DRAFT

ENVIRONMENTAL ASSESSMENT
APPENDICES

ATLANTIC COAST OF LONG ISLAND
JONES INLET TO EAST ROCKAWAY INLET
LONG BEACH ISLAND, NEW YORK

COASTAL STORM RISK MANAGEMENT PROJECT

HURRICAN SANDY LIMITED REEVALUATION REPORT

US ARMY CORPS OF ENGINEERS
NEW YORK DISTRICT

FEBRUARY 2014

APPENDIX A

PERTINENT CORRESPONDENCE

DEPARTMENT OF THE ARMY
NEW YORK DISTRICT, CORPS OF ENGINEERS
JACOB K. JAVITS FEDERAL BUILDING
NEW YORK, N.Y. 10278-0090

REPLY TO
ATTENTION OF
Environmental Branch

August 12, 2013

Mr. David A. Stilwell
Field Supervisor NY field Office
U.S. Fish and Wildlife Service
3817 Luker Road
Cortland, New York 13045

Subject: Atlantic Coast of Long Island, Jones Inlet to East Rockaway Inlet, Long Beach Island, New York, Storm Damage Reduction Project.

Dear Mr. Stilwell:

With the passage of the Hurricane Sandy Disaster Relief Appropriations Act of 2013 (Public Law 113-2), the U.S. Army Corps of Engineers has been given the authority and funding to complete ongoing coastal storm damage risk reduction projects and studies in the Northeast. As part of the planning and implementation process for the Atlantic Coast of Long Island, Jones Inlet to East Rockaway Inlet, Long Beach Island, New York, Storm Damage Reduction Project, the New York District will be updating prior engineering and design efforts, physical surveys, and environmental compliance.

This letter is to request your office to provide an update to the above referenced project's Fish and Wildlife Coordination Act Report (FWCAR) dated September 2004 and re-initiate informal consultation. Please find attached the updated plans and specifications and project description for your review. The District recognizes your heavy workload and appreciates your prompt response to the project description and the required funding to complete your reassessment.

I look forward to working with you and your staff on this effort. If you should have any questions, please contact Mr. Robert J. Smith of my staff at 917 790-8729.

Sincerely,

Leonard Houston
Chief, Environmental Analysis Branch

cc: USFWS, LI Field Office
Enclosures

DEPARTMENT OF THE ARMY
NEW YORK DISTRICT, CORPS OF ENGINEERS
JACOB K. JAVITS FEDERAL BUILDING
NEW YORK, N.Y. 10278-0090

REPLY TO
ATTENTION OF
Environmental Analysis Branch

August 12, 2013

Mr. Christopher Boelke
Field Office Supervisor
NOAA/NMFS/Habitat Conservation Division
55 Great Republic Drive
Gloucester, MA 01930-2276

Subject: **Atlantic Coast of Long Island, Jones Inlet to East Rockaway Inlet, Long Beach Island, New York Storm Damage Reduction Project**

Dear Mr. Boelke:

With the passage of the Hurricane Sandy Disaster Relief Appropriations Act of 2013 (Public Law 113-2), the U.S. Army Corps of Engineers has been given the authority and funding to complete ongoing coastal storm damage risk reduction projects and studies in the Northeast. As part of the planning and implementation process for the Atlantic Coast of Long Island, Jones Inlet to East Rockaway Inlet, Long Beach Island, New York, Storm Damage Reduction Project, the New York District will be updating prior engineering and design efforts, physical surveys, and environmental compliance.

Your office last reviewed and concurred on an Essential Fish Habitat (EFH) report for the above project in accordance with the Magnuson-Stevens Act, as amended by the Sustainable Fisheries Act of 1996 (PL 104-267) in September 2005. This letter is a request for your office to provide an update to the original EFH assessment. Please find attached the updated plans and specifications and project description for your review. The District recognizes your heavy workload and appreciates your prompt response to the project description and the required funding to complete your reassessment. Please review the information and provide any comments regarding any new potential project impacts on Essential Fish Habitat.

I look forward to working with you and your staff on this effort. If you should have any questions, please contact Mr. Robert J. Smith of my staff at 917 790-8729.

Sincerely,

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Leonard Houston
Chief, Environmental Analysis Branch

Attachments

DEPARTMENT OF THE ARMY
NEW YORK DISTRICT, CORPS OF ENGINEERS
JACOB K. JAVITS FEDERAL BUILDING
NEW YORK, N.Y. 10278-0090

REPLY TO
ATTENTION OF
Environmental Branch

August 12, 2013

Mr. David A. Stilwell
Field Supervisor NY field Office
U.S. Fish and Wildlife Service
3817 Luker Road
Cortland, New York 13045

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Dear Mr. Stilwell:

With the passage of the Hurricane Sandy Disaster Relief Appropriations Act of 2013 (Public Law 113-2), the U.S. Army Corps of Engineers has been given the authority and funding to complete ongoing coastal storm damage risk reduction projects and studies in the Northeast. As part of the planning and implementation process for the Atlantic Coast of Long Island, Jones Inlet to East Rockaway Inlet, Long Beach Island, New York, Storm Damage Reduction Project, the New York District will be updating prior engineering and design efforts, physical surveys, and environmental compliance.

This letter is to request your office to provide an update to the above referenced project's Fish and Wildlife Coordination Act Report (FWCAR) dated September 2004 and re-initiate informal consultation. Please find attached the updated plans and specifications and project description for your review. The District recognizes your heavy workload and appreciates your prompt response to the project description and the required funding to complete your reassessment.

I look forward to working with you and your staff on this effort. If you should have any questions, please contact Mr. Robert J. Smith of my staff at 212-264-0189.

Sincerely,

Leonard Houston
Chief, Environmental Analysis Branch

cc: USFWS, LI Field Office
Enclosures

APPENDIX B

SECTION 404(B)(1) GUIDELINES EVALUATION

APPENDIX : SECTION 404(b)(1) GUIDELINES EVALUATION

Introduction

This appendix of the Atlantic Coast of New York, Jones Inlet to East Rockaway Inlet, Long Beach Island, New York Storm Damage Reduction Project presents a Section 404(b)(1) Guideline evaluation for the comprehensive evaluation of improvements to the Long Beach Island (LBI) coastline. The evaluation is based on the regulations found at 40 CFR 230, Section 404(b)(1): Guidelines for Specification of Disposal Sites for Dredged or Fill Material. The regulations implement Sections 404(b) and 501(a) of the Clean Water Act, which govern the disposal of dredged and fill material inside the territorial sea baseline (§230.2(b)).

Generic 404 (b)(1) Evaluation

The following Section 404(b)(1) evaluation is presented in a format consistent with typical evaluations in the New York area and addresses all required elements of the evaluation.

Project Description

a. Location: The Atlantic Coast of New York, Jones Inlet to East Rockaway Inlet, Long Beach Island, New York Storm Damage Reduction Project, covers approximately 6.7 miles (of which 6.4 miles represents protection provided by the selected plan) of oceanfront along Long Beach Island, including the Town of Hempstead (Point Lookout and Lido Beach), Nassau County (Nickerson Beach), and the City of Long Beach.

b. General Description: In 1965, the USACE evaluated various storm protection options for the area and presented findings in the Beach Erosion Control and Interim Hurricane Study for the Atlantic Coast of Long Island, New York: Jones Inlet to East Rockaway Inlet (USACE 1965). Local interests did not support the plan and the project was terminated in 1971. Since that time, beach erosion and storm damage have continued in the area. At the request of the local interests following Hurricane Gloria in 1985, the USACE conducted a Reconnaissance Study (completed in 1989), and subsequently a Feasibility Study (completed in February of 1995), to evaluate an array of structural and non-structural measures to provide flood and storm protection for the Long Beach Island area (USACE 1989, 1995, 1998, 1999).

   As a result of the Feasibility Study, several alternatives were evaluated and a final plan was selected. The plan, as presented in the Final Feasibility Study and Final Environmental Impact Statement (FEIS) for the Project, included widening of the existing beach with the hydraulic placement of beach fill material, rehabilitation of 16 groins at Long Beach, construction of six new groins west of Point Lookout at Lido Beach, and construction/rehabilitation of numerous dune walkovers and dune access points (USACE 1995, 1998). The December 1998 Record of Decision (ROD) (filed in the Federal Register, January 1999) granted approval of the plan as presented in the 1998 FEIS and was signed on December 23, 1998.

Subsequent to the 1998 release of the FEIS for the Project, the proposed alternative was re-evaluated. The re-evaluation was conducted to address changes to the shoreline since the 1998 evaluation and changes in the Project scope (i.e., a reduction in the size of the Project area), and to address environmental concerns expressed by agencies and/or interest groups (USACE 1998, 2002). Furthermore, this re-evaluation allowed incorporation of advancements in engineering evaluation methods. As a result of the projects re-evaluation, several modifications were made to the plan that were selected in 1998 and are presented in the 2013 EA (USACE 2013). The proposed Project modifications are intended to provide a long-term, cost-effective solution for reducing erosion and maintaining the protective dune and beach berm in this area.

The currently proposed Project represents a modification to the original approved Project that has reduced the overall amount of beach fill, dune fill, dune plantings, sand fence, and fill required for renourishment activities. In addition, the proposed project modification also has excluded most Project activities within a 136-acre shorebird foraging/nesting area. Although, the Project has increased the number of proposed boardwalk walkovers and vehicular ramps and now includes a 100-foot extension of groin 58 (i.e., East Groin), these changes are overall insignificant relative to the original approved Project and will have no significant negative environmental impacts.

In the 1995 FEIS, it was determined that offshore, near shore and onshore components of the Project could potentially cause some minor adverse impacts to water quality, aquatic habitats and species (i.e., benthic organisms, fish and their habitat), potential threat to several endangered marine and terrestrial species (i.e., sea turtles, piping plover, sea beach amaranth), cultural resources (i.e., shipwrecks), and socio-economic impacts to recreational activities during construction (i.e., noise and restrictions to construction areas). Similar potential impacts are likely under the currently proposed Project. However, it is the physical extent (i.e., acreage of impacts) that has changed which translates to less overall impacts throughout the Project area relative to the original approved Project. No significant negative impacts, in addition to those described in the 1995 FEIS and highlighted below, are expected from the currently proposed Project modification. No new natural resources or endangered species have been identifying within the project area since the 1995 EIS.

c. Authority and Purpose: In October 1986, the Committee on Public Works and Transportation of the United States House of Representatives authorized the USACE to review the previous report on the Atlantic Coast of Long Island, New York, Jones Inlet to East Rockaway Inlet, to determine the feasibility of providing storm damage protection works for Long Beach Island. Subsequently, a reconnaissance study and report were completed in 1989, a Draft Feasibility Report and Draft Environmental Impact Statement (DEIS) report were circulated in 1994, and a Final Feasibility Report and Final

Environmental Impact Statement (FEIS) report, and circulated in 1998 (USACE 1998). A Record of Decision (ROD) was signed on December 23, 1998 and filed in the Federal Register in January 1999. The 1995 Feasibility Report Recommended Plan was authorized for construction by the 1996 Water Resources Development Act (WRDA).

As a result of the EIS, several alternatives were evaluated and a final plan was selected. The plan included widening of the existing beach with the hydraulic placement of beach fill material, rehabilitation of 16 groins at Long Beach, construction of six new groins west of Point Lookout at Lido Beach, and sand removal from an offshore borrow area. However, since the 1998 release of the FEIS for the Project the proposed alternative was re-evaluated. The re-evaluation was conducted to incorporate advancements in engineering evaluation methods, to address changes to the shoreline since the 1998 evaluation and changes in the Project scope (i.e., a reduction in the size of the Project area), and to address environmental concerns expressed by agencies and/or interest groups. As a result of project re-evaluation and several modifications were made to the plan that was selected in 1998 for this Project.

This re-evaluation EA was conducted with the intent of identifying and evaluating various means of maintaining the beach that are longer-term and less expensive than the current plan and that incorporate concerns addressed by agencies and/or interest groups. As a result of project re-evaluation, several modifications were made to the plan that was selected in 1998 and are presented in the EA (USACE 2013).

d. General Description of Placement Material: Sand that is compatible to the existing beach that will be pumped in from offshore borrow area.

e. Proposed Discharge Site: The Atlantic Coast of New York, Jones Inlet to East Rockaway Inlet, Long Beach Island, New York Storm Damage Reduction Project, covers approximately 6.7 miles (of which 6.4 miles represents protection provided by the selected plan) of oceanfront along Long Beach Island, including the Town of Hempstead (Point Lookout and Lido Beach), Nassau County (Nickerson Beach), and the City of Long Beach

f. Disposal Method: Use of hydraulic dredging equipment for the initial construction and renourishment efforts.

Factual Determinations

a. Physical Substrate Determinations

(1) The selected alternatives storm damage reduction plan including changes from the authorized project, comprises approximately 35,000 lf of dune and beach fill and generally extends from the eastern end of the barrier island at Point Lookout to the western boundary of the City of Long Beach, including an

incidental taper into East Atlantic Beach. This component of the Project includes the following: 1) a dune with a top elevation of +14 ft above NAVD, a top width of 25 ft, and landward and seaward slopes of 1V:5H (1V:3H on landward slope fronting the boardwalk) that will extend along the entire project area; 2) in Point Lookout, a beach berm extending a minimum of 110 ft from the seaward toe of the recommended dune at an elevation of +9 ft NAVD, then sloping at 1V:20H to intersection with existing bathymetry; 3) In the Nickerson Beach area in the Town of Hempstead, dune only (no berm) placed along approximately 5,000 If of shoreline. Existing berm will remain undisturbed to allow for bird nesting and foraging; 4) In Lido Beach and the City of Long Beach, a stepped beach berm extending 40 ft. from the seaward toe of the recommended dune at an elevation of +9 ft NAVD, a 1V:10H slope downward to +7 ft NAVD, a 130 ft flat berm at +7 ft NAVD, then sloping 1V:30H to intersection with existing bathymetry; Approximately 35,000 lf of beach fill and a total sandfill quantity of 4,570,000 cy for the initial fill placement, including tolerance, overfill and advanced nourishment (based on 2013 post-Hurricane Sandy survey); planting of 34 acres of dune grass and installation of 75,000 If of sand fence.

Structural components of the Project modification include the construction of 57 timber/gravel dune walkovers, extensions of existing dune walkovers and vehicle access ways. Construction of 6 new groins (two of the six groins originally proposed for the Project has been deferred indefinitely, and are not part of the proposed Project modification), the rehabilitation of 17 groins, the rehabilitation and extension of the eastern terminal groin.

(2) Sediment Type: Sediments similar to those present in the placement area will be utilized. No impacts are anticipated.

(3) Dredged Material Movement: Minor short-term movement and existing shore processes will continue.

(4) Physical Effects on Benthos: Minor short-term disruption. No long-term impact.

(5) Other Effects: None identified

(6) Action to Minimize Impacts: See section (5.0)

b. Water Circulation, Fluctuations, and Salinity Determinations

(1) Water

(a) Salinity: Proposed project is not expected to affect salinity because beach fill does not govern the overall water mass movements (tidal flow and river discharge) that control salinity.

(b) Water Chemistry: No major impacts are expected.

(c) Clarity: Temporary increase in turbidity will occur from sediment resuspension during placement of the material.

(d) Color: Minor temporary changes possible but no major impacts are expected.

(e) Odor: No measurable impacts are expected.

(f) Taste: Not applicable

(g) Dissolved Gas Levels: Possible short-term variation may occur due to turbulence created by placement of the material on the beach.

(h) Nutrients: Temporary and localized nutrient increases may occur due to sediment resuspension during beach fill activities. No long-term increase in nutrients and eutrophication will result from the proposed project.

(i) Eutrophication: None identified

(j) Other: None identified

(2) Current Patterns and Circulation: No impacts identified

(3) Normal Water Level Fluctuations: No impacts identified

(4) Salinity Gradients: No impacts expected

(5) Actions to Minimize Impacts: Not applicable

c. Suspended Particulate/Turbidity Determination

(1) Change at Disposal Site: Short-term, localized increases in suspended particulates/turbidity as a result of placement of material, but no long-term changes.

(2) Effects on Chemical and Physical Properties of the Water Column: Impact should be minimal since particles will settle out fairly rapidly and no toxic metals or organic compounds are anticipated to be encountered.

(3) Effects on Biota: Short-term exposure due to localized sediment resuspension during placement of material. No long-term effects are projected.

(4) Action to Minimize Impacts: Placement of material will be completed as early as possible to allow for optimum recruitment of benthic organism within the placement area.

d. Contaminant Determination: No impacts identified.

e. Aquatic Ecosystems and Organisms Determination: Possible effects to the gills of nekton species that are in the immediate area of placement. No major impacts are expected.

f. Proposed Disposal Site Determination: Not applicable.

g. Determination of Cumulative Effects on the Aquatic Ecosystem: See section (4.0).

h. Determination of Secondary Effects on the Aquatic Ecosystem: None identified.

Findings of Compliance or Noncompliance

a. There are no practicable alternatives for the proposed action under the jurisdiction of Section 404(b)(1) Guidelines.

b. The proposed action does not appear to violate applicable state water quality standards or effluent standards.

c. The proposal will not have significant adverse impacts on endangered species or their critical habitats. Formal coordination with the USFWS under section 7 of the Endangered Species Act of 1973 is ongoing to insure the safety of any transient species that may be present during construction. Informal consultation with NMFS is ongoing at this time.

d. The proposed action will not result in significant adverse impacts on human health or welfare, including municipal and private water supplies, recreational and commercial fishing, plankton, fish, shellfish, wildlife and special aquatic sites.

e. All appropriate steps to minimize adverse environmental impacts have been taken.

f. No significant adaptations of the guidelines were made relative to this evaluation.

Conclusions

Based on all of the above, the proposed action is determined to be in compliance with the Section 404(b)(1) Guidelines, subject to appropriate and reasonable conditions, to be determined on a case-by-case basis, to protect the public interest.

APPENDIX C

U.S. FISH AND WILDLIFE SERVICE COORDINATION ACT 2(b) REPORT

APPENDIX D

NEW YORK CITY AND STATE COASTAL ZONE MANAGEMENT PROGRAM CONSISTENCY DETERMINATION

DEPARTMENT OF THE ARMY
NEW YORK DISTRICT, CORPS OF ENGINEERS
JACOB K. JAVITS FEDERAL BUILDING
NEW YORK, N.Y. 10278-0090

REPLY TO
ATTENTION OF
Planning Division
PL-E
Rm. 2151

February 15, 2014

Mr. Jeff Zappieri
NYS Department of State
Division of Coastal Resources and Water Front Revitalization
41 State Street
Albany, NY 12231

Re: **F-94-696/ F-98-415(DA)**
Atlantic Coast of Long Island, Jones Inlet to East Rockaway Inlet, Long Beach Island, New York Storm Damage Reduction Project

Dear Mr. Zappieri,

Pursuant to the above referenced subject, the USACE New York District (NYD) requests a modification/re-issuance to an existing Consistency Statement, issued by the NYDOS Division of Coastal Resources and Water Front Revitalization in 1998. The NYD is requesting a modification based upon the project has undergone minor modifications and an updated Consistency Statement is required.

For your records and review, we have enclosed the following: (1) a detailed description of the proposed (modified) project and (2) the required, updated, (draft) Supplemental Environmental Assessment (EA) dated 2014. Please reference the original Coastal Zone Management (CZM) Consistency Statement, F-98-415 (DA), and re-issue for current project design. It is our assessment that the updated project does not differ significantly from the original.

We respectfully request that your agency review our proposed project and if any further documentation and/or assistance is needed to complete the modification process, please contact: Mr. Robert J. Smith, Project Biologist, at (917) 790 – 8729.

Sincerely,

Nancy Brighton
Acting Chief, Environmental Analysis Branch

MODIFICATIONS TO THE PROPOSED ACTION

The recommended plan for this Project includes the preferred plan (identified in the 1998 Feasibility Report and subsequent 1998 FEIS filing) with post-Feasibility modifications as detailed in the Draft Long Beach Limited Reevaluation Report and the Draft EA 2014. The recommended plan provides the most comprehensive, effective, and cost-effective solution to provide storm protection in the Project Area. The proposed Project modification entails an overall reduction in the Project area, which reduces the amount of fill material needed for beach fill and renourishment activities, and a reduction in dune sand fencing. When compared to the original Project, the Project modification entails an overall reduction in the Project area, which results in a reduction of 6,000 linear feet (lf) of fill area, a reduction of 3,922,000 cy of fill material needed for initial beach fill and 341,000 cy per yr for re-nourishment activities, a reduction of 15,000 lf of sand fence. Specifically, there will be approximately a reduction of 110 ac of filling in the upper beach zone, 39 fewer acres of filling in the intertidal zone, and 35 fewer acres of filling in the sub-tidal zone.

