://www.dec.ny.gov/about/558.html.

The following species have been documented at the project site, or within 0.5 mile. Potential onsite and offsite impacts from the project may need to be addressed.

COMMON NAME	*SCIENTIFIC NAME*	*NY STATE LISTING*	*FEDERAL LISTING*	
Birds				
Piping Plover *Breeding*	*Charadrius melodus*	Endangered	Threatened	11366

This report only includes records from the NY Natural Heritage database. For most sites, comprehensive field surveys have not been conducted, and we cannot provide a definitive statement as to the presence or absence of all rare or state-listed species. Depending on the nature of the project and the conditions at the project site, further information from on-site surveys or other sources may be required to fully assess impacts on biological resources.

If any rare plants or animals are documented during site visits, we request that information on the observations be provided to the New York Natural Heritage Program so that we may update our database.

Information about many of the listed animals in New York, including habitat, biology, identification, conservation, and management, are available online in Natural Heritage's Conservation Guides at www.guides.nynhp.org, and from NYSDEC at www.dec.ny.gov/animals/7494.html.

Letters Sent Out

DEPARTMENT OF THE ARMY
US ARMY CORPS OF ENGINEERS
NEW ENGLAND DISTRICT
696 VIRGINIA ROAD
CONCORD MA 01742-2751

August 13, 2014

Engineering/Planning Division
Planning Branch

Shinnecock Tribal Office
Shinnecock Indian Tribe
P.O. Box 5006
Southampton, New York 11969

To whom it may concern:

The US Army Corps of Engineers (USACE), New England District, would like to invite you and/or a member(s) of your staff to participate in a coordinated site visit for the Coastal Storm Damage Reduction (CSDR) Feasibility Study (FS) for the Hashamomuck Cove area of Southold, New York. The study area is a 1.5 mile stretch of coastal shoreline located in the Town of Southold, Suffolk County, New York, on the North Fork of Long Island (see enclosed Location Map).

Shore front development in the project area includes homes, recreation areas, and businesses. This 1.5 mile area of coastal shoreline is vulnerable to erosion, wave attack, and inundation from coastal storms including hurricanes and northeasters. The long term erosion rate is approximately 1 to 2 feet per year. A portion of Route 48 is being undermined by storm driven waves and will eventually collapse causing significant transportation impacts and loss of utilities located along the road right of way.

The study objective is to provide a project that will reduce the risk of coastal storm damages to the existing shorefront development, protect the County Road, and protect the utilities associated with the road right of way. Plan formulation will involve an analysis of potential structural and non structural alternatives. The USACE New England District will prepare the Hashamomuck CSDR FS decision document, including National Historic Preservation Act, of 1966, as amended (NHPA) information for Public and USACE review.

A coordinated site visit for interested state and federal agencies, town officials, and non-governmental organizations will occur on Thursday, September 4, 2014. The purpose of the site visit is to view the project area, discuss potential alternatives, and elicit concerns and suggestions from your office. Should you have any comments after the meeting, please submit a letter within 30 days of the visit.

Site visit participants will meet at 1:00 p.m. at the Southold Town Beach parking lot (see attached Study Area Map). Please RSVP with Ms. Kathleen A. Atwood, of the Economics/Cultural Resources Section at (978) 318-8537, or by email at Kathleen.A.Atwood@usace.army.mil or myself at 978-318-8737, or by email at Barbara.R.Blumeris@usace.army.mil.

Sincerely,

Barbara Blumeris

Barbara Blumeris
Study Manager

Enclosure

Similar letter sent to:

Ruth Pierpont, Deputy Commissioner/Deputy State Historic Preservation Officer
New York State Office of Parks, Recreation and Historic Preservation
State Historic Preservation Office
Peebles Island Resource Center
P.O. Box 189
Waterford, New York 12188-0189

DEPARTMENT OF THE ARMY
US ARMY CORPS OF ENGINEERS
NEW ENGLAND DISTRICT
696 VIRGINIA ROAD
CONCORD MA 01742-2751

August 13, 2014

Engineering/Planning Division
Planning Branch

Ruth Pierpont, Deputy Commissioner/Deputy State Historic Preservation Officer
New York State Office of Parks, Recreation and Historic Preservation
State Historic Preservation Office
Peebles Island Resource Center
P.O. Box 189
Waterford, New York 12188-0189

Dear Ms. Pierpont:

The US Army Corps of Engineers (USACE), New England District, would like to invite you and/or a member(s) of your staff to participate in a coordinated site visit for the Coastal Storm Damage Reduction (CSDR) Feasibility Study (FS) for the Hashamomuck Cove area of Southold, New York. The study area is a 1.5 mile stretch of coastal shoreline located in the Town of Southold, Suffolk County, New York, on the North Fork of Long Island (see enclosed Location Map).

Shore front development in the project area includes homes, recreation areas, and businesses. This 1.5 mile area of coastal shoreline is vulnerable to erosion, wave attack, and inundation from coastal storms including hurricanes and northeasters. The long term erosion rate is approximately 1 to 2 feet per year. A portion of Route 48 is being undermined by storm driven waves and will eventually collapse causing significant transportation impacts and loss of utilities located along the road right of way.

The study objective is to provide a project that will reduce the risk of coastal storm damages to the existing shorefront development, protect the County Road, and protect the utilities associated with the road right of way. Plan formulation will involve an analysis of potential structural and non structural alternatives. The USACE New England District will prepare the Hashamomuck CSDR FS decision document, including National Historic Preservation Act, of 1966, as amended (NHPA) information for Public and USACE review.

A coordinated site visit for interested state and federal agencies, town officials, and non-governmental organizations will occur on Thursday, September 4, 2014. The purpose of the site visit is to view the project area, discuss potential alternatives, and elicit concerns and suggestions from your office. Should you have any comments after the meeting, please submit a letter within 30 days of the visit.

Site visit participants will meet at 1:00 p.m. at the Southold Town Beach parking lot (see attached Study Area Map). Please RSVP with Ms. Kathleen A. Atwood, of the Economics/Cultural Resources Section at (978) 318-8537, or by email at Kathleen.A.Atwood@usace.army.mil or myself at 978-318-8737, or by email at Barbara.R.Blumeris@usace.army.mil.

