Lake Montauk Harbor, East Hampton, NY
Navigation Improvements
Feasibility Study
Final Environmental Assessment

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US Army Corps of Engineers

New York District

Final Environmental Assessment:

Lake Montauk Harbor Navigation Project

Montauk, New York

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1.1. Purpose and Need of Project

The Lake Montauk Harbor Navigation Study, Montauk, New York (Study), is intended to provide safer navigation to and from Lake Montauk Harbor. The United States Army Corps of Engineers (USACE), New York District (District), is the lead Federal agency for the Study. The Study area is located in the Township of East Hampton, Suffolk County, New York approximately 125 miles east of NY City (Figure 1). The initial Federal navigation project at Lake Montauk Harbor was authorized by the River and Harbor Act of 2 March 1945 (House Document 369, 76th Congress, 1st Session). The existing Lake Montauk Harbor is characterized by inadequate authorized channel depths for current vessel usage needs, especially with regard to the larger commercial fishing vessels.

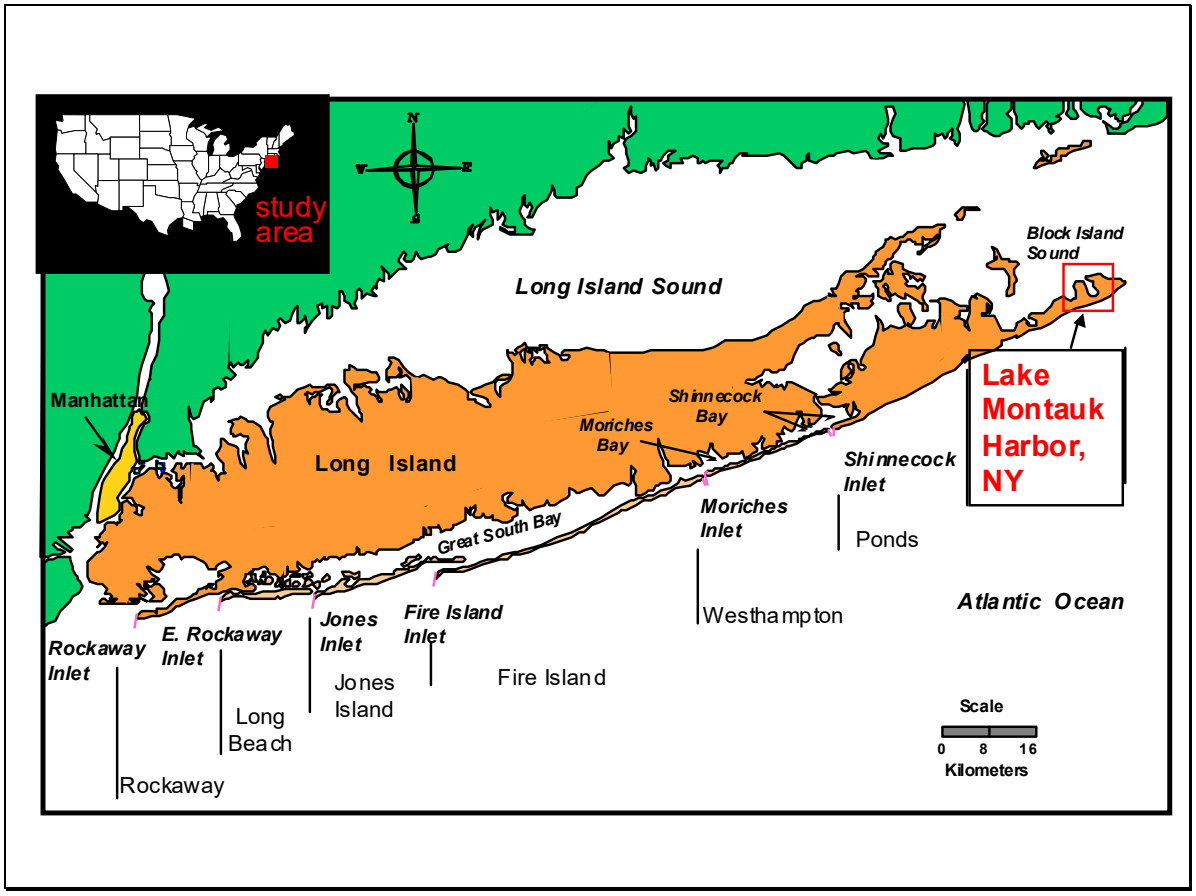

Figure 1: Location of proposed project.

The existing authorized project provides for a channel 12' (feet) deep at Mean Low Low Water (MLLW) and 150' wide, extending from the 12' contour in Block Island Sound to the same depth in the existing yacht basin east of Star Island. The length of the existing channel is approximately 0.7 miles (Figure 2). A 50' wide deposition basin, which is designed to reduce

shoaling of the navigation channel, is currently maintained at the same depth as the navigation channel (-12'MLLW) along the northeastern end of the channel.

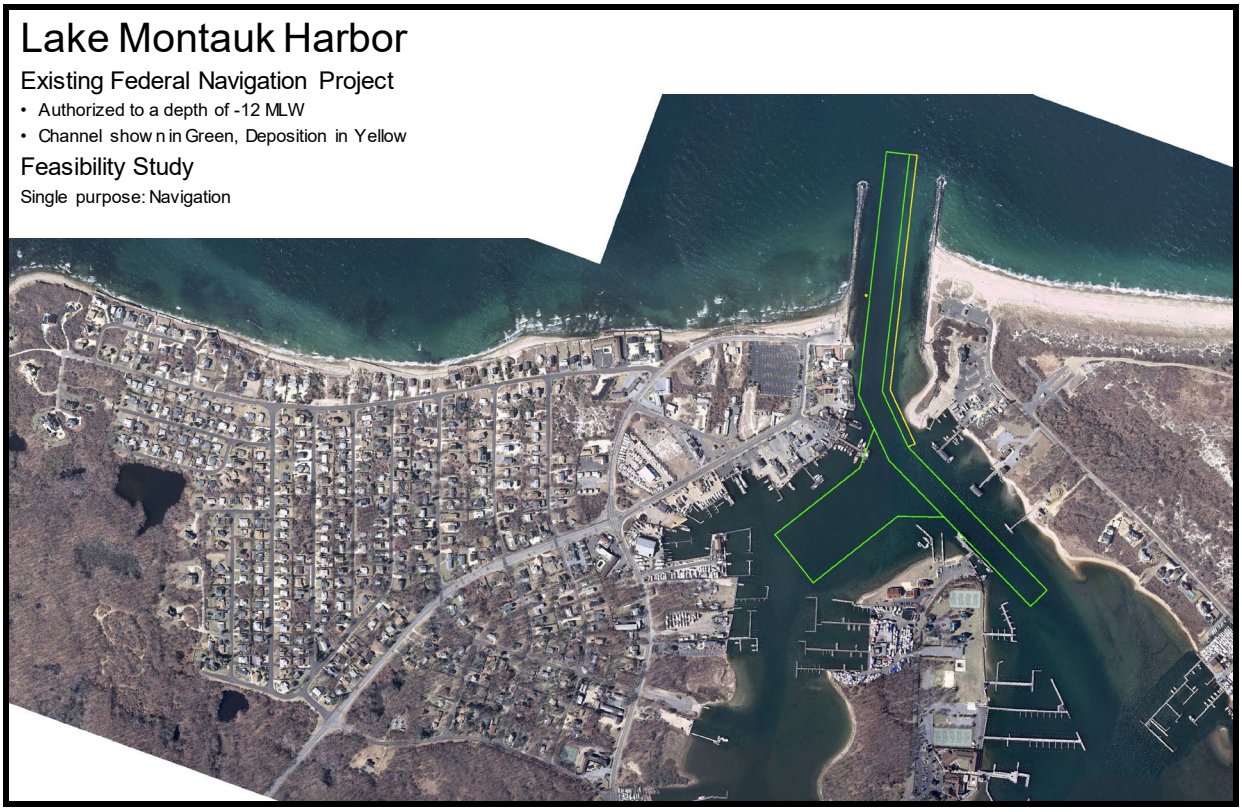

Figure 2: Existing authorized project.

The project site has experienced harbor channel shoaling and accretion of the shore line east of the inlet and erosion of the shoreline west of the inlet. The existing 12-foot channel and harbor depths are only marginally adequate for many of the current commercial vessels. In addition, maintaining the channel depth and width has become more difficult with the accumulation of sand on the eastern side of the east jetty and the deterioration of the east jetty through which sand migrates into the Federal navigation channel. As the channel and basin depths decrease, commercial navigation is further limited. Some deeper draft vessels, accounting for a significant portion of the commercial fish landings, must transit the channel only during high tides or must sail under less than their full load capacity to decrease their operating drafts. Maintenance dredging has been historically necessary every 4 to 5 years, and it is anticipated that this dredging will become necessary even more often in the near future. Persistent shoaling, as well as the deteriorating condition of the jetties have also been cited by local interests as potential problems. A large sand shoal, located northeast of Star Island and near the southern portion of the inshore end of the eastern jetty grows and reforms, with the result that it infringes ever more upon the authorized channel dimensions. The effective dimensions of the shoal thereby minimize the area of the channel where vessels can safely transit. Shoaling within the inlet has resulted in

delays in commercial activity, under loading of vessels, and potentially unsafe navigation practices. Lake Montauk Harbor is one of only a few harbors of refuges in the surrounding area for large fishing and recreational vessels during rough weather conditions. In view of the increasing concerns regarding homeland security issues, this study has been coordinated with the U.S. Coast Guard. Meetings held with that agency indicated that the undertaking of this project would not pose any security risks for the nation.

1.2. Study Authority

The study is conducted under the authority of two Congressional resolutions. First, a resolution was adopted by the United States Senate Committee on Environment and Public Works on October 17, 1991:

> *"Resolved by the Committee on Environment and Public Works of the United States Senate, that the Secretary of the Army is hereby requested to review the report of the Chief of Engineers on Lake Montauk Harbor, East Hampton, New York, published as House Document 369, Seventy-sixth Congress, First Session, and other pertinent reports, with a view to determining if further improvements for navigation are advisable at this time. Beneficial use of any dredged material for improvements to the environment should also be considered."*

In accordance with this resolution, the Reconnaissance Report was completed in May 1995. The Reconnaissance Report recognized that there were problems of insufficient channel and harbor depth for many vessels due to increased vessel size as well as erosion problems related to the navigation project and opportunities for multipurpose solutions. With the findings of erosion problems and opportunities for multipurpose solutions, the scope of the study was further expanded by authority of a resolution adopted by the United States Senate Committee on Transportation and Infrastructure on May 22, 2002:

> *"Resolved by the Committee on Transportation and Infrastructure of the United States House of Representatives, That, the Secretary of the Army is requested to review the report of the Chief of Engineers, published as House Document 369, 76th Congress, 1st Session, and other pertinent reports, to determine whether modifications to the recommendations contained therein in the interest of navigation improvements, to include beneficial uses of dredged material and sand-bypassing, in accordance with Section 110 of the River and Harbor Act of 1962, to determine the need for measures to address storm damage reduction, shoreline protection, environmental restoration and protection and allied purposes in the vicinity of Lake Montauk Harbor, East Hampton, New York."*

A Feasibility Cost Sharing Agreement (FCSA) under this 2002 authority was signed with the non-Federal sponsor on 24 February 2003. Following Hurricane Sandy in 2012, the Lake

Montauk Harbor study was identified in the May 2013 Second Interim Report to Congress in response to the Disaster Relief Appropriation Act of 2013 (PL 113-2) as a feasibility study to be completed at 100% Federal expense. The study was re-scoped to focus on coastal storm risk management (CSRM) as an interim response to the original congressional authorities, and a FCSA amendment was signed on 31 March 2014, with a separate response to the navigation improvement purpose to be completed in the future. A TSP for CSRM was identified and coordinated with the Non-Federal sponsor and its local partner, the Town of East Hampton, in 2016. Feedback from public meetings indicated a lack of non-Federal support for the CSRM TSP. The non-Federal sponsor, by letter dated 6 April 2017, requested that this study focus on navigation improvements only. By memo dated 15 May 2017, the U.S. Army Corps of Engineers New York District responded to this request and is now completing the study to recommend navigation improvement only. The recommendation of this study will be a partial response to the 2002 congressional authorization because the non-Federal sponsor would not agree to a TSP for CSRM and now requests this scope for the study. As PL 113-2 funding is solely for CSRM studies and projects, the Lake Montauk Harbor study is being completed with cost-shared funds on hand under the original 2003 FCSA that included navigation as a project purpose.

1.3. Study Area Description

The study area, Lake Montauk Harbor and vicinity, is located on the northern shore of the north fork of Long Island, within the Town of East Hampton, Suffolk County, New York (Figure 3). The study area is approximately 125 miles east of New York City, 21 miles southwest of New London, Connecticut, and about 3 miles west of Montauk Point. Lake Montauk Harbor is approximately 2.0 miles long in a north-south orientation and .7 miles wide, on average.

The brackish lake encompasses 1,037 acres with a mean depth of seven feet. The Lake Montauk watershed encompasses a drainage of $\pm$ 2,760 acres. Six vegetation associations have been identified within the Montauk watershed: tidal wetlands, freshwater wetland, forest vegetation, maritime shrub land, dune vegetation, and pasture land/open field.

Lake Montauk Harbor is a home port and a port of call for commercial and recreational vessels. There are several marinas for commercial vessels, a yacht club, and small-craft facilities on both sides near the entrance to Montauk Harbor. Two rock jetties stabilize the inlet. The east and west jetties are approximately 1,100 and 980 feet in length, respectively, with top elevations of +8' MLLW. There is a 500-foot separation between them. The harbor is landlocked on the east, south, and west sides. To the north, it connects with Block Island Sound through the north-south oriented inlet. The study area also encompasses the Block Island Sound shorelines bounded by Fort Pond Bay on the west and Shagwong point on the east. These extended shoreline areas were included in the study area to fully consider the littoral transport system, erosion and accretion problems of the shorelines adjacent to the inlet, and the sources and quantities of material contributing to channel shoaling. The shoreline east of the inlet jetties is accreting and is generally undeveloped parkland. The shoreline to the west of the inlet jetties is eroding and is

developed with residential and commercial properties (including rental properties with supporting roads and infrastructure).

Star Island, located south of the inlet within the lake, is 0.5 mile long in a north-south direction and 0.2 mile wide. It is connected to the mainland by a causeway. The U.S. Coast Guard Station is situated at the northern end of Star Island with direct access to the inlet. Coonsfoot Cove is between Star Island and the western shore of the lake. The channel and turning basin servicing Coonsfoot Cove have been maintained by Suffolk County. There has been extensive development of the Coonsfoot Cove area to provide marina services for commercial fishing vessels, charter boats, and pleasure craft.

Figure 3: Study Area

1.4. Proposed Action

The proposed action, which is to deepen and widen an existing Federal channel and identify a dredged material placement site, will result from an environmentally sustainable, economically efficient and navigationally safe and sufficient array of alternatives designed to address and resolve the issues identified in this study. As such, this Final EA provides analyses, as applicable and appropriate, for each alternative identified as feasible for implementation after the initial array of alternatives have been screened out during plan formulation due to unacceptable adverse impacts to the environment as required under NEPA, and/or due to lack of compliance with economic and/or navigational needs and/or safety requirements. This study will also identify the National Economic Development Plan (NED) and the Environmentally Preferred Plan (EPP), which will be limited to identifying the preferred new channel and deposition basin configuration (e.g. depth, width) that meets the navigational needs of the Federally-authorized channel, as well as the dredged material placement options.

The Tentatively Selected Plan (TSP), which is now referred to as the Recommended Plan (RP), has been determined to be Alternative 3: Deepening of existing 12’ deep and 150’ wide channel to -17’MLLW, and increasing the deposition basin width from 50’ to 100’ wide and deepening it to -17’MLLW. All dredged material would then be placed, historically as has the maintenance material, west of the inlet on the downdrift beach (Figure 4).

The following Section 2 is directly excerpted from the Main Report, which presents the array of alternatives considered and the screening criteria applied to develop the final four Alternatives, without the No Action Alternative, similarly considered.

Figure 4: Tentatively Selected Plan/Recommended Plan

2. Plan Formulation Alternatives: Navigation Improvement Measures

An alternative analysis to compare the without project condition/no action alternative to the following array of alternatives plans**,** composed of measures, has been conducted and is presented in Section 4. This section presents the alternatives that survived the original array of alternatives that which incorporated environmental considerations.