Structural components of the Project modification include the construction of 57 timber/gravel dune walkovers, extensions of existing dune walkovers and vehicle access ways. Construction of 6 new groins (two of the six groins originally proposed for the Project has been deferred indefinitely, and are not part of the proposed Project modification), the rehabilitation of 17 groins, the rehabilitation and extension of the eastern terminal groin.

In addition to the decrease in the size of the Project Area and the amount of sand material required for the Project, when compared to the original Project, the Project modification would result in minimal construction activities originally proposed within a 136-acre shorebird nesting/foraging area which will be mostly excluded from the Project (Table 1). The proposed Project modification would, however, result in an increase of walkover extensions and vehicle access as well as the rehabilitation of two additional groins, and the rehabilitation and extension of the east jetty. A comparison of components of the original selected plan and the proposed Project modification are shown in Table 1.

Table 1. Summary Comparison of the Original Proposed Project and the Currently Proposed Project Modifications.

Component	Original Project	Project Modification	Change
Beach fill material (for creation of beach berm, sand barrier and a dune)	41,000 linear feet (lf), some within shorebird nesting area	35,000 lf, none within shorebird nesting area	- 6,000 lf
Borrow area sand removal (i.e., total sandfill quantity, excluding 5-year renourishments)	8,642,000 cubic yards (cy)	4,720,000 cy	- 3,922,000 cy
Dune plantings	29 acres (ac)	34.0 ac	+5.0 ac

Sand fence	90,000 lf	75,000 lf	- 15,000 lf
Timber dune walkover ADA	13	12	-1
Timber Dune walkovers (from boardwalk) ADA	5	5	0
Timber Dune walkovers (from boardwalk) None ADA	0	6	+6
Timber non-ADA walkovers	6	23	+17
Timber Vehicle and pedestrian access from boardwalk	2	2	0
Gravel surface vehicle and pedestrian access way	2	9	+7
Extension of existing walkovers	12	8	-4
Raised timber vehicular access	1	0	-1
5-yr renourishment	2,111,000 cy/year (yr)	1,770,000 cy/yr	- 341,000 cy/yr
Rehab and 100 ft Extension of terminal groin	0	1	+ 1
New groins	6	4 (6 proposed, but 2 have been deferred)	0
Rehabilitation of existing groins	15	17	+ 2
Impacts to shorebird nesting/foraging area	136 ac	0 ac	No impacts

Proposed Action Elements

This proposed action would require beach fill placement, walkover extension/construction, groin extension/construction, and construction of vehicle access areas and walkovers at the locations shown in the appendix. An estimated 700 acres of nearshore, intertidal beach, upper beach and dune habitats in the project area would be disturbed as a result of the proposed action. Elements to be included in the proposed action were selected based upon an evaluation of alternatives as outlined in the *Final Environmental Impact Statement* for this Project and subsequent re-evaluation and modification of the proposed plan as presented in detail in the Draft Long Beach Limited Reevaluation Report. A summary of each element is provided below.

Beachfill

The selected LRR storm damage reduction plan including changes from the authorized project, comprises approximately 35,000 If of dune and beach fill and generally extends from the eastern end of the barrier island at Point Lookout to the western boundary of the City of Long Beach, including an incidental taper into East Atlantic Beach. This component of the Project includes the following: 1) a dune with a top elevation of +14 ft above NAVD, a top width of 25 ft, and landward and seaward slopes of 1V:5H (1V:3H on landward slope fronting the boardwalk) that will extend along the entire project area; 2) in Point Lookout, a beach berm extending a minimum of 110 ft from the seaward toe of the recommended dune at an elevation of +9 ft NAVD, then sloping at 1V:20H to intersection with existing bathymetry; 3) In the Nickerson Beach area in the Town of Hempstead, dune only (no berm) placed along approximately 5,000 If of shoreline. Existing berm will remain undisturbed to allow for bird nesting and foraging; 4) In Lido Beach and the City of Long Beach, a stepped beach berm extending 40 ft. from the seaward toe of the recommended dune at an elevation of +9 ft NAVD, a 1V:10H slope downward to +7 ft NAVD, a 130 ft flat berm at +7 ft NAVD, then sloping 1V:30H to intersection with existing bathymetry; Total sandfill quantity of 4,720,000 cy for the initial fill placement, including tolerance, overfill and advanced nourishment (based on 2013 post-Hurricane Sandy survey); planting of 34 acres of dune grass and installation of 75,000 If of sand fence

Rehabilitation of Existing Groins

Sixteen groins were proposed for rehabilitation in the plan selected in 1998. However, the existing groins within the Project were re-evaluated in September 2003. The groins were evaluated for structural condition, sand trapping effectiveness, and planform holding effectiveness. As a result of this survey, a total of 17 groins were recommended for rehabilitation, including 15 groins in Long Beach and two groins in Point Lookout.

Rehabilitation was based on a condition survey of the existing groins conducted in September 2003, the plans for rehabilitation of existing groins in the Recommended Plan has been modified to include rehabilitation of those groins that were found in poor or fair condition that would be beneficial to the beach stability. Based on this evaluation, 15 of the 23 groins in the City of Long Beach and 2 groins in Point Lookout should be rehabilitated. The proposed rehabilitation would consist of repositioning existing armor stone and adding additional armor stone along the seaward 100-330 feet of each of the groins. A minimum constructible crest width of approximately 13 ft was selected with side slopes of 1V on 2H. A primary armor weight of approximately 5 tons was selected in order to approximately match the existing armor stone order to match the existing armor.

Construction of New Groins

The selected 1998 plan proposed eventual construction of six new groins (all 765 ft long and 70 ft wide) at Point Lookout (USACE 1998). Currently only the first four groins are targeted for immediate construction, whereas the remaining two groins are proposed for deferred construction as needed based on the stability of the existing weldment area. However, based on subsequent re-evaluation of the area, some modifications to the original design of the four new groins have been proposed. The Project requires the immediate construction of a new groin field at Point Lookout that will contain six groins that begin 800 feet west of existing Groin 55 in Point Lookout. The four groins would be constructed with tapered lengths and spaced at an interval of 800 feet. Groin lengths vary and range from 380 ft to 800 ft. Groin widths will be 13 ft.

A determination to construct the two westernmost groins will be triggered at a later date within the 50-year Project life and be based on monitoring data. The criterion for construction includes a change from an accreting beach to an eroding beach in the area where the structures are to be located (USACE 2004b). The criteria will be evaluated based upon field measurements and analysis (USACE 2004b).

Point Lookout Terminal Groin Rehabilitation and Extension

During re-evaluation of the proposed Project, the USACE determined that Groin #58 (i.e., West Groin), the terminal groin in Point Lookout, required rehabilitation and extension (USACE 2004b). Accordingly, the District plans to rehabilitate the existing portion of the groin, extend the length an additional 100 feet (currently 200 ft), and extend the width to between 107 and 170 ft (currently widths range from 50 to 107 ft), in accordance with design specifications presented in the 1999 USACE Terminal Groin Rehabilitation and Extension at Jones Inlet, Long Beach Island, New York Report (Figure 2). Extending the terminal groin may decrease the amount of sediment lost toward the inlet after the beach fill component of the project is carried out (USACE 2004b). It will also possibly retain additional longshore sediment transport without causing large changes in inlet dynamics (USACE 2004b). The median armor weight for the rehabilitated and new portions of Groin #58 is approximately 10 to 10.75 tons (USACE 2004b).

Dune Walkovers, Vehicle Access, and Boardwalk Extensions

Several dune walkovers, vehicle access points and boardwalk extensions are proposed for the City of Long Beach and the Town of Hempstead (USACE 2004b). Construction of these structures will allow the public to gain safe access to the beach without harming the existing and enhanced dune system.

A total of 57 timber dune walkovers (including 17 timber wheelchair accessible), 9 gravel surface vehicle and pedestrian walkovers, 29 timber non ADA compliant, two timber vehicular access ways from the boardwalk, eight extensions to existing walkovers, are currently proposed. Originally, 29 dune walkovers (both timber and gravel) and 12 vehicle access ramps were included in the selected plan (USACE 1995).

Bird Nesting and Foraging Area

The proposed Project modification has limited Project activities from within a 93.4-acre ephemeral pool and a 42.3-acre tern/piping plover nesting area located in Point Lookout, near the Jones Inlet ebb shoal attachment point (Appendix J). Project activities were proposed within this area as part of the original plan that was selected in 1998. However, the USACE reevaluated proposed Project activities in direct response to concerns regarding shorebird habitat from Federal and State agencies and other interested parties

(USACE 1998). As a result, construction of a beach berm within the bird nesting/foraging area has been eliminated from the proposed Project to allow for the continued unimpeded use of the area as shorebird nesting and foraging habitat. Two new groins were originally proposed within the ephemeral pool and tern/piping plover nesting area. However, based on a re-evaluation of the Project, construction of these groins has been deferred indefinitely, and is not part of the proposed Project modification. No beach fill activities will take place within the bird foraging and nesting area.

POLICY 1 - RESTORE, REVITALIZE, AND REDEVELOP DETERIORATED AND UNDERUTILIZED WATERFRONT AREAS FOR COMMERCIAL, INDUSTRIAL, CULTURAL, RECREATIONAL, AND OTHER COMPATIBLE USES.

The Long Beach project will advance Policy 1 by restoring the natural coastal processes in this dynamic waterfront area while maintaining safe recreational and emergency traffic. The project will enhance recreational opportunities in the area. The Long Beach project will ensure the continued use of the water front area to advance and support recreational activites, fishing and other compatible activities. Enhanced recreational beach areas will result in the placement area.

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

The Long Beach project will advance Policy 2 by enhancing recreational activities which depend on access to coastal waters to name a few: swimming, fishing, boating, wildlife viewing.

POLICY 4 - STRENGTHEN THE ECONOMIC BASE OF SMALLER HARBOR AREAS BY ENCOURAGING THE DEVELOPMENT AND ENHANCEMENT OF THOSE TRADITIONAL USES AND ACTIVITIES WHICH HAVE PROVIDED SUCH AREAS WITH THEIR UNIQUE MARITIME IDENTITY.

The Long Beach project will advance Policy 4 by promoting desirable activities such as recreational activities, fishing and other compatible activities that have made smaller harbor areas appealing as tourist destinations.

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

The Long Beach project will advance Policy 7 by protecting and advancing fish and wildlife habitat to assure the survival of these species populations. Long Beach project is a significant foraging area for migratory fowl and this project will protect and enhance this habitat.

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

The Long Beach project will advance Policy 9 as Long Beach offers a wide array of recreational activities pertaining to fish and wildlife resources. The project will maintain and increase the recreational use of these resources in a manner which ensures the protection of these species resources and by providing public access to the project area.

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

The Project advances Policy 14 by ensuring the stability of the beach and Inlet navigation while augmenting the natural coastal features providing shore protection and reducing erosion on the eastern side of the inlet.

POLICY 19 - PROTECTS, MAINTAIN, AND INCREASE THE LEVEL AND TYPES OF ACCESS TO PUBLIC WATER-RELATED RECREATION RESOURCES AND FACILITIES.

Long Beach provides a vital recreational outlet for residents of the areas and other parts of Nassau County. On an average summer weekend day Long Beach beaches draw thousands of people for sunbathing, picnicking, swimming, and sport fishing. During the winter months the area is also used to some extent for recreational walks and exercise, nature study, and sport fishing

POLICY 21 - WATER-DEPENDENT AND WATER-ENHANCED RECREATION WILL BE ENCOURAGED AND FACILITATED, AND WILL BE GIVEN PRIORITYOVER NON-WATER-RELATED USED ALONG THE COAST.

The Long Beach project will maintain and boost an existing water-related and water-dependent recreation, as well as increase the general public's access to the coast to enjoy and take advantage of coastal scenery.

APPENDIX E

AIR CONFORMITY ANALYSIS

Andrew M. Cuomo
Governor

Joe Martens
Commissioner

State of New York
Department of Environmental Conservation
Albany, New York 12233-1010

JAN 27 2014

Colonel Paul E. Owen, P.E.
Commander - NY District
U.S. Army Corps of Engineers
26 Federal Plaza
New York, NY 10278

Dear Colonel Owen:

The purpose of this letter is to assist the United States Army Corps of Engineers (USACE) in complying with the General Conformity requirements of the Clean Air Act (CAA) as USACE performs coastal restoration and repair projects in New York.

Superstorm Sandy significantly diminished the protective value of New York's beach and dune system, leaving New York coastal communities vulnerable to damage from future storms. Coastal restoration and repair projects will enhance the sustainability of New York's coastline and diminish the impacts of future storms. The New York Department of Environmental Conservation (DEC) has been working with your District to ensure that federal emergency coastal restoration and repair projects start as quickly as possible.

Emissions of oxides of nitrogen (NO_X) for several of the Authorized but Unconstructed (ABU) beach and dune repair/restoration projects will be greater than 100 tons per year. As a result, USACE must demonstrate that those projects meet the General Conformity requirements of the CAA. Under the General Conformity provisions, federal agencies must work with state governments in nonattainment areas to ensure that their federal actions conform to the State Implementation Plans (SIPs) established by the state.

Based on the emission estimates received to date, the USACE must demonstrate compliance for the following projects:

- East Rockaway to Rockaway Inlet - Oceanfront and Back Bay;
- Fire Island to Montauk Point - beach fill, dunes, groin modification; and
- Long Beach - beach fill, dunes, groins.

While the DEC does not have the authority to exempt these critical ABU projects from the General Conformity requirements, there are a number of options available to the USACE to demonstrate conformity in the New York-New Jersey-Connecticut nonattainment area. The demonstration can consist of any combination of options and there is no requirement to include all of the options to meet conformity. USACE may demonstrate conformity with the New York SIP by utilizing the emission offset options listed below to offset the emissions from all "Waterside Equipment[1]":

a. Emission reductions from project and/or non-project related sources in an appropriately close vicinity to the project location. In assessing the potential impact of this offset option on the construction schedule, the possibility of lengthening the time period in which offsets can be generated as appropriate and allowable under the general conformity rule should be recognized (40 CFR §93.163).

b. Use of Surplus NOx Emission Offsets (SNEOs) generated under the Harbor Deepening Project (HDP). As part of the mitigation of the HDP, USACE and the Port Authority of New York & New Jersey developed emission reduction programs coordinated through the Regional Air Team (RAT). The RAT is comprised of the USACE, NJDEP, EPA, DEC, and other stakeholders. SNEOs will be applied in concurrence with the agreed upon SNEO Protocols to ensure the offsets are real, surplus, and not double counted. As noted in the SNEO protocol, Proctor & Gamble (P&G) Emission Reduction Credits (ERCs) are not part of the SNEOs generated under the HDP. The need for future application of the P&G ERCs under the HDP, while unlikely, will impact the surplus determination under the SNEO protocol.

c. Use of Clean Air Interstate Rule ozone season NOx Allowances.

Due to unpredictable nature of dredge-related construction and the preliminary estimates of sand required to restore the integrity of the coastlines and DEC's assessment that land based equipment emissions are in the SIP, in order to demonstrate compliance, project emissions must be monitored as appropriate and regularly reported to the RAT to assist the USACE in ensuring that each project is fully offset.

DEC staff is committed to working closely with USACE to ensure a smooth and expeditious process. Should you have any further questions or need additional assistance, please do not hesitate to contact David J. Shaw, Director, Division of Air Resources at (518) 402-8452.

Sincerely,

Joseph J. Martens

c: D. Shaw

---

1 Based on the estimates provided, DEC has determined for offset purposes that "Waterside Equipment" refers to emissions from equipment identified as Dredge, Auxiliary, Pumps and Barge. For the purposes of general conformity, the "Shore Crew Support and Groin Construction Equipment," identified as Dozer, Excavator and Front End Loader are considered to be part of the State's nonroad SIP inventory.

USACE - New York District

NAN - ABU Sandy-Related Projects

General Conformity Related Emission Estimates

Emission Estimates & Supporting Information - Long Beach 14-Jan-14

DRAFT

General Conformity-applicable emissions per calendar year based on project duration

Pollutant	Estimated Emissions, tons per year 2013	2014	2015	2016	2017	2018	2019	2020
NO_x	0.0	0.04	0.17	433.3	22.8	0.0	0.0	0.0
VOC	0.0	0.001	0.005	16.3	0.9	0.0	0.0	0.0
$PM_{2.5}$	0.0	0.002	0.007	22.5	1.2	0.0	0.0	0.0
SO_2	0.0	0.00003	0.0001	0.25	0.01	0.0	0.0	0.0
CO	0.0	0.007	0.030	56.5	3.0	0.0	0.0	0.0

Maximum emissions per year given the project duration as listed in the "project duration" table

Pollutant	Estimated Emissions, maximum tons per year									
	Water Side			Shore Crew Support*			Groin Construction*			
	Dredge	Auxiliary	Pumps	Dozer	Front-end loader	Total Dredging	Barge	Excavator	Front-end loader	Total Groin
NO_x	447.1	15.3	68.4	15.2	1.2	547.3	0.2	0.5	0.6	1.3
VOC	17.1	0.4	2.8	0.3	0.02	20.6	0.006	0.010	0.011	0.028
$PM_{2.5}$	23.5	0.6	4.1	0.3	0.02	28.4	0.009	0.009	0.009	0.027
SO_2	0.23	0.01	0.07	0.008	0.0006	0.32	0.0002	0.0003	0.0003	0.001
CO	48.9	2.7	17.7	1.9	0.2	71.4	0.04	0.07	0.07	0.18

Supporting information and data

				Shore crew*		Groin construction*		
	Dredge	Auxiliary	Pumps	Dozer	Front-end loader	Barge	Excav	Front-end loader
Horsepower	8,000	600	2,000	310	25	20	23	25
Load factors	0.66	0.40	0.80	0.59	0.59	0.40	0.59	0.59
Emission factors								
NO_x	9.7	7.3	4.9	9.5	9.5	7.3	9.5	9.5
VOC	0.37	0.20	0.20	0.19	0.19	0.20	0.19	0.19
$PM_{2.5}$	0.51	0.29	0.29	0.16	0.16	0.29	0.16	0.16
SO_2	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
CO	1.06	1.27	1.27	1.21	1.21	1.27	1.21	1.21

* Per NYDEC finding, land-side emissions are accounted for in the applicable SIP and are therefore not considered in the General Conformity evaluation. Accordingly, only barge emissions are included from the groin construction work in the calendar year emission totals.

Project Duration and Working Months per Year

Cu yds	2013	2014	2015	2016	2017	2018	2019	2020	Total Months Dredging
4,500,000		2	9	9.5	0.5				10
		(groin work)		(dredging and beach work)					

USACE - New York District
NAN - ABU Sandy-Related Projects
General Conformity Related Emission Estimates
Methodology
DRAFT

1-Nov-13

The emission estimating methodology is designed to be conservatively high in terms of calculated horsepower-hours.
Operating parameters and schedules may be revised as project plans are developed in more detail.