Sincerely,

Barbara Blumeris

Barbara Blumeris
Study Manager

Enclosure

Similar Letter Sent to:

Shinnecock Tribal Office
Shinnecock Indian Tribe
P.O. Box 5006
Southampton, New York 11969

DEPARTMENT OF THE ARMY
US ARMY CORPS OF ENGINEERS
NEW ENGLAND DISTRICT
696 VIRGINIA ROAD
CONCORD MA 01742-2751

August 8, 2014

Engineering/Planning Division
Planning Branch

Steve Papa
Long Island Field Office
U.S. Fish and Wildlife Service
340 Smith Road
Shirley, New York 11967

Dear Mr. Papa:

The US Army Corps of Engineers (USACE), New England District, would like to invite you and/or a member(s) of your staff to participate in a coordinated site visit for the Coastal Storm Damage Reduction Feasibility Study (FS) for the Hashamomuck Cove area of Southold, New York. The study area is a 1.5 mile stretch of coastal shoreline located in the Town of Southold, Suffolk County, New York, on the North Fork of Long Island (see attached Location Map).

Shore front development in the project area includes homes, recreation areas, and businesses. This 1.5 mile area of coastal shoreline is vulnerable to erosion, wave attack, and inundation from coastal storms including hurricanes and northeasters. The long term erosion rate is approximately 1 to 2 feet per year. A portion of Route 48 is being undermined by storm driven waves and will eventually collapse causing significant transportation impacts and loss of utilities located along the road right of way.

The study objective is to provide a project that will reduce coastal storm damages to the existing shorefront development, protect County Road, and protect the utilities associated with the road right of way. Plan formulation will involve an analysis of potential structural and non structural alternatives. The USACE New England District will prepare the Hashamomuck Coastal Storm Risk Management FS decision document, including National Environmental Policy Act (NEPA) information for Public and USACE review.

A coordinated site visit for interested state and federal agencies, town officials, and non-governmental organizations will occur on Thursday, September 4, 2014. The purpose of the site visit is to view the project area, discuss potential alternatives, and elicit concerns and suggestions from your office pursuant to the Fish and Wildlife Coordination Act. If you have any comments pursuant to the coordinated site visit, please submit a letter within 30 days of the visit.

Site visit participants will meet at 1:00 p.m. at the Southold Town Beach parking lot (see attached Study Area Map). Please RSVP with Ms. Judith L. Johnson, of the Environmental Resources Section at (978) 318-8138, or by email at Judith.L.Johnson@usace.army.mil, or myself at 978-318-8737, or by email at Barbara.R.Blumeris@usace.army.mil.

Sincerely,

Barbara Blumeris

Barbara Blumeris
Study Manager

Enclosure

DEPARTMENT OF THE ARMY
US ARMY CORPS OF ENGINEERS
NEW ENGLAND DISTRICT
696 VIRGINIA ROAD
CONCORD MA 01742-2751

August 8, 2014

Engineering/Planning Division
Planning Branch

Grace Musumeci
NEPA Regional Coordinator
USEPA Region 2
290 Broadway-25th Floor
New York, New York 10007-1866

Dear Ms. Musumeci:

The US Army Corps of Engineers (USACE), New England District, would like to invite you and/or a member(s) of your staff to participate in a coordinated site visit for the Coastal Storm Damage Reduction Feasibility Study (FS) for the Hashamomuck Cove area of Southold, New York. The study area is a 1.5 mile stretch of coastal shoreline located in the Town of Southold, Suffolk County, New York, on the North Fork of Long Island (see attached Location Map).

Shore front development in the project area includes homes, recreation areas, and businesses. This 1.5 mile area of coastal shoreline is vulnerable to erosion, wave attack, and inundation from coastal storms including hurricanes and northeasters. The long term erosion rate is approximately 1 to 2 feet per year. A portion of Route 48 is being undermined by storm driven waves and will eventually collapse causing significant transportation impacts and loss of utilities located along the road right of way.

The study objective is to provide a project that will reduce coastal storm damages to the existing shorefront development, protect County Road, and protect the utilities associated with the road right of way. Plan formulation will involve an analysis of potential structural and non structural alternatives. The USACE New England District will prepare the Hashamomuck Coastal Storm Risk Management FS decision document, including National Environmental Policy Act (NEPA) information for Public and USACE review.

A coordinated site visit for interested state and federal agencies, town officials, and non-governmental organizations will occur on Thursday, September 4, 2014. The purpose of the site visit is to view the project area, discuss potential alternatives, and elicit concerns and suggestions from your office. Should you have any comments after the coordinated site visit, please submit a letter within 30 days of the visit.

Site visit participants will meet at 1:00 p.m. at the Southold Town Beach parking lot (see attached Study Area Map). Please RSVP with Ms. Judith L. Johnson, of the Environmental Resources Section at (978) 318-8138, or by email at Judith.L.Johnson@usace.army.mil, or myself at 978-318-8737, or by email at Barbara.R.Blumeris@usace.army.mil.

Sincerely,

Barbara Blumeris

Barbara Blumeris
Study Manager

Enclosure

DEPARTMENT OF THE ARMY
US ARMY CORPS OF ENGINEERS
NEW ENGLAND DISTRICT
696 VIRGINIA ROAD
CONCORD MA 01742-2751

August 8, 2014

Engineering/Planning Division
Planning Branch

Denise Caldwell, Consistency Coordinator
Consistency Review Unit
Office of Communities & Waterfronts
New York Department of State
Suite 1010
One Commerce Place, 99 Washington Avenue
Albany, New York 12231-0001

Dear Ms. Caldwell:

The US Army Corps of Engineers (USACE), New England District, would like to invite you and/or a member(s) of your staff to participate in a coordinated site visit for the Coastal Storm Damage Reduction Feasibility Study (FS) for the Hashamomuck Cove area of Southold, New York. The study area is a 1.5 mile stretch of coastal shoreline located in the Town of Southold, Suffolk County, New York, on the North Fork of Long Island (see attached Location Map).

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Sincerely,

Barbara Blumeris

Barbara Blumeris
Study Manager

Enclosure

DEPARTMENT OF THE ARMY
US ARMY CORPS OF ENGINEERS
NEW ENGLAND DISTRICT
696 VIRGINIA ROAD
CONCORD MA 01742-2751

August 8, 2014

Engineering/Planning Division
Planning Branch

Eric Star
New York Department of Environmental Conservation
Region 1
SUNY Stony Brook
50 Circle Road
Stony Brook, New York 11790-3409

Dear Mr. Star:

The US Army Corps of Engineers (USACE), New England District, would like to invite you and/or a member(s) of your staff to participate in a coordinated site visit for the Coastal Storm Damage Reduction Feasibility Study (FS) for the Hashamomuck Cove area of Southold, New York. The study area is a 1.5 mile stretch of coastal shoreline located in the Town of Southold, Suffolk County, New York, on the North Fork of Long Island (see enclosed Location Map).