A measure is an activity or a feature that can be implemented at a specific geographic site to address one or more planning objectives. They can be used individually or combined with other management measures to form alternative plans. Measures were developed to address problems and to capitalize upon opportunities. They were derived from a variety of sources including prior Lake Montauk Harbor studies, the public scoping process, and the project delivery team. The following measures were considered in the Lake Montauk Harbor navigation improvement feasibility Study. The table at the end of this section (Table 1) shows the results of the screening of identified measures.

Non-structural Measures

1. Unconventional drafts. Use of larger vessels with shallower drafts was considered, but this is not the present trend. It is not projected that the commercial fishing fleet at Lake Montauk

Harbor will deviate from the general trend of using larger, deeper draft vessels. This measure was removed from further consideration because it does not meet study objective 1, specifically, it does not provide adequate channel depths for the existing fleet. Rather, it would call for the replacement of the existing fleet. It also meets no other study objective.

2. High water transit; Waiting for high tide to traverse the inlet for deeper draft vessels. Astronomical tides in the study area are semi-diurnal, flooding and ebbing twice a day. The mean and spring tides range from 2.0' to 2.4'. Waiting for the tide leads to costly delays for commercial fishing vessels, estimated by local fishing captains. The U.S. Coast Guard reports that potentially unsafe navigation practices result from the limited channel depth. This measure is considered a component of Alternative 1 below and is removed from further consideration because it does not meet study objective 1 in that it does not provide reliability nor is it cost effective, based on, for example, at least a portion of the without project commerce not realized.

3. Relocation of the Existing Fleet. Relocation of the existing fleet would be to the nearest major commercial fishing fleet, which is at Shinnecock Inlet. This measure was removed from further consideration because it is not cost effective. Indeed, boats still calling at Lake Montauk Harbor would relocate to another harbor if it were cost effective.

Structural Measures

4. Channel Extension East and West of Star Island. Extending the channel into the former yacht basin area, east of Star Island, was also given consideration. The use of the area, maintained by the Town of East Hampton, for purposes including a turning basin for transient vessels and for access to southern portions of the Lake, was investigated. The presence of sea grass beds and productive shellfish areas in the shallow portions of Lake Montauk, south of Star Island, would require a detailed evaluation of potential environmental impacts associated with such extension. The option would likely be less cost effective than other viable plans as there is no advantage for the large fishing boats to transit further into the harbor. Generally, only recreational vessels would benefit from a channel extension and Corps projects cannot be formulated with recreation as a purpose. The Federal Government is restricted from participating in maintenance of private marinas, berthing areas, and access points. In addition, extending the Federal channel into the Coonsfoot Cove area, west of Star Island, was given consideration. However, the large percentage of silts and clays in the sediment would make this material unsuitable as beach fill and would require further environmental testing. This measure was removed from further consideration because it does not meet study objective 1 in that it does not provide adequate channel depths. The requirement for detailed environmental evaluation also makes this measure likely technically not feasible.

5. Channel Widening. The present authorized channel width of 150' was determined to be sufficient for two-way vessel traffic clearances. Since channel deepening would inevitably lead to a wider channel also, this option was not given further consideration. It also meets no other study objective.

6. Channel Realignment. Any major shift in the authorized channel due to its large initial costs would likely be not feasible. Shifting the outer channel west of its present position would temporarily improve the present shoaling condition resulting from east jetty leakage, but this

plan would not solve the deeper draft requirements of the larger vessels per Objective 1. It also would not provide a long-term safeguard against shoaling because, without jetty rehabilitation, sand bars would begin to form again. This option was not considered as an effective use of resources. It also meets no other study objective, and it was not considered further.

7. Deepening of Boat Basin. Sediment sample analyses indicated the presence of many silts and clays in this area, which is currently authorized at -10' MLLW. This may be a disposal hindrance, pending further testing. The area is currently used primarily by shallow draft recreational craft. Based on boating survey conducted in 2005, there are not enough transient vessels or turning basin needs to deepen the existing depth. Further, this measure does not address the channel. It also meets no other study objective. As a result, this option was not considered further.

8. Sand-Bypassing. Based on the results of sediment budget analysis, there is an approximately 12,800 cy per year of sediment supply from the updrift (east) shoreline. Of the total supply, approximately 7,000 cy per year is bypassed to the downdrift beach via channel dredging and approximately 800 cy per year is lost to deep water offshore. The remaining 5,000 cy per year continues to accumulate to the east of the inlet. The east sediment fillet is close to saturation and the accumulated sediment is shoaling the entrance channel both around the east jetty and by migration into the inner channel via gaps in east jetty. The accumulated updrift sediment fillet could be bypassed to the downdrift beach via trucking or hydraulic pumping across the channel to reduce future channel shoaling and maintenance dredging costs. Due to the small bypassing rate, temporary hydraulic pumping equipment or trucking would be more effective than using a fixed bypassing plant which requires a high investment cost and has inherent risks with regard to its effectiveness.

9. Jetty Rehabilitation. Rehabilitation of the eastern jetty could play an essential role in improving the navigation through the channel for the vessel fleet. A large portion of the shoaling material that enters the channel results from leakage through the eastern jetty. Accordingly, this plan component could reduce the future Operation and Maintenance Costs for the navigation channel. The without project future condition would mean continued deterioration of the eastern jetty and a mandate for more frequent dredging (shorter dredging cycles). Since the shoal that results from leakage tends to be localized but quite intrusive at certain channel points, this component could help enhance navigation maneuverability.The U.S. Army Corps of Engineers New York District, under a separate Operations and Maintenance Authority, rehabilitated a section of the eastern jetty from Station 5+55 to 9+55 together with a tie-in at the inshore end in year 1999. Despite this, it is projected that seepage of sand into channel through the voids of the east jetty would continue without further rehabilitation.

10. Deepening of the Federal Navigation Channel. There is a trend toward larger, deeper draft commercial fishing vessels. In 1993, there were 24 vessels overall with a loaded draft of 12' to 13' that listed Lake Montauk Harbor as a homeport. According to local fishing captains who were recently interviewed, there are approximately 15 large fishing vessels that operate out of the harbor. The vessels range from 50' to 100' in length with loaded drafts of 10' to 16'. When considering squat requirements, wave allowance requirements, and safety clearances, deepening would be necessary under present guidance and would meet concerns of local

interests. Deepening would improve navigation through the channel for the existing and future fleet and would enhance navigation maneuverability. This measure is considered further.

11. Removal of shoal at the inshore end of the East Jetty. A large sand shoal has been developing near the inshore end of the eastern jetty, just northeast of Star Island. It has been infringing upon the authorized channel width. In 1995, 2000, 2004, 2009, 2011, and 2014 the U.S. Army Corps of Engineers New York District removed part of this shoal during maintenance dredging. Local interests have indicated however that it has already begun to shoal in again because the jetty has not been rehabilitated enough to prevent further leakage into this area. However, due to the construction of a bulkhead, complete removal of the shoal will result in flanking of the structure; therefore this measure is no longer technically feasible and does not meet technical constraints.

12. Deposition basin outside the current authorized channel limits. Over the past several dredging cycles (1991, 1995, 2000, 2009, 2011, and 2014), advanced maintenance dredging measures have been employed. Essentially, for a length of channel approximately equal to the existing east jetty length, an additional 50' (outside and to the east of the existing channel) is dredged. This additional cut serves as a deposition basin to protect the authorized channel. This is also done for economic reasons because removing larger quantities is more efficient, given the high dredging mobilization and demobilization costs. This practice could be authorized and extended around the bend and into the inner channel, approximately an additional 1,800' length. The width of the deposition basin could be extended from 50' to 100' to increase the capacity. This measure further reduces environmental impacts from more frequent maintenance and the costs caused by the shoal migration into the harbor. This measure is carried forward for further consideration.

Table 1: Measure Screening Summary

Measure	Does the measure…			Carried forward?
	1 - provide adequate channel depths for reliable navigation	2 - provide for efficient navigation maintenance	3 - efficiently utilize all dredged material	
1. Unconventional drafts	No	No	No	No
2. High water transit	No	No	No	No
3. Relocation of the existing fleet	No	No	No	No
4. Channel Extension East and West of Star Island	No	No	No	No
5. Channel Widening	No	No	No	No
6. Channel Realignment	No	No	Yes	No

Measure	Does the measure…			Carried forward?
	1 - provide adequate channel depths for reliable navigation	2 - provide for efficient navigation maintenance	3 - efficiently utilize all dredged material	
7. Deepening of Boat Basin	No	No	No	No
8. Sand-Bypassing	No	Yes	Yes	Yes
9. Jetty Rehabilitation	No	Yes	N/A	Yes
10. Deepening of the Federal Navigation Channel	Yes	Yes	Yes	Yes
11. Removal of Shoal at the Inshore End of the East Jetty	Yes	Yes	Yes	No
12. Deposition Basin Outside the Current Authorized Channel Limits as a Deposition Basin	Yes	Yes	Yes	Yes

2.1. Initial Set of Alternatives

Measures that remained after the initial screening were considered for the initial set of alternatives. For this set, navigation improvement measures were combined to arrive at 4 alternatives (Alternatives 2 – 5) for further evaluation and consideration.

Alternative 1, for these evaluations, is the future without project condition. Specifically, Alternative 1 estimates that the current channel at -12 ft. MLLW and the regular practice of having the 50-ft. deposition basin will be maintained approximately every 4 years at a volume of 32,000 cy per operation beginning in 2026, which is the date estimated in the formulation of the maintenance conducted in 2018. Measure 2 High Water Transit is an inherent component of this alternative.

Alternative 2: Uniform dredging of both the 150- foot-wide channel and 50-foot-wide deposition basin: This alternative includes Measures 10 and 12. For this alternative, for both the channel itself and the deposition basin, depths for new Congressional authorization to be considered range from -14 to -18 feet MLLW. Both the channel and deposition basin would be dredged to a

uniform depth (both to -14, -15, -16, -17, or -18 feet MLLW). All dredged material would be placed on the downdrift beach but with no design (or disposed of offshore using the methods discussed in the next section). The expected maintenance cycle would be approximately 4 years at a volume of 32,000cy per operation beginning in 2027.

Alternative 3: Uniform dredging of both the 150-foot-wide channel and 100-foot-wide deposition basin: This alternative includes Measures 10 and 12 with the option in 12 to widen the deposition basin to 100 feet. For this alternative, for both the channel itself and the deposition basin, depths for new congressional authorization to be considered range from -14 to -18 feet MLLW. Both the channel and deposition basin would be dredged to a uniform depth (both to -14, -15, -16, -17, or -18 feet MLLW). All dredged material would be placed on the downdrift beach but with no design (or disposed of offshore using the methods discussed in the next section). The post-construction jetty slope stability after the greater widening of the deposition basin will be analyzed based on U.S. Army Corps of Engineers' slope stability manual (EM 1110-2-1902) guideline during the Planning, Engineering & Design; more details and adaptations to manage any risk to jetty stability (such as a shallower, stepped up dredging depth within the proposed 100 ft wide deposition basin; or reduced width of the proposed deposition basin width; or a combination of both) are discussed in Appendix A of the Main Report: Engineering and Design in the description of this alternative. The expected maintenance cycle would be approximately 7 years at a volume of 56,000cy per operation beginning in 2030.

Alternative 4: Uniform dredging of both the 150-foot-wide channel and 100-foot-wide deposition basin with East Fillet Mining: This alternative includes Measures 8, 10, and 12 with the option in 12 to widen the deposition basin to 100 feet. The east jetty impoundment offers an additional source of sand for the channel, and mining it reduces that source. The potential borrow region extends east from the inlet approximately 1000 ft and out to a depth of approximately -10 ft NAVD. It was assumed the fillet would be mined back to the baseline with a final slope of 1 on 12 down to a depth of -10 ft NAVD. Originally it was thought a cutter head dredged would be used to mine the fillet out from a depth of -17 ft NAVD up to the baseline, creating a construction slope of 1 on 3 that would gradually evolve to a final slope of 1 on 12. Field work (Mattituck Inlet) in 2014 indicated this is not a viable option for mining any appreciable volume of material. An alternative mining method of beach scraping and trucking of the sub aerial portion of the fillet is considered, and it would yield a significantly smaller volume of material (approximately 7,000 to 10,000 cy of sand). The rate at which this sand would be replenished to the fillet was estimated to range between 8 and 11 years. This was constructed using the most recent sediment budget for the region, assuming equal distribution of sand within the transport cell and along the profile, and constraining the mineable area to the sub aerial portion of the fillet. The gradual impoundment on the beach face and berm east of the jetty will reduce shoaling rates within the channel and deposition basin by roughly 3 to 5 percent, increasing the maintenance cycle by 1 year, to approximately 8 years. Maintenance would be at a rate of 64,000cy per operation beginning in 2031.

2.2. Dredging Method Selection

Volumes to be initially dredged for the final array of alternatives, Alternatives 2, 3, and 4, at depths ranging from -14 ft. MLLW to -18 ft. MLLW, with an additional 2 ft. tolerance, range from 51,800 cy to 205,300 cy. Volumes for Alternatives 3 and 4 are now calculated following feasibility level design to adjust the footprint slightly to avoid submerged aquatic vegetation. These volumes indicate that there are three potential dredge types and methods that could be used. It is noted here that all previous maintenance operations up through the operation conducted in 2018 (during which the channel was dredged below -14 ft. MLLW as advanced maintenance) was done by a cutterhead dredge. Dredging methods and dredged material disposal are interdependent in that some disposal methods are only practicable with certain dredging methods.

Mechanical Dredging: Mechanical dredging is typically accomplished using a barge mounted crane or excavator. A crane with a clamshell bucket can remove all but the most consolidated materials. Some clamshell buckets overlapping jaws and closure flaps to contain the dredged material and are known as environmental buckets, as they minimize loss of material to the water column during ascent. Other clamshells have teeth to facilitate removal of harder materials such as gravel and tills. Barge mounted excavators generally have much heavier gage buckets with heavy teeth to remove harder material such as compacted sands, consolidated tills, and weathered rock that can be ripped. The dredged material is placed in scows which are then towed by tugs to a disposal or offloading site. Most bucket dredging involves open-water or ocean disposal of the dredged material. The number of scows and tugs used would depend on the distance to the disposal site and the rate of dredging, in order to keep the dredge working while some scows were in transit to or from the disposal site. The nearest open water site is the Eastern Long Island Sound site recently designated by the EPA off the Connecticut coast southwest of New London. That site is 14 miles from Lake Montauk Harbor. Use of this site would place sandy dredged material in deep ocean waters where it would be unavailable to any littoral system processes. This would not be consistent with the USACE policy of using dredged material beneficially wherever practicable. Placement even this close to Lake Montauk Harbor also raises the estimated unit cost to between $15 and $30 per cubic yard of material. Scows can also be offloaded and material moved upland for treatment and or disposal, but this would be at a similar unit cost. Harder materials can often be beneficially used for reef construction. Sands can be placed in nearshore feeder bars off of eroding beaches where spring tides can push some of the material onshore. Mechanical dredging with nearshore placement could be used at Lake Montauk Harbor, however NYSDEC considers this less environmentally acceptable than placing onshore and outside the tidal zone. Only a portion of the material placed nearshore would ultimately be made available to the western beaches, limiting achieving Objective 3 unless it is now found less costly than the longstanding practice of dredging contractors using a cutterhead.

Hydraulic Pipeline Dredging: Hydraulic Pipeline Dredging involves the use of a cutter head suction dredge with onboard pump attached to a discharge line that carries the material to the location where the dredged material is deposited. The material is suctioned into the cutter head arm and pump by mixing it with water as a slurry. Depending on the type of material being

dredged (silt to sand) the slurry can be as much as 90 percent water. Silty dredged material can be pumped into containments to dewater, or onto other shallow areas for marsh creation. Sand can be pumped directly onto beaches where it can be spread and graded by heavy equipment as beach nourishment and shore protection. Cutter heads on pipeline dredges are general front mounted allow the dredge to dig its way in from deep water. Hydraulic pipeline dredges are typically classified according to their pump or discharge line diameter. Large pipeline dredges are typically employed on larger projects or those with greater dredge depths. Booster pumps, typically on barges, may be required along the discharge line for the slurry to reach more distant placement sites. Elevation can be an issue where the discharge point is significantly above the cutter head's working depth. A hydraulic pipeline cutter head dredge could be used for the improvement of Lake Montauk Harbor, provided it was of sufficient size to reach to the intended -20-foot (18+2) pay removal depth at high tide. The pipeline could be routed directly to the west beach areas in need of nourishment material. With proper site preparation (toe dikes, discharge diffusers) and timely grading of the beachfill this would ensure that the majority of the dredged material reached and remained on the beach. The estimated unit cost of this method is between $10 and $12 per cubic yard of material.