Equipment & Engines to be Used	Nominal Horsepower	Operating Hours/day	Operating Days/year	Load Factor	Emission Factors NOx	VOC g/hphr	PM2.5	CO	SO2
Dredge & related									
Dredge engines	8,000	22	assume 30 x 12	0.66	9.7	0.37	0.51	1.06	0.0050
Pump engines	2,000	22	assume 30 x 12	0.80	4.9	0.20	0.29	1.27	0.0048
Dredge auxiliary engines	600	22	assume 30 x 12	0.40	7.3	0.20	0.29	1.27	0.0048
Dozer	310	22	assume 30 x 12	0.59	9.5	0.19	0.16	1.21	0.0050
Loader (working dredged material)	25	22	assume 30 x 12	0.59	9.5	0.19	0.16	1.21	0.0050
Groin construction									
Loader (groin construction)	26	10	assume 30 x 12	0.59	9.5	0.19	0.16	1.21	0.0050
Excavator	23	10	assume 30 x 12	0.59	9.5	0.19	0.16	1.21	0.0050
Barge aux.	20	10	assume 30 x 12	0.40	7.3	0.20	0.29	1.27	0.0048

Terms

Horsepower	hp	Total horsepower of type of dredge likely to be used on projects
Operating hours per day	hrs/day	Operating hours per day based on project engineer's experience
Operating days per year	days/yr	Estimated number of operating days per year based on volume of work, expected production rate, and schedule limitations resulting from environmental windows
Load factor	LF	Load factors from NONROAD model tables for similar equipment
Emission factors	EF	NOx EF derived from emission standards for similar engine types, g/hp-hr
	e.g., dredge Dodge Island equipped with Tier 0 propulsion engines, Tier 2 pump engines	

Calculations

Emissions calculated using the following equation:

Emissions, tons per year = (hp x hrs/day x days/yr x LF x EF)/(453.59 g/lb x 2,000 lbs/ton)

VOC, PM2.5, CO emission factors:

2010 PANYNJ Emissions Inventory, marine vessel emisison factors used as a reasonable surrogate for the variety of vessels in use in the New York/New Jersey area in the absence of specific information regarding the vessels to be used on any specific project.

		VOC	PM2.5	CO
Propulsion (g/kWhr)	Table 5.35	0.50	0.68	1.42
Propulsion (g/hphr)		0.37	0.51	1.06
Auxiliary (g/kWhr)	Table 5.35	0.27	0.39	1.70
Auxiliary (g/hphr)		0.20	0.29	1.27
Off-road: DEQ results for representative 600 hp crawler tractor (MY 1995)				
Default hrs/year:	936	Horsepower: 600		
Emissions, short tons per year:		0.1925	0.1667	1.2671
Estimated EF, g/hphr:*		0.183	0.16	1.21
Conversion factor		1.053 VOC/THC		
Estimated VOC EF, g/hphr:		0.19		

* Hydrocarbons provided by DEQ converted to VOC
Assumed load factor for off-road: 0.59 (from PANYNJ Emissions Inventory)
Conversion factor 0.7457 kW/hp g/kWhr x kW/hp = g/hphr

SO2 emission factors:

Quantification of emissions from ships associated with ship movements between ports in the European Community
Final Report, July 2002, Entec UK Limited. Chapter 2

	g/kWhr	g/hphr	g S/hphr	g SO2/hphr
Medium and high speed auxiliary, distillate fuel (Table 2	217	162	0.0024	0.0048
Medium and high speed propulsion, distillate fuel (Tabl	223	166	0.0025	0.0050

(maneuvering)
ULSD as of 2014: 15 g S/1,000,000 g fuel
Land-side diesel engines exhibit similar fuel consumption characteristice as marine propulsion engines,* so the same SO2 EFs are used.
*Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling - Compression-Ignition
EPA-420-R-10-018 NR-009d July 2010
Table C1. Average Emission Test Results for 1988 to 1995 Model Ye 0.367 lb fuel/hphr
From the text: "Due to lack of data, the brake-specific fuel consumption (BSFC) for the 1988-and-later pre-control (Tier 0) engines is used for all engines, both earlier pre-control engines and later engines subject to emissions standards."
Converted to g/hphr: 167 g/hphr

United States Army Corps of Engineers, New York District
Draft General Conformity Determination Notice

On October 30, 2012, New York State (DR-4085) and New Jersey State (DR-4086) declared Super Storm Sandy a Major Disaster. In response to the unprecedented breadth and scope of the damages sustained along the New York and New Jersey coastlines, the U.S. Congress passed Public Law (PL) 113-2 "Disaster Relief Appropriations Act 2013", also known as House Resolution (H.R.) 152-2 Title II which was signed into law on January 29, 2013. PL 113-2, which states "That the amounts... are designated by the Congress as being for an emergency requirement pursuant to section 251(b)(2)(A)(i) of the Balanced Budget and Emergency Deficit Control Act of 1985", provides funding for numerous projects to repair, restore and fortify the coastline in both states as a result of the continuing emergency as people and property along the coast remain in a vulnerable condition until the coastline is restored and fortified. To protect the investments by the Federal, State, local governments and individuals to rebuild damaged sites, it is imperative that these emergency disaster relief projects proceed as expeditiously as possible.

There are a number of coastal projects that were previously proposed and authorized but unconstructed (ABU). The Long Beach Project, Nassau County, New York project is an ABU project that is anticipated to start construction during or after October 2014 and this document represents the General Conformity Determination required under 40CFR§93.154 by the United States Army Corps of Engineers (USACE). USACE is the lead Federal agency that will contract, oversee, approve, and fund the project's work, and thus is responsible for making the General Conformity determination for this project.

USACE has coordinated this determination with the New York State Department of Environmental Conservation (NYSDEC) and the US Environmental Protection Agency, Region 2. The New York, Northern New Jersey, Long Island, Connecticut nonattainment area is currently classified as "marginal" nonattainment for the 2008 8-hour ozone standard, nonattainment of the 2006 particulate matter less than 2.5 microns ($PM_{2.5}$) standard, and maintenance of the carbon monoxide (CO) standard. The area is in the Ozone Transport Region. Ozone is controlled through the regulation of its precursor emissions, which include oxides of nitrogen (NOx) and volatile organic compounds (VOCs).

The equipment associated with this project that is evaluated under General Conformity (40CFR§93.153) includes direct and indirect nonroad diesel sources, such as dredging equipment and land based earth-moving equipment. The primary precursor of concern with this type of equipment is NOx, as VOCs, $PM_{2.5}$, and CO are generated at significantly lower rates. The NOx emissions associated with the project are estimated to range from <1.0, <1.0, 433.3, and 22.8 tons per calendar year for 2014 through 2017, respectively (see emissions estimates provided as Attachment A). The Long Beach project exceeds the NOx trigger level of 100 tons in any calendar year and as a result, the USACE is required to fully offset the emissions of this project. The project does not exceed the ozone related VOC trigger level of 50 tons (for areas in a ozone transport region) in any calendar year, nor the $PM_{2.5}$ and CO related trigger levels of 100 tons in any calendar year.

USACE is committed to fully offsetting the emissions generated as a result of the disaster relief coastal work associated with this project. USACE recognizes that the feasibility and cost-effectiveness of each offset option is influenced by whether the emission reductions can be achieved without introducing delay to the construction schedule that would prevent timely disaster relief.

USACE will demonstrate conformity with the New York State Implementation Plan by utilizing the emission offset options listed below. The demonstration can consist of any combination of options, and is not required to include all or any single options to meet conformity. The options for meeting general conformity requirements include the following:

a. Emission reductions from project and/or non-project related sources in an appropriately close vicinity to the project location. In assessing the potential impact of this offset option on the construction schedule, USACE recognizes the possibility of lengthening the time period in which offsets can be generated as appropriate and allowable under the general conformity rule (40CFR§93.163 and §93.165).
b. Use of Surplus NOx Emission Offsets (SNEOs) generated under the Harbor Deepening Project (HDP). As part of the mitigation of the HDP, USACE and the Port Authority of New York & New Jersey developed emission reduction programs coordinated through the Regional Air Team (RAT). The RAT is comprised of the USACE, NYSDEC, New Jersey Department of Environmental Protection, EPA, and other stakeholders. SNEOs will be applied in concurrence with the agreed upon SNEO Protocols to ensure the offsets are real, surplus, and not double counted.
c. Use of Clean Air Interstate Rule (CAIR) ozone season NOx Allowances with a distance ratio applied to allowances, similar to the one used by stationary sources.

Due to unpredictable nature of dredge-related construction and the preliminary estimates of sand required to restore the integrity of the coastlines, the project emissions will be monitored as appropriate and regularly reported to the RAT to assist the USACE in ensuring that the project is fully offset.

In summary, USACE will achieve conformity for NOx using the options outlined above, as coordinated with the NYSDEC and coordinated through the RAT.

Approved:

APPENDIX F

NEW YORK STATE OFFICE OF PARKS, RECREATION AND HISTORIC PRESERVATION (NYSOPRHP) CORRESPONDENCE

DEPARTMENT OF THE ARMY
NEW YORK DISTRICT CORPS OF ENGINEERS
JACOB K. JAVITS FEDERAL BUILDING
NEW YORK, N.Y. 10278-0090

REPLY TO
ATTENTION OF

14 June 1993

Environmental Analysis Branch
Environmental Assessment Section

Ms. Julia S. Stokes
Deputy Commissioner for Historic Preservation
New York State Office of Parks, Recreation, and
Historic Preservation
Historic Preservation Field Services Bureau
Peebles Island
P.O. Box 189
Waterford, New York 12188-0189

Dear Ms. Stokes,

The New York District, Corps of Engineers (Corps), has been authorized to construct a beach nourishment project along the length of Long Beach Island, Nassau County, New York (Figure 1). This project is needed to replace portions of the beach that have undergone severe erosion and to protect existing development from further erosion. The current project area includes the shore and near-shore sand placement area as well as an offshore borrow area located approximately 2000 feet south of the eastern end of Long Beach Island (Figure 1 and 2). The proposed project will not impact the salt marshes situated on the northeast side of Long Beach Island.

Current project plans call for the placement of sand dredged from the offshore borrow site to be placed on Long Beach Island. This material will be placed above the mean high water mark to widen the beach berm to a width of 110 feet and to construct dunes in certain areas. Two portions of Long Beach Island, the westernmost portion of Atlantic Beach and a section of Lido Beach, are not being considered as part of the initial nourishment project, although they will be included as part of the subsequent maintenance cycle. As the project is currently scheduled, the beach maintenance program will last for 50 years, with beach nourishment occurring every five years.

Two structures, the Granada Towers and the U.S. Post Office, are listed on the National Register of Historic Places (NRHP). One private residence located on Washington Boulevard is listed on the historic structures inventory maintained by the New York State Office of Parks, Recreation, and Historic Preservation because it is considered to be one of the first private homes built in Long Beach. None of these structures will be affected by this project.

Enclosure 3

New York State Office of Parks, Recreation and Historic Preservation
Historic Preservation Field Services Bureau
Peebles Island, PO Box 189, Waterford, New York 12188-0189 518-237-8643

Orin Lehman
Commissioner

June 23, 1993

Mr. Bruce A. Bergmann
Chief, Planning Division
Department of the Army
Corps of Engineers
New York District Office
Jacob K. Javits Federal Building
New York, New York 10278-0090

Dear Mr. Bergmann:

Re: CORPS
Long Beach Erosion Control
Long Beach Island, Nassau County
92PR2416

Thank you for requesting the comments of the State Historic Preservation Office (SHPO). We have reviewed the Cultural Resources Reconnaissance Report in accordance with Section 106 of the National Historic Preservation Act of 1966 and the relevant implementing regulations.

Based upon this review, the SHPO concurs with the recommendations of the the report. It is the opinion of the SHPO that no further investigations are warranted for the on-shore area of the project. We look forward to receiving the results of the surveys of the off-shore borrow areas when that work is completed.

If you have any questions, please call James Warren of our Project Review Unit at (518) 237-8643 ext. 280.

Sincerely,

Julia S. Stokes
Deputy Commissioner for
Historic Preservation

JSS/RDK:gc

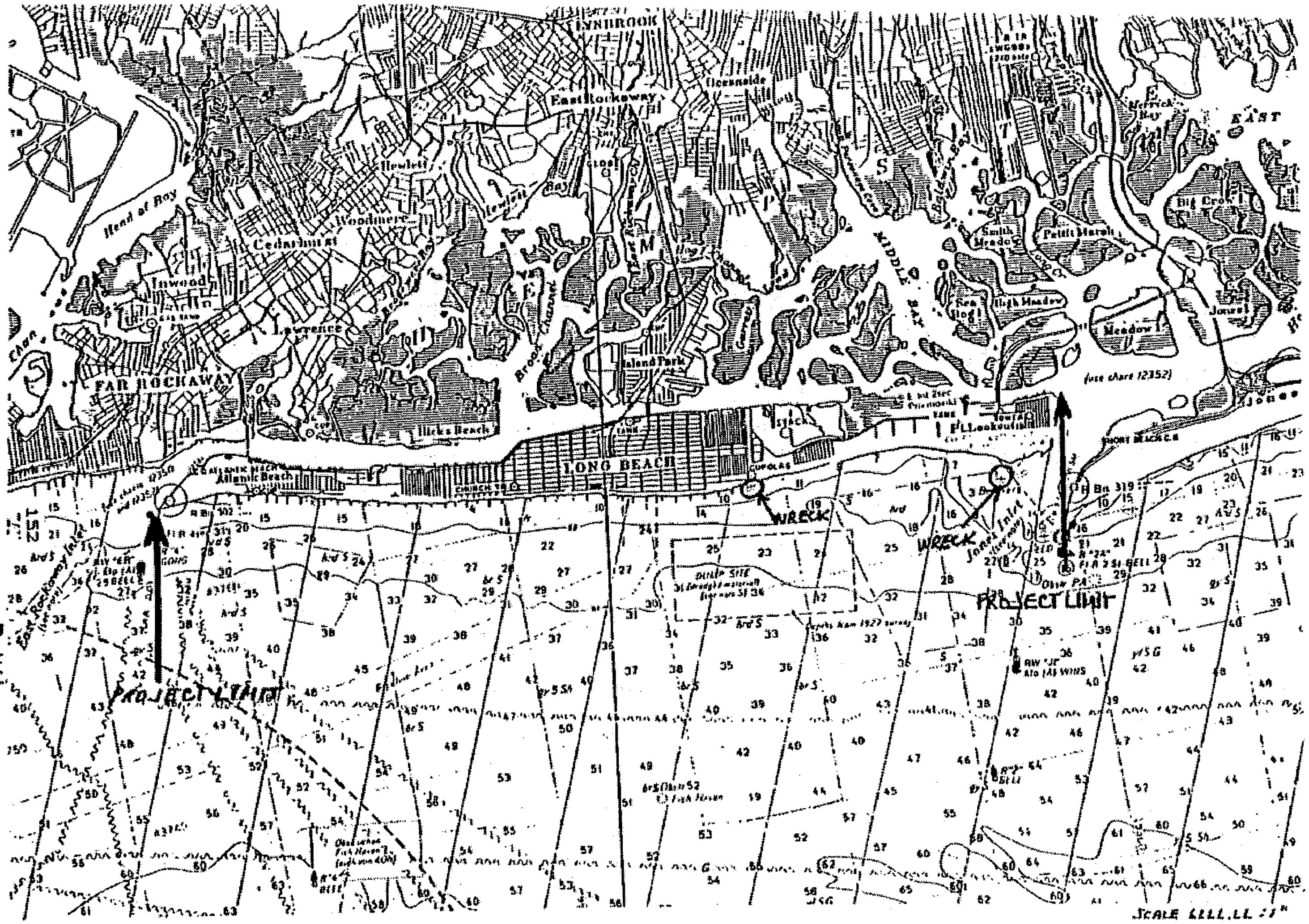


Figure 1: Project Map
Long Beach Island, Nassau unty,
New York.

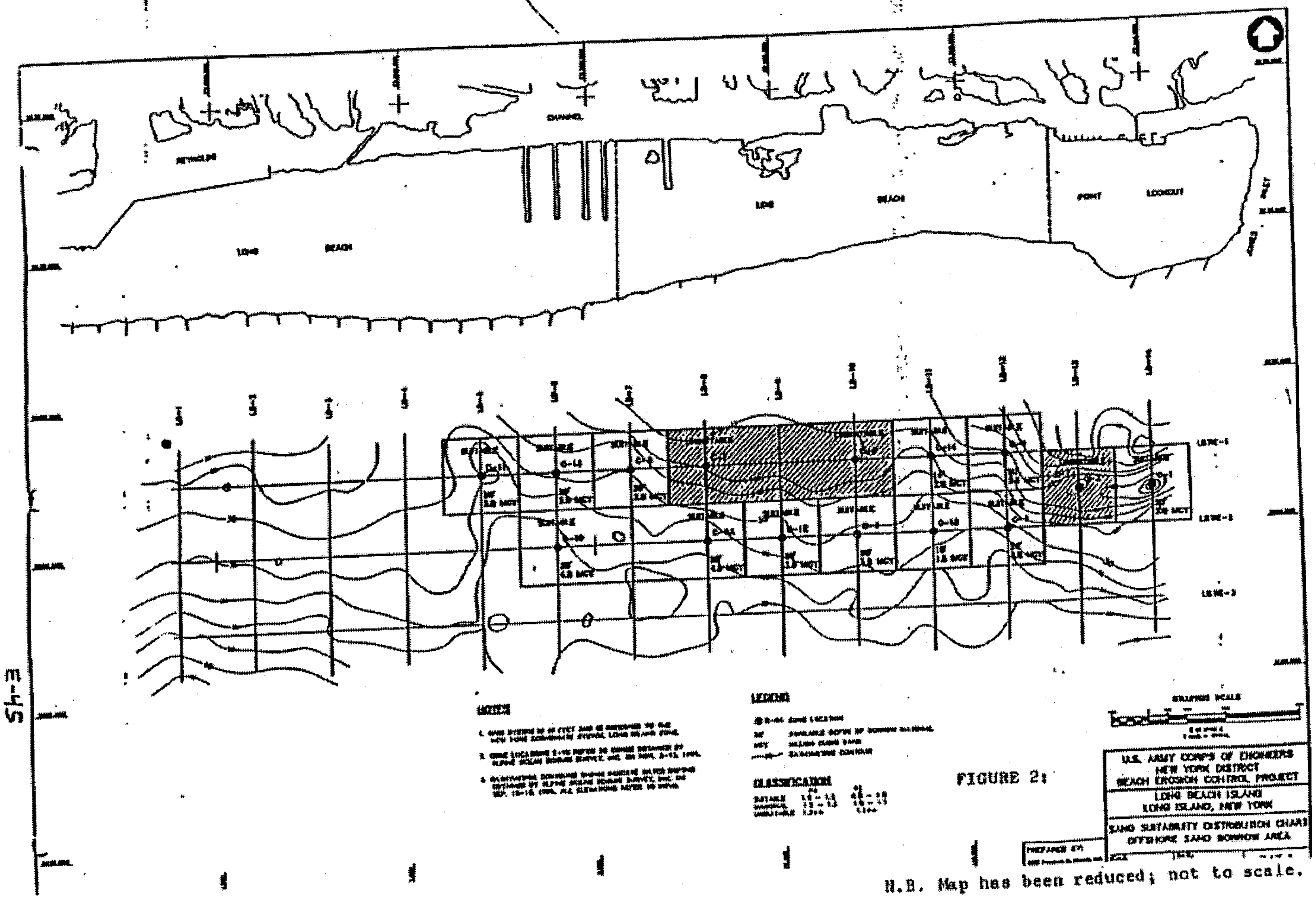


FIGURE 2:

N.B. Map has been reduced; not to scale.

To determine if there were any other potentially NRHP eligible properties located within the project area, the Corps had a cultural resources study prepared as part of this project (Attachment 1). An extensive history and prehistory of the Long Beach Island area was compiled and a pedestrian survey was also conducted for this report. This study found that there were no prehistoric/contact period occupations or archaeological sites on Long Beach. In addition, the location of the 19th and early 20th century structures would be located north of the present beach zone and that no significant remains of the project area's history would be located at the site of the present beach. Since the proposed project involves the deposition of sand, no sites will be disturbed.

The cultural resources study also examined the potential for shipwrecks to be located in the near-shore placement area and the offshore borrow area. Marine charts of the project area show two wrecks within the near-shore sand placement zone in the Lido Beach/Point Lookout areas. These wrecks, however, are not listed on the National Oceanic and Atmospheric Administration's (NOAA) Automated Wreck and Obstruction Information System (AWOIS) listing for the project area. Mark J. Friese, Hydrographic Surveys Branch, NOAA, stated that the AWOIS is often not updated to include information from their charts. There is the potential, then, for the two wrecks to be located in the eastern section of the project area. An underwater investigation of the near-shore area in the vicinity of the two wrecks will be conducted during the next phase of the project.