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A coordinated site visit for interested state and federal agencies, town officials, and non-governmental organizations will occur on Thursday, September 4, 2014. The purpose of the site visit is to view the project area, discuss potential alternatives, and elicit concerns and suggestions from your office pursuant to the Fish and Wildlife

Coordination Act. Should you have any comments after the coordinated site visit, please submit a letter within 30 days of the visit.

Site visit participants will meet at 1:00 p.m. at the Southold Town Beach parking lot (see attached Study Area Map). Please RSVP with Ms. Judith L. Johnson, of the Environmental Resources Section at (978) 318-8138, or by email at Judith.L.Johnson@usace.army.mil, or myself at 978-318-8737, or by email at Barbara.R.Blumeris@usace.army.mil.

Sincerely,

Barbara Blumeris

Barbara Blumeris
Study Manager

Enclosure

DEPARTMENT OF THE ARMY
US ARMY CORPS OF ENGINEERS
NEW ENGLAND DISTRICT
696 VIRGINIA ROAD
CONCORD MA 01742-2751

August 8, 2014

Engineering/Planning Division
Planning Branch

Peter A. Scully, Regional Director
New York Department of Environmental Conservation
Region 1
SUNY Stony Brook
50 Circle Road – Building 40
Stony Brook, New York 11790-3409

Dear Mr. Scully:

The US Army Corps of Engineers (USACE), New England District, would like to invite you and/or a member(s) of your staff to participate in a coordinated site visit for the Coastal Storm Damage Reduction Feasibility Study (FS) for the Hashamomuck Cove area of Southold, New York. The study area is a 1.5 mile stretch of coastal shoreline located in the Town of Southold, Suffolk County, New York, on the North Fork of Long Island (see enclosed Location Map).

Shore front development in the project area includes homes, recreation areas, and businesses. This 1.5 mile area of coastal shoreline is vulnerable to erosion, wave attack, and inundation from coastal storms including hurricanes and northeasters. The long term erosion rate is approximately 1 to 2 feet per year. A portion of Route 48 is being undermined by storm driven waves and will eventually collapse causing significant transportation impacts and loss of utilities located along the road right of way.

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Sincerely,

Barbara Blumeris

Barbara Blumeris
Study Manager

Enclosure

DEPARTMENT OF THE ARMY
US ARMY CORPS OF ENGINEERS
NEW ENGLAND DISTRICT
696 VIRGINIA ROAD
CONCORD MA 01742-2751

August 8, 2014

Engineering/Planning Division
Planning Branch

Mary Colligan
Assistant Regional Administrator
National Marine Fisheries Service
Protected Resources Division
55 Great Republic Drive
Gloucester, Massachusetts 01930

Dear Ms. Colligan:

The US Army Corps of Engineers (USACE), New England District, would like to invite you and/or a member(s) of your staff to participate in a coordinated site visit for the Coastal Storm Damage Reduction Feasibility Study (FS) for the Hashamomuck Cove area of Southold, New York. The study area is a 1.5 mile stretch of coastal shoreline, including County Road (Route 48), located in the Town of Southold, Suffolk County, New York, on the North Fork of Long Island (see enclosed Location Map).

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A coordinated site visit for interested state and federal agencies, town officials, and non-governmental organizations will occur on Thursday, September 4, 2014. The purpose of the site visit is to view the project area, discuss potential alternatives, and elicit concerns and suggestions from your office pursuant to the Fish and Wildlife

Coordination Act and the Endangered Species Act. If you have any comments pursuant to the coordinated site visit, please submit a letter within 30 days of the visit.

Site visit participants will meet at 1:00 p.m. at the Southold Town Beach parking lot (see attached Study Area Map). Please RSVP with Ms. Judith L. Johnson, of the Environmental Resources Section at (978) 318-8138 or by email at Judith.L.Johnson@usace.army.mil, or myself, at 978-318-8737 or by email at Barbara.R.Blumeris@usace.army.mil.

Sincerely,

Barbara Blumeris

Barbara Blumeris
Study Manager

Enclosures

DEPARTMENT OF THE ARMY
US ARMY CORPS OF ENGINEERS
NEW ENGLAND DISTRICT
696 VIRGINIA ROAD
CONCORD MA 01742-2751

August 8, 2014

Engineering/Planning Division
Planning Branch

Lou Chiarella
Assistant Regional Administrator
National Marine Fisheries Service
Habitat Conservation Division
55 Great Republic Drive
Gloucester, Massachusetts 01930

Dear Mr. Chiarella:

The US Army Corps of Engineers (USACE), New England District, would like to invite you and/or a member(s) of your staff to participate in a coordinated site visit for the Coastal Storm Damage Reduction Feasibility Study (FS) for the Hashamomuck Cove area of Southold, New York. The study area is a 1.5 mile stretch of coastal shoreline including County Road (Route 48), located in the Town of Southold, Suffolk County, New York, on the North Fork of Long Island (see emclosed Location Map).

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Sincerely,

Barbara Blumeris

Barbara Blumeris
Study Manager

Enclosures

DEPARTMENT OF THE ARMY
US ARMY CORPS OF ENGINEERS
NEW ENGLAND DISTRICT
696 VIRGINIA ROAD
CONCORD MA 01742-2751

August 8, 2014

Engineering/Planning Division
Planning Branch

David Shaw, Director
New York Department of Environmental Conservation
Division of Air Resources
625 Broadway
Albany, New York 12233-3250

Dear Mr. Shaw:

The US Army Corps of Engineers (USACE), New England District, would like to invite you and/or a member(s) of your staff to participate in a coordinated site visit for the Coastal Storm Damage Reduction Feasibility Study (FS) for the Hashamomuck Cove area of Southold, New York. The study area is a 1.5 mile stretch of coastal shoreline, including County Road (Route 48), located in the Town of Southold, Suffolk County, New York, on the North Fork of Long Island (see enclosed Location Map).