Hopper Dredging: A hopper dredge is similar to a pipeline dredge in that it suctions material from the dredge area. Instead of pumping the material through a pipeline the material is discharged into hoppers onboard the dredge. The dredge then places the material in ocean or open water disposal sites, into nearshore bar systems, or onto other subaqueous sites (such as those used for shellfish habitat creation). Hopper dredges can also work together with barge mounted pump-off equipment which re-fluidizes the dredge material to remove it from the hoppers and pumps it via pipeline to the placement site. Some larger hopper dredged can perform this action without a separate piece of equipment and merely need pipelines to connect to which extend to shore. In this manner beaches more distant from the dredge site than could be reached by a pipeline dredge can be nourished. Most hopper dredges are trailing drag arm suction dredges, with the suction trailing the vessels as it moves forward. This limits the ability of the dredged to make deep vertical cuts. Hopper dredges also have significant differences in their loaded and unloaded drafts. Even smaller hopper dredges that draw 4 feet unloaded will draw 11 feet loaded making use in shallow draft channels such as the channel at Lake Montauk Harbor difficult and not having been preferred during previous maintenance. The USACE has two shallow draft modified split-hull drag arm hopper dredges (Currituck and Murden) that are used to dredge smaller east coast harbors and typically work in New York and New England in the May to October timeframe. A hopper dredge could be used for the improvement of Lake Montauk Harbor, however it would be limited by several factors that could make such a method impracticable, such as a need to work around the tide in the shallow draft channel.

Based on the above analysis, costs have been estimated using a cutterhead with onshore disposal on the shore west of the inlet. This construction and placement scenario is most similar to longstanding maintenance practices. For environmental analyses purposes, it will be assumed that a small cutterhead dredge will be used for construction of the channel and deposition basin and to place the dredged material, via pipeline, on the west shore/downdrift of the inlet.

3. Existing Conditions and Potentially Affected Environment

3.1. Existing Conditions

General. The topography of the Montauk Peninsula is generally hilly, with rolling topography and numerous depressions and includes the project area. Soils of the Lake Montauk watershed can be characterized as deep and excessively to moderately drained. The soil texture is silt loam and/or fine sandy loam in the surface layer, and silt loam, loam, and/or fine sandy loam in the subsurface layer. Offshore sediments are influenced by strong currents and generally consist of coarse material such as gravels and sands, including the sediments found within the Lake Montauk Inlet. Sediments within the lake in general contain significantly higher proportions of fine particles, muds and silts. Ground water recharge for Montauks principle aquifer is precipitation which amounts to about 50 inches a year. Suffolk County Water Authority supplies water to most dwellings on the west of Lake Montauk.

Aesthetics and Scenic Resources. The existing project site consists of the northern portion of Lake Montauk, the Marina, the inlet and the shorelines and surface waters of Long Island/Block Island Sound. The harbor and marina provides boating and fishing opportunities as well as other activities relevant to such facilities. The beach and the areas contiguous with the inlet and jetties facilitate swimming, fishing, windsurfing, sun bathing, beach strolling, picnicking and bird watching, as well as a quality view shed for the surrounding environs. Presently west of the inlet there is a substantial amount of eroded shoreline within the project area due to recent erosion and the damage to the land forms as well as aging shore protection structures.

Aesthetic and scenic resources in the study area are derived from the water vistas and the open coastal nature of much of the project site. The value of these areas have been enhanced through the area's use for recreation and open space. West of the immediate project site is county park land which is undeveloped and provides for camping opportunities. Due to the open space offered by the parkland the area east of the inlet offers natural scenic resources associated with views of the Long Island Sound, and Block Island Sound, as well as adjacent undisturbed uplands to the south. The Project area attracts sightseers interested in views of natural scenic resources that include vistas of open water, as well as the potential for wildlife observation, such as migratory waterfowl.

Development within the study area has been modest, and consists primarily of the facilities related to the harbor and its marinas but also includes restaurants and several motels. Part of this development has been residential and includes the lake shore, as well as the somewhat more densely populated district west of the lake along the beach out to Culloden Point. Within the vicinity of Lake Montauk is Montauk Point (at 6 miles east) which has the Montauk Lighthouse and six associated historic structures which sustain an enormous popular interest by the public, and which have a close association with maritime history. The aesthetic quality of the Lighthouse complex is enhanced by the landscape of Montauk Point. Montauk Point is also a very popular destination for tourists and sportsman.

Transportation. The study area is linked to adjacent population center (Village of Montauk) by two roads: West Lake Drive, County Road 77 which parallels the western shore of Lake Montauk and Montauk Highway (State Route 27) which runs on an east-west axis through the center of Montauk peninsula, and functions as the main transportation route along the east end of the south fork of the Long Island. There is also a network of streets that interconnect the residential area west of the lake. The main route from this development is Sound View Drive which connects to West Lake Drive and Montauk Highway. The study area is served by the Long Island Rail Road and the Suffolk County Transit System's Bus Route 10c.

Storm Water. Limited stormwater infrastructure data is available for the Lake Montauk Watershed. Data was compiled from the Town, the Peconic Estuary Program (PEP) and field visits to identify infrastructure locations. The Town's data was collected in 2012 as part of their MS4 reporting requirements, and the data collected by PEP was compiled in 2000 as an initial dataset for the Peconic Estuary. Several direct outfall pipes are located along the lake shoreline. Additionally, several areas of direct overland flow were identified by the Town or PEP along the shoreline. As a result, it can be surmised that at a minimum, areas located in close proximity to the lake shoreline have some direct discharge to the lake. There is evidence of upland catchment, as illustrated by the abundance of catch basins located in the northwest portion of the watershed. Similar catchment facilities may be provided in other areas of the watershed; however, complete data illustrating drainage infrastructure within the watershed is unavailable at this time.

Sanitary. No private or municipally owned sewage treatment plants are located within the watershed. As a result, all property owners have individual sanitary systems for each building. The age and functionality of these systems is unknown as some structures have been expanded or restored, while others have had very little change since being built. This is particularly true in the Ditch Plains neighborhood located south of the lake. Many of the residences located in this neighborhood were built between the 1950's and the 1970's, and may not have had upgrades to the sanitary systems. This area also has shallow depth to groundwater (less than 8 feet), suggesting that some sanitary systems may not have adequate separation distance to groundwater and therefore are not functioning properly. As a result, these systems could be contributing nitrogen and coliform pollution to the lake and to the Atlantic Ocean.

Hazardous, Toxic, and Radioactive Waste. A preliminary Hazardous, Toxic, Radioactive Waste (HTRW) assessment was performed for regulated sites at the recommended search distances from the study site in accordance with the American Society for Testing and Material (ASTM) E1527-00 Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process.

An assessment of HTRW in the study area was conducted by reviewing recent state and Federal data sources. No HTRW sites or New York State-listed Inactive Hazardous Waste Disposal Sites

have been identified within the study area (NYSDEC 1998b, USEPA 2002). The initial reconnaissance report (USACE 2005) for the Project included a survey for HTRW in and around the study area. No evidence of HTRW was identified within the study area. However, there were two sites nearby that contain HTRW.

The Montauk landfill is located several miles away from the Project area and was investigated for potential seepage from septic lagoons. However, there is no evidence that any seepage would impact Lake Montauk or any locations within the project study area. Camp Hero, a former military installation, is approximately 3.6 miles southeast of the Project area. Potential HTRW at Camp Hero consisted of underground storage tanks (oil storage), above ground storage tanks, transformers, and a deteriorating sewage treatment plant. Although some seepage from these HTRW sources may have occurred at Camp Hero, there is a very low probability that the contaminants would impact the Project area.

Land Use. The Lake Montauk watershed area is approximately 2,728 acres in size, the majority of which is occupied by Recreation & Open Space (24.94%), Medium Density Residential 18.61%), Transportation/Utilities (13.15%) and Low Density Residential (10.94%) uses. Vacant Land also occupies a significant portion of the watershed, as it currently comprises 22.08% of lands. Although High Density Residential (4.43%), Commercial (3.18%), Agricultural (0.86%) and Marinas (0.54%) occupy a much smaller portion of the watershed, these uses represent the remainder of the major uses that occupy lands. All other uses within the watershed occupy less than 0.5% of the overall land mass.

Geology. Long Island belongs to the inner part of the Atlantic Coastal Plain. The main body of Long Island divides into two branches at the head of Great Peconic Bay. The backbone of the Island in the main body consists principally of two moraine ridges of Pleistocene age, the Harbor Hill Moraine and the Ronkonkoma Moraine. The moraine and outwash accumulations, associated with the glacial or recent epochs, constitute the greater portion of both the surface and underlying materials throughout the entire island.

The geology underlying the Lake Montauk watershed is comprised of six geologic units. The first and deepest is comprised of crystalline bedrock. Above this bedrock lie the sedimentary deposits which form the three major water-bearing units that underlie the area. Lying immediately atop the bedrock is the Raritan formation, which is comprised of the Lloyd sand layer and an overlying clay layer. Directly above the Raritan formation is the Magothy formation. The Magothy formation is comprised of fine to medium sand mixed with silt and clay and some beds of coarse sand and gravel.

Soil. Surveys identify the majority of the Lake Montauk study site as lying within an area characterized entirely by Montauk-Montauk, sandy variant-Bridgehampton Association soils. Soils of this association are characterized as deep, rolling and hilly, excessively-drained and moderately well-drained to well-drained soils, having medium to coarse-textured soils on moraines. It is noted that Montauk soils within this association have a fragipan or compact layer that is at a depth of 20 to 30 inches, and that Bridgehampton soils within this association have a compact glacial till at a depth of about 48 inches. A much smaller portion of the Lake Montauk watershed, located on the northeastern side of the lake lies within an area characterized by Dune Land-Tidal marsh-Beaches association.

At Montauk Point, to the east of the study site, the shoreline is characterized by a series of bluffed headlands formed by erosion of the face of the Ronkonkoma Moraine, with some nearly vertical bluffs rising to a height of almost 70 feet above sea level. The shoreline from this point westward to Fort Pond Bay, the western limit of the study area, is a succession of wave-formed beaches. The beaches are backed by sand dunes with widths ranging from 20 to 50 feet and heights ranging from 10 to 25 feet above mean sea level. At most parts of the shoreline west of the inlet, a mild, narrow foreshore slope backed by a steep dune characterizes the beach profile.

Littoral Materials. Littoral material on the study shoreline is predominantly sand and gravel. On the westward 3,000 feet of shoreline next to the inlet, beach sand due to erosion has been reduced to a gravel beach. Two sediment samples were collected at the east and west sides of the inlet in October 1994, representing typical beach sand sizes in the study area. The sand samples were tested for grain size distribution. The littoral material is predominantly light to brown fine to medium sand. The median sand size at the east shoreline is approximately 0.4 mm. The median size at the west shoreline is approximately 0.24 mm. The finer sediment size at the west shoreline is believed to be material from channel dredging. Due to slow-down of bluff erosion (providing littoral material source) and man-made shore protection structures, the littoral transport rates along the project shoreline have slowed down gradually.

Sediment Grain Size. The predominant substrate type in areas of swift currents (i.e., at the mouth of the inlet) included coarse material such as gravels and sands. Littoral material on the study shoreline is predominantly sand with some gravel. The finer sediment size at the west shoreline is believed to be material from channel dredging. The dredged material in the channel and boat basin is predominantly comprised of fine to medium sand with traces of silt. Grain size testing for compatibility with shore placement will be updated during the Pre-Engineering and Design (PED) phase of the project, and as a requirement to obtain water quality certification or permits from the affected state.

Precipitation. Precipitation trends in East Hampton are similar to that of the Long Island region. Data for East Hampton was obtained from the Northeast Regional Climate Center and analyzed for monthly and annual trends. It is noted that the dataset for East Hampton is extremely limited, as data only exists from 2003 to present. The majority of precipitation occurs between November

and March, while precipitation declines during mid-spring and summer months. The highest average precipitation occurs in March, which averages 14.51 inches within that month. The smallest average quantity of precipitation occurs in June, which only averaged 5.75 inches of precipitation.

Surface Water. Two freshwater streams and one tidal stream feed directly into the lake, and several wetland systems drain either directly or indirectly to the lake. Three significant pond systems are located within the lake's watershed, including Big Reed Pond and Little Reed Pond, located in the northeastern portion of the watershed while an unnamed pond (New York State Department of Environmental Conservation Freshwater Wetland #MP-13) is located in the southwestern portion of the watershed. The most prominent system discharging to the lake is Big Reed Pond which drains to Little Reed Pond, which ultimately drains to Lake Montauk in the vicinity of East Lake Drive, south of the Montauk Airport. As previously indicated, a number of freshwater wetland systems drain directly or indirectly to the lake.

Water Bodies. The principal marine water bodies in the study area are the Atlantic Ocean to the south and the Long Island Sound to the north. Lake Montauk, once a spring fed fresh water lake, has since become saline due to the permanent inlet. Several fresh water bodies are present within the Montauk watershed, including Peter's Run, Stepping Stones Pond, and Little Red Pond. Fresh water bodies comprise only about 72 acres (1.8%) of the Montauk watershed. As a result, the Montauk watershed lacks potable surface water resources because the majority of the surface water in the watershed drains to, or is contained within, Lake Montauk proper. The salinity in Lake Montauk ranges from 28 to 31.7 parts per thousand (ppt) (Austin 1973, ISRA 1983). The Lake is approximately 2.3 miles long, 1 mile wide, and covers approximately 1,037 acres, with a mean depth of 7 feet.

Tides. Lake Montauk Inlet is subject to semi-diurnal tides (two highs and two lows per day). A tabulation of the astronomical tide elevations based on the Tide Tables pertain to datum referenced to Mean Lower Low Water (MLLW). The National Geodetic Vertical Datum (NGVD), established by the U.S. Geological Survey as mean sea level datum in 1929, is used in many official survey monuments. NGVD is approximately 0.8 ft above MLLW.

Water circulation. Lake Montauk is mainly tidally induced with the areas of greatest circulation at the inlet and least circulation in the central portion of the Lake. According to Flagg and Greene (1981), the average tidal range was approximately 23 inches. Generally speaking, Lake Montauk is a well-mixed estuary in the northern two-thirds of the Lake, and a partially mixed estuary in the southern third. Water circulation is impeded by Star Island and the causeway; the two one-way valves underlying the causeway to Star Island, which were installed to increase tidal flushing north of the causeway, have silted in, occasionally.

Waves. Typical waves reaching the site of the study area include both the locally generated short period wind waves and long period sea swells generated in the deep ocean. Due to the sheltering effect of the site, only waves from West South West (WSW) clockwise to East North East (ENE) will affect the site. The predominant wind waves are from Northwest (NW) with the majority of wave heights in the range from 1.0 to 1.5 feet. The long period ocean swells will have minor effect on the study area. Ocean swells and deep-water waves are sheltered by Block Island and Montauk Point due to the northeast-southwest orientation of the shoreline. Storm waves are determined based on extreme winds in the direction of NNW, which generate the most critical wave for beach erosion and shore protection structures.

Sea Level Rise. A study of tidal records at Montauk Point indicated that average rates of sea level rise range from 0.072 inches to 0.11 inches/year. Sea level rise at the north shore of Long Island was estimated at 0.096 inches/year or 0.96 feet in 100 years. This value represents a forecast based on documented historic changes in tide levels.

Groundwater. Groundwater in the Lake Montauk watershed is derived from precipitation. Rainfall and melt water entering the ground ("recharge") passes downward through the unsaturated zone to a level below which all porous layers are saturated. The upper surface of this level is referred to as the "water table". Groundwater is a mild expression of topography and consequently, the water table coincides with sea level along the shorelines of the Lake Montauk watershed, and rises in elevation towards the western and southeastern edges of the sub-watershed boundaries.