A number of marine accidents or wrecks have occurred within and near the borrow site. In the next phase of this project, the Corps is planning to conduct a remote sensing survey of the proposed borrow area to determine if any wrecks are present.

On the basis of current project plans and pending review by your office, the Corps is of the opinion that the "Atlantic Coast of Long Island, Jones Inlet to East Rockaway Inlet, Long Beach Island, Nassau County, New York Beach Nourishment Project" will have no effect on historic properties located onshore. Please provide us with Section 106 comments for the onshore portion of this project as pursuant to 36 CFR 800.5.

The remote sensing survey of the borrow site using a magnetometer and side scan sonar will be conducted as part of the next phase of the project. In addition, an underwater survey of the near-shore area in the location of the two wrecks will also be conducted. The results of these surveys will be coordinated with your office when this work is completed.

If your or your staff have any questions or require further information about this project, please contact Ms. Nancy J. Brighton, Project Archaeologist, (212)264-4663. Thank you for your assistance.

Sincerely,

Bruce A. Bergmann
Chief, Planning Division

Attachments

DEPARTMENT OF THE ARMY
NEW YORK DISTRICT, CORPS OF ENGINEERS
JACOB K. JAVITS FEDERAL BUILDING
NEW YORK, N.Y. 10278-0090

REPLY TO
ATTENTION OF

November 27, 1995

Environmental Analysis Branch
Environmental Assessment Section

Mr. J. Winthrop Aldrich
Deputy Commissioner for Historic Presrvation
New York State Office of Parks, Recreation, and
Historic Preservation
Historic Preservation Field Services Bureau
Peebles Island
P.O. Box 189
Waterford, New York 12188

RE: CORPS
Long Beach Erosion Control
Long Beach Island, Nassau County
92PR2416

Dear Mr. Aldrich,

Enclosed is a draft copy of the report entitled "Remote Sensing Survey, Atlantic Coast of Long Island, Jones Inlet to East Rockaway Inlet, Long Beach Island, Nassau County, New York" (Enclosure 1). The report provides a description of the remote sensing survey of the borrow area to be utilized to provide sand for the hurricane and storm protection for Long Beach Island. During the course of the survey, 19 targets or anomalies were identified. Four of them have been identified as belonging to a pipe and thirteen others represent modern debris. The remaining two targets have been identified as potentially significant cultural resources. As currently planned, the targets and anomalies identified as potentially significant cultural resources will be avoided during dredging.

The draft report for the underwater investigations, for which your office has provided comments on an interim report, is currently being prepared. It will be submitted to your office for review when it is complete.

Please review this report and provide comments by January 8, 1996. If you have any questions or require additional information, please contact Ms. Nancy Brighton, (212)264-4663 or by fax (212)264-5472.

Sincerely,

Joseph Va L

Stuart Piken, P.E.
Chief, Planning Division

Enclosure

OFFICE OF PARKS · RECREATION · HISTORIC PRESERVATION
NEW YORK STATE
Bernadette Castro
Commissioner

New York State Office of Parks, Recreation and Historic Preservation
Historic Preservation Field Services Bureau
Peebles Island, PO Box 189, Waterford, New York 12188-0189 518-237-8643

November 28, 1995

Stuart Piken, P.E.
Department of the Army
N.Y. District Corps of Engineers
Jacob K. Javits Federal Building
New York, NY 10278-0090

Dear Mr. Piken:

Re: CORPS
Long Beach Island Erosion Control
Long Beach, Nassau County
92PR2416

Thank you for providing this office with a copy of your draft report on the remote sensing survey of the intended borrow area involved in this project. The State Historic Preservation Office concurs with the findings of this report and believes that it is unlikely that significant cultural resources exist in the borrow area. In addition, several of the questions addressed to you in my November 02 letter are satisfactorily answered by Amy Mitchell of Panamerican Consultants in her October 05 memorandum to Nancy Brighton of your staff. At this point in time, the only unresolved issue in our Section 106 review of this project concerns the eligibility of the steam tugboat wreck and its location in relationship to dredging and placement of soils. Amy Mitchell indicates that the tugboat site is located 1000 feet offshore, placing it, we believe, well outside the limits of intended soil deposition or dredging. If this statement is correct, no further investigations or submissions will be necessary for this office to issue a no effect finding. If, however, you find that the tugboat site will be impacted by this project, information supporting the eligibility or non-eligibility of this site will need to be forwarded to this office for a determination.

Thank you for your continuing consultation with the State Historic Preservation Office. When responding, please be sure to refer to the OPRHP project review number (PR) noted above. If you have any questions, please feel free to contact me at (518) 237-8643 ext. 258.

Sincerely,

Robert D Kuhn

Robert D. Kuhn, Ph.D.
Historic Preservation Coordinator
Field Services Bureau

OFFICE OF PARKS · RECREATION · HISTORIC PRESERVATION
NEW YORK STATE

New York State Office of Parks, Recreation and Historic Preservation
Historic Preservation Field Services Bureau
Peebles Island, PO Box 189, Waterford, New York 12188-0189 518-237-8643

Bernadette Castro
Commissioner

February 21, 1996

Stuart Piken, P.E.
Chief, Planning Division
Environmental Assessment Section
Department of the Army
New York District, Corps of Engineers
Jacob K. Javits, Federal Building
New York, New York 10278-0090

Re: Long Beach Erosion Control
Long Beach, Nassau Co.
92PR2416

Dear Mr. Piken:

Thank you for providing our office with an update on this shore stabilization project together with copies of the final remote sensing survey report and the draft archaeological report documenting the remains of a wooden steam tug located at Jones Inlet. Based on the information provided, we concur with Panamerican Consultants' recommendations that the tugboat no longer retains sufficient integrity to meet the criteria for listing on the National Register. For the reasons outlined in the same recommendations, the suspected remains of three other vessels in the project area could not be identified or evaluated. In the case of the unnamed wreck and the barge, a determination of eligibility will not be required since neither site appears to be impacted by the project. However, in the case of the Mexico, we concur with the recommendations of the consultants and the Corps that further efforts be made to locate, identify and evaluate the site prior to construction. The 1826 Mexico, if located, is likely to be eligible for listing given its historical associations, age and the circumstances of its accidental loss in 1837.

We look forward to continuing coordination with your office on this and other cultural resources issues in New York State. Please feel free to contact me at 518-237-8643 ext. 258 or Dr. Kuhn, Program Coordinator at ext. 255 if you have any questions.

Sincerely,

Mark L. Peckham
Historic Preservation
Program Analyst

DEPARTMENT OF THE ARMY
NEW YORK DISTRICT, CORPS OF ENGINEERS
JACOB K. JAVITS FEDERAL BUILDING
NEW YORK, N.Y. 10278-0090

REPLY TO ATTENTION OF

November 18, 1997

Environmental Analysis Branch
Environmental Assessment Section

Mark Peckham
Historic Preservation Program Analyst
Historic Preservation Field Services Bureau
New York State Office of Parks, Recreation and
Historic Preservation
Peebles Island
P.O. Box 189
Waterford, New York 12188-0189

RE: CORPS
Long Beach Island Erosion Control
Long Beach, Nassau County
92PR2416

Dear Mr. Peckham,

Reference is made to the underwater inspection of four shipwrecks in the near shore placement area for the above subject and the comments provided by your office (Enclosures 1 and 2). The inspection recommended a remote sensing survey of the near shore area of the proposed study area to ensure the identification of any remains of vessels that may lie along the Long Beach shoreline. In June 1997, Panamerican Consultants, Inc., under contract to the U.S. Army Corps of Engineers, New York District, completed a remote sensing survey of the near shore area of Long Beach Island. Enclosed is the draft report entitled "Remote-Sensing Survey, Near-Shore Project Area, Atlantic Coast of Long Island, Jones Inlet to East Rockaway Inlet, Long Beach Island, Nassau County, New York Storm Damage Reduction Project" that presents the results of this investigation (Enclosure 3).

The remote-sensing data identified 26 anomalous features that fit the criteria for potentially significant submerged resources. The majority of these features has only a magnetic signature indicating they are buried beneath the seabed. These resources should not be impacted by the placement of sand along the near-shore area and the placement of additional sand in this area should further protect any targets that represent historic shipwrecks. No further work is recommended for these targets if the proposed storm reduction project activities do not disturb the sea floor.

There are four targets with associated sidescan sonar images that represent potentially significant submerged cultural resources protruding from the sea floor that might be impacted by the placement of fill. One of the targets is a tug that was investigated in 1996. No further work is recommended for this target. The three other targets, however, are unidentified. One target is a cluster of four anomalies; one of which has a sidescan return that may be an anchor. This cluster is in the general area that local informants believe is the site of the *Mexico*. It is recommended that these three target areas, represented by six anomalies, be assessed by qualified underwater archaeologists to determine the nature of these anomalies and their historical significance.

The Corps concurs with the report's recommendations because of the potential significance of these targets. At this time, however, current proposed project plans are limited to work on the jetty at the eastern end of the Long Beach Island. The jetty project will be coordinated with your office when the proposed plans have been developed. If project plans change to include storm damage protection consisting of the placement of sand along the shoreline, then this office will conduct the recommended underwater archaeological survey. The results of that effort will be coordinated with your office.

Please review the attached report and provide comments. If you have any questions or require additional information, please contact Ms. Nancy Brighton (212) 264-4663. Thank you for your cooperation.

Sincerely,

John Sassi, P.E.
Chief, Planning Division

Enclosures

Contract No. DACW51-95-D-0024
Delivery Order No. 0004

U.S. Army Corps
of Engineers
New York District

UNDERWATER INSPECTION OF FOUR SHIPWRECKS ATLANTIC COAST OF LONG ISLAND JONES INLET TO EAST ROCKAWAY INLET LONG BEACH ISLAND, NASSAU COUNTY, NEW YORK STORM DAMAGE REDUCTION PROJECT

FINAL REPORT

April 1996

Panamerican Consultants, Inc.
15 South Idlewild Street
Memphis, Tennessee 38104

PREPARED FOR:

U.S. Army Corps of Engineers
New York District
26 Federal Plaza
New York, New York 10278

OFFICE OF PARKS · RECREATION · HISTORIC PRESERVATION
NEW YORK STATE

New York State Office of Parks, Recreation and Historic Preservation
Historic Preservation Field Services Bureau
Peebles Island, PO Box 189, Waterford, New York 12188-0189 518-237-8643

Bernadette Castro
Commissioner

February 21, 1996

Stuart Piken, P.E.
Chief, Planning Division
Environmental Assessment Section
Department of the Army
New York District, Corps of Engineers
Jacob K. Javits, Federal Building
New York, New York 10278-0090

Re: Long Beach Erosion Control
Long Beach, Nassau Co.
92PR2416

Dear Mr. Piken:

Thank you for providing our office with an update on this shore stabilization project together with copies of the final remote sensing survey report and the draft archaeological report documenting the remains of a wooden steam tug located at Jones Inlet. Based on the information provided, we concur with Panamerican Consultants' recommendations that the tugboat no longer retains sufficient integrity to meet the criteria for listing on the National Register. For the reasons outlined in the same recommendations, the suspected remains of three other vessels in the project area could not be identified or evaluated. In the case of the unnamed wreck and the barge, a determination of eligibility will not be required since neither site appears to be impacted by the project. However, in the case of the Mexico, we concur with the recommendations of the consultants and the Corps that further efforts be made to locate, identify and evaluate the site prior to construction. The 1826 Mexico, if located, is likely to be eligible for listing given its historical associations, age and the circumstances of its accidental loss in 1837.

We look forward to continuing coordination with your office on this and other cultural resources issues in New York State. Please feel free to contact me at 518-237-8643 ext. 258 or Dr. Kuhn, Program Coordinator at ext. 255 if you have any questions.

Sincerely,

Mark L. Peckham
Historic Preservation
Program Analyst

Contract No. DACW51-95-D-0024
Delivery Order No. 0018

U.S. Army Corps
of Engineers
New York District

REMOTE-SENSING SURVEY, NEAR-SHORE PROJECT AREA, ATLANTIC COAST OF LONG ISLAND, JONES INLET TO EAST ROCKAWAY INLET, LONG BEACH ISLAND, NASSAU COUNTY, NEW YORK STORM DAMAGE REDUCTION PROJECT

DRAFT REPORT

1997

Panamerican Consultants, Inc.
15 South Idlewild Street
Memphis, Tennessee 38104

PREPARED FOR:

U.S. Army Corps of Engineers
New York District
26 Federal Plaza
New York, New York 10278

OFFICE OF PARKS · RECREATION · HISTORIC PRESERVATION
NEW YORK STATE

Bernadette Castro
Commissioner

New York State Office of Parks, Recreation and Historic Preservation
Historic Preservation Field Services Bureau
Peebles Island, PO Box 189, Waterford, New York 12188-0189

518-237-8643

December 01, 1997

Mr. John Sassi, P.E.
Chief, Planning Division
Department of the Army
New York District Corps of Engineers
Jacob K. Javits Federal Building
New York, New York 10278-0090

Re: Long Beach Erosion Control
Long Beach, Nassau Co.
92PR2416

Dear Mr. Sassi:

Thank you for your letter of November 18 and the attached remote sensing report by Panamerican Consultants, Inc. We concur with the recommendations outlined in the report and endorsed in your letter and look forward to continuing consultation as construction plans develop. Please feel free to contact me at 518-237-8643 ext. 258 if I can be of any assistance.

Sincerely,

Mark L. Peckham
Historic Preservation
Program Analyst

OFFICE OF PARKS, RECREATION · HISTORIC PRESERVATION
NEW YORK STATE
Bernadette Castro
Commissioner

New York State Office of Parks, Recreation and Historic Preservation
Historic Preservation Field Services Bureau
Peebles Island, PO Box 189, Waterford, New York 12188-0189 518-237-8643

January 20, 2005

Christopher Ricciardi
U.S. Army corps of Engineers - Planning Division
Jacob K. Javits Federal building
26 Federal Plaza- Room 2131
New York, NY 10278-0090

Dear Mr. Ricciardi,

Re: CORPS
Long Beach Island Erosion Control
Long Beach, Nassau County, NY
05PR00126 (formerly 92PR2416)

Thank your for requesting the comments of the New York State Historic Preservation Office (SHPO) with regard to the potential for thIs project to affect significant historical/cultural resources. SHPO has reviewed your agencies correspondence of December 22, 2004 and the report "*Phase II Underwater Inspection of Seven Targets in the Eastern Portion of the Long Beach Project, Nassau County, New York - Draft Report*" prepared by Panamerican Consultants in December 2004. SHPO con curs with the findings and recommendations of that report. We have assigned Unique Site Number A05901.000450 to the Marble Wreck Site, which has been determined eligible for the National Register of Historic Places. We request that you have a completed archaeological site inventory form prepared and submitted for this site.

Our review in included a review of the Mitigation Plan included as Appendix C of the report. We concur with the Data Recovery Plan presented, however we would like to request that a protocol for the treatment of humans remains be added as well as a protocol for disseminating the results of the investigations to the public. Public dissemination may take the form of publications, presentations, displays, web sites or other measures appropriate for a particular site. Please provide some discussion/options for this site. The revised plan should be included as part of an Memorandum of Agreement (MOA) that will be developed to mitigate the adverse effects of your project. Please contact me to discuss preparation of the MOA.

Please contact me at extension 3291, or by e-mail at douglas.mackey@oprhp.state.ny.us, if you have any questions regarding these comments.

Sincerely

Douglas P. Mackey

Douglas P. Mackey
Historic Preservation Program Analyst
Archaeology

DEPARTMENT OF THE ARMY
NEW YORK DISTRICT, CORPS OF ENGINEERS
JACOB K. JAVITS FEDERAL BUILDING
26 FEDERAL PLAZA
NEW YORK, N.Y. 10278-0090

Reply to
Environmental Analysis Branch

September 10, 2013

Ruth Pierpont, Director
New York State Office of Parks, Recreation & Historic Preservation
Historic Preservation Field Service Bureau
Peebles Island, P.O. Box 189
Waterford, New York 12188-0189

Re: CORPS
Long Beach Island Storm Damage Reduction
Long Beach, Nassau County
05PR00126 (formerly 92PR2416)

Dear Ms. Pierpont:

The U.S. Army Corps of Engineers, New York District (District) has developed a plan to restore the shoreline and provide shoreline protection to Long Beach Island, a barrier island located between Jones Inlet and East Rockaway Inlet, in Nassau County, New York (Enclosure 1). The Atlantic Coast of New York, Jones Inlet to East Rockaway Inlet, Long Beach Island, New York Storm Damage Reduction Project (Project) covers of approximately 29,000 linear feet of shoreline and generally extends from the eastern end of the barrier island at Point Lookout to the western boundary of the City of Long Beach. The plan consists of dune and berm construction, planting of dune grass and installation of sand fencing. Also included in the project is construction of dune walkovers, vehicle accessways, retaining walls, and lifeguard stations as well as the rehabilitation of 18 existing groins including the terminal groin at Point Lookout and the construction of 7 new groins. The project shall also include advanced nourishment and periodic renourishment at 5 year intervals for the 50 year life of the project.

The District has carried out cultural resources and remote sensing investigations to determine whether the project will have an adverse impact on cultural resources. The following is a list of relevant reports:

1) *Underwater Inspection of Four Ship Wrecks, Atlantic Coast of Long Island, Jones Inlet to East Rockaway Inlet, Long Beach Island, Nassau County, New York Storm Damage Reduction Project, 1996, prepared by Panamerican Consultant, Inc..*
2) *Remote Sensing Survey, Atlantic Coast of Long Island, Jones Inlet to East Rockaway Inlet, Long Beach Island, Nassau County, New York. 1996. Prepared by Panamerican Consultants, Inc. (An investigation of the Sand Borrow Area)*

3) *Remote-Sensing Survey, Near-Shore Project Area, Atlantic Coast of Long Island, Jones Inlet to East Rockaway Inlet, Long Beach Island, Nassau County, New York Storm Damage Reduction Project, 1998, prepared by Panamerican Consultants, Inc.*
4) *Phase II Underwater Inspection of Seven Targets in the Eastern Portion of the Long Beach Project, Nassau County, New York – February,* 2005, *prepared by Panamerican Consultants, Inc.*

The remote sensing and dive inspection surveys of the study area and sand borrow area resulted in the identification of two shipwrecks within the near shore sand placement area vicinity, the *Mexico* Wreck and the *Marble* Wreck, and one anomaly of interest. At this time the anomaly, number 18, identified during the 1998 near shore remote sensing survey requires further investigation, the *Mexico* is considered potentially eligible for the National Register of Historic Places (NRHP) but requires further investigation to determine its NRHP eligibility and the *Marble*, which was subject to dive investigation in the 2005 survey, has been determined potentially eligible for the NRHP. Section 106 consultation was carried out with your office regarding this project as part of the feasibility study and environmental impact statement which were completed in 1995. Also, coordination was carried out following the 2005 underwater inspections for the subsequent re-evaluation of the selected alternative which was carried out to address changes to the shoreline, the project scope, and to address environmental concerns.

In accordance with the recommendations of the surveys and the consultation comments received from your office, the New York District has prepared, for review and comment, a fact sheet summarizing the previous investigations, coordination with your office, and the project plans as well as a draft Programmatic Agreement (PA) (Enclosures 2 and 3). The draft PA stipulates how the anticipated adverse impacts shall be managed as this project moves forward. A Data Recovery Plan, developed in 2005 for the *Marble*, is included as an attachment to the PA. The New York District plans to begin construction of this project in the fall of 2014. Considering this short consultation period the New York District has begun the process of awarding a contract for a survey of the three resources, which shall fulfill the requirements outlined in Stipulation A of the draft PA. The current investigation shall include a refinement remote sensing survey of the anomaly and wreck sites, diver investigation of anomalies, and diver assessment of the Marble Wreck Site, the Mexico Wreck Site, and Anomaly 18. A determination shall be made as to the NRHP eligibility of each site so that plans for further investigations may be developed as well as mitigation plans if necessary.

We ask that you and your staff review and comment on the enclosed draft PA and supporting documentation provided as soon as possible pursuant to 36 CFR Part 800.5(e)(4). We are currently preparing input to the Limited Re-evaluation Report and the supplemental EA and will include this draft PA in the Appendices. If you or your staff require additional information or have any questions, please contact Carissa Scarpa, Project Archaeologist, at (917)790-8612.