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Sincerely,

Barbara Blumeris

Barbara Blumeris
Study Manager

Enclosures

DEPARTMENT OF THE ARMY
US ARMY CORPS OF ENGINEERS
NEW ENGLAND DISTRICT
696 VIRGINIA ROAD
CONCORD MA 01742-2751

August 8, 2014

Engineering/Planning Division
Planning Branch

David A. Silwell, Field Supervisor
New York Field Office
U.S. Fish and Wildlife Service
2817 Luker Road
Cortland, New York 13045

Dear Mr. Silwell:

The US Army Corps of Engineers (USACE), New England District, would like to invite you and/or a member(s) of your staff to participate in a coordinated site visit for the Coastal Storm Damage Reduction Feasibility Study (FS) for the Hashamomuck Cove area of Southold, New York. The study area is a 1.5 mile stretch of coastal shoreline located in the Town of Southold, Suffolk County, New York, on the North Fork of Long Island (see attached Location Map).

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Sincerely,

Barbara Blumeris

Barbara Blumeris
Study Manager

Enclosure

DEPARTMENT OF THE ARMY
US ARMY CORPS OF ENGINEERS
NEW ENGLAND DISTRICT
696 VIRGINIA ROAD
CONCORD MA 01742-2751

August 8, 2014

Engineering/Planning Division
Planning Branch

Steve Papa
Long Island Field Office
U.S. Fish and Wildlife Service
340 Smith Road
Shirley, New York 11967

Dear Mr. Papa:

The US Army Corps of Engineers (USACE), New England District, would like to invite you and/or a member(s) of your staff to participate in a coordinated site visit for the Coastal Storm Damage Reduction Feasibility Study (FS) for the Hashamomuck Cove area of Southold, New York. The study area is a 1.5 mile stretch of coastal shoreline located in the Town of Southold, Suffolk County, New York, on the North Fork of Long Island (see attached Location Map).

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Barbara Blumeris

Barbara Blumeris
Study Manager

Enclosure

DEPARTMENT OF THE ARMY
US ARMY CORPS OF ENGINEERS
NEW ENGLAND DISTRICT
696 VIRGINIA ROAD
CONCORD MA 01742-2751

August 8, 2014

Engineering/Planning Division
Planning Branch

Joan Matthews, Director
Clean Water Division (CWD)
USEPA Region 2
290 Broadway
New York, New York 10007-1866

Dear Ms. Matthews:

The US Army Corps of Engineers (USACE), New England District, would like to invite you and/or a member(s) of your staff to participate in a coordinated site visit for the Coastal Storm Damage Reduction Feasibility Study (FS) for the Hashamomuck Cove area of Southold, New York. The study area is a 1.5 mile stretch of coastal shoreline located in the Town of Southold, Suffolk County, New York, on the North Fork of Long Island (see attached Location Map).

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Sincerely,

Barbara Blumeris

Barbara Blumeris
Study Manager

Enclosure

DEPARTMENT OF THE ARMY
US ARMY CORPS OF ENGINEERS
NEW ENGLAND DISTRICT
696 VIRGINIA ROAD
CONCORD MA 01742-2751

August 8, 2014

Engineering/Planning Division
Planning Branch

William P. Ruland
Town of Southhold
Town Board Member/Deputy Supervisor
53095 Main Road
P.O. Box 1179
Southold, New York 11971

Dear Mr. Ruland:

The US Army Corps of Engineers (USACE), New England District, would like to invite you and/or a member(s) of your staff to participate in a coordinated site visit for the Coastal Storm Damage Reduction Feasibility Study (FS) for the Hashamomuck Cove area of Southold, New York. The study area is a 1.5 mile stretch of coastal shoreline located in the Town of Southold, Suffolk County, New York, on the North Fork of Long Island (see enclosed Location Map).

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Sincerely,

Barbara Blumeris

Barbara Blumeris
Study Manager

Enclosure

DEPARTMENT OF THE ARMY
US ARMY CORPS OF ENGINEERS
NEW ENGLAND DISTRICT
696 VIRGINIA ROAD
CONCORD MA 01742-2751

August 8, 2014

Engineering/Planning Division
Planning Branch

Nicholas Conrad
Information Resources Coordinator
New York Natural Heritage Program
New York State Department of Environmental Conservation
625 Broadway, 5th Floor
Albany, New York 12233-4757

Dear Mr. Conrad:

The US Army Corps of Engineers (USACE), New England District, would like to invite you and/or a member(s) of your staff to participate in a coordinated site visit for the Coastal Storm Damage Reduction Feasibility Study (FS) for the Hashamomuck Cove area of Southold, New York. The study area is a 1.5 mile stretch of coastal shoreline located in the Town of Southold, Suffolk County, New York, on the North Fork of Long Island (see enclosed Location Map).

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Coordination Act. Should you have any comments after the coordinated site visit, please submit a letter within 30 days of the visit.

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Sincerely,

Barbara Blumeris

Barbara Blumeris
Study Manager

Enclosure

DEPARTMENT OF THE ARMY
US ARMY CORPS OF ENGINEERS
NEW ENGLAND DISTRICT
696 VIRGINIA ROAD
CONCORD MA 01742-2751

August 8, 2014

Engineering/Planning Division
Planning Branch

James A. Richter
Office of the Engineer
Town of Southhold
53095 Main Rd
P.O. Box 1179
Southold, New York 11971

Dear Mr. Richter:

The US Army Corps of Engineers (USACE), New England District, would like to invite you and/or a member(s) of your staff to participate in a coordinated site visit for the Coastal Storm Damage Reduction Feasibility Study (FS) for the Hashamomuck Cove area of Southold, New York. The study area is a 1.5 mile stretch of coastal shoreline located in the Town of Southold, Suffolk County, New York, on the North Fork of Long Island (see enclosed Location Map).

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Sincerely,

Barbara Blumeris

Barbara Blumeris
Study Manager

Enclosure

DEPARTMENT OF THE ARMY
US ARMY CORPS OF ENGINEERS
NEW ENGLAND DISTRICT
696 VIRGINIA ROAD
CONCORD MA 01742-2751

August 8, 2014

Engineering/Planning Division
Planning Branch

Scott A. Russell
Town of Southhold
Town Supervisor
53095 Main Road
P.O. Box 1179
Southold, New York 11971

Dear Mr. Russell:

The US Army Corps of Engineers (USACE), New England District, would like to invite you and/or a member(s) of your staff to participate in a coordinated site visit for the Coastal Storm Damage Reduction Feasibility Study (FS) for the Hashamomuck Cove area of Southold, New York. The study area is a 1.5 mile stretch of coastal shoreline located in the Town of Southold, Suffolk County, New York, on the North Fork of Long Island (see enclosed Location Map).

Shore front development in the project area includes homes, recreation areas, and businesses. This 1.5 mile area of coastal shoreline is vulnerable to erosion, wave attack, and inundation from coastal storms including hurricanes and northeasters. The long term erosion rate is approximately 1 to 2 feet per year. A portion of Route 48 is being undermined by storm driven waves and will eventually collapse causing significant transportation impacts and loss of utilities located along the road right of way.