The elevation of groundwater underlying the Lake Montauk watershed ranges from 8 feet above mean sea level (MSL) in the northwest part of the watershed, to zero at the above ground surface in areas of wetlands and surface water. In general, groundwater flows from the 8 foot elevation mound on the west side of Lake Montauk toward the north, south, east and west. A secondary mound of groundwater forms in the southeastern higher elevation part of the lake, such that the high points of these two groundwater mounds form a watershed divide between groundwater that flows generally toward Lake Montauk, Block Island Sound or the Atlantic Ocean. As groundwater migrates away from areas of higher elevation toward the shore, it eventually discharges to surface water as a result of surface seepage and subsea (or subsurface) outflow. Near the shore, water entering the system tends to flow horizontally along a shallow flow system and is discharged from the subsurface into streams or marine surface waters. Water that enters the system farther inland and along the western end of the Island generally flows vertically downward deeper into the Upper Glacial aquifer before flowing toward the shores where it is discharged as subsurface outflow.

Vegetation. Six vegetation types associations within the Montauk watershed were identified: tidal wetlands, freshwater wetland, forest vegetation, maritime scrubland, dune vegetation, and pasture land/open field. Additional vegetated cover type designations include two invasive species identified in the study area: Japanese knotweed and common reed. Submerged aquatic

vegetation is present in Lake Montauk. Specific analyses of SAV is presented in Section 4, and in the Essential Fish Habitat (EFH) Assessment in Appendix B. Specific analyses of protected species of plants are presented in Section 4, and in Appendix C.

Wetlands. The NYSDEC has identified 20 freshwater wetlands within or partially within the Lake Montauk Watershed; these areas comprise approximately 700.3 acres of wetland systems, 431.3 acres of which are located within the watershed. It is noted that the largest freshwater wetland, MP-2, is associated with Big Reed Pond located in the northeastern portion of the watershed and is approximately 197.3 acres in size of which approximately 106.22 acres are located within the watershed, and is generally of high quality. The only two freshwater wetlands of moderate quality (MP-41 and MP-42) are located in proximity to the southeastern shoreline of the lake while the only two freshwater wetlands of low quality (MP-19 and MP-36) are located in the southern and west-central portions of the watershed, respectively.

The tidal wetlands within the watershed are located where the shoreline intersects and interfaces with tidal waters. These wetlands contain saline waters, which originate from the ocean-fed surface waters associated with the lake. These features are formed by coastal processes and, with the exception of formerly connected tidal wetlands, are subject to tidal influence. These areas are not only vital to the ecological systems to which they serve, but also function to control storm surges during flood and major storm events which may impact sensitive watershed areas.

Tidal wetlands in the study area are generally located around the perimeter of the Lake, or directly adjacent and hydrologically connected to the Lake. Tidal wetlands were predominantly vegetated with salt marsh cord grass (*Spartina alterniflora*), whereas high marsh areas included vegetation such as salt hay (*Spartina patens*), spike grass (*Distichlis spicata*), black grass (*Juncus gerardi*), marsh elder (*Iva frutescens*), and glasswort (*Salicornia* spp.). Tidal wetlands comprise about 75% of Lake Montauk's shoreline (Town of East Hampton 1989). This description is consistent with the current tidal wetland community in the study area, with the exception of a decrease in the amount of tidal wetlands along the Lake Montauk shoreline, due to development in the area since the 1981 survey was conducted.

Uplands. Forested vegetation is located mostly in upland (non-beach) areas. Species found within this category include white oak, scrub oak (*Quercus ilicifolia*), hickory (*Carya* spp.), flowering dogwood (*Cornus florida*), American holly (*Ilex opaca*), pitch pine (*Pinus rigida*), catbriers (*Smilax rotundifolia*), inkberry (*Ilex glabra*), and smooth sumac (*Rhus glabra*) (SCPD 1981).

Dunelands. Dunelands are located in the northeast section of the Montauk watershed and include species such as beach grass (*Ammophila breviligulata*), American sea rocket (*Cakile edentula*), and seaside goldenrod (*Solidago sempervirens*) (SCPD 1981). The (Sound) beaches to the north of the lake are narrow and sparsely vegetated communities on substrates of unstable sand, gravel,

or cobble. These communities occur above mean high tide and in many cases have been modified as a result of storm waves, wind erosion or erosion protection measures. The maritime dunes associated with these beaches (west of the inlet) are covered by American beachgrass (*Ammophila breviliqulata*) and wooly beachheather (*Hudsonia tomentosa*). Farther landward where there is a decrease in the amount of salt spray and sand burial, less specialized species such as seaside goldenrod (*Solidago sempervirens*) and beach pea (*Lathyrus japonicus*) accompany the American beachgrass. Narrow bands of dune grass communities are also present at several locations around the perimeter of the Lake.

Invasive Species. Invasive species communities were observed in many locations in the study area. Japanese knotweed (*Polygonum cuspidatum*) was observed in two areas: at the north end of Star Island adjacent to the paved parking area, and along the southern shoulder of the access road to Star Island. Common reed was present in many areas in the study area, including adjacent to a boat launch west of Star Island, near Stepping Stones Pond, around the small pond that drains into the southern tip of the Lake, and in small patches at various locations around the perimeter of the Lake.

Reptiles and Amphibians. Site-specific studies and/or surveys describing the diversity and abundance of amphibians and reptiles within the study area are not available. However, the New York State Amphibian and Reptile Atlas Project sponsored by the NYSDEC has recorded several reptile and amphibian species as occurring in, or in the vicinity of, the Project area. Frog and toad species such as the green frog (*Rana clamitans melanota*), spring peeper (*Pseudacris crucifer*), and Fowler's toad (*Bufo woodhousii fowleri*) are common to the area and can be found inhabiting fresh and brackish water wetlands and ponds (NYSDEC 2001). Diamondback terrapins (*Malaclemys terrapin*) also are common to Long Island waters (Morreale 1992), especially in estuarine waters associated with bays and marshes, and may be found in the Lake waters. Common snakes such as the ribbon snake (*Thamnophis sauritus*), garter snake (*Thamnophis sirtalis*), and black racer (*Coluber constrictor*) can be found inhabiting vegetated upland and wetland areas in the study area (NYSDEC 2001). Several species of sea turtles seasonally migrate through the deeper waters off Montauk Point. However, their presence in the shallow nearshore waters associated with the study area including Lake Montauk is not likely.

Birds. The nearshore open waters, and the estuarine, fresh, and brackish waters within the Lake Montauk watershed provide feeding, nesting, roosting, and over-wintering habitat for a wide variety of bird species. In particular, the nearshore open waters surrounding nearby Montauk Point provide regionally significant and critical wintering waterfowl habitat and concentration areas, including one of the highest total Christmas' "bird counts" in the northeastern United States (USFWS 1997). The diversity and quality of marine, estuarine, and terrestrial habitat in and around Lake Montauk provides habitat for a variety of waterfowl, wading birds, seabirds, shorebirds, passerines, non-passerines, and birds of prey. Specific analyses of protected bird species is presented in Section 4, and Appendices C&D.

Mammals. The marsh, forest, and shrubland areas in the Lake Montauk study area provide habitat for a variety of small, mid, and large sized mammal species, including insectivores, rodents, rabbits, hoofed mammals, and seals. The terrestrial species most likely to occur in the Project area are habitat generalists tolerant of development. However, the high quality and diversity of habitat in the vicinity of the Project area (i.e., Montauk peninsula) provides habitat for some less tolerant species. Two marine mammals, gray seals (*Halichoerus grypus*) and harbor seals (*Phoca vitulina*), are known to use the rocks in the revetment around nearby Montauk Point, and other shoreline areas including Culloden Point, as haul-out areas during the winter (USFWS 1997, PEP 2001). Specific analyses of protected mammal species is presented in Section 4, and in Appendix C&D.

Finfish, Shellfish and Benthos. As the species that comprise these communities will be the focus of detailed analyses due to their potential to be adversely affected from the proposed Federal action, discussion of these species and detailed analyses of potential effects to these species is deferred to Sections 3.2, 4.2, 5 and in Appendix B.

3.2. Potentially Affected Environment

Resources identified in Sections 3.1 through 3.2.3.8 result from the screening of the expanse of resources identified in Section 3.1 (Existing Conditions) that could potentially be significantly adversely affected by implementation of the proposed action.

3.2.1. Natural Resources Identified for Focused Analyses

Subsection 3.2.1 identifies those resources that will be further analyzed for potential significant adverse effects (see Section 4) resulting from the deepening of an existing Federal navigation project within a marine environment (e.g. marine zone) and from the placement of dredged material on an eroded (barren) downdrift beach in an upland (supratidal) environment (e.g. upland zone).

Finfish. Lake Montauk supports few species of adult finfish. However, it is an important estuary, providing spawning grounds, nursery, and hatching areas for residential and migratory species (ISRA 1985). Additionally, the area outside the Lake (from The Great Peconic Bay to Montauk Point) appears to be much more productive than other estuaries and embayments around Long Island for finfish species such as scup (*Stenotomus chrysops*), weakfish (*Cynoscion regalis*), and winter flounder (*Pseudopleuronectes americanus*) (PEP 2001). Austin (1973) found Atlantic silverside (*Menidia menidia*) to be the most common fish species in the Lake. However, a more recent study found three-spine stickleback (*Gasterosteus aculeatus*) to be the most abundant forage minnow, and young Atlantic tomcod (*Microgadus tomcod*) and blackfish (*Tautoga onitis*) were the most widely distributed recreational fish throughout the Lake (ISRA 1985).

Anadromous species found near the study area include the alewife (*Alosa pseudoharengus*), Atlantic menhaden (*Brevoortia tyrannus*), Atlantic silverside (*Menidia menidia*), striped bass

(*Morone saxatilis*), and white perch (*Morone americana*). American eel (*Anguilla rostrata*) was the only catadromous species, and crevalle jack (*Caranx hippos*) and Florida permit (*Trachinotus falcatus*) were the only tropical species observed in the study area.

Fish species with commercial and recreational importance observed in the Lake Montauk watershed include alewife, American eel, American sand lance (*Ammodytes americanus*), Atlantic butterfish (*Peprilus triacanthus*), Atlantic croaker (*Micropogonias undulatus*), Atlantic mackerel (*Scomber scombrus*), black sea bass (*Centropristis striata*), bluefish (*Pomatomus saltatrix*), bluegill (*Lepomis macrochirus*), cod (*Gadus callarias*), pumpkinseed (*Lepomis gibbosus*), scup, silver hake (*Merluccius bilinearis*), smallmouth bass (*Micropterus dolomieu+*), spot (*Leiostomus xanthurus*), striped bass, summer flounder (*Paralichthys dentatus*), tautog (*Tautoga onitis*), and winter flounder(Pleuronectes americanus).

Shellfish. Similar to the finfish species, Lake Montauk supports valuable commercial and recreational shellfisheries, and is one of four prime bay scallop (*Argopecten irradians*) grounds in the Town of East Hampton. Significant populations of bay scallop and northern quahog (*Mercenaria mercenaria*) are found within most of Lake Montauk, and are harvested on a commercial basis by the baymen of the Town of East Hampton. Due to the bottom substrate and the presence of eelgrass (*Zostera marina*), the scallop population areas are commercially more significant than the harvesting of the hard clams. Additionally, traps are also deployed around the inlet of the Lake for American lobster (*Homarus americanus*) and channeled whelk (*Busycotypus canaliculatus*) (Flagg and Green 1981).

Surveys conducted in 1989 (Town of East Hampton 1989) showed an area south of Star Island contained common oyster (*Crassostrea virginica*). Other shellfish of commercial and recreational importance in the Lake include blue crab (*Callinectes sapidus*), sea urchin (*Strongylocentrotus* spp.), soft-shelled clam (*Mya arenaria*), and squid (*Loligo* spp.)

Numerous shellfish predators are also found throughout Lake Montauk. Species such as mud crab (*Dyspanopeus sayi*) and rock crab (*Cancer irroratus*) are confirmed predators of juvenile shellfish. Species such as the common starfish (*Asterias forbesi*) prey on both juvenile and adult shellfish, particularly the less motile species such as bay scallops and juvenile clams. Although the food supply for starfish is abundant, the warm temperature of the Lake seems to limit the starfish populations. Molluscan gastropods that prey on shellfish in Lake Montauk include mud dog whelk (*Ilyanassa obsoleta*), northern moon snail (*Euspira heros*), and oyster drill (*Usalpinx cinerea*) (Flagg and Green 1981).

Benthic Resources. Within the lake, the bottom sediments consists of sand with varying amounts of silt, clay (fine grain materials) and gravel. In areas that have been dredged, such as the marinas, but are not open to direct tidal action, silt and fine-grain materials have been deposited over the sand in significant amounts. Distribution and composition of benthic fauna along the

north shore intertidal and near shore zone is dependent on an organism's ability to withstand wave action, exposure to the air, and in general the capacity to adapt to this harsh environment. High energy environments do not exist in the lake, thus, distribution and diversity of lake-benthos are more dependent on such factors as sediment composition, salinity gradient, and other water quality parameters such as dissolved oxygen and siltation (ISRA 1983). The EFH Assessment adequately describes and assesses the potential impacts to regulated benthic habitat (Appendix B).

Submerged Aquatic Vegetation (SAV). Although the background data reviewed did not contain a comprehensive assessment of submerged aquatic vegetation (SAV) within the Montauk watershed, Flagg and Greene (1981) conducted an assessment of relative eelgrass (*Zostera marina*) abundance in the northern half of the Lake. They found that eelgrass was present at every sample location and it was the dominant vegetation of the Lake bottom. Eelgrass was found to be most abundant in the shallower portions (i.e., up to 1 meter) of the Lake, moderately abundant in water at a depth of 1 to 2 meters, and sparse at water depths greater than 2 meters (Flagg and Greene 1981). No other maritime vegetative species were identified.

USFWS mapped SAV based on review of fall 2000 aerial photography of the region. This survey identified green fleece and eelgrass beds in Lake Montauk (PEP 2006). Also, a 2004 survey of the northern third of the Lake identified two large areas of eelgrass located east and southeast of Star Island identified the presence (unmapped) of green fleece in the southern end of the Lake (Town of East Hampton 2005).

One SAV bed was identified by NMFS as being potentially adversely affected by the proposed project. USACE has received a letter of concurrence from NMFS on the EFH Assessment for the proposed project containing Conservation Recommendations (CR) that includes a seasonal restriction that will be incorporated in the construction schedule as a Best Management Practice (BMP) to be fully protective of the one identified SAV bed adjacent to the deposition basin. Redesign of the Deposition Basin was incorporated into the study to ensure complete avoidance of the one known SAV bed. The potential adverse effects of the proposed project on SAV is further analyzed in the EFH Assessment, Appendix B.

3.2.2. Natural Resources of Special Concern

3.2.2.1. Essential Fish Habitat (EFH)

As required by the Magnuson-Stevens Act, the National Marine Fisheries Service (NMFS) promulgated regulations to provide guidance to the regional fishery management councils for EFH designation. EFH designation were based on the presence or absence, and, in some cases, on the relative abundance of eggs, larvae, juvenile, and adults fish in long-term survey datasets, and on information compiled by the National Oceanic Atmosphere Administration (NOAA)/National Ocean Services (NOS) Estuarine Living Marine Resource Program, from the U.S. Atlantic coast from the Gulf of Maine to Cape Hatteras, North Carolina per the New England Fisheries Management Council (NOAA, 1999).

Pursuant to Section 305(b)(2) of the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA), Federal agencies are required to consult with the NMFS regarding any action they authorize, fund, or undertake that may adversely affect EFH. The regional fisheries management councils, with assistance from NOAA-Fisheries, are required under the 1996 amendments to Magnuson-Stevens Fishery Management and Conservation Act to delineate EFH for all managed species, to minimize to the extent practicable adverse effects on EFH, and to identify other actions to encourage the conservation and enhancement of EFH. EFH is defined in the Magnuson-Stevens Act as: "waters" to include aquatic areas and their associated physical, chemical, and biological properties that are used by fish which may include areas historically used by fish where appropriate; "substrate" to include sediment, hard bottom and structures underlying the water, and associated biological contribution to a healthy ecosystem; and areas used for "spawning, breeding, and growth to maturity" to cover a specie's full life cycle. Prey species are defined as being a forage source for one or more designated fish species, and the presence of adequate prey can classify a habitat as essential.