Sincerely,

L. Houston

Leonard Houston,
Chief, Environmental Analysis Branch

Enclosures

DRAFT PROGRAMMATIC AGREEMENT
AMONG
THE U. S. ARMY CORPS OF ENGINEERS, NEW YORK DISTRICT,
AND
THE NEW YORK STATE OFFICE OF PARKS, RECREATION, and HISTORIC PRESERVATION
REGARDING
THE JONES INLET TO ROCKAWAY INLET, LONG BEACH ISLAND, NASSAU COUNTY, NEW YORK
COASTAL STORM RISK MANAGEMENT PROJECT

WHEREAS, the U. S. Army Corps of Engineers, New York District (District), is undertaking a coastal storm risk management project that would provide shoreline protection to Long Beach Island, a barrier island located between Jones Inlet and East Rockaway Inlet, in Nassau County, New York, to include the construction of dunes, groins and sand berms, the rehabilitation and/or extension of existing groins, the placement of sand fill, the creation of pedestrian and vehicular access ways, and the planting of dune grass (Project; Appendix A); and

WHEREAS, the Area of Potential Effect (APE) for the Project includes the on-shore and near shore sand placement area, the groin construction and rehabilitation area and the offshore sand borrow source; and

WHEREAS, two anomalies were identified in the offshore borrow area and are considered to be potentially significant cultural resources; and

WHEREAS, the *Marble* Wreck and the wreck of the *Mexico* has been determined potentially eligible for the National Register of Historic Places (NRHP), but requires further investigation to make that determination, and Anomaly 18 represents an unknown object that also requires further investigation to determine its eligibility for the NRHP; and

WHEREAS, the District has determined that the use of the off shore borrow area will avoid the two potentially significant anomalies identified; and

WHEREAS, the District has determined that the project will have an adverse effect on the three submerged cultural resources, the *Marble* Wreck, the *Mexico* Wreck, and Anomaly 18. The *Marble* Wreck is located approximately 100 feet from the work limits for the terminal groin at Point Lookout. The *Mexico* Wreck is located roughly 100 feet from the sand placement area and Anomaly 18 is located within the sand placement area; but cannot fully identify the extent and nature of the adverse effects at this time; and

WHEREAS, the District has consulted with the New York State Historic Preservation Office (NYSHPO) pursuant to Section 106 of the National Historic Preservation Act (16 U.S.C. 470f) and its implementing regulations, 36 CFR Part 800;

WHEREAS, in accordance with 36 CFR Part 8000.14(b), the District has notified the Advisory

Council on Historic Preservation (ACHP), of its adverse effect determination and its intent to prepare a Programmatic Agreement, providing the specified documentation for actions where such effects have been determined, and has given the ACHP the opportunity to participate in consultation; and

WHEREAS, the District has consulted with the Federally-recognized Tribes, the Shinnecock Nation, the Delaware Nation, the Delaware Tribe of Nations and the Stockbridge-Munsee Banc of Mohicans and invited them to participate in this PA; and

WHEREAS, the District has consulted with the Long Beach Historical and Preservation Society, the Nassau County Historical Society, the Institute for Long Island Archaeology, Long Island Divers Association, Inc., and the Unkechaug Nation as interested parties;

NOW, THEREFORE, the New York District, and the NYSHPO agree that the undertaking shall be administered in accordance with the following stipulations in order to take into account the effect of the Project on historic properties.

STIPULATIONS

I. The New York District shall ensure that the following measures are carried out:

A. The District shall conduct a remote sensing survey of the *Mexico* Wreck, the *Marble* Wreck, and Anomaly 18. Each site will receive a comprehensive magnetometer, side scan sonar, and sub-bottom profiler survey to relocate and delineate the anomaly and wreck sites, as well as to form baseline data for the wreck sites. The District shall also conduct archeological diver identification and testing of each site. The survey shall be designed to collect sufficient information on the three sites to locate and evaluate their eligibility for the NRHP and make recommendations for future investigations or mitigation measures. The results of the survey shall be provided for comment to the NYSHPO, ACHP, and the consulting and interested parties. The sites shall only be deemed eligible upon concurrence from the NYSHPO following a review of the survey report. If the NYSHPO fails to respond within 30 calendar days of receipt of the District's request for concurrence with the determination, the District's determination shall be deemed conclusive.

B. In consultation with the NYSHPO and interested parties, the District shall determine whether the NRHP-eligible resources can be protected from adverse impacts through use of buffer zones or if, in addition to the buffer zones, there is a need for data recovery as a mitigating measure. If the resources cannot be avoided through the use of buffer zones the District shall prepare a data recovery plan for each resource as mitigation for adverse impacts. Each data recovery plan will be designed to document the remains both photographically and architecturally. A data recovery plan was developed for the *Marble* Wreck and has been reviewed and accepted by the NYSHPO (Appendix C).

C. Once executed, the data recovery plan(s) will be implemented prior to construction of the particular project element.

D. For each site that is determined eligible for the NRHP and documented through Stipulation B, measures will be developed, in consultation with the NYSHPO and interested parties for disseminating the data that is collected through publications, presentations, displays, and/or websites.

E. For all work conducted under this PA, the District shall ensure that qualified professionals meeting the *Secretary of the Interior's Professional Qualification Standards* (48 FR 44738-9) and the *Secretary of the Interior's Standards and Guidelines for Archaeology and Historic Preservation* (48 FR 44738-390).

F. The District and its contractors will ensure that all materials and records resulting from the survey, evaluation and data recovery conducted as part of this PA will be curated in accordance with 36 CFR Part 79. The archaeological materials and records will be retained by the District until a suitable repository is identified.

II. Administrative Terms

A. AMENDMENT

This PA may be amended when such an amendment is agreed to in writing by all signatories. The amendment will be effective on the date a copy signed by all of the signatories is filed with the ACHP.

B.TERMINATION

If any signatory to this PA determines that its terms will not or cannot be carried out, that party shall immediately consult with the other parties to attempt to develop an amendment per Stipulation IV(A) above. If within 30 calendar days (or another time period agreed to by all signatories) an amendment cannot be reached, any signatory may terminate the PA upon written notification to the other signatories. Once the PA is terminated and prior to work continuing on the Project, the District must either 1) execute a PA pursuant to 36 CFR 800.6; or 2) request, take into account, and respond to the comments of the ACHP under 36 CFR 800.7. The District shall notify the signatories as to the course of action it will pursue.

C. ANTI-DEFICIENCY ACT

All requirements set forth in this PA requiring expenditure of funds by the New York District are expressly subject to the availability of appropriations and the requirements of the Anti-Deficiency Act (31 U.S.C. 1341). No obligation undertaken by the New York District under the terms of this PA shall require or be interpreted to require a commitment to extend funds not appropriated for a particular purpose. If the New York District cannot perform any obligation set forth in this PA because of unavailability of funds, that obligation must be renegotiated among the District and the NYSHPO as necessary.

D. DISPUTE RESOLUTION

Should any signatory to this PA object at any time to any actions proposed or the manner in which the terms of this PA are implemented, the District shall consult with such that party to resolve the objection. If the District determines that such an objection cannot be resolved, the District will:

1. Forward all documentation relevant to the dispute, including the New York District's proposed resolution, to the ACHP. The ACHP shall provide the New York District with its advice on the resolution of the objection within 30 calendar days of receiving adequate documentation. Prior to reaching a final decision on the dispute, the New York District shall prepare a written response that takes into account any timely advice or comments regarding the dispute from the ACHP, signatories and concurring parties, and provide them with a copy of this written response. The New York District will then proceed according to its final decision.

2. If the ACHP does not provide its advice regarding the dispute within the thirty (30) calendar day time period, the New York District may make a final decision on the dispute and proceed accordingly. Prior to reaching such a final decision, the New York District shall prepare a written response that takes into account any timely comments regarding the dispute from the signatories and concurring parties to the PA, and provide them and the ACHP with a copy of such written response.

3. The District's responsibilities to carry out all other actions subject to the terms of this PA that are not the subject of the dispute remain unchanged.

E. UNANTICIPATED DISCOVERY

If during the construction of this Project or the implementation of any other Project features, including but not limited to those associated with the secondary impacts and impact areas described in this PA, , the District will treat unanticipated discoveries in a manner that is in accordance with 36 CFR Part 800.13 "Post Review Discoveries" and in the case of the discovery of human remains, treatment shall follow the "Human Remains Discovery Protocol" of the New York State Office of Parks, Recreation and Historic Preservation.

F. SUNSET CLAUSE

This PA will continue in full force and effect until the construction of the Project is complete and all terms of this PA are met, unless the Project is terminated or authorization is rescinded.

Execution of this PA by the District and the NYSHPO and implementation of its terms evidences that the District has taken into account the effects of the Project on historic properties and afforded the ACHP an opportunity to comment.

NEW YORK STATE HISTORIC PRESERVATION OFFICE

By: ______________________________ Date: _________________

Ruth Pierpont, Deputy Commissioner and Deputy State Historic Preservation Officer

U.S. ARMY CORPS OF ENGINEERS

By: ______________________________ Date: _________________

Paul E. Owen
Colonel, U.S. Army
Commander

APPENDIX A – HSRR Selected Alternative

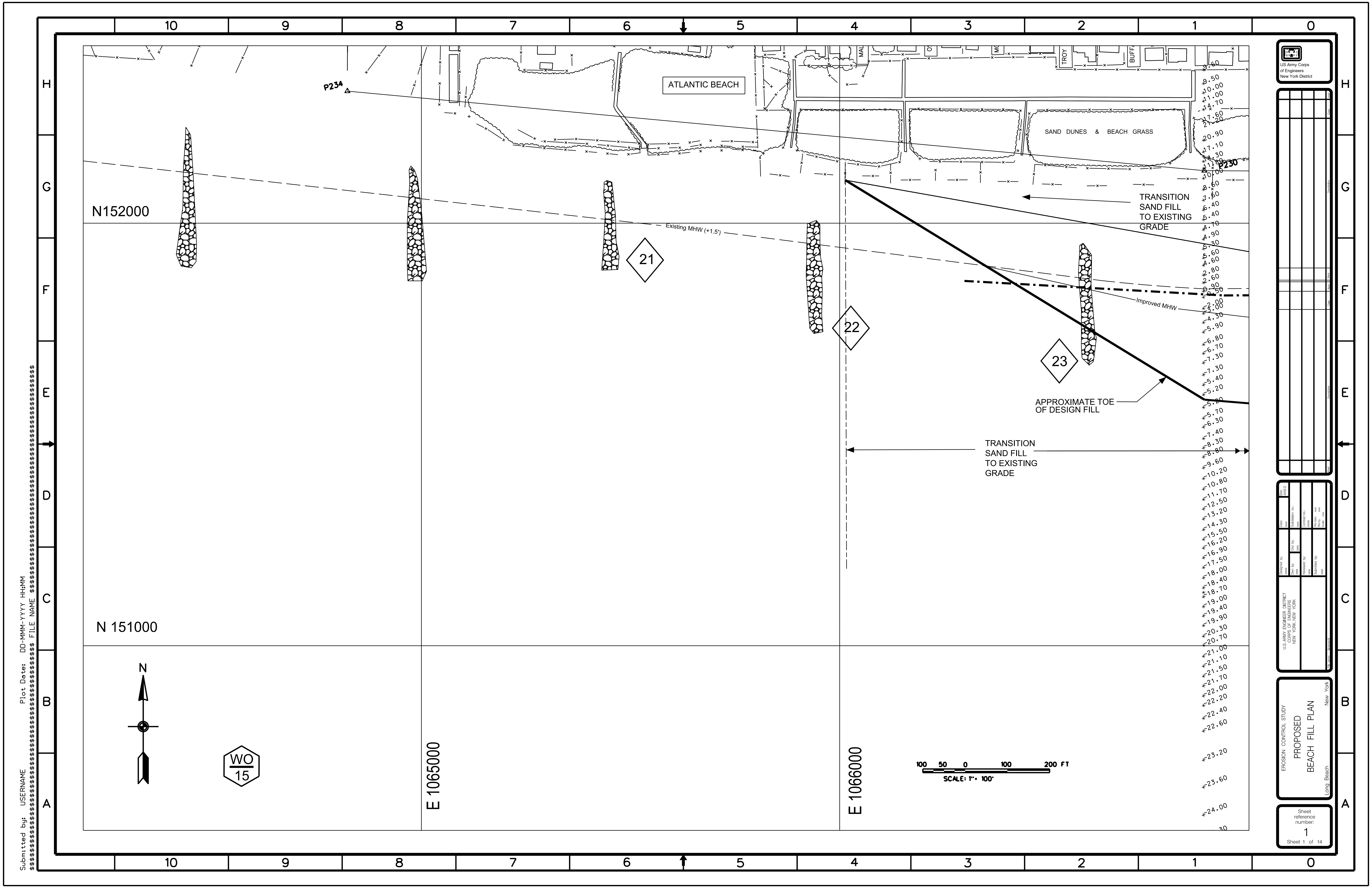

ATLANTIC BEACH
SAND DUNES & BEACH GRASS
P234
P230
N152000
N 151000
E 1065000
E 1066000
Existing MHW (+1.5')
Improved MHW
21
22
23
TRANSITION SAND FILL TO EXISTING GRADE
APPROXIMATE TOE OF DESIGN FILL
TRANSITION SAND FILL TO EXISTING GRADE
N
WO
15
100 50 0 100 200 FT
SCALE: 1"= 100'
Submitted by: USERNAME
Plot Date: DD-MMM-YYYY HH:MM
FILE NAME
US Army Corps of Engineers New York District
U.S. ARMY ENGINEER DISTRICT CORPS OF ENGINEERS NEW YORK, NEW YORK
EROSION CONTROL STUDY
PROPOSED
BEACH FILL PLAN
Long Beach New York
Sheet reference number:
1
Sheet 1 of 14

FIGURE 8-1

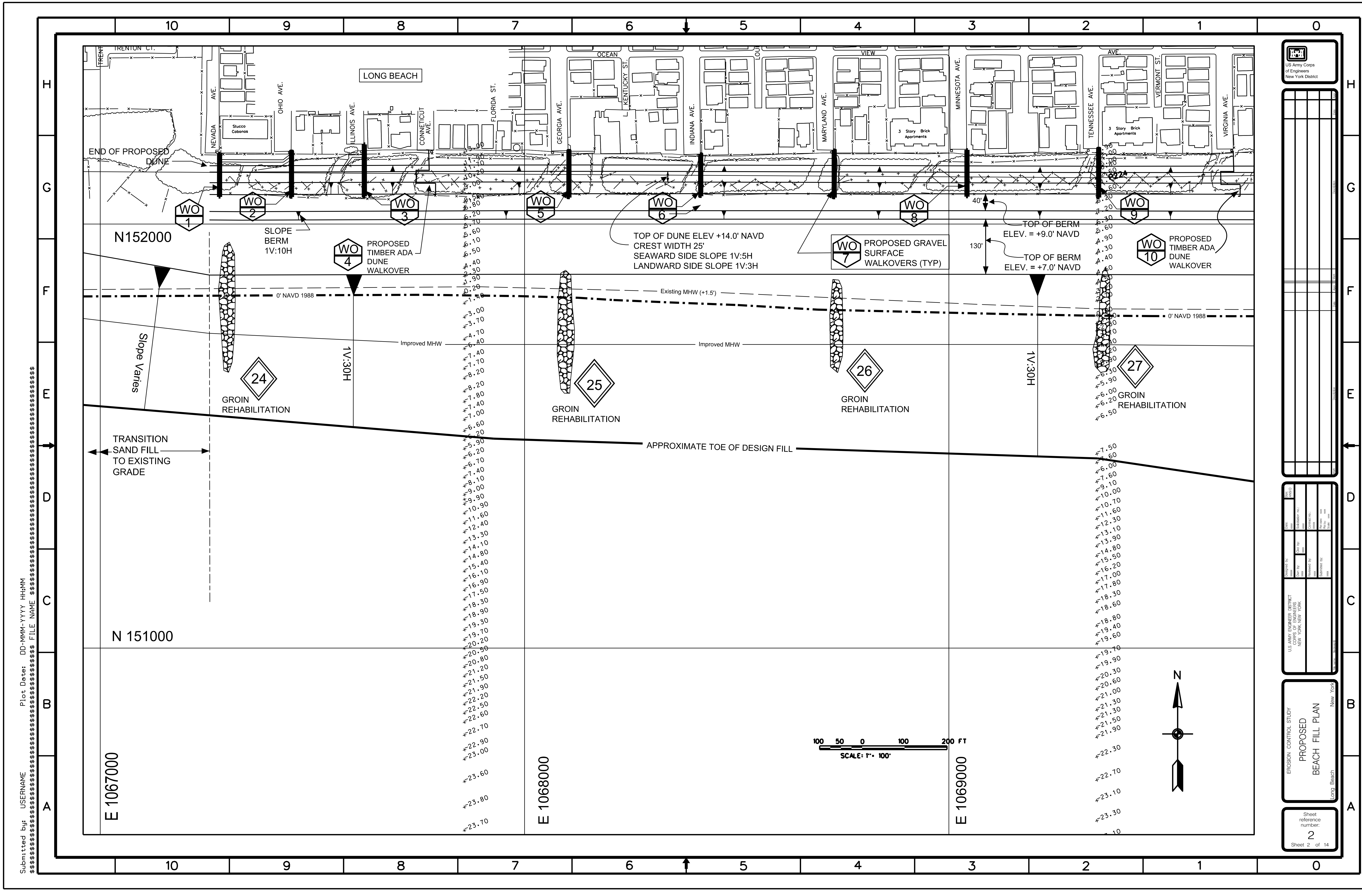
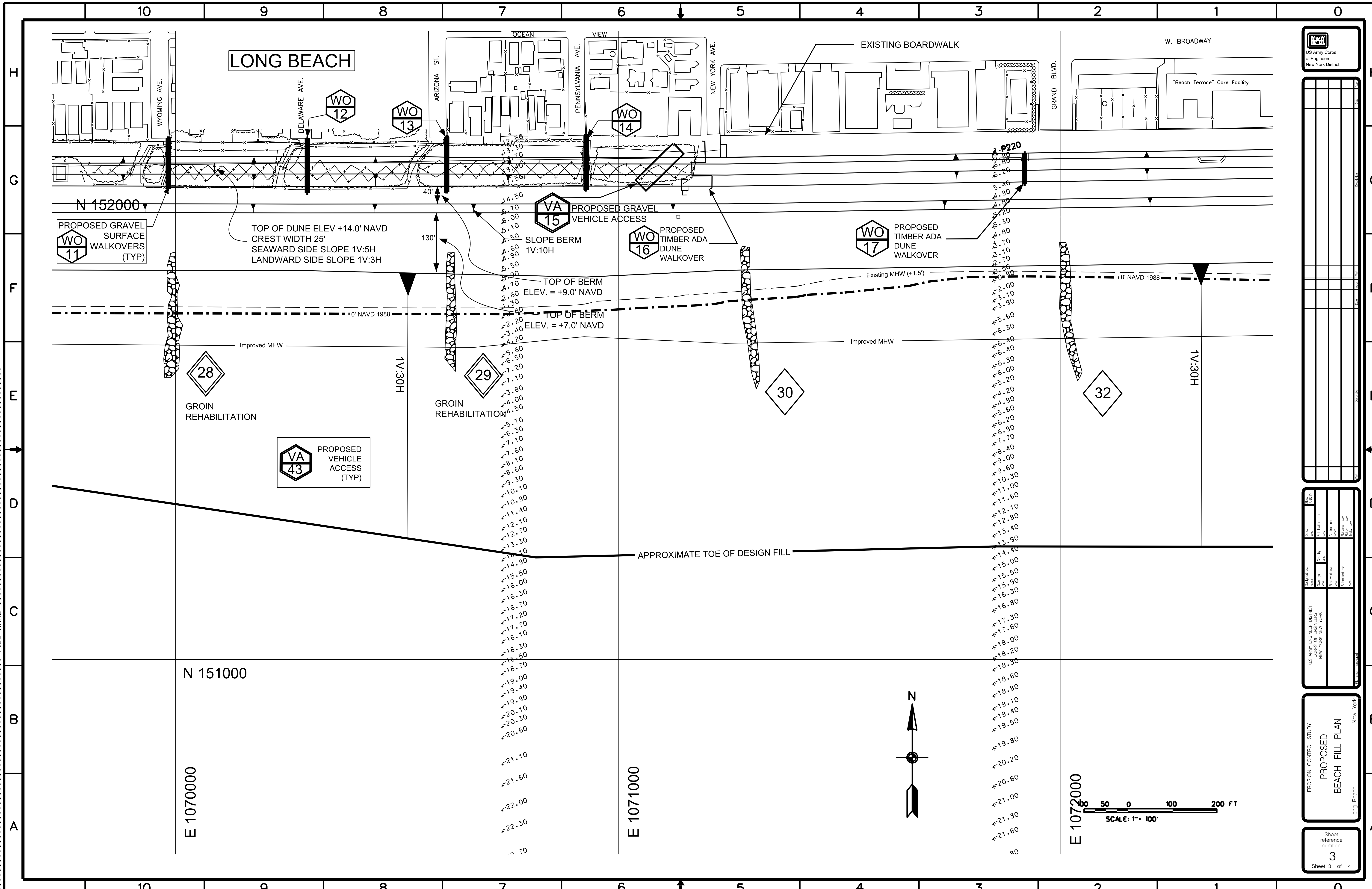
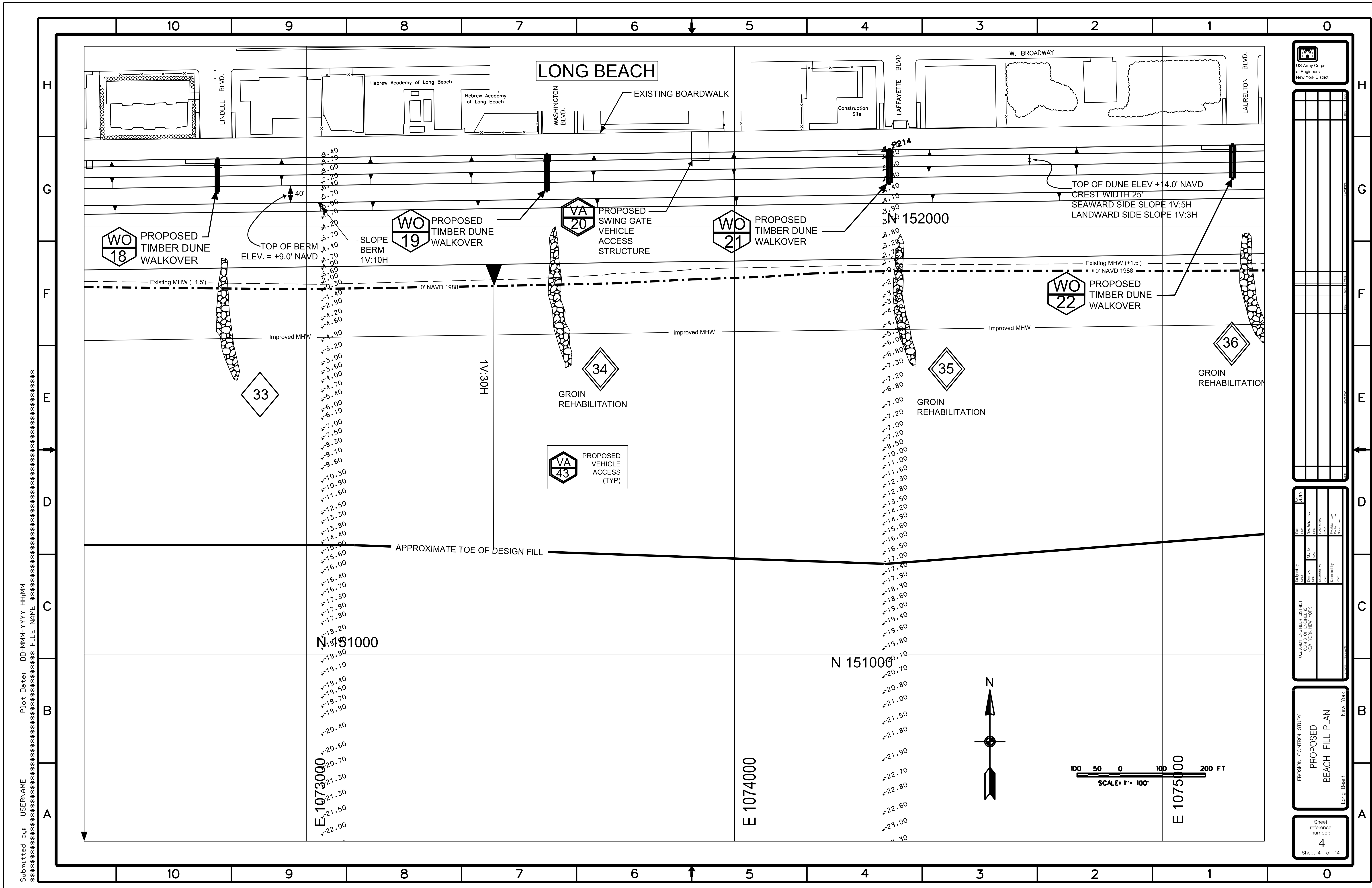