The study objective is to provide a project that will reduce coastal storm damages to the existing shorefront development, protect County Road, and protect the utilities associated with the road right of way. Plan formulation will involve an analysis of potential structural and non structural alternatives. The USACE New England District will prepare the Hashamomuck Coastal Storm Risk Management FS decision document, including National Environmental Policy Act (NEPA) information for Public and USACE review.

A coordinated site visit for interested state and federal agencies, town officials, and non-governmental organizations will occur on Thursday, September 4, 2014. The purpose of the site visit is to view the project area, discuss potential alternatives, and elicit concerns and suggestions from your office. Should you have any comments after the coordinated site visit, please submit a letter within 30 days of the visit.

Site visit participants will meet at 1:00 p.m. at the Southold Town Beach parking lot (see enclosed Study Area Map). Please RSVP with Ms. Judith L. Johnson, of the Environmental Resources Section at (978) 318-8138, or by email at Judith.L.Johnson@usace.army.mil, or myself at 978-318-8737, or by email at Barbara.R.Blumeris@usace.army.mil.

Sincerely,

Barbara Blumeris

Barbara Blumeris
Study Manager

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CONCORD MA 01742-2751

August 8, 2014

Engineering/Planning Division
Planning Branch

New York Sportfishing Federation
72-11 Austin Street, Suite 144
Forest Hills, New York 11375

To whom this may concern:

The US Army Corps of Engineers (USACE), New England District, would like to invite you and/or a member(s) of your staff to participate in a coordinated site visit for the Coastal Storm Damage Reduction Feasibility Study (FS) for the Hashamomuck Cove area of Southold, New York. The study area is a 1.5 mile stretch of coastal shoreline, including County Road (Route 48), located in the Town of Southold, Suffolk County, New York, on the North Fork of Long Island (see enclosed Location Map).

Shore front development in the project area includes homes, recreation areas, and businesses. This 1.5 mile area of coastal shoreline is vulnerable to erosion, wave attack, and inundation from coastal storms including hurricanes and northeasters. The long term erosion rate is approximately 1 to 2 feet per year. A portion of Route 48 is being undermined by storm driven waves and will eventually collapse causing significant transportation impacts and loss of utilities located along the road right of way.

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August 8, 2014

Engineering/Planning Division
Planning Branch

William Hillman, P.E.
Chief Engineer
Suffolk County DPW
335 Yaphank Avenue
Yaphank, New York 11980

Dear Mr. Hillman:

The US Army Corps of Engineers (USACE), New England District, would like to invite you and/or a member(s) of your staff to participate in a coordinated site visit for the Coastal Storm Damage Reduction Feasibility Study (FS) for the Hashamomuck Cove area of Southold, New York. The study area is a 1.5 mile stretch of coastal shoreline located in the Town of Southold, Suffolk County, New York, on the North Fork of Long Island (see enclosed Location Map).

Shore front development in the project area includes homes, recreation areas, and businesses. This 1.5 mile area of coastal shoreline is vulnerable to erosion, wave attack, and inundation from coastal storms including hurricanes and northeasters. The long term erosion rate is approximately 1 to 2 feet per year. A portion of Route 48 is being undermined by storm driven waves and will eventually collapse causing significant transportation impacts and loss of utilities located along the road right of way.

The study objective is to provide a project that will reduce coastal storm damages to the existing shorefront development, protect County Road, and protect the utilities associated with the road right of way. Plan formulation will involve an analysis of potential structural and non structural alternatives. The USACE New England District will prepare the Hashamomuck Coastal Storm Risk Management FS decision document, including National Environmental Policy Act (NEPA) information for Public and USACE review.

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August 8, 2014

Engineering/Planning Division
Planning Branch

Joanne Minieri
Deputy County Executive / Commissioner
Suffolk County Planning – Department of Planning
100 Veterans Memorial Highway – 4th Floor
Hauppauge, New York 11788-0099

Dear Ms. Minieri:

The US Army Corps of Engineers (USACE), New England District, would like to invite you and/or a member(s) of your staff to participate in a coordinated site visit for the Coastal Storm Damage Reduction Feasibility Study (FS) for the Hashamomuck Cove area of Southold, New York. The study area is a 1.5 mile stretch of coastal shoreline located in the Town of Southold, Suffolk County, New York, on the North Fork of Long Island (see enclosed Location Map).

Shore front development in the project area includes homes, recreation areas, and businesses. This 1.5 mile area of coastal shoreline is vulnerable to erosion, wave attack, and inundation from coastal storms including hurricanes and northeasters. The long term erosion rate is approximately 1 to 2 feet per year. A portion of Route 48 is being undermined by storm driven waves and will eventually collapse causing significant transportation impacts and loss of utilities located along the road right of way.

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August 8, 2014

Engineering/Planning Division
Planning Branch

Thomas Muse, Environmental Director
Surfrider Foundation
Eastern Long Island Chapter
PO Box 2681 Amagansett, NY 11930

Dear Mr. Muse:

The US Army Corps of Engineers (USACE), New England District, would like to invite you and/or a member(s) of your staff to participate in a coordinated site visit for the Coastal Storm Damage Reduction Feasibility Study (FS) for the Hashamomuck Cove area of Southold, New York. The study area is a 1.5 mile stretch of coastal shoreline located in the Town of Southold, Suffolk County, New York, on the North Fork of Long Island (see enclosed Location Map).

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Sincerely,

Barbara Blumeris
Study Manager

Enclosure

DRAFT

Hashamomuck Cove
Southold, New York
Coastal Storm Risk Management
Draft Integrated Feasibility Study/EA

Appendix A7

Environmental Appendices

Clean Water Act Section 404(b)(1)Evaluation

DRAFT CLEAN WATER ACT SECTION 404(b) (1) GUIDELINES EVALUATION
North Shore of Long Island, Hashamomuck Cove Coastal Storm Risk Management Feasibility Study

INTRODUCTION

This document presents a Section 404(b) (1) guidelines evaluation for the coastal storm risk management (CSRM) project at Hashamomuck Cove, in Southold, New York. The recommended plan includes beach fill using suitably sized sand. Best management practices will be fully utilized to ensure that turbidity and sedimentation are limited to the area immediately adjacent to the project site and minimized to the greatest extent possible. This evaluation is based on the regulations presented in 40 CFR 230, Section 404(b) (1): Guidelines for Specification of Disposal Sites for Dredged or Fill Material. The regulations implement Sections 404(b) and 401(1) of the Clean Water Act, which govern disposal of dredged and fill material inside the territorial seas baseline [§230.2(b)].