For assessment purposes, an adverse effect has been defined in the Act as follows: "Any impact which reduces the quality and/or quantity of EFH. Adverse effects may include direct (e.g., contamination or physical disruption), indirect (e.g., loss of prey, reduction in species' fecundity), site specific or habitat wide impacts, including individual, cumulative, or synergistic consequences of actions." EFH has been designated for species for which Federal management plans have been developed. The District has prepared an EFH Assessment for the study, provided in Appendix B.

3.2.2.2. Protected Species and Communities of Special Concern

The USACE consulted with the USFWS, NMFS and the NYSDEC's Natural Heritage Program (NYNHP) to determine whether any Federal or state listed species (endangered threatened or special concern), or communities of special concern occur in the study area. The following sections discuss Federal and state listed Species of Special Concern identified by these agencies, as well as Communities of Special Concern, or that require special management, are also discussed below. Copies of the consultation with the agencies are provided in Appendices C and D.

Section 7 of the ESA requires a Federal agency to ensure that any action authorized, funded, or carried out by the agency does not jeopardize the continued existence of Federally-listed endangered and threatened species, or result in the destruction or adverse modification of the designated critical habitat of Federally-listed species. The USACE is required to consult with the USFWS and/or the NMFS to determine whether any Federally-listed or proposed species, or critical proposed critical habitat may occur in the proposed Project area, and to determine the proposed action's potential effects on these species or critical habitats.

To comply with the requirements of Section 7 of the ESA, the District has conducted informal consultations with the USFWS and NMFS regarding the presence of Federally-listed or proposed listed endangered and threatened species and their critical habitat in the vicinity of the proposed Project (Appendices C&D). In addition, the USFWS has contacted the NYSDEC's Natural Heritage Program to review their database regarding Federally-listed and state-listed endangered and threatened species potentially occurring in the study area (USFWS 2019). The following sections discuss the Federal and state species of concern identified by these agencies and other sources. Areas or communities of special concern, or that require special management, are also discussed below.

Species of Special Concern

Reptiles. The Federally-listed endangered Atlantic (Kemps) ridley (*Lepidochelys kempii*) and leatherback (*Dermochelys coriacea*) sea turtles and threatened loggerhead (*Caretta caretta*) and green (*Chelonia mydas)* sea turtles have been identified as transient species through the study area (Beach 1992). Recent studies indicate that the nearshore waters within Peconic Bay, Gardiners Bay, Block Island Sound, and Long Island Sound are critical developmental habitat for juveniles of the Atlantic ridley sea turtle and a major feeding area for the loggerhead sea turtle (USFWS 1997, Bortman and Niedowski 1998, PEP 2001). Juvenile Atlantic ridley sea turtles recorded in Long Island waters represent the largest concentrations ever documented outside the Gulf of Mexico (Morreale et al. 1992). In the Northeast, during the summer months, juveniles (approximately 2 to 5 years of age) of the Atlantic ridley, loggerhead, leatherback, and green sea turtles migrate from the open ocean to inshore waters including areas along the coast of Long Island (Bortman and Niedowski 1998).

Mammals. Federally-listed endangered northern right whales (*Eubalaena glacialis*), usually individuals, are regularly sighted migrating through the nearshore waters off Montauk Point, usually from March through June (USFWS 1997) and have been identified as a transient species by the NMFS (Beach 1992). Small aggregations of Federally-listed endangered finback whales (*Balaenoptera physalus*) feed close to shore from Shinnecock Inlet to Montauk Point from January to March, and Federally-listed endangered humpback whales (*Megaptera novaengliae*) feed all around Montauk Point, primarily between June and September (USFWS 1997). Northern Long-eared bats are also documented as being in the vicinity of the study area (USFWS 2019).

Birds. The least bittern (*Ixobrychus exilis*) and northern harrier (*Circus cyanus*), and three species of concern, the red-shouldered hawk (*Buteo lineatus*), whip-poor-will (*Caprimulgus vociferous*), and osprey (*Pandion haliatus*), may potentially nest in the vicinity of the study area (USFWS 2003).

Piping Plover (*Charadrius melodus*) may also occur in or utilize the study area. Piping plovers are small, sand-colored shorebirds approximately 7 inches long, with a wingspread of about 15 inches. The Atlantic Coast population breeds on coastal beaches from Newfoundland to North

Carolina (NC) (and, occasionally, in South Carolina) and winters along the Atlantic Coast from NC southward, along the Gulf Coast, and in the Caribbean.

Piping plovers begin returning to their Atlantic Coast nesting beaches in mid-March. Males establish and defend territories and court females by early April (Cairns 1982). Piping plovers are monogamous, but usually shift mates between years, and, less frequently, between nesting attempts in a given year. Plovers are known to breed at one year of age, but the rate at which this occurs is unknown. Egg-laying and incubation can start as early as mid-April.

Piping plovers nest on coastal beaches (NC to Newfoundland), sand spits at the end of barrier islands, gently sloping foredunes, blowout areas behind primary dunes, and in overwash-created bare sand areas cut into or between dunes. In the central portions of their Atlantic Coast range (including NY-NJ), they may also nest on areas where suitable dredged material has been deposited. Along the Atlantic coast, development, encroachment of beach vegetation, flooding and erosion are primary factors in the loss of suitable breeding and nesting habitat for piping plover, as well as predation, which has been identified as a major factor limiting piping plover reproductive success.

Red Knot (*Calidris Canutus*). The rufa red knot is a medium-sized shorebird about 9 to 11 inches (in) (23 to 28 centimeters (cm)) in length. The red knot migrates annually between its breeding grounds in the Canadian Arctic and several wintering regions, including the Southeast United States (Southeast), the Northeast Gulf of Mexico, northern Brazil, and Tierra del Fuego at the southern tip of South America. During both the northbound (spring) and southbound (fall) migrations, red knots use key staging and stopover areas to rest and feed (ER BA).

The red knot is a large, bulky sandpiper with a short, straight, black bill. During the breeding season, the legs are dark brown to black, and the breast and belly are a characteristic russet color that ranges from salmon-red to brick-red. Males are generally brighter shades of red, with a more distinct line through the eye. When not breeding, both sexes look alike – plain gray above and dirty white below with faint, dark streaking. As with most shorebirds, the long-winged, strong-flying knots fly in groups, sometimes with other species. Red knots feed on invertebrates, especially small clams, mussels, and snails, but also crustaceans, marine worms, and horseshoe crab eggs. On the breeding grounds, knots mainly eat insects.

Red knots require open habitats that allow them to see potential predators and that are away from tall perches used by avian predators. Invasive species, particularly woody species, degrade or eliminate the suitability of red knot roosting and foraging habitats by forming dense stands of vegetation. Although not a primary cause of habitat loss, invasive species can be a regionally important contributor to the overall loss and degradation of the red knot's nonbreeding habitat.

Roseate Tern (*Sterna dougallii dougallii*): The roseate tern is about 40 centimeters in length, with light-gray wings and back. Its first three or four primaries are black and so is its cap. The rest of the body is white, with a rosy tinge on the chest and belly during the breeding season. The tail is deeply forked, and the outermost streamers extend beyond the folded wings when perched. During the breeding season the basal three-fourths of the otherwise entirely black bill and legs turn orange-red.

Roseate terns nest on small barrier islands, often at ends or breaks. They nest in hollows or under dense vegetation, debris or rocks hidden from predators. Roseate terns in northeastern North America almost always nest in colonies with common terns. Roseate terns begin arriving to breeding areas at the end of April and begin laying eggs as early as the third or fourth week of May. They lay about one to two eggs, rarely three, and rely on the more aggressive Arctic and common terns in the surrounding colony to defend them. In the winter, roseate terns migrate south in late August to early September.

Fish. Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*) may also occur in the study area. Like all anadromous fish, Atlantic sturgeon are vulnerable to various impacts because of their wide-ranging use of rivers, estuaries, bays, and the ocean throughout the phases of their life. General factors that may affect Atlantic sturgeon include: dam construction and operation; dredging and disposal; and water quality modifications such as changes in levels of dissolved oxygen (DO), water temperature and contaminants. Atlantic sturgeon also exhibit life history characteristics that make them particularly vulnerable to population collapse from overfishing, including: advanced age and large size at maturity, eggs that are numerous and small in relation to body size, and spawning that is episodic and seasonal. Other threats to the species include vessel strikes.

Dredging in riverine, nearshore and offshore areas has the potential to impact aquatic ecosystems by removal/burial of benthic organisms, increased turbidity, alterations to the hydrodynamic regime and the loss of shallow water or riparian habitat. Hydraulic dredges can directly impact sturgeon and other fish by entrainment in the dredge, and dredging may also impact important habitat features of Atlantic sturgeon if these actions disturb benthic fauna, or alter rock substrates. Indirect impacts to sturgeon from either mechanical or hydraulic dredging include the potential disturbance of benthic feeding areas, disruption of spawning migration, or detrimental physiological effects of resuspension of sediments in spawning areas.

Plants. The state-listed species sandplain gerardia was historically identified as occurring in the study area, and the rare seabeach knotweed (*Polygonum glaucum*), threatened saltmarsh spike rush (*Eleocharis halophile*), and small's knotweed (*Polygonum buxiforme*) may be present in the study area (USACE 1993, USFWS 2003). In addition, Southern arrowwood (*Viburnum dentatum* var. *venosum*), another state-listed species, is known to occur along the entrance loop road (NYSOPHP 2003).

Seabeach Amaranth (*Amaranthus pumilus*) may also occur in the study area. Seabeach amaranth germinates as small, unbranched, fleshy red colored sprigs between June and July in New York State (USFWS 2004b). These sprigs develop into a rosette of small, wrinkled leaves that branch out from the low-lying reddish stems. As the plant matures, it develops into a clump with numerous stems, which can reach a diameter of 3 ft. The small (1.3 to 2.5 centimeters in diameter) rounded leaves are clustered around the tip of the stems, exhibit a spinach-green color, and have a small notch at the rounded tip of the leaf (USFWS 1996). Inconspicuous flowers develop in clusters around the stem in mid-summer and can produce seed by July. Seed production continues until the plant dies, usually in mid to late fall, but can continue into January.

Seabeach amaranth is a native annual plant that inhabits barrier island beaches along the Atlantic Coast. Seabeach amaranth is dependent on natural coastal processes to create and maintain habitat. However, high tides and storm surges from tropical systems can overwash, bury, or inundate seabeach amaranth plants or seeds, and seed dispersal may be affected by strong storm events.

Seabeach amaranth occupies a narrow beach zone that lies above mean high tide at the lowest elevations at which vascular plants regularly occur. Seaward, the plant grows only above the high tide line, as it is intolerant of even occasional flooding during the growing season. Landward, seabeach amaranth does not occur more than a meter or so above the beach elevation on the foredune, or anywhere behind it, except in overwash areas. The species is, therefore, dependent on a terrestrial, upper beach habitat that is not flooded during the growing season. This zone is absent on beaches that are experiencing high rates of erosion. Seabeach amaranth is never found on beaches where the foredune is scarped by undermining water at high or storm tides. The most serious threats to the continued existence of seabeach amaranth are construction of beach stabilization structures, natural and man-induced beach erosion and tidal inundation, fungi (i.e., white wilt), beach grooming, herbivory by insects and mammals, and off-road vehicles.

Communities of Special Concern.

The entire Montauk Peninsula complex has been designated as a Significant Habitat Complex of the New York Bight watershed, and contains regionally significant, unique, and relatively pristine coastal complexes including maritime forest communities (USFWS 1997). Also, three areas within the Montauk Peninsula complex that are within or directly adjacent to the Project area have been designated as Significant Coastal Fish and Wildlife Habitats, as recognized by New York State Department of State, including Lake Montauk itself, Culloden Point, and Big and Little Reed ponds (USFWS 1997). Also, the USFWS has designated Culloden Point as a priority wetlands site under the Federal Emergency Wetlands Resources Act of 1986, and the National Park Service has designated Big Reed Pond as a National Natural Landmark (USFWS 1997).

The National Audubon Society of New York State recognizes Montauk Point (the area east of Montauk Lake to Montauk Point including offshore waters) as an Important Bird Area (IBA). IBAs are designated for sites that represent the most important habitats for the survival of birds and the conservation of bird species. Specifically, Montauk Point was recognized due to its importance to wintering waterfowl, and for supporting the largest winter concentration of sea ducks in the state. In addition, the site's importance to pelagic seabirds, migrant songbirds, and state threatened and special concern species is noted.

The USFWS lists the Montauk Peninsula Complex as a Significant Habitat Complex of the New York Bight Watershed (USFWS 1997). Significant Habitat Complexes are identified by the USFWS to aid in the identification, description, distribution, and population status of key marine, coastal, and terrestrial species occurring within the near-coastal waters, coastal lands, and uplands of the New York Bight watershed. The complex consists of undeveloped maritime communities that support an unusual diversity of rare plants and animals, and the nearshore waters support important concentrations of marine species.

In 1993, the Peconic Estuary, which encompasses Montauk Point, was designated as an estuary of national significance and included in the USEPA's National Estuary Program. The National Estuary Program has identified the Peconic Estuary as embracing diverse resources and habitats, which, in turn, provide values and uses important to all the citizens of New York, as well as to residents of the region.

3.2.3. Other Resources

3.2.3.1. Navigation.

Lake Montauk is a marine harbor with a Federally-maintained, navigable channel that opens to the north connecting Lake Montauk to Block Island Sound. Lake Montauk, formerly a freshwater lake, was permanently opened to Block Island Sound in 1925. In 1926 Montauk Beach Development Company was issued a Federal permit to construct two stone jetties at the inlet (United States Congress, House 1939). In 1927, a Federal permit was issued to allow the Montauk Beach Development Company to dredge the inlet to a depth of 15 feet. In the late 1930's the Montauk Beach Company, formerly the Montauk Beach Development Company, was financially unable to continue to maintain the entrance to the channel. The channel was not maintained to any degree until 1939, when the Board of Engineers for Rivers and Harbors agreed with recommendations by the Chief of Engineers and justified Federal participation in maintaining the channel. The USACE has been maintaining the Lake Montauk channel since 1949. From 1949 to 1983, the channel was dredged seven times (SCPD 1981). The channel was most recently dredged 2018. The parcel containing the Gone Fishing Marina has also been dredged to accommodate their dock and recreational users (ISRA 1985).

The current maintained channel depth of the Lake Montauk channel is -12' MLLW, which is not adequate for many of the current commercial activities. This has resulted in limited travel windows or habitual under-loading for deeper draft vessels using the Lake Montauk Harbor, as well as scouring of the bottom by vessels transiting the shallow channel. Navigation in the channel is also impacted by sedimentation in the southeastern portion of the channel, causing channel crowding and slowing United States Coast Guard (USCG) response times from the Lake Montauk Station (USACE 2005). Section 2.3 of the Main Report has more detailed information on the history of the existing navigation channel.

3.2.3.2. Recreation

Many recreational opportunities are available in the vicinity of the Lake Montauk that offer year-round recreational activities, including sightseeing, picnicking, wildlife observation, recreational fishing, hunting, golfing, playing tennis, biking, beach-going, surfing, and the multiple uses of trails for hiking, cross-country skiing, and horseback riding. Of particular interest are those sites located closest to the Lake, including the town beaches, Indian Field Park, Montauk Downs State Park, and Shadmoor State Park. These areas combined offer a wide variety of year-round recreational opportunities. In addition to outdoor recreation activities, there are also an assortment of restaurants and shops in and around the Town of Montauk that provide dining and shopping opportunities to local residents and tourists.

Nearby Montauk Point is considered to be one of the best surfing locations along the East Coast, primarily due the physical characteristics of the shoreline at Montauk Point. Surfers are attracted from all over the country to enjoy the specific waves and scenic setting that the point offers.

Also, Montauk Point is considered to be one of the great fishing areas for migratory game fish in the Northeast. With over 900 members, the Montauk Surfcasters Association (MSA) represents the locally organized fishing group (MSA 2006). Recreational fishing is an important part of the local economy, attracting "surfcasters" from across the nation (MSA 2006). The stone jetties that flank the Lake Montauk channel provide access for surfcasters to the nearshore waters surrounding the jetties. Also, recreational fishing outfitters based in Lake Montauk offer ample opportunities for offshore fishing in the area.