LONG BEACH
TRENTON CT.
OCEAN
VIEW
AVE.
NEVADA AVE.
OHIO AVE.
ILLINOIS AVE.
CONNECTICUT AVE.
FLORIDA ST.
GEORGIA AVE.
KENTUCKY ST.
INDIANA AVE.
MARYLAND AVE.
MINNESOTA AVE.
TENNESSEE AVE.
VERMONT ST.
VIRGINIA AVE.
Stucco Cabanas
3 Story Brick Apartments
END OF PROPOSED DUNE
WO 1
WO 2
WO 3
WO 4
WO 5
WO 6
WO 7
WO 8
WO 9
WO 10
SLOPE BERM 1V:10H
PROPOSED TIMBER ADA DUNE WALKOVER
TOP OF DUNE ELEV +14.0' NAVD
CREST WIDTH 25'
SEAWARD SIDE SLOPE 1V:5H
LANDWARD SIDE SLOPE 1V:3H
PROPOSED GRAVEL SURFACE WALKOVERS (TYP)
40'
130'
TOP OF BERM ELEV. = +9.0' NAVD
TOP OF BERM ELEV. = +7.0' NAVD
PROPOSED TIMBER ADA DUNE WALKOVER
N152000
N 151000
0' NAVD 1988
Existing MHW (+1.5')
Improved MHW
Slope Varies
1V:30H
24
25
26
27
GROIN REHABILITATION
APPROXIMATE TOE OF DESIGN FILL
TRANSITION SAND FILL TO EXISTING GRADE
E 1067000
E 1068000
E 1069000
N
100 50 0 100 200 FT
SCALE: 1" = 100'
US Army Corps of Engineers New York District
U.S. ARMY ENGINEER DISTRICT CORPS OF ENGINEERS NEW YORK, NEW YORK
EROSION CONTROL STUDY
PROPOSED BEACH FILL PLAN
Long Beach New York
Sheet reference number: 2
Sheet 2 of 14
Submitted by: USERNAME
Plot Date: DD-MMM-YYYY HH:MM
FILE NAME

FIGURE 8-2



Submitted by: USERNAME Plot Date: DD-MMM-YYYY HH:MM FILE NAME

FIGURE 8-3



LONG BEACH
EXISTING BOARDWALK
W. BROADWAY
LINDELL BLVD.
Hebrew Academy of Long Beach
WASHINGTON BLVD.
Construction Site
LAFFAYETTE BLVD.
LAURELTON BLVD.
PROPOSED TIMBER DUNE WALKOVER
TOP OF BERM ELEV. = +9.0' NAVD
SLOPE BERM 1V:10H
PROPOSED SWING GATE VEHICLE ACCESS STRUCTURE
TOP OF DUNE ELEV +14.0' NAVD
CREST WIDTH 25'
SEAWARD SIDE SLOPE 1V:5H
LANDWARD SIDE SLOPE 1V:3H
N 152000
Existing MHW (+1.5')
0' NAVD 1988
Improved MHW
GROIN REHABILITATION
1V:30H
PROPOSED VEHICLE ACCESS (TYP)
APPROXIMATE TOE OF DESIGN FILL
N 151000
E 1073000
E 1074000
E 1075000
SCALE: 1" = 100'
US Army Corps of Engineers New York District
US ARMY ENGINEER DISTRICT CORPS OF ENGINEERS NEW YORK, NEW YORK
EROSION CONTROL STUDY
PROPOSED BEACH FILL PLAN
Long Beach New York
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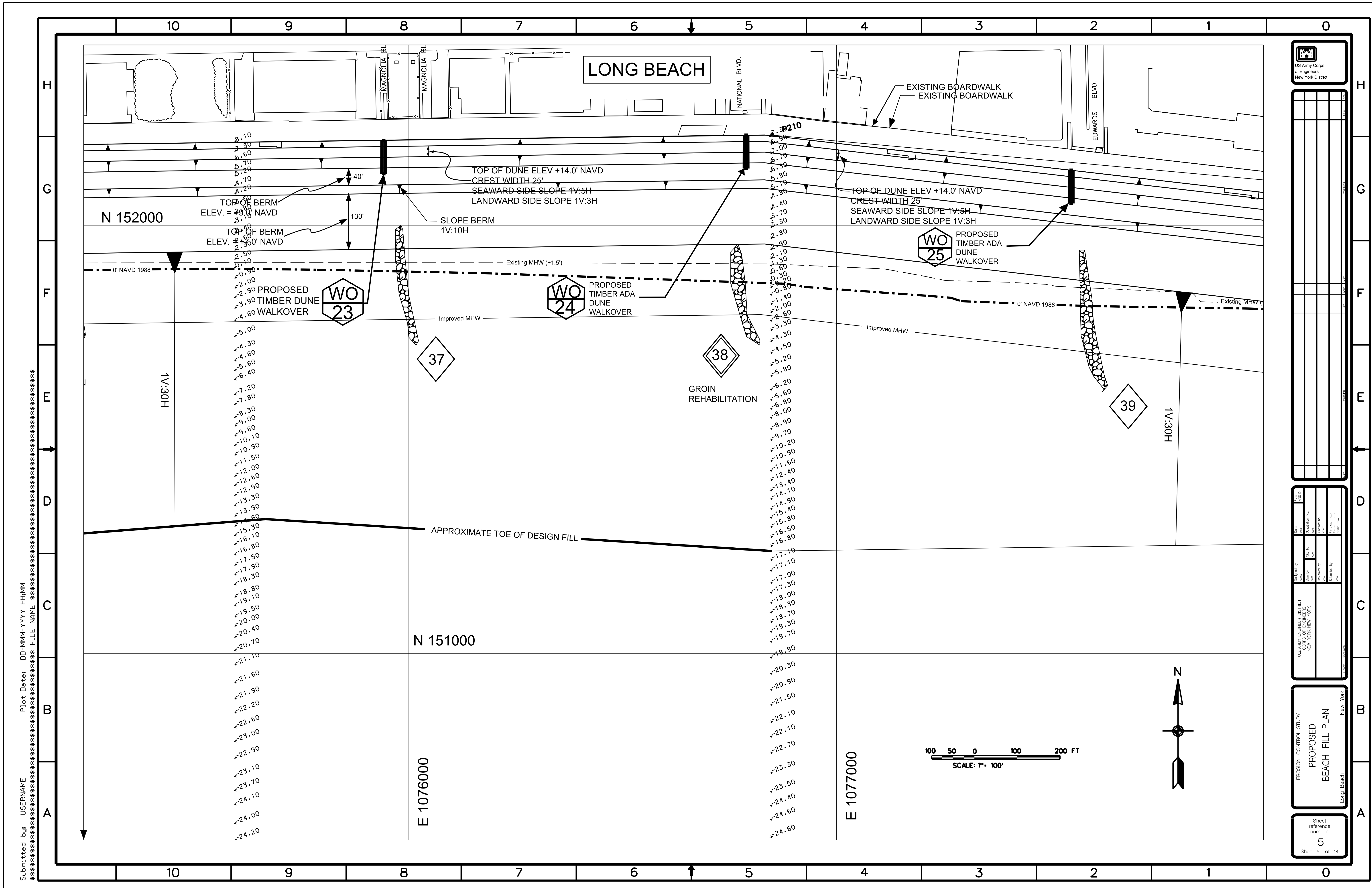
FIGURE 8-4



LONG BEACH
MAGNOLIA BLVD.
NATIONAL BLVD.
EDWARDS BLVD.
EXISTING BOARDWALK
TOP OF DUNE ELEV +14.0' NAVD
CREST WIDTH 25'
SEAWARD SIDE SLOPE 1V:5H
LANDWARD SIDE SLOPE 1V:3H
TOP OF BERM
TOP OF BERM
40'
130'
SLOPE BERM 1V:10H
N 152000
Existing MHW (+1.5')
0' NAVD 1988
PROPOSED TIMBER DUNE WALKOVER
WO 23
PROPOSED TIMBER ADA DUNE WALKOVER
WO 24
PROPOSED TIMBER ADA DUNE WALKOVER
WO 25
Improved MHW
37
38
GROIN REHABILITATION
39
1V:30H
APPROXIMATE TOE OF DESIGN FILL
N 151000
E 1076000
E 1077000
N
100 50 0 100 200 FT
SCALE: 1"= 100'
US Army Corps of Engineers New York District
US ARMY ENGINEER DISTRICT CORPS OF ENGINEERS NEW YORK, NEW YORK
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PROPOSED BEACH FILL PLAN
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FIGURE 8-5

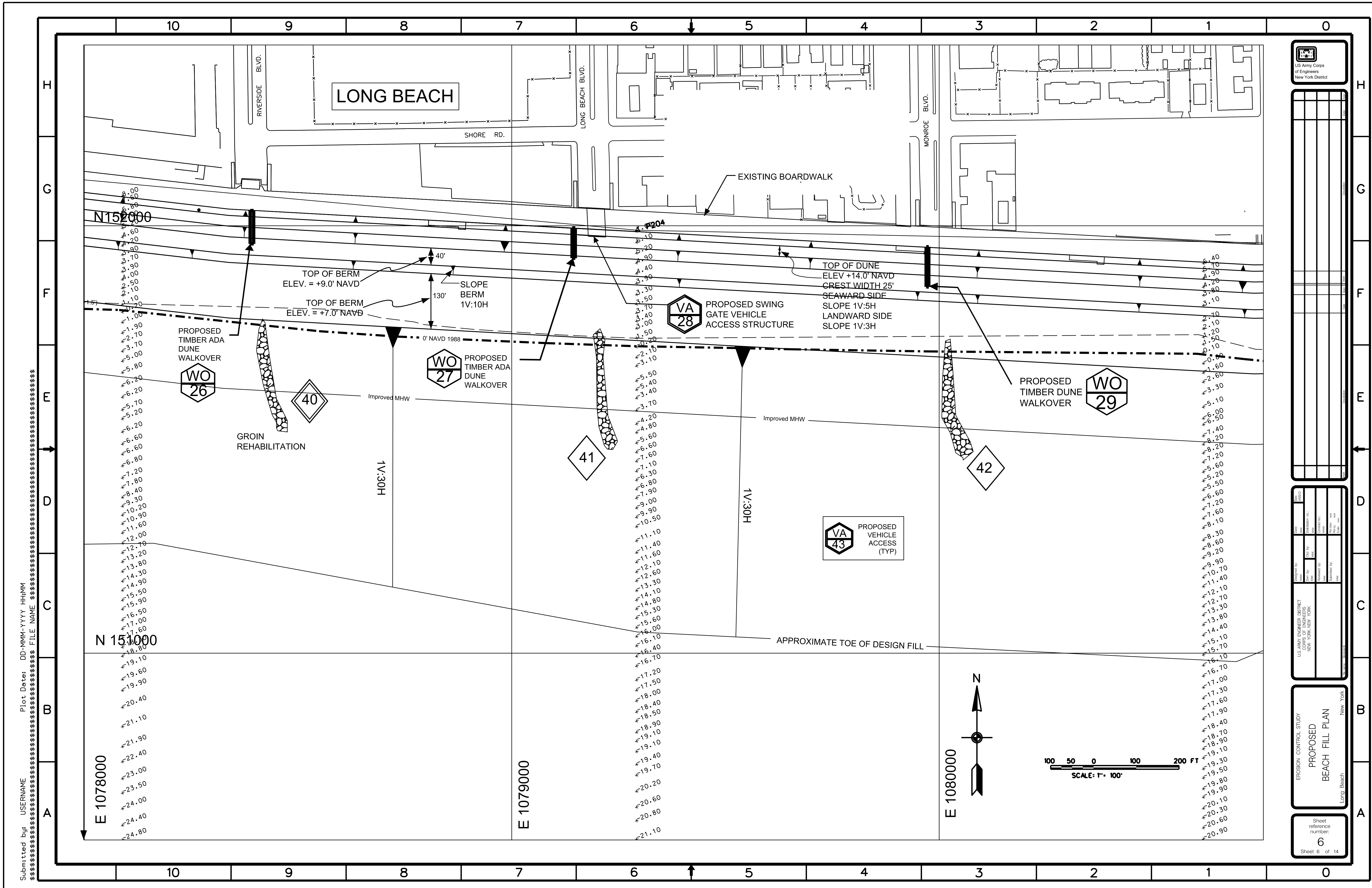
LONG BEACH
RIVERSIDE BLVD.
LONG BEACH BLVD.
MONROE BLVD.
SHORE RD.
EXISTING BOARDWALK
N152000
N 151000
E 1078000
E 1079000
E 1080000
TOP OF BERM
ELEV. = +9.0' NAVD
40'
130'
SLOPE
BERM
1V:10H
TOP OF BERM
ELEV. = +7.0' NAVD
0' NAVD 1988
PROPOSED
TIMBER ADA
DUNE
WALKOVER
WO 26
40
GROIN
REHABILITATION
Improved MHW
1V:30H
PROPOSED
TIMBER ADA
DUNE
WALKOVER
WO 27
41
VA 28
PROPOSED SWING
GATE VEHICLE
ACCESS STRUCTURE
TOP OF DUNE
ELEV +14.0' NAVD
CREST WIDTH 25'
SEAWARD SIDE
SLOPE 1V:5H
LANDWARD SIDE
SLOPE 1V:3H
PROPOSED
TIMBER DUNE
WALKOVER
WO 29
42
VA 43
PROPOSED
VEHICLE
ACCESS
(TYP)
APPROXIMATE TOE OF DESIGN FILL
N
100 50 0 100 200 FT
SCALE: 1" = 100'
US Army Corps
of Engineers
New York District
U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
NEW YORK, NEW YORK
EROSION CONTROL STUDY
PROPOSED
BEACH FILL PLAN
Long Beach
New York
Sheet
reference
number:
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FIGURE 8-6