As stated in Section 230.10(a) (4): For actions subject to NEPA, where the Corps of Engineers is the permitting agency, the analysis of alternatives required for NEPA environmental documents, including supplemental Corps NEPA documents, will in most cases provide the information for the evaluation of alternatives under these Guidelines. The Integrated Feasibility Report and Environmental Assessment (FR/EA) for the Hashamomuck Cove CSRM project, provides the documentation necessary to attest that the project is fully in compliance with the Section 404(b) (1) guidelines. The FR/EA provides a full project description and location, description of existing conditions, alternatives analysis, and description of potential impacts as a result of the project and the project's construction. The analysis provided within the FR/EA, that will be also be used during the application process for the NYDEC State Water Quality Certificate under Section 401(1), documents that the implementation of this CSRM project will not cause or contribute to significant degradation of the waters of the United States, as is demonstrated in the following sections and tables.

PROJECT DESCRIPTION

Location: The Hashamomuck Cove study area is in Southold, New York on the north fork of Long Island on Long Island Sound. The study area extends from Soundview Road near the Southold Town Beach west about 1.5 miles. The majority of the properties within the Study Area are residential, with a restaurant and motel on the eastern end. There is a Town Beach on the

western end. The study area is made up of three coves separated by headlands referred to as West Cove (which is the location of Southold Town Beach), Central Cove, and East Cove. County Road 48 parallels the coast and intersects the coves.

The proposed plan for Hashamomuck Cove includes the placement of fill material at the West, Central, and East Coves to rebuild the beaches with a 25' to 75' wide berm and beachfill. The source of the initial sand for the beach fill will be from an upland off-site source. Periodic renourishment is anticipated during the 50 year project life, with the renourishment sand trucked in from a certified upland source. The West Cove will involve 164,000 square feet (SF) of intertidal disturbance and 69,000 (SF) of subtidal disturbance. The Central Cove will have 149,000 SF of intertidal disturbance and 249,000 SF of subtidal disturbance. The East Cove will result in 151,000 SF of intertidal disturbance and 198,000 SF of subtidal disturbance.

General Characteristics of Fill Material: The material that will be used for beach renourishment will have similar characteristics to exiting conditions (grain size and color). The material will be free of debris and trucked from an upland sand source to the site.

Description of Proposed Discharge Site: All sand material will be placed on the project beach in pre-designated locations according to the project design.

Time and Duration of Disposal: The placement of fill material will take approximately 7 to 10 months to complete. Construction is estimated to begin in March and continue until the project is complete. Work will begin in the West Cove and proceed in an easterly direction.

Disposal Method: Sand would be trucked to the site and the upland sand would be delivered to staging points where direct access to the beach could be gained by equipment needed to transport and spread sand on the beach. It is anticipated that articulated end-dump trucks would be used for transporting sand along the beach. These specially designed trucks are suitable for work directly on the beach. The articulated end-dumps would deposit loads at appropriate intervals, for subsequent spreading and regrading by bulldozers or front end loaders. The materials would be spread down to the mean low water line. Deposited materials between the mean low water and the mean high water would be redistributed by each tide cycle. This construction cycle would repeat until the design profile is achieved.

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

	YES	NO
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	
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 habitat; and 3) violate requirements of any Federally designated marine sanctuary.	X	
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.	X	
d. Appropriate and practicable steps have been taken to minimize potential adverse impacts of the discharge on the aquatic ecosystem.	X	

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 column impacts		X	
	4) Current patterns and water circulation		X	
	5) Normal water circulation		X	
	6) Salinity gradients		X	
b. Potential Impacts on Biological Characteristics on the Aquatic Ecosystem (Subpart D)				
	1) Threatened and endangered species		X	
	2) Fish, crustaceans, mollusks, and other organisms in the aquatic food web		X	
	3) Other wildlife (mammals, birds, reptiles and amphibians)		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) Aesthetic impacts		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		
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	X	
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	X	
8) Other sources (specify)	X	
List appropriate references – See Environmental Assessment		
	YES	**NO**
b. An evaluation of the appropriate information factors in 3a above indicates that there is reason to believe the proposed dredged 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.	**X**	

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

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) Depth of water at disposal site	X	
2) Current velocity, direction, variability at disposal site	X	
3) Degree of turbulence	X	
4) Water column stratification	X	
5) Discharge of vessel speed and direction	N/A	
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)	X	
List appropriate references – See Environmental Assessment		
	YES	**NO**
b. An evaluation of the appropriate information factors in 4a above indicated that the disposal sites and/or size of mixing zone are acceptable.	**X**	

5. Actions to Minimize Adverse Effects (Subpart H)

	YES	**NO**
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	

6. Factual Determination – Section 230.11

A REVIEW OF APPROPRIATE INFORMATION, AS IDENTIFIED IN ITEMS 2-5 ABOVE, INDICATES THERE IS MINIMAL POTENTIAL FOR SHORT OR LONG- TERM ENVIRONMENTAL EFFECTS OF THE PROPOSED DISCHARGE AS RELATED TO:		
	YES	**NO**
a. Physical substrate at the disposal site (review Sections 2a, 3, 4 and 5 above)	X	
b. Water circulation, fluctuation and salinity (review Sections 2a, 3, 4 and 5)	X	
c. Suspended particulates/turbidity (review Sections 2a, 3, 4 and 5)	X	
d. Contaminant availability (review Sections 2a, 3 and 4)	X	
e. Aquatic ecosystem structure, function and organisms (review Sections 2b, 2c, 3 and 5	X	
f. Proposed disposal site (review Sections 2, 4 and 5)	X	
g. Cumulative effects on the aquatic ecosystem	X	
h. Secondary effects on the aquatic ecosystem	X	

	YES	**NO**
The proposed disposal site for discharge of dredged or fill material complies with Section 404(b) (1) guidelines.	X	

7. Findings of Compliance or Non-Compliance

In summary, the implementation of the recommended plan to construct a coastal storm risk management project at Hashamomuck Cove:

Will have no adverse effects in regard to the discharge of pollutants on human health or welfare, including but not limited to effects on municipal water supplies, plankton, fish, shellfish, wildlife, and special aquatic sites;

Will have no significant adverse effects of the discharge of pollutants on life stages of aquatic life and other wildlife dependent on aquatic ecosystems, including the transfer, concentration, and spread of pollutants or their byproducts outside of the disposal site through biological, physical, and chemical processes;

Will have no significant adverse effects of the discharge of pollutants on aquatic ecosystem diversity, productivity, and stability;

Will have no significant adverse effects of discharge of pollutants on recreational, aesthetic, and economic values.