3.2.3.3. Socioeconomics

Socioeconomic conditions in the Project area in the Township of East Hampton, Suffolk County, New York, are affected by the area's development and zoning regulations. Much of the eastern portion of Long Island has been preserved primarily as recreational and open space according to land use planning and zoning ordinances. This area is moderately developed for residential, commercial or industrial purposes. (Suffolk County Planning Department [SCPD] 2001). In particular, development in the project area is dominated by the harbor marina and residential development west of the inlet. The harbor's commercial and recreational uses strongly influences

the socioeconomic conditions of the project area, especially with its associated use of the area for tourism and other recreational purposes by both seasonal and year-round residents and visitors.

Economic information for the Project area indicates that, in general, Suffolk County's local economy is characterized by healthy employment figures and low unemployment. Employment opportunities are provided by an increasingly diverse base. The defense industry remains a strong employer in Suffolk County, with additional employment opportunities in medical care, banking, educational institutions, department stores, and manufacturers (SCPD 2002). Suffolk County's local economy is also closely associated with the hotel and motel industry (including bed-and-breakfast lodging), particularly in eastern Suffolk County, where occupancy is primarily seasonal and associated with the tourism in this area.

Tourism is a particularly important part of the Suffolk County economy, and is focused on the eastern part of Suffolk County. This half of Suffolk County contains 986 miles of shoreline, and over 70,000 acres of parkland. In addition to the hotel and motel industry (including bed-and-breakfasts), Suffolk County has more than 38,000 seasonal homes designed specifically to accommodate the influx of seasonal visitors during prime vacation times of the year (SCPD 2002).

Lake Montauk harbor with its recreational uses as well as Montauk Point State Park attracted several hundred thousand visitors annually (USACE 2005). These two attractions contribute significantly to the local economy of Suffolk County, by attracting vacationers as well as local residents to enjoy the recreational opportunities including sightseeing, surfing, and fishing (Levine 2002).

Lake Montauk Harbor can accommodate recreational craft, fishing boats, and other small commercial craft with lengths up to approximately 100 feet. There are currently 18 marinas and five temporary docking and ramp facilities within Lake Montauk Harbor. The marinas have a total of approximately 1,235 dockside slips. Currently, the largest slip is 70 feet long. A few of the marinas have slips designated for transient boats and fishing and charter boats. Lake Montauk Harbor has two town docks, one named Star Island and the other Montauk Dock with 23 and 17 slips, respectively. Nearly all of these slips are occupied. About 400 additional moorings are used by transients during the summer. The demand for moorings is greater than the availability by 200 moorings.

The heavy volume of vessel traffic using the entrance channel consists primarily of pleasure boats and commercial fishing boats. The inlet channel is used by an average total of 500 boats per day during the warmer seasons. Although subject to turnover and change, the commercial fleet has at times comprised as many as 44 ground fish trawlers, 12 inshore and 7 offshore lobster boats, and 53 long liners (including as many as 32 transient boats from other areas of the east coast). The number of commercial vessels has increased by 578% since 1967 and currently

numbers 148. Clearly, the population of commercial vessels has increased significantly since the initial channel design and the trend of vessel size is to larger, deeper draft boats. The most recent survey of the commercial fishing fleet captains indicates that at least 10 boats are negatively impacted by the current navigation channel depth; an updated channel design for this report shows that the channel should be deepened to -17 ft. MLLW to best accommodate the current vessel fleet.

The area east of the inlet is a park owned by the Town for the first 500 ft. east of the inlet and beyond that first 500 ft are park lands owned by Suffolk County. The Suffolk County shores further to the east are used in the warmer seasons for camping and recreational vehicle use. The land east of the east jetty can be subject to erosion during storms, but more typically this shore is growing in width and elevation especially closer to the east jetty which impounds littoral material transported from the east.

As for the shoreline inside of Lake Montauk inlet, currently approximately 75% is tidal wetland, which is a decrease over the past three decades as a result of development. Moving southeast inside the Lake the shore is heavily developed with docks for commercial and recreational fishing including head boats which take customers out for fishing trips. The docks are backed by marinas, fish storage or handling facilities, and restaurants and seafood snack bars.

3.2.3.4. Environmental Justice

Environmental justice (Executive Order 12898) requires the fair treatment and meaningful involvement of all people with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. No group of people (including racial, ethnic, or socioeconomic groups) should experience a disproportionate share of negative environmental impacts from any private, state, or federal action, program, or policy (USEPA 2004). In order to prevent such a situation, potentially affected communities should have every opportunity to participate in decisions about a proposed activity that will affect their environment and/or health. The potentially affected community should also be afforded the opportunity to influence the final decision of the regulatory agency involved through the consideration of that community's concerns (USEPA 2004). There are no EJ communities in the project area.

3.2.3.5. Cultural Resources

Regulations

As a federal agency, USACE has responsibilities concerning the protection and preservation of historic properties. Section 106 of the National Historic Preservation Act of 1966, as amended (16 U.S.C. 470 et seq.), and its implementing regulations, the Advisory Council on Historic Preservation's "Procedures for the Protection of Historic and Cultural Properties" (36 CFR 800), and EO 11593 direct Federal agencies to take into account the effect of an undertaking on historic properties included or eligible for listing on the National Register of Historic Places

(NRHP). In accordance with these guiding regulations, the District carried out a Phase 1A cultural resources inventory for the area of potential effect (APE) to identify historic properties, including archaeological sites, and initiated coordination with the New York Historic Preservation Office, Federally-recognized tribes, and local interested parties.

Area of Potential Effect

The APE for the identification of historic properties and the undertaking's effects on historic properties has three parts; the federal navigation channel dredged to -17 ft MLLW, the 100 foot wide deposition basin, and the beach to the west of the inlet where the sand will be placed in an area extending 3,000 feet from the western jetty and 44 feet in width (Figure 5).

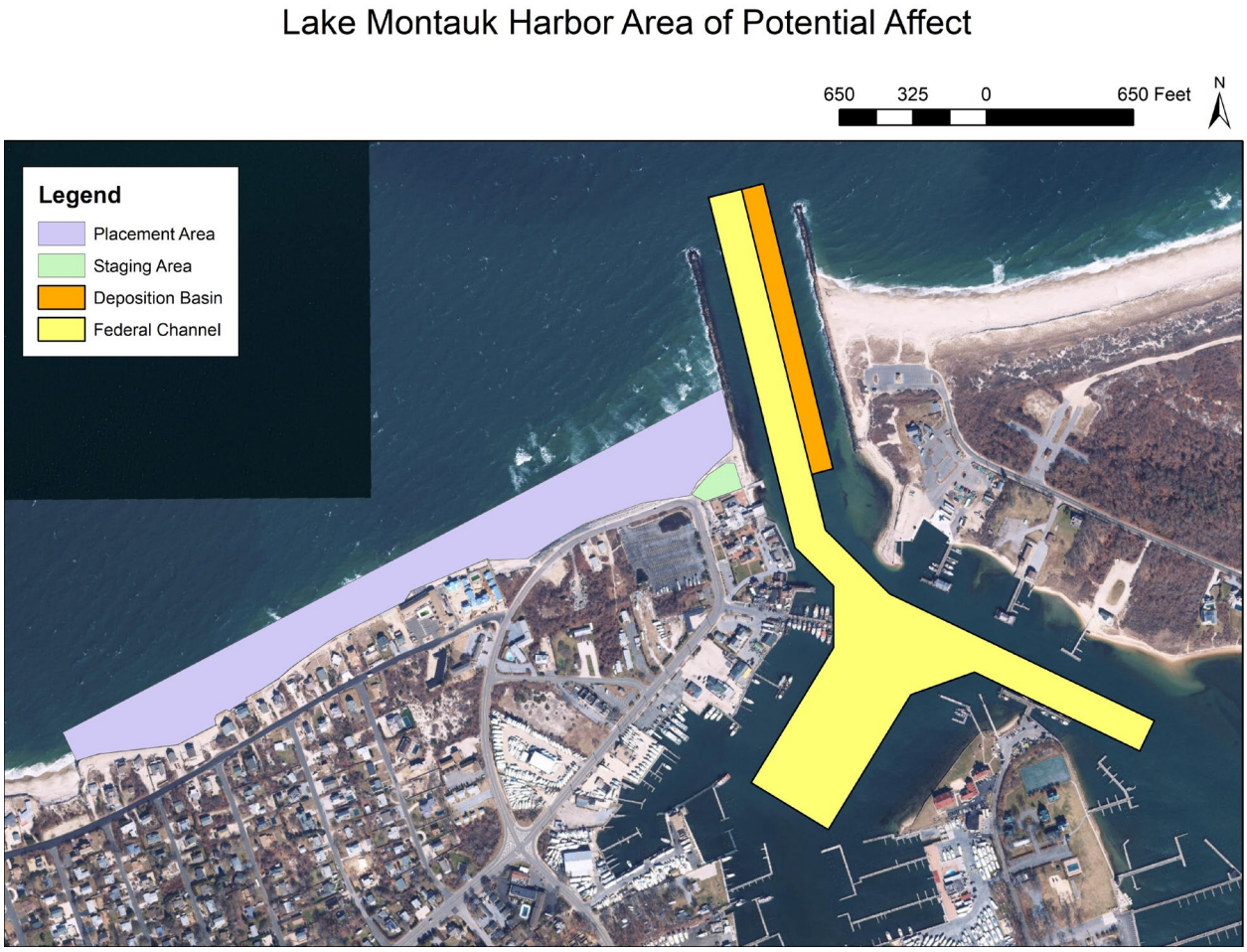

Figure 5: Lake Montauk Harbor APE.

Note: the dredged material will only be placed in a 44 foot wide berm. The placement area shown here is much larger and shows the possible area for placement.

Phase 1A Inventory

A preliminary records search of historic properties on New York's Cultural Resources Information System (CRIS) on January 16, 2019 showed that there are no known sites within the

project area. Outside of the APE but within half a mile, there are nine historic properties (Table 2). Five of these sites are historic and four are prehistoric. The nearest resource is the Caleb Bragg Estate, which is about 150 feet from the federal channel to be dredged. Next, there are three USCG buildings about 350 feet from the federal channel. Two of these buildings are eligible for the NRHP while the third is ineligible. Then, about ¼ mile (1,500 feet) from the federal channel is the NRHP eligible Star Island Prehistoric Site. The remaining four sites are about ½ mile from the APE. These include the NRHP listed wreck of the HMS Culloden, a British Man-of War that ran aground in 1781 (~ 2,500 feet west from the sand placement area), and three prehistoric sites: Culloden Point Prehistoric Sites; Culloden Point IV Prehistoric Site; and Culloden Point Area F Extension (all ~2,800 feet from the sand placement area). The first of which is eligible for the NRHP and the other two have undetermined eligibility.

Table 2: Sites Nearby the Project Area

USN Number	**Site Name**	**Description**	**NRHP Eligibility**
10303.000077	H.M.S. Culloden Shipwreck Site	A British Man-of-War that ran aground on January 24, 1781	Listed
10303.000140	Culloden Point Prehistoric Sites	4 Woodland Period Prehistoric sites. All lithic scatters with buried components.	Eligible
10303.000192	Culloden Point IV Prehistoric Site	4 Woodland Period Prehistoric sites. All lithic scatters with buried components.	Undetermined
10303.000819	Culloden Point Area F extension (Pedersen/Dixson)	Prehistoric with human remains. Features, lithic scatter with fires cracked rock, ceramics, and animal bones.	Undetermined
10303.000816	Star Island Prehistoric Site	Lithic scatter with projectile points.	Eligible
10303.000724	Montauk USCG Station Bldg., Multi-Mission Bldg.	Combined administration/barracks US Coast Guard building constructed in 1939 in Napeague, NY, and relocated to current location in 1954	Eligible

USN Number	Site Name	Description	NRHP Eligibility
10303.000837	Engineering/Boat Maintenance Building	Axillary building to the Multi-Mission Building. Has more alterations than the Multi-Mission Building.	Eligible, USCG recommends as ineligible
10303.000838	Unaccompanied Personnel Housing (UPH)	Building constructed on USCG complex in 1989.	Not Eligible
10303.000185	Caleb Bragg Estate	Historic residential property built in 1929 containing 7 buildings, circular driveway, tennis courts, docks, parking lot and landscaping.	Listed

Remote Sensing Survey

Over the years, this project has gone through many iterations. For the period between 2005 and 2006 the recommended plan included constructing two groins along the western beach where the dredged materials were to be placed. In preparation for this part of the project, the District conducted a remote sensing survey of the area where the groins were to be placed. Since then, the groins are no longer being considered as part of the project, and will no longer be moved forward. Nonetheless, this remote sensing report is an archaeological survey near the APE that is relevant to the current project. This survey found two magnetic anomalies just offshore the western beach. These anomalies represented fairly small items that were not large enough to be individual shipwrecks. Panamerican Consultants (the contractor) did not recommend these anomalies for future study. These anomalies are to the east of the *Culloden* wreck site. Since this area is no longer part of the APE, future study will not be carried out.

Precontact and Historic Culture History

The Montaukett or Montauk Indians inhabited the area of East Hampton, Napeague, Montauk, and Montauk Point when the first Europeans settled in the area. Seventeenth century deeds between the Europeans and the Montauks describe two forts to the west of Lake Montauk. One was entrenched in the side of Fort Hill overlooking Fort Pond. The fort measured approximately 180 feet on each of its three sides with the hill forming the fourth side. This site was identified as an "earthwork and ditch on the northeast side of Fort Pond on Fort Hill". A second, older fort was at the west end of Montauk near Napeague Beach. This fort had been abandoned by the time of European settlement. A deed written in 1661 called the site the place "where the old Indian fort stood". A burial ground is also reported to be nearby this area. Recent archaeological

investigations in this area have determined that most of the fort has been destroyed, although some graves have been found.

The Montauk peninsula contained plenty of freshwater resulting from the prevalence of kettle-hole ponds. The Montauks also created wells from springs by driving hollow tree trunks into these springs. Subsistence activities centered on the use of marine resources, primarily fish and clams, and the collection of plant foods and hunting. By the time of the arrival of the Europeans, the Montauks were cultivating corn in the fields surrounding Lake Montauk. The Montauks continued to hold these lands throughout the 18th and 19th centuries, until 1885, when their population had dwindled and the land was eventually incorporated in the Village of Montauk.

Throughout the 18th and most of the 19th centuries, the land around Montauk and Lake Montauk was used by the residents of East Hampton as grazing land for their sheep and cattle. The residents of East Hampton constructed dwellings, the First, Second and Third Houses, for the shepherds caring for the livestock at different areas around Montauk. The Montauk Point Lighthouse was first lit in 1797. It was built on land purchased from the residents of East Hampton, on the point of land east of Lake Montauk. When it was first constructed, the light station consisted of the lighthouse, keeper's house and oil vaults for the storage of lamp oil. By the mid-19th century, the lighthouse had been increased in height to accommodate its new lens and a new keeper's dwelling. A coal shed, a smokehouse and an ice house and fog signals were built at the station. In the 1920's businessmen and developer Carl Fisher formed the Montauk Development Company and purchased Montauk, the area around Lake Montauk and Montauk Point, except for the lighthouse. The development planned for the property included a marina, a hotel and golf course. Fisher's company built a number of roads around Montauk and cut a channel through Lake Montauk to provide the boats from Star Island and the planned yacht club with access to deep sea fishing. Carl Fisher's construction plans were stopped with the stock market crash in 1929. However, the development of Montauk continued with the Montauk Beach Company and later, the Montauk Improvement Company.

3.2.3.6. Coastal Zone Management (16 USC Section 1451-1464)

The project site is located within the New York State Coastal Zone and is also included in *Town of East Hampton Local Waterfront Revitalization Plan (EHLWRP).* The estuarine habitats of the project area serves important functions to fish, birds, and other wildlife populations. Salt marsh and other wetlands serve as important nursery grounds for larval and juvenile fish, along with reproductive areas for invertebrates such as mussels, crabs and other invertebrates. Areas of sandy beach provide critical habitat to breeding horseshoe crabs (*Limulus polyp emus*) and various shorebirds. The Lake Montauk area is within the Atlantic flyway and is essential to migrating birds. Lake Montauk and vicinity offers public access to a variety of active and passive recreational opportunities.