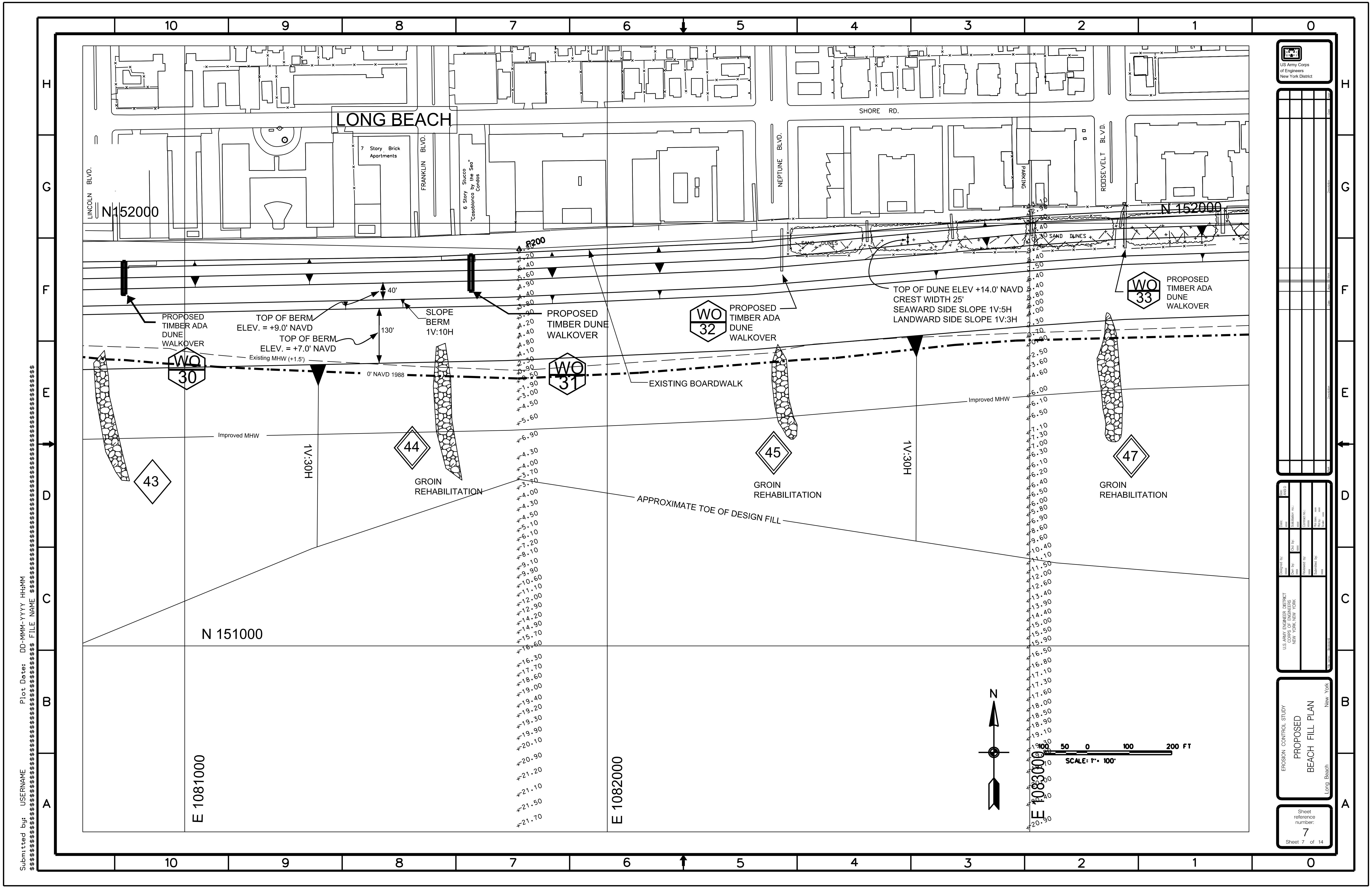
LONG BEACH
SHORE RD.
LINCOLN BLVD.
FRANKLIN BLVD.
NEPTUNE BLVD.
ROOSEVELT BLVD.
PARKING
7 Story Brick Apartments
6 Story Stucco "Casablanca by the Sea" Condos
N152000
N 152000
N 151000
E 1081000
E 1082000
E 1083000
SAND DUNES
PROPOSED TIMBER ADA DUNE WALKOVER
TOP OF BERM ELEV. = +9.0' NAVD
TOP OF BERM ELEV. = +7.0' NAVD
40'
130'
SLOPE BERM 1V:10H
PROPOSED TIMBER DUNE WALKOVER
Existing MHW (+1.5')
0' NAVD 1988
WO 30
WO 31
WO 32
WO 33
EXISTING BOARDWALK
TOP OF DUNE ELEV +14.0' NAVD
CREST WIDTH 25'
SEAWARD SIDE SLOPE 1V:5H
LANDWARD SIDE SLOPE 1V:3H
Improved MHW
1V:30H
43
44
45
47
GROIN REHABILITATION
APPROXIMATE TOE OF DESIGN FILL
N
SCALE: 1"= 100'
50 0 100 200 FT
US Army Corps of Engineers New York District
US ARMY ENGINEER DISTRICT CORPS OF ENGINEERS NEW YORK, NEW YORK
EROSION CONTROL STUDY
PROPOSED BEACH FILL PLAN
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FIGURE 8-7

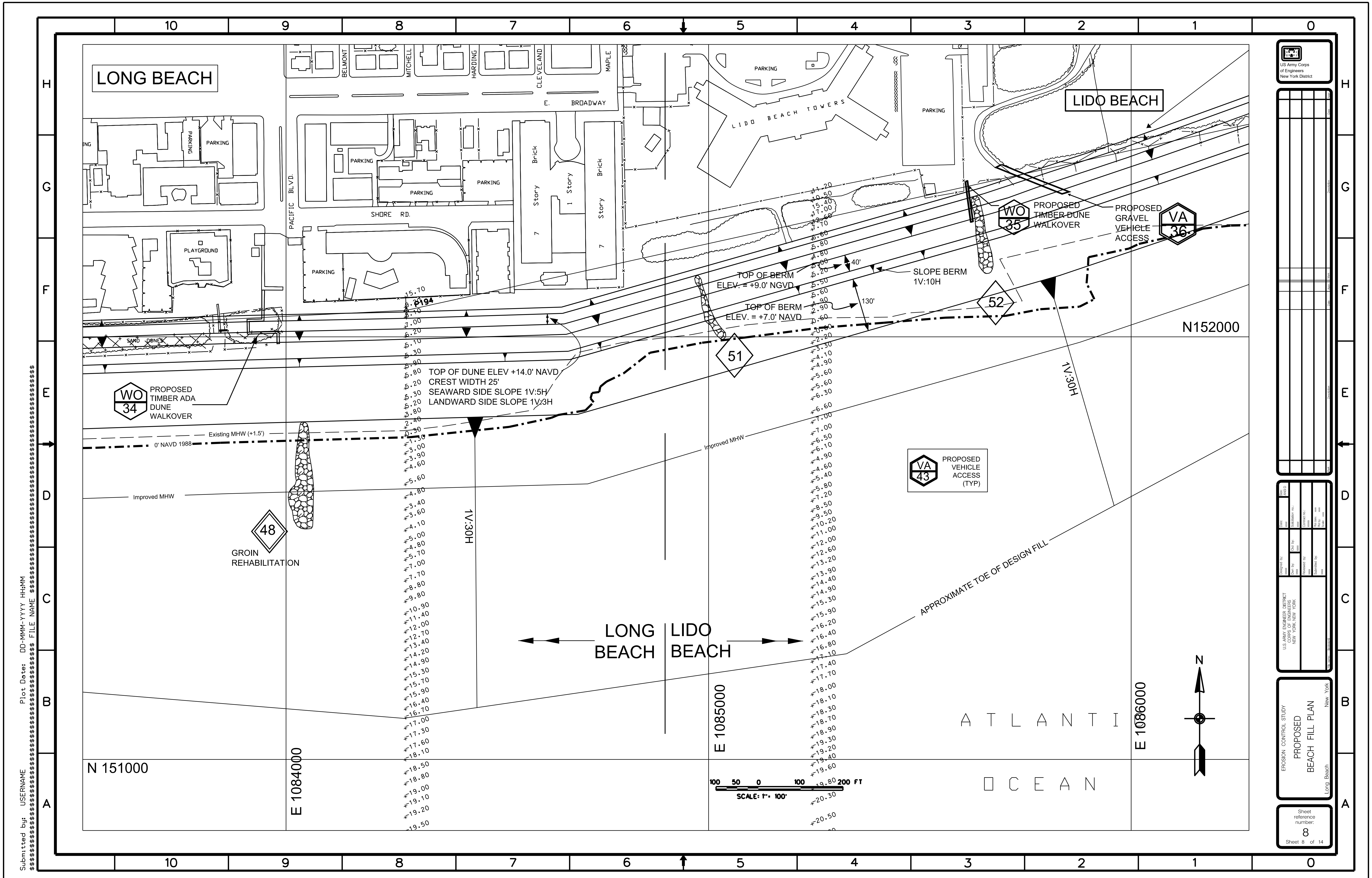
LONG BEACH
LIDO BEACH
E. BROADWAY
BELMONT
MITCHELL
HARDING
CLEVELAND
MAPLE
PACIFIC BLVD.
SHORE RD.
PARKING
PLAYGROUND
LIDO BEACH TOWERS
7 Story Brick
1 Story
SAND DUNES
P194
TOP OF DUNE ELEV +14.0' NAVD
CREST WIDTH 25'
SEAWARD SIDE SLOPE 1V:5H
LANDWARD SIDE SLOPE 1V:3H
TOP OF BERM
ELEV. = +9.0' NGVD
TOP OF BERM
ELEV. = +7.0' NAVD
40'
130'
SLOPE BERM
1V:10H
WO 34
PROPOSED
TIMBER ADA
DUNE
WALKOVER
WO 35
PROPOSED
TIMBER DUNE
WALKOVER
PROPOSED
GRAVEL
VEHICLE
ACCESS
VA 36
VA 43
PROPOSED
VEHICLE
ACCESS
(TYP)
48
GROIN
REHABILITATION
51
52
Existing MHW (+1.5')
0' NAVD 1988
Improved MHW
1V:30H
APPROXIMATE TOE OF DESIGN FILL
LONG
BEACH
LIDO
BEACH
N152000
N 151000
E 1084000
E 1085000
E 1086000
ATLANTIC
OCEAN
N
100 50 0 100 200 FT
SCALE: 1"= 100'
US Army Corps
of Engineers
New York District
U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
NEW YORK, NEW YORK
EROSION CONTROL STUDY
PROPOSED
BEACH FILL PLAN
Long Beach
New York
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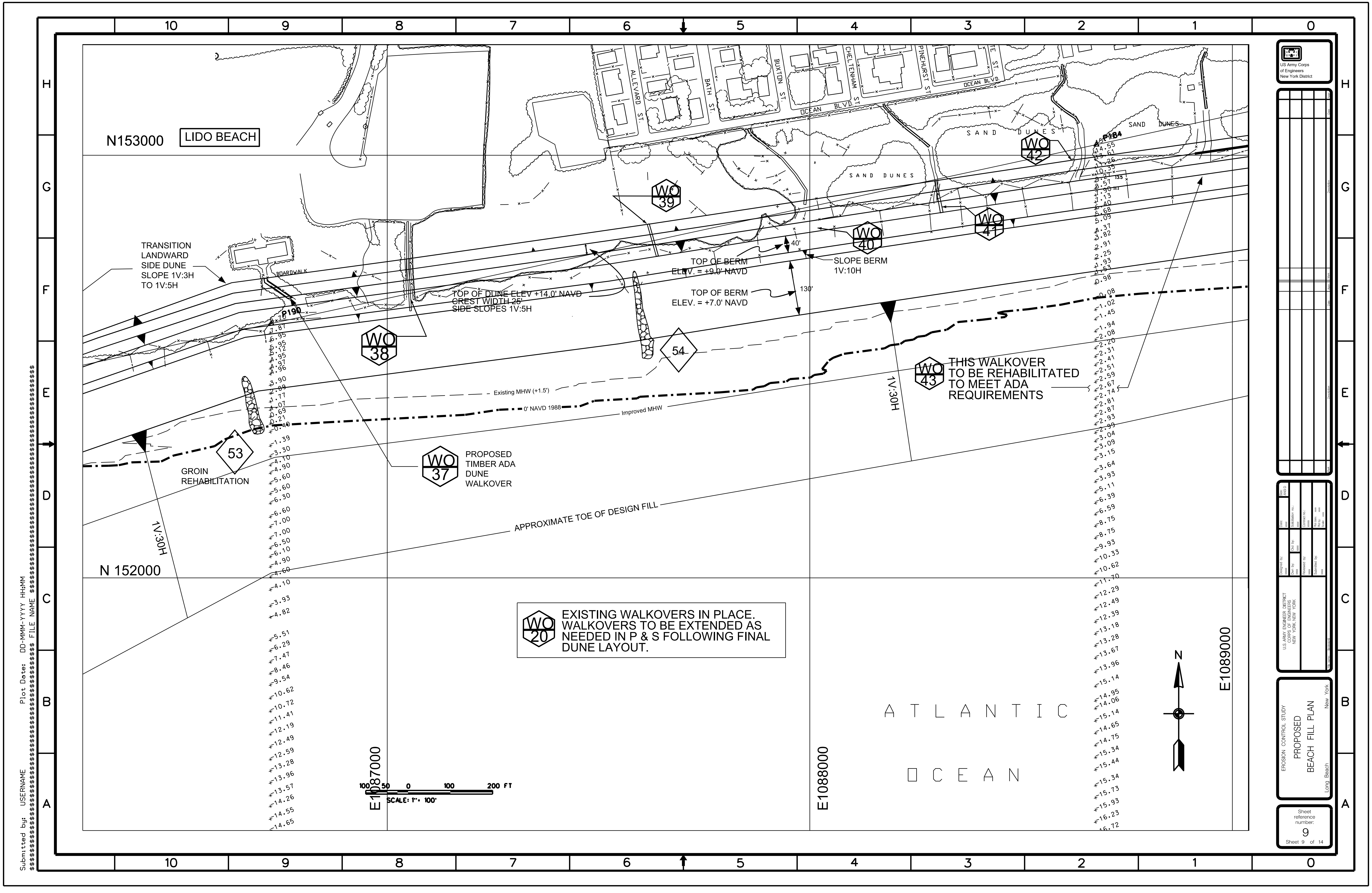
FIGURE 8-8



LIDO BEACH
N153000
N 152000
E1087000
E1088000
E1089000
ALLEVARD ST.
BATH ST.
BUXTON ST.
CHELTENHAM
PINEHURST ST.
OCEAN BLVD.
SAND DUNES
BOARDWALK
P190
P184
TRANSITION LANDWARD SIDE DUNE SLOPE 1V:3H TO 1V:5H
TOP OF DUNE ELEV +14.0' NAVD
CREST WIDTH 25'
SIDE SLOPES 1V:5H
TOP OF BERM ELEV. = +9.0' NAVD
TOP OF BERM ELEV. = +7.0' NAVD
SLOPE BERM 1V:10H
40'
130'
Existing MHW (+1.5')
0' NAVD 1988
Improved MHW
APPROXIMATE TOE OF DESIGN FILL
1V:30H
GROIN REHABILITATION
53
54
WO 37
WO 38
WO 39
WO 40
WO 41
WO 42
WO 43
PROPOSED TIMBER ADA DUNE WALKOVER
THIS WALKOVER TO BE REHABILITATED TO MEET ADA REQUIREMENTS
WO 20
EXISTING WALKOVERS IN PLACE. WALKOVERS TO BE EXTENDED AS NEEDED IN P & S FOLLOWING FINAL DUNE LAYOUT.
ATLANTIC OCEAN
N
100 50 0 100 200 FT
SCALE: 1"= 100'
US Army Corps of Engineers New York District
U.S. ARMY ENGINEER DISTRICT CORPS OF ENGINEERS NEW YORK, NEW YORK
EROSION CONTROL STUDY
PROPOSED BEACH FILL PLAN
Long Beach New York
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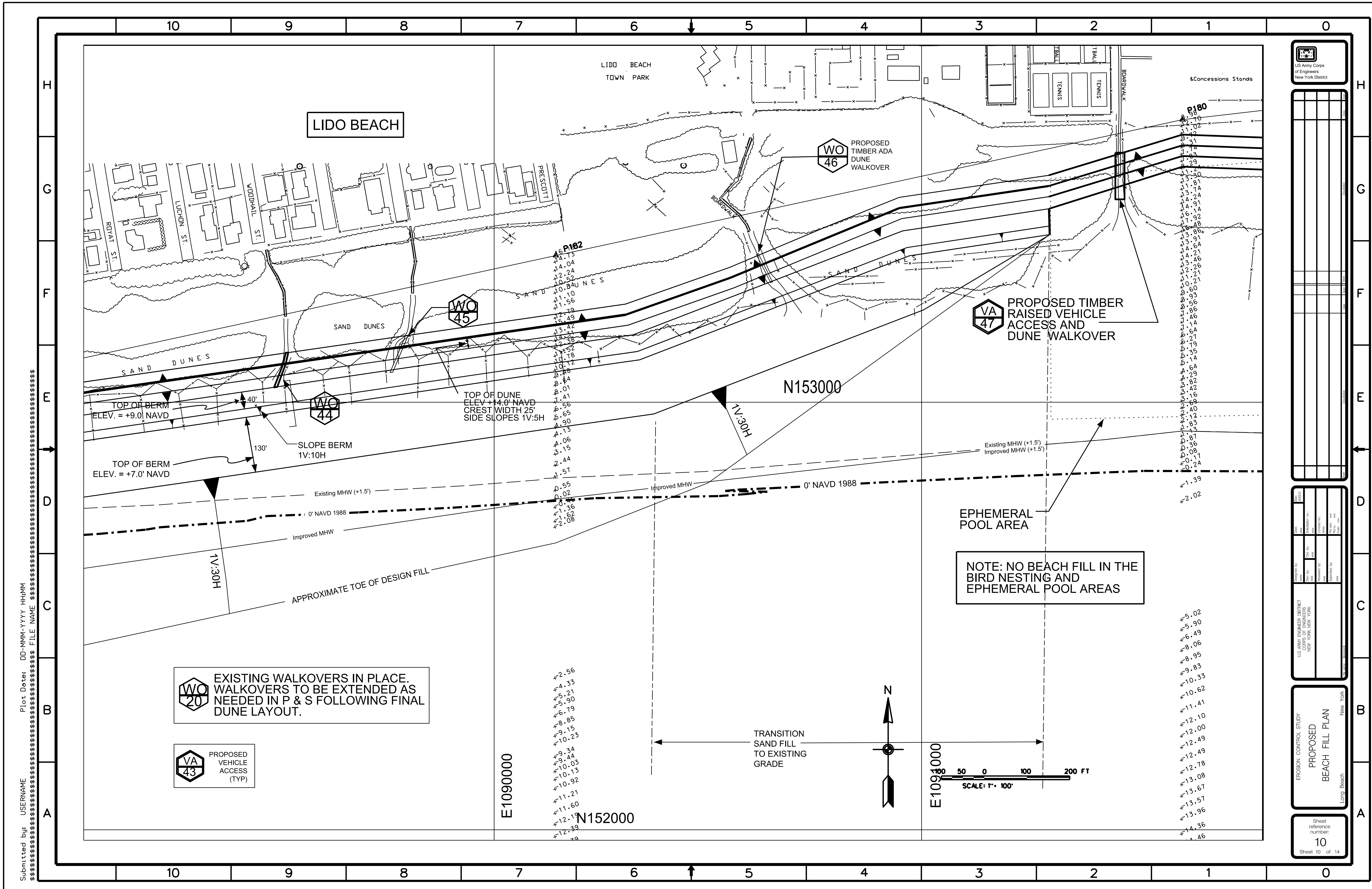
FIGURE 8-9