DATE:	SIGNATURE BLOCK

DRAFT

Hashamomuck Cove
Southold, New York
Coastal Storm Risk Management
Draft Integrated Feasibility Study/EA

Appendix A8

Clean Air Act
Record of Non-Applicability

and Emissions Calculations

RECORD OF NON-APPLICABILITY (RONA)

Project Name: Hashamomuck Cove, Southold, New York, Coastal Storm Risk Management
Reference: Equipment list provided by Cynthia Zhang to Jenine Gallo, 31 May 2016

Project/Action Point of Contact: Dan Falt, USACE, New York District, Project Manager

Begin Date: tbd
End Date: tbd

1. The project described above has been evaluated for Section 176 of the Clean Air Act. Project related emissions associated with the federal action were estimated to evaluate the applicability of General Conformity regulations (40CFR§93 Subpart B).

2. The requirements of this rule do not apply because the total direct and indirect emissions from this project are significantly below the 100 tons trigger levels for NO_x, $PM_{2.5}$, and SO_2 for the project year and below the 50 tons trigger level for VOCs for the project year (40CFR§93.153(b)(1)&(2)). The estimated total NO_x emissions for the project are 10.2 tons. $PM_{2.5}$, SO_2, and VOC are estimated less than 1 ton.

3. The project is presumed to conform with the General Conformity requirements and is exempted from Subpart B under 40CFR§93.153(c)(1).

Emissions have been estimated using project planning information developed by the New York District, consisting of anticipated equipment types and estimates of the horsepower and operating hours of the diesel engines powering the equipment. In addition to this planning information, conservative factors have been used to represent the average level of engine load of operating engines (load factors) and the average emissions of typical engines used to power the equipment (emission factors). The basic emission estimating equation is the following:

$$\mathbf{E = hrs \times LF \times EF}$$

Where:

E = Emissions per period of time such as a year or the entire project.
hrs = Number of operating hours in the period of time (e.g., hours per year, hours per project).
LF = Load factor, an estimate of the average percentage of full load an engine is run at in its usual operating mode.
EF = Emission factor, an estimate of the amount of a pollutant (such as NO_x) that an engine emits while performing a defined amount of work.

In these estimates, the emission factors are in units of grams of pollutant per horsepower hour (g/hphr). For each piece of equipment, the number of horsepower hours (hphr) is calculated by multiplying the engine's horsepower by the load factor assigned to the type of equipment and the number of hours that piece of equipment is anticipated to work during the year or during the project. For example, a crane with a 250-horsepower engine would have a load factor of 0.43 (meaning on average the crane's engine operates at 43% of its maximum rated power output). If the crane were anticipated to operate 1,000 hours during the course of the project, the horsepower hours would be calculated by:

$$\mathbf{250\ horsepower \times 0.43 \times 1{,}000\ hours = 107{,}500\ hphr}$$

The emissions from diesel engines vary with the age of an engine and, most importantly, with when it was built. Newer engines of a given size and function typically emit lower levels of pollutants than older engines. The NO_x emission factors used in these calculations assume that the equipment pre-dates most emission control requirements (known as Tier 0 engines in most cases), to provide a reasonable "upper bound" to the emission estimates. If newer engines are actually used in the work, then emissions will be lower than estimated for the same amount of work. In the example of the crane engine, a NO_x emission factor of 9.5 g/hphr would be used to estimate emissions from this crane on the project by the following equation:

$$\frac{\mathbf{107{,}500\ hphr \times 9.5\ g\ NO_x/hphr}}{\mathbf{453.59\ g/lb \times 2{,}000\ lbs/ton}} = \mathbf{1.1\ tons\ of\ NO_x}$$

As noted above, information on the equipment types, horsepower, and hours of operation associated with the project have been obtained from the project's plans and represent current best estimates of the equipment and work that will be required. Load factors have been obtained from various sources depending on the type of equipment. Marine engine load factors are primarily from a document associated with the New York and New Jersey Harbor Deepening Project (HDP): "Marine and Land-Based Mobile Source Emission Estimates for the Consolidated Schedule of 50-Foot Deepening Project, January 2004," and from EPA's 1998 Regulatory Impact Analysis (RIA): "EPA Regulatory Impact Analysis: Control of Commercial Marine Vessels." Land-side nonroad equipment load factors are from the documentation for EPA's NONROAD emission estimating model, "Median Life, Annual Activity, and Load Factor Values for Nonroad Engine Emissions Modeling, EPA420-P-04-005, April 2004."

Emission factors have also been sourced from a variety of documents and other sources depending on engine type and pollutant. The NO_x emission factors for marine engines have been developed primarily from EPA documentation for the Category 1 and 2 standards (RIA, "Control of Emission from Marine Engines, November 1999) and are consistent with emission factors used in documenting emissions from the HDP, while the VOC emission factors for marine engines are from the Port Authority of New York and New Jersey's (PANYNJ) "2014 Multi-Facility Emissions Inventory" which represent the range of marine engines operating in the New Jersey harbor and coastal region in terms of age and regulatory tier level. Nonroad equipment NO_x emission factors have been derived from EPA emission standards and documentation, while the nonroad VOC emission factors have been based on EPA's Diesel Emissions Quantifier (DEQ, accessed at: *www.epa.gov/cleandiesel/quantifier/*), run for moderately old equipment (model year 1995). On-road vehicle emission factors have also been developed from the DEQ, assuming a mixture of Class 8, Class 6, and Class 5 (the smallest covered by the DEQ) on-road trucks.

Greenhouse gas (GHG) emissions are represented as CO_2, which makes up by far the greatest amount of GHG emitted from the diesel-fueled engines that will be used on the project. GHG emissions are calculated in the same manner as the emissions discussed above, except that GHG emissions are expressed as metric tons (tonnes) instead of short tons to be consistent with standard GHG reporting methodology. The CO_2 emission factors were obtained from the most recent emissions inventory released by the PANYNJ, using the average nonroad equipment and on-road heavy-duty diesel vehicle emission factors.

As noted above, the emission factors have been chosen to be moderately conservative so as not to underestimate project emissions. Actual project emissions will be estimated and tracked during the course of the project and will be based on the characteristics and operating hours of the specific equipment chosen by the contractor to do the work.