As a Federally funded project located within the New York State Coastal Zone, the proposed project must be reviewed by the New York State Department of State for consistency with the policies of the Coastal Zone Management Plan (CZMP) and the applicable local program, *Town of East Hampton Local Waterfront Revitalization Plan.* Both of these programs serve to protect, maintain, promote and enhance various characteristics and functions of the NYS coastal environment. These policies serve to safeguard urbanized and otherwise developed coastal areas as well parklands and public space. Within this purpose the Federal and local CZMs protect and maintain significant coastal resources including, water quality, fish and wild life and scenic beauty. The CZM policies also provide protection from the discharge of pollutants and the degradation of flood protection capacity, thus protecting and enhancing human life and property. CZM policies also function to promote and enhance water dependent activities including both active and passive recreation.

Both state and local CZM policies were determined to be applicable for the proposed project alternatives. These applicable policies, along with an impact analysis are discussed within the CZM consistency determination (Appendix F).

3.2.3.7. Air Quality and Noise

Clean Air Act

Air quality is measured in terms of regulated constituents under the affected states implementation plan (SIP) for non-attainment areas (NAA) emissions of oxides of nitrogen (NO_x), as regulated under the Clean Air Act.

The RP will take place in Suffolk County, New York, and will temporarily produce emissions associated with diesel fueled equipment relating to dredging, beach sand placement, and related landside construction activities. With respect to the National Ambient Air Quality Standards (NAAQS, 40CFR§81.333), Suffolk County is currently classified as in 'marginal' nonattainment of the 2008 and 2015 8-hour ozone standards and 'maintenance' for the 2006 particulate matter less than 2.5 microns ($PM_{2.5}$) standard. The county is part of the Ozone Transport Region. Ozone levels are controlled through the regulation of its precursor emissions, which include oxides of nitrogen (NO_x) and volatile organic compounds (VOC). Sulfur dioxide (SO_2) is a precursor of $PM_{2.5}$ (USACE 2014). The project is anticipated to produce emissions associated with diesel-powered construction equipment that will be temporary in nature, spanning only the construction period. The project is anticipated to be conducted from November through January. The localized emission increases from the diesel-fueled equipment will last only during the project's construction period (and only local to where work is actually taking place at any time), and then end when the project is over.

The General Conformity applicability trigger levels in Suffolk County for 'marginal' ozone nonattainment areas are: 100 tons of NO_x per year (any year of the project) and 50 tons of VOC per year (40 CFR§93.153(b)(1)). In areas designated as 'maintenance' for $PM_{2.5}$, such as Suffolk

County, the applicability trigger levels are: 100 tons per year each of direct $PM_{2.5}$ and SO_2 per year (40 CFR§93.153(b)(2)).

The General Conformity-related emissions associated with the project have been estimated as part of the General Conformity Review and are summarized by estimated calendar year in Table 3 below. Emission calculations are provided as Appendix G.

Table 3: General Conformity-Related Emissions per Calendar Year, tons

Pollutant	Year 1	Year 2	Total
NO_x	57.6	9.6	67.2
VOC	2.2	0.4	2.5
$PM_{2.5}$	3.0	0.5	3.5
SO_x	0.0	0.0	0.04
CO	6.4	1.1	7.5

The emission levels do not exceed the General Conformity 'de minimis' trigger levels for any pollutant in any one year, or for the total project as a whole. Therefore, the project is presumed to conform with the General Conformity requirements and is exempted from Subpart B under 40CFR§93.153(c)(1). The Record of Non-Applicability (RONA) and associated emission estimates can be found in Appendix G.

Noise

Noise is generally defined as unwanted sound. The day-night noise level (L_{dn}) is the most widely used descriptor of community noise levels. Humans are most sensitive to frequencies in the 1,000 to 5,000 Hz range. Since ambient sound contains many different frequencies, measures of human response to sound assign more weight to frequencies in this range. This is known as the A-weighted sound level. The unit of measurement of the L_{dn} is the A-weighted decibel (dB-A) that closely approximates the frequency responses of human hearing.

Noise criteria and the descriptors used to evaluate project noise are dependent on the type of land use in the vicinity of the proposed project. In general, land uses near the project site include residences private and commercial, and marine oriented businesses.

The primary source of noise in the Project area is vehicular traffic on local roadways, and noise associated with the marina such as that from boat engines and noise generated by the various components of marine industry that exist in proximity to the harbor. Noise level measurements

have not been obtained in the Project area. In lieu of measurement, the noise levels in the Project area can be approximated based on the existing land uses. The USEPA document Protective Noise Levels (USEPA 1978) lists typical day-night sound levels at various locations. The primary land use in the Project area is residential and recreational. Typical day-night sound levels in these types of areas range from 39 to 59 dB-A (USEPA 1978). Therefore, it can be assumed that the existing sound levels in the Project area are within this range. Similarly, it can be assumed that sound levels in the Project area are at the lower end of this range due to the lack of heavy development in the area and the large amount of open space.

3.2.3.8. Water Quality.

While the central portion of the Lake generally exhibits good water quality, the northwest portion of the Lake (Coonsfoot Cove) and the southern portion of the Lake are areas that do not receive significant tidal flushing and have significant pollution inputs from the watershed; these areas exhibit poor water quality. Water quality data examined was collected by the NYSDEC which demonstrated the following impairments:

> *"Water quality within the Lake Montauk watershed and its nearby beach shorelines are assigned a "Class SA" water quality classification by the New York State Department of Environmental Conservation. Class SA surface waters are defined within the New York State Codes, Rules, and Regulations, Title 6, Chapter X Parts 700-705, Section 701.10, as saline surface waters best used for shell fishing for market purposes, primary and secondary contact recreation and fishing, and are considered suitable for fish propagation and survival (NYSDEC 2000)".*

As previously indicated, three streams and three major ponds are located within the Lake Montauk Watershed. The lake itself is classified SA, indicating that the most appropriate use is as habitat, for recreation, and for shell fishing for human consumption. Little Reed Pond and its associated stream are classified as SC, suggesting that the most appropriate use for this area is as habitat for fish, shellfish and wildlife and may be utilized for recreational purposes; however, other factors (e.g. size, invasive species) may limit their use for recreation.

Historically, Montauk Harbor and parts of the inlet were closed for shell fishing as a result of high coliform levels. Additionally, high coliform levels were found in the southern portion of Lake Montauk (NYSDEC 1964–1981). Flagg and Greene (1981) determined that increased coliform levels were most likely results of additional recreational boat use and an increased use of shoreline facilities during the summer months. In addition, chlorophyll data from 1979 to 1980 showed that chlorophyll values were usually highest in the summer, resulting from an increase in algal growth. The chlorophyll levels recorded, and therefore algae levels, were not excessive and the data provided no evidence of severe pollution problems (Flagg and Greene 1981).

Many other potential contaminants (i.e., gasoline, oil, boating products as well as sediment input from runoff, etc.) can affect water quality and shell fishing in the area. None of these pollutants were monitored in the Lake at the time of the Flagg and Greene survey in 1981. It is likely that boat usage within the Lake is a significant contributor of pollutants to the Lake, based on a 1981 estimate of 2,000 small boats using the Lake during the summer months (Flagg and Greene 1981). Non-point source pollution via surface water runoff is a likely contributor to impaired water quality in the Lake (Town of East Hampton 2005). Appendix A contains an evaluation, as required under the Clean Water Act, Section 404(b)(1) of the potential adverse effects the project could have within the study area.

4. Environmental Effects of Alternatives

This Section provides an assessment (Direct, Indirect, Cumulative) of those resources found within the Marine Zone or Upland Zone as identified in Subsection 3.2.1 (i.e. finfish, shellfish, benthos, SAV), Subsection 3.2.2 Special Concern (i.e. EFH, ESA) and Subsection 3.2.3.5 Cultural Resources, for each proposed Alternative (Subsection 4.2) when compared with the No Action/Without Project condition, Alternative 1 (Subsection 4.1), as is required under NEPA to determine if a FONSI is supportable. Additional analyses were conducted to demonstrate compliance with other Federal statutes (see Appendices A, B, C, D, F, G), which are also included in the assessment for each Alternative, as appropriate, as well as incorporated by reference. Other Resources (Subsection 4.2.4) are also addressed and included in the overall Summary, as applicable (see Table 5).

These alternative analyses assumes the use of a small cutterhead dredge to deepen the channel and basin and a pipeline configuration to place the dredged material at the upland site from 1 November through 31 December so as to abide by seasonal restrictions designed to protect aquatic (marine zone) resources, including those resources protected under the EFH and ESA statutes, and includes analyses of direct, indirect and cumulative effects of the proposed action on the marine zone, the upland zone, as well as effects on cultural resources in both zones.

4.1. Alternative 1

Alternative 1 is the No Action/Without Project Condition which involves the regular cyclical maintenance dredging of the authorized channel at its current depth of -12’ MLLW every 4 years, including placement of the dredged material at the upland placement site, as has been the historical practice.

Direct.

Marine Zone. Potential direct effects are associated with the periodic removal and/or disturbance of the benthos that have may have recolonized the benthic habitat within the channel prism between maintenance cycles, including the disruption of finfish utilization of essential habitat within the channel, cyclical disruption of navigation due to construction equipment staging in the channel, and scouring due to vessels.

Upland Zone. There are no impacts identified for the dredged material placement site since the material is of similar natal composition to the receiving (currently eroded) beach and no natural resources of concern have been identified at the placement site. The No-Action Alternative 1 would result in maintenance dredging and placement of approximately 32,000 cubic yards (cy) of dredged material every four years.

Cultural Resources. The No Action alternative has no direct effects to cultural resources since regular maintenance dredging has occurred in the past, and will continue in the without project future. Continuing to dredge the areas that have already been dredged will not affect Precontact or historic sites because no new sediment is being disturbed. There are no known cultural resources where the dredged sand is to be placed on the western beach, so the sand placement will also have no direct effect to cultural resources.

Indirect.

Marine Zone. Indirect environmental effects of Alternative 1 will be the continuation of the indirect impacts associated with the regular cyclical maintenance of the authorized channel at its current depth of -12'MLLW every 3-4 years. Potential indirect impacts associated with this alternative are related to the more frequent disturbance to benthos, and with the more frequent resuspension of sediments caused by maintenance dredging, vessel as well as potential adverse effects on local commercial and recreational fishery operations.

Upland Zone. Indirect impacts of Alternative 1 associated with the placement of dredged maintenance material at the upland eroded (barren) beach site approximately every four years includes the resuspension of those finer grained sediments in the intertidal zone lost to the replenished upland site due to storms, or other erosional forces.

Cultural Resources. There are no indirect effects to cultural resources.

Cumulative.

Marine Zone. The cumulative environmental effects of Alternative 1 will be the continuation of the cumulative impacts associated with the regular cyclical maintenance of the authorized channel at its current depth of -12'MLLW every 3-4 years. Those potential cumulative impacts are associated with potential decrease in water quality due to increased turbidity resultant from more frequent scouring and cyclical maintenance of the currently authorized channel depth and delays of benthic recovery of habitat within the currently authorized channel prism.

Upland Zone. Cumulative effects of Alternative 1 at the upland placement site could be the continued erosion of placed fine grained material causing turbidity in the nearshore intertidal zone during storm events that facilitate erosion.

Cultural Resources. There are no cumulative effects to cultural resources.

4.2. Other Alternatives

4.2.1. Alternative 2

Uniform dredging of the 150ft wide channel and 50ft wide deposition basin to depths ranging from -14+2 to -18+2 ft. MLLW. All dredged material, estimated for this alternative to be 32,000 cubic yards (cy) would be placed on the downdrift beach above the high tide elevation, and would maintain the existing placement footprint above the high tide.

Direct.

Marine Zone. The potential direct effects of this Alternative, when compared with Alternative 1, would not lead to the incurrence of significant impacts to the marine environment since the habitat within the confines of the existing channel and deposition basin is continuously disturbed by ongoing maintenance and by utilization of the channel by many vessels scouring the channel bottom, both of which resuspend sediments within the channel and subsequently the deposition basin, thereby, potentially disturbing recolonization attempts by benthic organisms, or utilization by finfish. The removal of channel bottom from -12'MLLW to between -14'MLLW to -18'MLLW would not adversely affect the existing (unregulated) habitat since the existing bottom sediments which are sand will remain sand post deepening.

Upland Zone. There are no potential direct adverse effects from this Alternative when compared with the No Action Alternative 1 since the volume of material to be placed upland remains the same, as does the approximate 4 year maintenance cycle.

Cultural Resources. This alternative has no direct effects to historic properties. There will be no effect to Precontact resources from deepening the navigation channel because the sediments that would be excavated are too old to contain cultural materials. This is because the lake basin is composed of glacial till that was deposited at the end of the last ice age. The till in the Montauk area is part of the Ronkonkoma moraine, which is one of two Late Wisconsin age glacial moraines on Long Island (Lewis and Stone 1991). The Ronkonkoma Moraine was deposited during the early part of the Wisconsin State of the Pleistocene Epoch (Stage 4 – prior to about 55,000 years ago) (USGS 2017). This means that the sediment composing the moraine and lake bottom was laid down prior to 55,000 years ago. This is significantly earlier than when the first humans occupied North America. Some of the earliest evidence of humans in North America has been found at the Upward Sun River

site in Alaska. Human remains from this site date to 11,500 calibrated years ago (Potter et al. 2014). This means that the sediment that would be dredged out of the federal channel in the lake basin would be older than 55,000 years ago, and hence hold no potential to contain human cultural materials. More recent sediment will have certainly settled on top of the lake bottom, but any artifacts mixed in with this Quaternary sediment would have been transported from elsewhere, meaning that they would be out of context. Concerning historic sites, the CRIS database does not show any submerged historic era properties that are located within the federal channel or nearby it. Since the navigation channel is a hub of commercial activity, any historical debris or shipwrecks that blocked the channel would have been removed. Due to this, it is very unlikely to find historic resources within the navigation channel or deposition basin. Continuing to dredge the channel will not affect historic properties. There are no known sites in the area where the dredged material is to be placed on the western beach, so this action also has no direct effect to cultural resources.

Indirect.

Marine Zone. Indirect effects to the marine zone associated with this alternative as compared with Alternative 1 are immeasurable.

Upland Zone. Indirect effects to the upland zone associated with this alternative as compared with Alternative 1 are immeasurable.

Cultural Resources. There are no indirect effects to known historic properties.

Cumulative.

Marine Zone. There are no potential cumulative effects of this Alternative in the marine zone when compared with Alternative 1. Deepening the existing channel and deposition basin from -12’ MLLW to maximum -18’ MLLW would incur no measurable cumulative effects to the marine zone.

Upland Zone. There are no potential cumulative effects resulting from this Alternative in the upland zone when compared with Alternative 1. Placement of the maintenance dredged material downdrift of the west jetty, as has been the current practice every four years to support the maintenance of the currently authorized channel. The volume estimated for four year cyclical maintenance and placement is 32KCY for this Alternative, which is the same volume placed every four years under Alternative 1. It is presumed that the placement of dredged material from this Alternative would mirror the historic placement of dredged material that has been conducted under Alternative 1.

Cultural Resources. There are no cumulative effects historic properties.

4.2.2. Alternative 3

Uniform dredging of both the 150’ wide channel from -14+2 to 17+2 ft. MLLW and widening the 50’ basin to 100’. All dredged material, volume estimated to be approximately 56,000 cy, would be placed in the supratidal (above high tide) portion on the downdrift beach, resulting in a footprint of approximately 3,000’ length and 44’ wide.

Direct.

Marine Zone. The potential direct effects of this alternative, when compared with Alternative 1, would not lead to the incurrence of significant adverse impacts to the marine environment since the habitat within the confines of the existing navigation channel and deposition basin are currently continuously disturbed by the utilization of the channel by many vessels often scouring the channel bottom and side slopes thereby resuspending sediments within the channel, and subsequently the deposition basin, thereby, potentially disturbing recolonization attempts by benthic organisms, or utilization by finfish. The channel and the deposition basin bottom and side slopes would remain in unregulated habitat and as predominantly sand post-deepening and widening due to nearshore littoral forces resulting in the constant influx of sand. The deepening proposed in this Alternative would have the effect of reducing the scouring and its near-field turbidity effects. As the harbor system is already subject to much turbidity due to resuspended sediments from the regular addition of sediments from utilization of the navigation channel, as well as from natural processes inherent in a harbor marine environment.

Upland Zone. The potential direct effects of this Alternative when compared with Alternative 1is the slight expansion of the placement site at the supratidal (above high tide) zone to approximately 3,000’ length and approximate 44’ width. As the eroded beach area is already (chronically) barren and not serving as habitat for any natural resources, and any loss of placed dredged material to the intertidal zone due to storms or other erosional events is a natural process, it is anticipated that there would be no significant adverse effect to the upland zone, nor the marine zone resulting from this Alternative.