The following pages summarize the estimated emissions of pollutants relevant to General Conformity, NO_x, VOC, $PM_{2.5}$, SO_2, and CO_2 in sum for the project and by calendar year based on the schedule information also presented (in terms of operating months per year). Following this summary information are project details including the anticipated equipment and engine information developed by the New York District, the load factors and emission factors as discussed above, and the estimated emissions for the project by piece of equipment.

USACE - New York District
NAN - Sandy-Related Projects
Hashamomuck Cove Draft Integrated Feasibility Report and Environmental Assessment
Equipment Emission Estimate Summary
2 June 2016
DRAFT

	tons					
	NO_x	**VOC**	**SO_x**	**$PM_{2.5}$**	**CO**	**CO_2**
	tons	tons	tons	tons	tons	metric tons
Project Emissions:	**10.2**	**0.4**	**0.007**	**0.3**	**2.1**	**658**

USACE - New York District
NAN - Sandy-Related Projects
Hashamomuck Cove Draft Integrated Feasibility Report and Environmental Assessment
Equipment Emission Estimates
2 June 2016
DRAFT

Hashamomuck Alternative 2
17 BEACH REPLENISHMENT Alt 2A - West Area (25' Berm)

Description, off-road equipment*	Category	Horsepower (approx.)	Load Factor	Hours	hphrs	grams per hphr* NO_x	VOC	SO_x	$PM_{2.5}$	CO	CO_2	tons NO_x	VOC	SO_x	$PM_{2.5}$	CO	metric tons CO_2
Mobilization / Demobilization																	
D6 TRACTOR	Crawler tractor	250	0.59	90	13,275	9.5	0.19	0.005	0.16	1.21	562	0.139	0.003	0.0001	0.002	0.02	7
TRACTOR, CRAWLER (DOZER)	Crawler tractor	250	0.59	90	13,275	9.5	0.19	0.005	0.16	1.21	562	0.139	0.003	0.0001	0.002	0.02	7
TRACTOR, CRAWLER (DOZER)	Crawler tractor	80	0.59	90	4,248	9.5	0.19	0.005	0.16	1.21	562	0.044	0.001	0.0000	0.001	0.01	2
Beach Replenishment																	
D6 TRACTOR	Crawler tractor	250	0.59	561	82,674	9.5	0.19	0.005	0.16	1.21	562	0.866	0.017	0.0005	0.015	0.11	46
TRACTOR, CRAWLER (DOZER)	Crawler tractor	250	0.59	140	20,650	9.5	0.19	0.005	0.16	1.21	562	0.216	0.004	0.0001	0.004	0.03	12
TRACTOR, CRAWLER (DOZER)	Crawler tractor	80	0.59	140	6,608	9.5	0.19	0.005	0.16	1.21	562	0.069	0.001	0.0000	0.001	0.01	4
Alt 2C - Central Area (75'/25' Berm) Beach Replenishment																	
D6 TRACTOR	Crawler tractor	250	0.59	931	137,297	9.5	0.19	0.005	0.16	1.21	562	1.438	0.029	0.0008	0.024	0.18	77
TRACTOR, CRAWLER (DOZER)	Crawler tractor	250	0.59	240	35,400	9.5	0.19	0.005	0.16	1.21	562	0.371	0.007	0.0002	0.006	0.05	20
TRACTOR, CRAWLER (DOZER)	Crawler tractor	80	0.59	240	11,328	9.5	0.19	0.005	0.16	1.21	562	0.119	0.002	0.0001	0.002	0.02	6
Alt 2A - East Area (25' Berm) Beach Replenishment																	
D6 TRACTOR	Crawler tractor	250	0.59	1,171	172,705	9.5	0.19	0.005	0.16	1.21	562	1.809	0.036	0.0010	0.030	0.23	97
TRACTOR, CRAWLER (DOZER)	Crawler tractor	250	0.59	300	44,250	9.5	0.19	0.005	0.16	1.21	562	0.463	0.009	0.0002	0.008	0.06	25
TRACTOR, CRAWLER (DOZER)	Crawler tractor	80	0.59	300	14,160	9.5	0.19	0.005	0.16	1.21	562	0.148	0.003	0.0001	0.002	0.02	8
					555,870	* Emission factors consistent with NAN ABU emission estimates and documented with that work.						**5.8**	**0.1**	**0.003**	**0.1**	**0.7**	**312**

Description, on-road vehicles*	Category	Hours	Miles	grams per mile** NO_x	VOC	SO_x	$PM_{2.5}$	CO	CO_2	tons NO_x	VOC	SO_x	$PM_{2.5}$	CO	metric tons CO_2
Mobilization / Demobilization															
DUMP TRUCK, HIGHWAY	Class 8 diesel truck	90	3,150	29.7	1.0	0.017	1.3	7.3	1,824	0.103	0.004	0.0001	0.005	0.03	6
Beach Replenishment - Trucking															
DUMP TRUCK, HIGHWAY	Class 6 diesel truck	1,121	39,235	20.6	1.2	0.017	1.1	6.3	1,824	0.891	0.050	0.0007	0.046	0.27	72
Alt 2C - Central Area (75'/25' Berm) Beach Replenishment - Trucking															
DUMP TRUCK, HIGHWAY	Class 6 diesel truck	1,862	65,158	20.6	1.2	0.017	1.1	6.3	1,824	1.480	0.083	0.0012	0.077	0.45	119
Alt 2A - East Area (25' Berm) Beach Replenishment - Trucking															
DUMP TRUCK, HIGHWAY	Class 6 diesel truck	2,342	81,962	20.6	1.2	0.017	1.1	6.3	1,824	1.862	0.104	0.0015	0.096	0.57	149
			189,505							**4.3**	**0.2**	**0.004**	**0.2**	**1.3**	**346**
									Total estimated project emissions	**10.2**	**0.4**	**0.01**	**0.3**	**2.1**	**658**

On-road truck activity assume travel at 35 mph average, conservative 1995 MY trucks

* Per NYDEC finding, land-side emissions are accounted for in the applicable SIP and are therefore not considered in the General Conformity evaluation.

** Emission factors estimated from EPA's Diesel Emission Quantifier. While not valid for SIP work, provides close approximation for these project-level estimates. Based on 1995 model year vehicles in CY 2015 (latest year in DEQ) to provide conservatively high estimates. The exception is SOx EFs which are taken from the PANYNJ 2014 emissions inventory report for heavy-duty diesel vehicles