Cultural Resources. As stated in Alternative 2, there are no direct effects to historic properties by increasing the depth the federal channel or the width and depth of the deposition basin. There are no sites on the western beach where the dredged sand is to be place, so this action will also have no effect to cultural resources.

Indirect.

Marine Zone. Potential indirect adverse effects on the marine zone resulting from this Alternative when compared with Alternative 1 are related to deepening the existing channel and deposition basin and widening the deposition basin. No significant indirect adverse effects are anticipated from this Alternative when compared with Alternative 1.

Upland Zone. Potential indirect adverse effects to the upland zone resulting from this Alternative when compared with Alternative 1 could be the increase of available dredged material at the upland placement site to the intertidal (marine) zone. As the intertidal (marine) zone is already a highly turbid environment the potential addition of fin grain material lost from the upland site eroded beach due to storm events would not cause significant adverse effects to the environment.

Cultural Resources. There are no indirect effects to historic properties.

Cumulative.

Marine Zone. Potential cumulative effects associated with this Alternative when compared with Alternative 1 within the marine zone relates to the current maintenance schedule of the existing (Alternative 1) navigation project as pertains to frequency of maintenance cycles, which delay recovery of benthos, as well as obstructing channel utilization by marine resources during more frequent dredging. The reduced frequency of maintenance dredging from every four years to every 7 years would support benthic recovery and channel utilization by finfish, and less cumulative disturbance of the marine environment, overall.

Upland Zone. Potential cumulative effects at the upland zone associated with this Alternative when compared with Alternative 1 would relate to the placement of larger quantities of dredged material at the supratidal eroded beach placement site less frequently. There are no measurable significant adverse cumulative effects associated with this Alternative.

Cultural Resources. There are no cumulative effects on historic properties.

4.2.3. Alternative 4

Uniform dredging (from -14'MLLW to -18'MLLW) of both the 150' channel and 100' wide deposition basin with East Fillet Mining: This alternative includes Measures 8, 10, and 12 with the option in 12 to widen the deposition basin to 100'. The east jetty impoundment offers an additional source of sand for the channel, and mining it reduces that source. The potential borrow region extends east from the inlet approximately 1000 ft and out to a depth of approximately -10' NAVD. It was assumed the fillet would be mined back to the baseline with a final slope of 1 on 12 down to a depth of -10' NAVD. Originally it was thought a cutter head dredged would be used to mine the fillet out from a depth of -17' NAVD up to the baseline, creating a construction slope of 1 on 3 that would gradually evolve to a final slope of 1 on 12. Field work (Mattituck Inlet) in 2014 indicated this is not a viable option for mining any appreciable volume of material.

An alternative mining method of beach scraping and trucking of the sub aerial portion of the fillet is considered, and it would yield a significantly smaller volume of material (approximately 7,000 to 10,000 cy of sand). The rate at which this sand would be replenished to the fillet was estimated to range between 8 and 11 years. This was constructed using the most recent sediment budget for the region, assuming equal distribution of sand within the transport cell and along the profile, and constraining the mineable area to the sub aerial portion of the fillet. The gradual impoundment on the beach face and berm east of the jetty will reduce shoaling rates within the channel and deposition basin by roughly 3 to 5 percent, increasing the maintenance cycle by 1 year, to approximately 8 years.

Direct

Marine Zone. The potential direct effects of this Alternative when compared with Alternative 1 would involve the disturbance of benthic habitat within the confines of the existing navigation channel and deposition basin, as well as at the borrow area/sand fillet/east jetty impoundment. The channel and basin areas are currently continuously disturbed by the utilization of the channel by vessels often scouring the channel bottom and resuspending sediments within the channel and subsequently redepositing them in the deposition basin. This ongoing process (Alternative 1) would have the effect of removing and burying benthos, as well as restricting fish utilization of the channels, or benthic habitat, whereas, this Alternative would deepen the channel, thereby, reducing the adverse effect of scouring. The widening of the deposition basin from 50’ wide to 100’ wide would remove potential benthic habitat on the side slopes of the basin within unregulated habitat from between -12’ MLLW to -18’MLLW, but that unregulated habitat is already subject to much turbidity due to resuspended sediments from the continuous addition of sediments from the navigation channel and surrounding and adjacent sediments. The sand mining at the East Fillet designed to reduce the availability as deposition material in the navigation channel, and subsequently, the deposition basin, via scraping and trucking, would not have a significant direct adverse effect on any known or significant resource within the fillet area since is it is a depository of sand caused by the obstruction of littoral movement of those sediments caused by the jetty impoundment and not a naturally-occurring natural resource. The scraping and trucking of the fillet material would have no effect on marine sources other than the potential increase of nearshore turbidity within the intertidal zone during the sand mining removal process.

Upland Zone. There are no potential direct significant adverse effects resulting from this Alternative in the upland zone when compared with Alternative 1. Placement of the maintenance dredged material downdrift of the west jetty, as has been the current practice every four years to support the maintenance of the currently authorized channel. The volume estimated for eight year cyclical maintenance and placement is 64,000 cy for this Alternative. The same placement site, above the high water/tide (supratidal) zone would be utilized, with the exception of elongating the footprint to approximately 3,000’ and increasing the width to approximately 44’, thereby replacing/restoring lost nascent fine grain material over eroded barren beach, and reducing the erosional processes. Some of the

placed material could erode into the intertidal zone, and already turbid environment, due to storm events. The scraping and trucking of the east fillet sand deposits (approx. 7,000 cy to 10,000 cy) could lead to minor upland impacts to the upland environment, which would need to be sufficiently capable of weight bearing (developed) for the operation of the trucks, surrounding the east fillet area.

Cultural Resources. This alternative has no direct effects to cultural resources because the East Fillet is a modern feature that has formed because the jetties obstruct natural littoral movement and cause sediment to accumulate in this area. Since the fillet is composed of modern sediments, excavating them would not be an adverse effect to cultural resources.

Indirect

Marine Zone. Potential indirect adverse effects on the marine zone resulting from this Alternative when compared with Alternative 1 are similar to Alternative 3, with the exception of the East Fillet sand mining. The potential indirect adverse effects of the East Fillet sand mining on the marine zone are immeasurable/negligible when compared with Alternative 1.

Upland Zone. Potential indirect adverse effects resulting from this Alternative when compared with Alternative 1 are similar to Alternative 3, with the exception of the East Fillet sand mining. The potential indirect adverse effects of the East Fillet sand mining on the upland zone are immeasurable/negligible when compared with Alternative 1.

Cultural Resources. There are no indirect effects to historic properties.

Cumulative.

Marine Zone. Potential cumulative adverse effects on the marine zone resulting from this Alternative when compared with Alternative 1 are similar to Alternative 3, with the exception of the East Fillet sand mining. The potential cumulative adverse effects of the East Fillet sand mining are immeasurable/negligible when compared with Alterative 1.

Upland Zone. Potential cumulative adverse effects on the upland zone resulting from this Alternative when compared with Alternative 4 are negligible when compared with Alternative 1.

Cultural Resources. There are no cumulative effects historic properties.

4.2.4. Other Resources; Navigation, Recreation, Socioeconomics and Environmental Justice

Potential Direct, Indirect and Cumulative potential adverse effects to Navigation, Socioeconomics and Recreation resulting from any of the Alternatives when compared with Alternative 1 are anticipated to be beneficial since the only effects to these resources would be an improvement in navigation (*e.g*. safer, more efficient) and thereby supportive of the local economic and recreational (*e.g*. fishing) industries. Alternative 1 would continue to incur moderate adverse effects associated with less efficient and less safe navigation, which would continue to incur potential moderate adverse effects to Recreation and Socioeconomics due to the moderate adverse effects associated with navigation. When compared with Alternative 1, potential significant adverse effects of Alternatives 2-4 on these resources are negligible.

There is no designation of an Environmental Justice community within or adjacent to the study area. Thus, there is a No Effect determination for this resource.

Table 4: Summary of Potential Effects

Alternative	*Focus Resources*			Navigation	Recreation	Socioeconomic
	Marine Zone	**Upland Zone**	**Cultural Resources**			
1	Insignificant	Insignificant	Insignificant	Moderate	Moderate	Moderate
2	Insignificant	Insignificant	Insignificant	Negligible	Negligible	Negligible
3	Insignificant	Insignificant	Insignificant	Negligible	Negligible	Negligible
4	Insignificant	Insignificant	Insignificant	Negligible	Negligible	Negligible

5. Tentatively Selected Plan (TSP)/Recommended Plan (RP)

The Tentatively Selected Plan (TSP) has now been identified as the Recommended Plan (RP) and has been determined to be Alternative 3: Uniform dredging of both the 150ft wide channel and deposition basin to -17'MLLW, and increasing the basins width from 50' to 100ft wide: All dredged material would be placed on the downdrift beach, with no design, approximately 3,000 ft in length and approximately 44 ft wide (see `Figure 6`).

Figure 6: Recommended Plan

6. Mitigation

The dredging equipment to be utilized will likely be hydraulic equipment (eg. small cutterhead), and the schedule will likely be approximately 80 days dredging schedule to occur between 1 November and 1 January due to seasonal restrictions designed to be protective of natural resources. The following Best Management Practices (BMPs) were incorporated into the construction schedule to minimize and avoid adverse environmental impacts: the implementation of a seasonal restriction from 1 November to 31 December , based on the Conservation Recommendations from NMFS as pertains to Essential Fish Habitat, including SAV protection. Seasonal monitoring to determine if piping plover nesting habitat exists will also be conducted by the town of East Hampton (TEH), which will result in ongoing coordination between USACE, USFWS and NYSDEC should nesting habitat that could be at risk is documented in the project area. Currently, there is no documented occurrence of piping plover nesting habitat in the study area (see Appendix C).

7. Summary of Environmental Effects of the Recommended Plan (RP)

7.1. Effects to Natural Resources.

A summary of potential adverse effects to the environment resulting from implementation of the RP is presented in Table 5. Marine Zone resources include those natural aquatic resources found in the project area, such as: water quality (e.g. dissolved oxygen, temperature, salinity, contamination, and clarity), in addition to those resources for which potential adverse effects were identified and assessed under Section 4.2.2 (Alternative 3) and 4.2.4 (Other Resources). The RP will not have a significant adverse effect to resources within the marine zone or the

upland zone, and will have either a negligible effect or no effect on all other analyzed environmental and human quality parameters.

7.2. Effects on Cultural Resources

Impacts to Known Resources

The recommended plan will have no adverse effect to known historic properties. There are no known historic properties inside the APE, and the activities taking place for the construction of the recommended plan will not impact the resources that are nearby the APE.

Potential to Affect Unknown Prehistoric and Historic Archaeological Sites

As discussed above, deepening the federal channel and deposition basin will have no adverse effect on unknown Prehistoric or Historic archaeological sites, since none are expected to be located at the bottom of the lake. Placing the sand on the beach will also have no adverse effect on unknown Prehistoric or historic properties because if any cultural materials are present, placing additional sand on top of them will create a protective cap over the site, but also make the site more inaccessible for future research.

Findings

On August 6, 2019 the NYSHPO concurred with the determination that the undertaking will have No Adverse Effect on Historic properties (See Appendix E for correspondence). On November 6, 2019 the Delaware Nation commented that the proposed project does not endanger cultural, or religious sites of interest to the Delaware Nation, but noted that if an archaeological site or artifact is inadvertently uncovered during construction to stop all ground disturbing activities and notify the appropriate state agencies and Delaware Nation within 24 hours so a proper archaeological assessment can be made. On August 1, 2019 the Stockbridge-Munsee stated that they deferred comments to the Shinnecock Indian Nation. No comments from the Shinnecock were received by USACE.

Inadvertent Discovery of Cultural Resources

If, during excavation or other construction activities, any previously unidentified or unanticipated historical, archaeological, and cultural resources are discovered or found, activities that may damage or alter such resources will be suspended. Resources covered by this paragraph include, but are not limited to: any human skeletal remains or burials; artifacts; shell, midden, bone, charcoal, or other deposits; rock or coral alignments, pavings, wall, or other constructed features; and any indication of agricultural or other human activities. Upon such discovery or find, the contractor will immediately notify the USACE Contracting Officer so that the appropriate authorities may be notified and a determination made as to their significance and what, if any, special disposition of the finds should be made. All activities that may result in impact to or the destruction of these resources will be ceased. The area will be secured and

employees or other persons will be prevented from trespassing on, removing, or otherwise disturbing such resources. The Government retains ownership and control over archaeological resources.

8. Agency Coordination and Environmental Compliance

This EA has be coordinated with the public and involved agencies via public posting of the reports on the Corps website at www.nan.usace.army.mil for 30 days. The Corps has prepared a Finding of No Significant Impact (FONSI) to support conclusions in the EA.

This EA/FONSI will serve as the basis for NEPA compliance and ongoing compliance coordination, as applicable, with the following state and federal agencies: the U.S. Fish and Wildlife Service, the New York Historic Preservation Office (relating to the SHPO letter of concurrence; Appendix E); the NYSDEC regarding issuance of a Water Quality Certification (Appendix A), the National Oceanographic and Atmospheric Administration - Fisheries concerning the Essential Fish Habitat evaluation (Appendix B), Endangered Species Act (USFWS and NOAA; Appendices C&D), Clean Air Act (US EPA, as delegated to the potentially-affected State of New York; Appendix G), and the NYSDOS regarding the CZM consistency determination (Appendix F). Coordination with NYSDEC will continue to obtain the final permit. Applicable laws and regulations pertaining to federal actions are summarized in Table 6.

Table 5: Summary of Primary Laws and Regulations Applicable to the Proposed Project

Legislative Title	U.S. Code/Other	Compliance
Clean Air Act	42 U.S.C. §§ 7401-7671g	An air quality analysis was completed for the project. Based upon the completed analysis, the emissions from the proposed project are determined to have an insignificant impact on the affected states air quality, and according to 40 CFR 93.153 (f) and (g) the proposed project is presumed to conform to the SIP. A Record of Non-Applicability is located in Appendix G.
Clean Water Act	33 U.S.C. §§ 1251 et seq.	A 404(b)(1) analyses is included in Appendix A of the EA. The Corps will be requesting a water quality certificate from NYSDEC to fulfill the requirements of Section 404 of this Act. The EA also serves to meet DEC's SEQRA requirement.
Coastal Zone Management Act of 1972	16 U.S.C. §§ 1451-1464 N.J.A.C. 7:7 and N.J.A.C.	A Coastal Zone Management Consistency Determination is included in Appendix E. The Corps received concurrence from the

Legislative Title	U.S. Code/Other	Compliance
	7:7E	NYSDOS 7 October 2020.
Endangered Species Act of 1973	16 U.S.C. §§ 1531 et seq.	Concurrence by FWS and NOAA has been received. Consultation is concluded. App. C&D.
Magnuson-Stevens Act Fishery Conservation and Management Act	Section 305(b)(2) 1996 Amendments	Concurrence by NOAA has been received. Consultation is concluded. App. B.
Fish and Wildlife Coordination Act	16 U.S.C. § 661 et seq.	USFWS Concurred. Consultation concluded. App. C.
National Environmental Policy Act of 1969	42 U.S.C. §§ 4321-4347	The circulation of the Draft NEPA document and the subsequent signing of a NEPA decision document fulfills requirements of this Act.
National Historic Preservation Act of 1966	16 U.S.C. §§ 470 et seq.	The Corps coordinated with the State Historic Preservation Office to fulfill requirements of this Act. Appendix E
Executive Order 11990, Protection of Wetlands	May 24, 1977	Circulation of this report for public and agency review fulfills the requirements of this Order.

9. Conclusions

Alternative 3 is the Recommended Plan (RP): Uniform dredging of both the 150’ wide channel and deposition basin to -17’MLLW, and increasing the deposition basin width from 50’ to 100’ wide. All dredged material would be placed upland (above MHW) on the downdrift beach, and be approximately 3,000’ in length and approximately 44’ wide. The RP will provide safe and efficient navigation, while also ensuring protection and sustainability of the natural and human environment.

The proposed RP for the navigation project is not anticipated to have significant adverse impacts on the environment, and would therefore result in a Finding of No Significant Impact (FONSI).

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