LIDO BEACH
LIDO BEACH TOWN PARK
&Concessions Stands
TENNIS
BOARDWALK
ROYAT ST.
LUCHON ST.
WOODHAIL ST.
PRESCOTT
SAND DUNES
PROPOSED TIMBER ADA DUNE WALKOVER
WO 46
WO 45
WO 44
VA 47
PROPOSED TIMBER RAISED VEHICLE ACCESS AND DUNE WALKOVER
TOP OF BERM ELEV. = +9.0' NAVD
40'
TOP OF DUNE ELEV +14.0' NAVD CREST WIDTH 25' SIDE SLOPES 1V:5H
SLOPE BERM 1V:10H
130'
TOP OF BERM ELEV. = +7.0' NAVD
N153000
1V:30H
Existing MHW (+1.5')
Improved MHW (+1.5')
Improved MHW
0' NAVD 1988
APPROXIMATE TOE OF DESIGN FILL
EPHEMERAL POOL AREA
NOTE: NO BEACH FILL IN THE BIRD NESTING AND EPHEMERAL POOL AREAS
EXISTING WALKOVERS IN PLACE. WALKOVERS TO BE EXTENDED AS NEEDED IN P & S FOLLOWING FINAL DUNE LAYOUT.
WO 20
VA 43
PROPOSED VEHICLE ACCESS (TYP)
TRANSITION SAND FILL TO EXISTING GRADE
N
E1090000
E1091000
N152000
P182
P180
100 50 0 100 200 FT
SCALE: 1" = 100'
US Army Corps of Engineers New York District
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PROPOSED BEACH FILL PLAN
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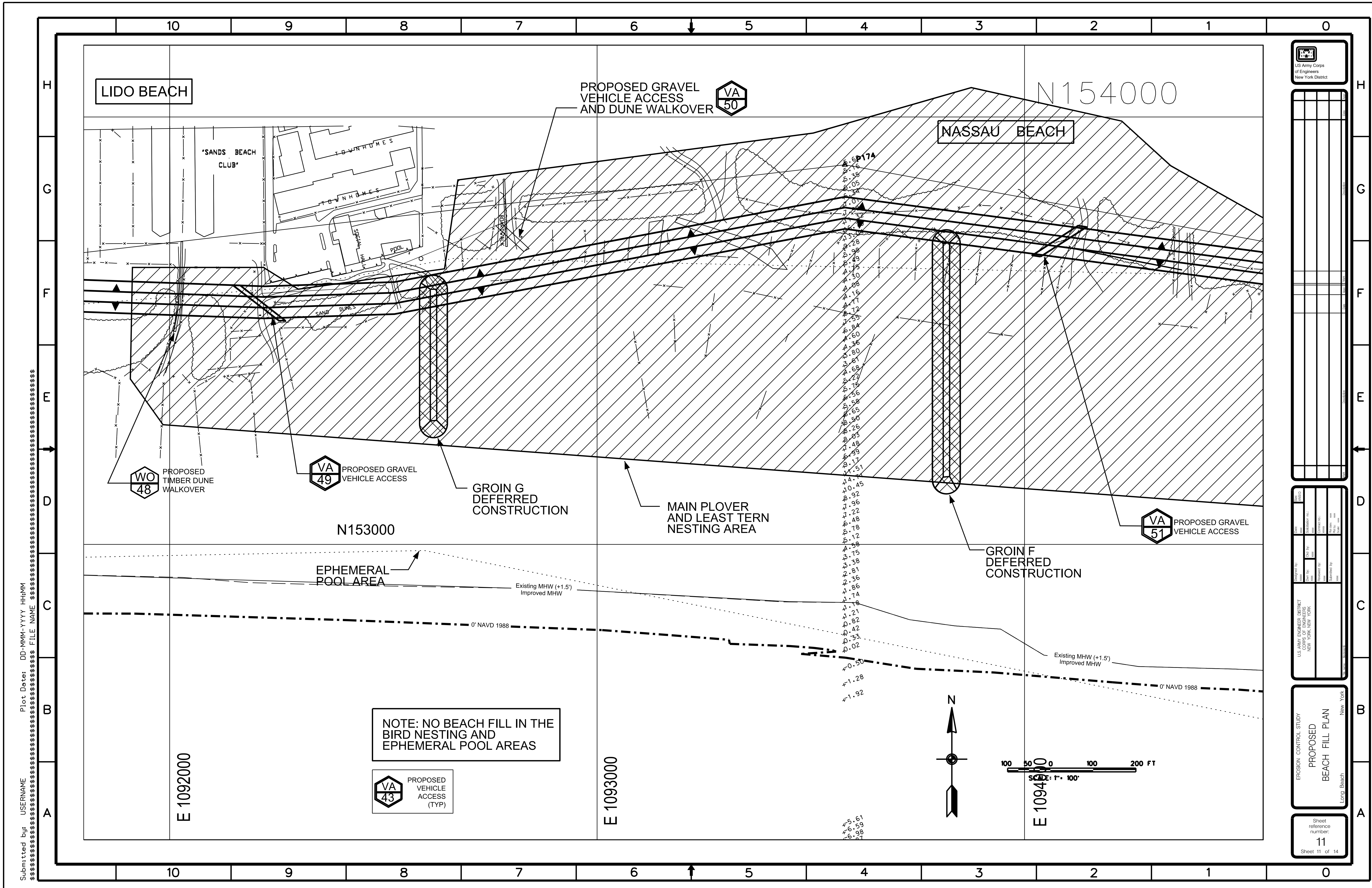
FIGURE 8-10



LIDO BEACH
"SANDS BEACH CLUB"
TOWNHOMES
POOL
SOCIAL HALL
SAND DUNES
PROPOSED GRAVEL VEHICLE ACCESS AND DUNE WALKOVER
VA 50
N154000
NASSAU BEACH
P174
WO 48
PROPOSED TIMBER DUNE WALKOVER
VA 49
PROPOSED GRAVEL VEHICLE ACCESS
GROIN G DEFERRED CONSTRUCTION
MAIN PLOVER AND LEAST TERN NESTING AREA
VA 51
PROPOSED GRAVEL VEHICLE ACCESS
GROIN F DEFERRED CONSTRUCTION
N153000
EPHEMERAL POOL AREA
Existing MHW (+1.5')
Improved MHW
0' NAVD 1988
NOTE: NO BEACH FILL IN THE BIRD NESTING AND EPHEMERAL POOL AREAS
VA 43
PROPOSED VEHICLE ACCESS (TYP)
E 1092000
E 1093000
E 1094000
N
100 50 0 100 200 FT
SCALE: 1" = 100'
US Army Corps of Engineers New York District
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PROPOSED BEACH FILL PLAN
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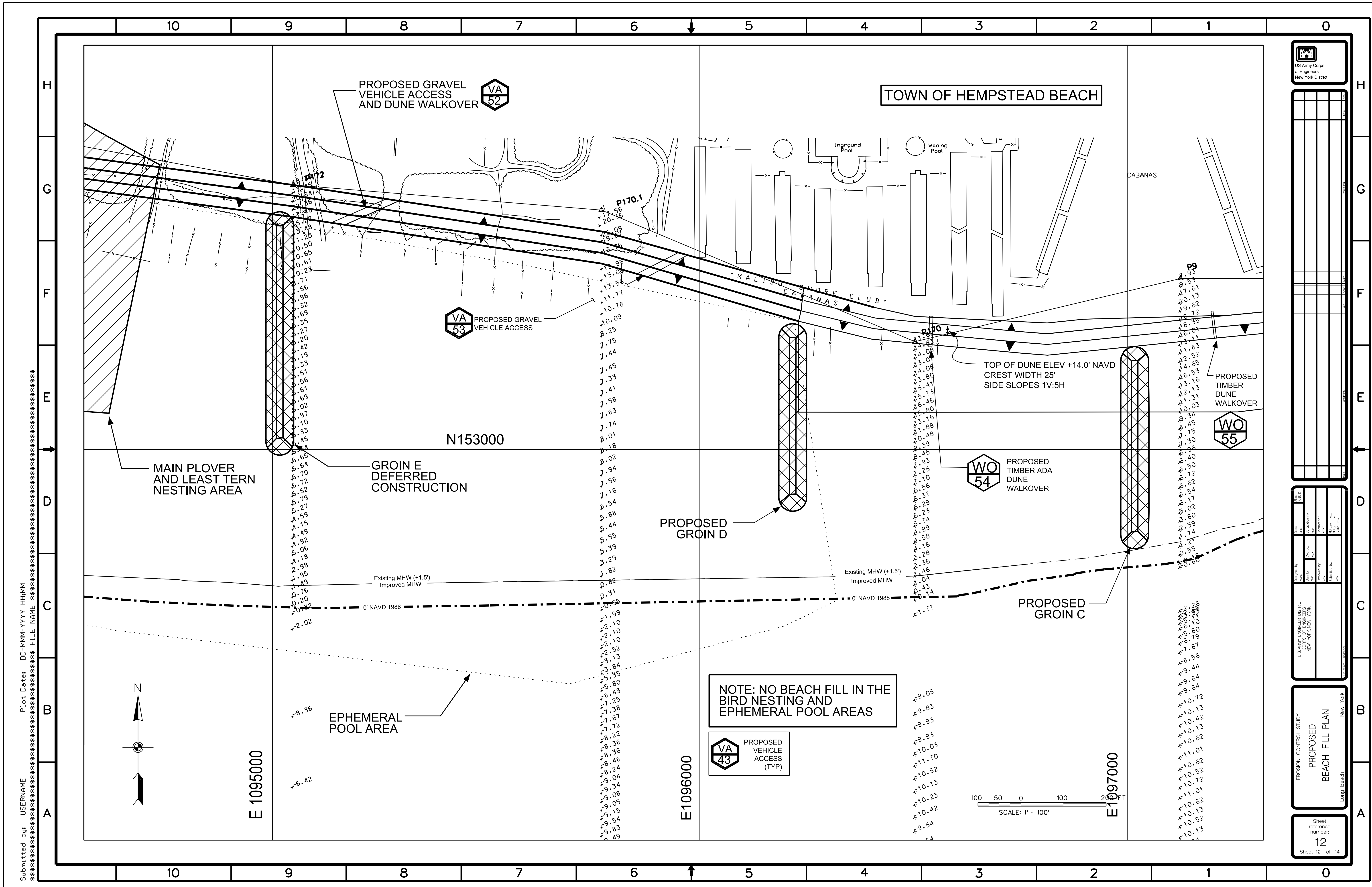
FIGURE 8-11



TOWN OF HEMPSTEAD BEACH
PROPOSED GRAVEL VEHICLE ACCESS AND DUNE WALKOVER
VA 52
VA 53
PROPOSED GRAVEL VEHICLE ACCESS
MALIBU SHORE CLUB
CABANAS
Inground Pool
Wading Pool
P172
P170.1
P170
P9
TOP OF DUNE ELEV +14.0' NAVD
CREST WIDTH 25'
SIDE SLOPES 1V:5H
PROPOSED TIMBER DUNE WALKOVER
WO 55
WO 54
PROPOSED TIMBER ADA DUNE WALKOVER
N153000
MAIN PLOVER AND LEAST TERN NESTING AREA
GROIN E DEFERRED CONSTRUCTION
PROPOSED GROIN D
PROPOSED GROIN C
Existing MHW (+1.5')
Improved MHW
0' NAVD 1988
EPHEMERAL POOL AREA
NOTE: NO BEACH FILL IN THE BIRD NESTING AND EPHEMERAL POOL AREAS
VA 43
PROPOSED VEHICLE ACCESS (TYP)
E 1095000
E1096000
E1097000
N
SCALE: 1"= 100'
US Army Corps of Engineers New York District
U.S. ARMY ENGINEER DISTRICT CORPS OF ENGINEERS NEW YORK, NEW YORK
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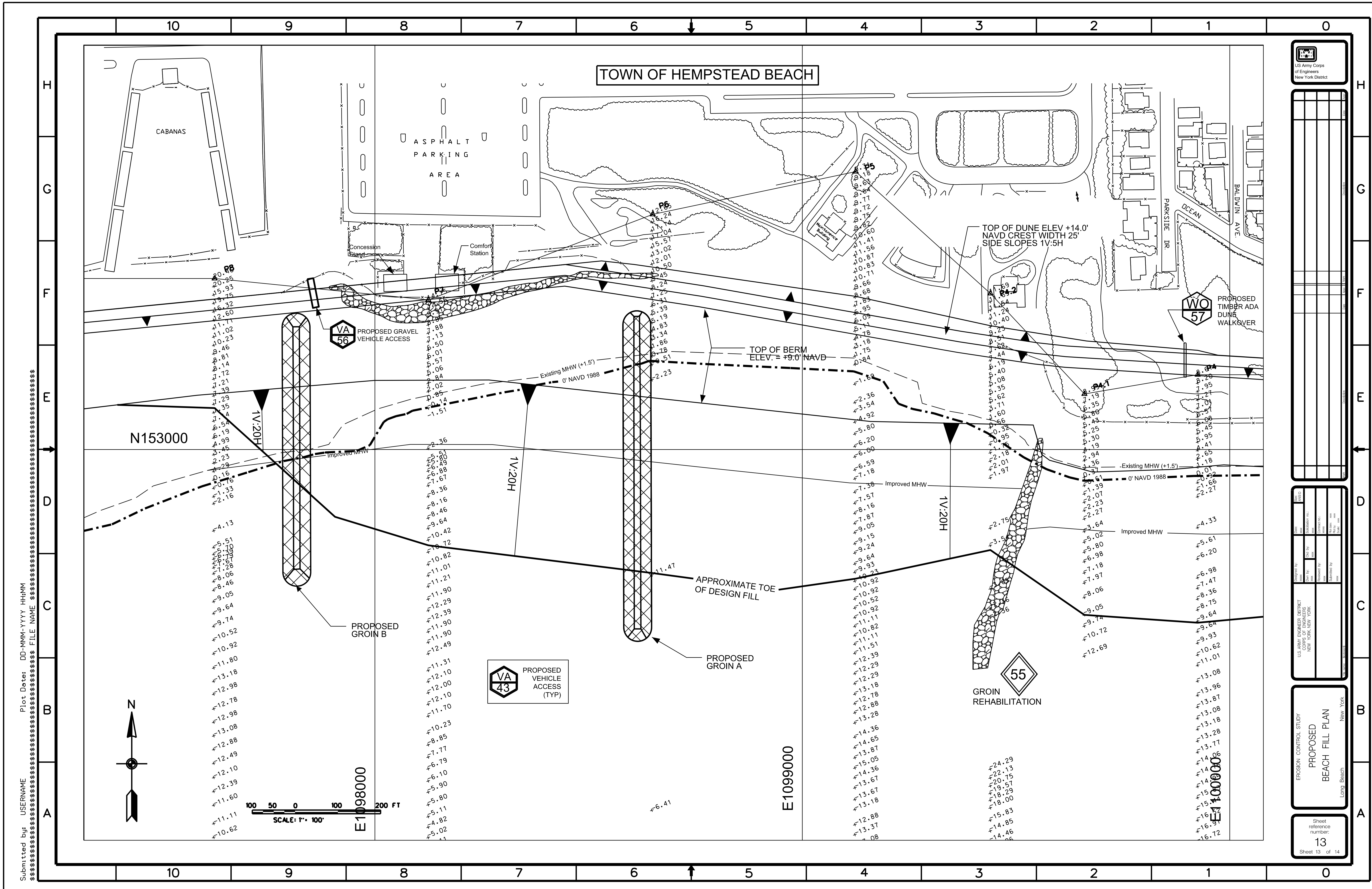
FIGURE 8-12



TOWN OF HEMPSTEAD BEACH
CABANAS
ASPHALT PARKING AREA
Concession Stand
Comfort Station
Maintenance Building
TOP OF DUNE ELEV +14.0' NAVD CREST WIDTH 25' SIDE SLOPES 1V:5H
PARKSIDE DR.
OCEAN
BALDWIN AVE.
PROPOSED TIMBER ADA DUNE WALKOVER
WO 57
PROPOSED GRAVEL VEHICLE ACCESS
VA 56
TOP OF BERM ELEV. = +9.0' NAVD
Existing MHW (+1.5')
0' NAVD 1988
Improved MHW
1V:20H
N153000
APPROXIMATE TOE OF DESIGN FILL
PROPOSED GROIN B
PROPOSED GROIN A
PROPOSED VEHICLE ACCESS (TYP)
VA 43
55
GROIN REHABILITATION
N
SCALE: 1" = 100'
E1098000
E1099000
E1100000
US Army Corps of Engineers New York District
U.S. ARMY ENGINEER DISTRICT CORPS OF ENGINEERS NEW YORK, NEW YORK
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FIGURE 8-13

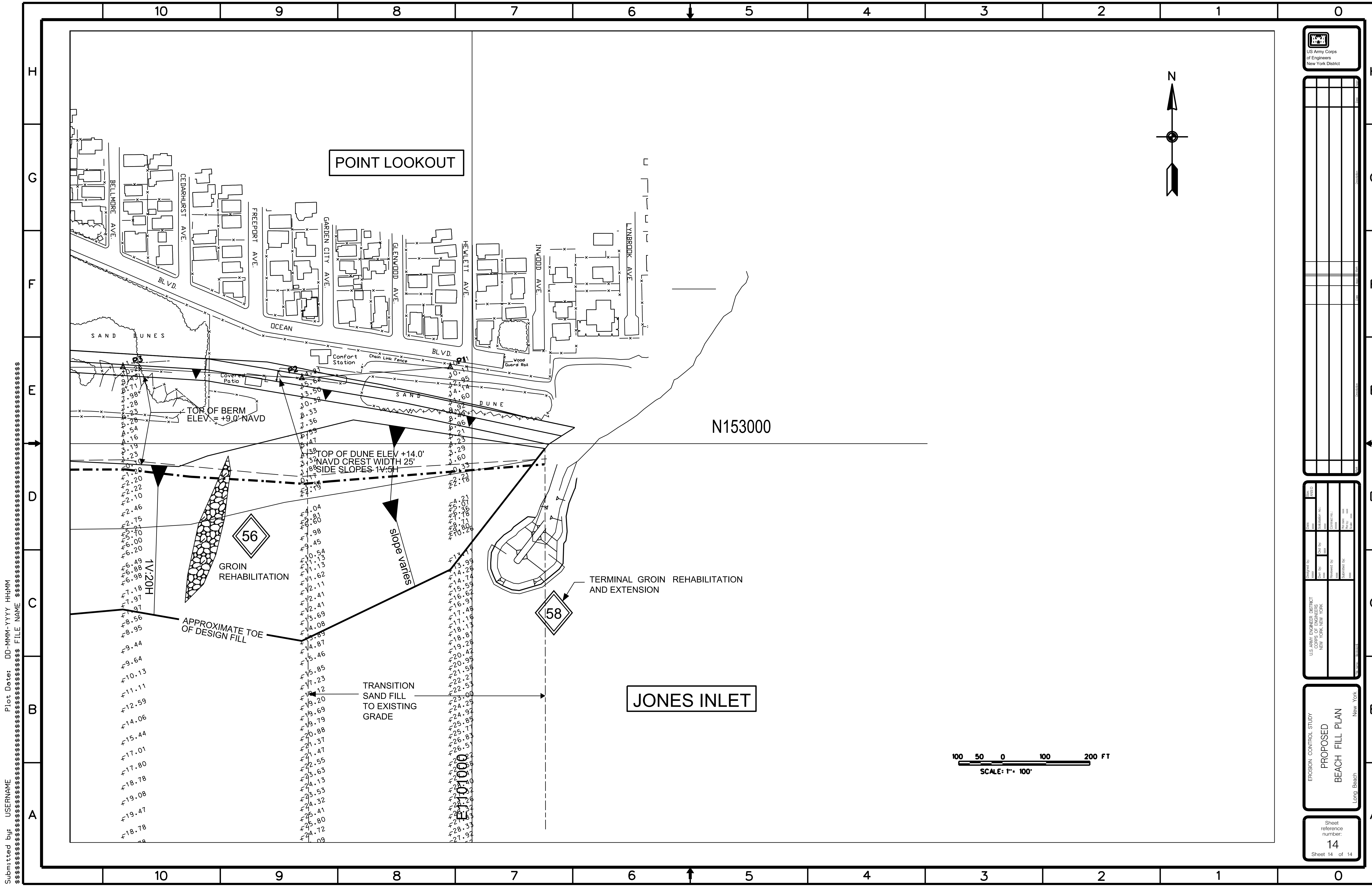
POINT LOOKOUT
BELLMORE AVE.
CEDARHURST AVE.
FREEPORT AVE.
GARDEN CITY AVE.
GLENWOOD AVE.
HEWLETT AVE.
INWOOD AVE.
LYNBROOK AVE.
OCEAN BLVD.
SAND DUNES
SAND DUNE
Comfort Station
Chain Link Fence
Covered Patio
Wood Guard Rail
P1
P2
P3
TOP OF BERM ELEV. = +9.0' NAVD
TOP OF DUNE ELEV +14.0' NAVD CREST WIDTH 25' SIDE SLOPES 1V:5H
N153000
56
GROIN REHABILITATION
slope varies
1V:20H
APPROXIMATE TOE OF DESIGN FILL
TERMINAL GROIN REHABILITATION AND EXTENSION
58
TRANSITION SAND FILL TO EXISTING GRADE
JONES INLET
EJ101000
N
100 50 0 100 200 FT
SCALE: 1"= 100'
US Army Corps of Engineers New York District
U.S. ARMY ENGINEER DISTRICT CORPS OF ENGINEERS NEW YORK, NEW YORK
EROSION CONTROL STUDY
PROPOSED
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FIGURE 8-14

APPENDIX G

NATIONAL MARINE FISHERIES SERVICE (NMFS) CORRESPONDENCE

Introduction

In compliance with Section 305(b)(2) of the Magnuson-Stevens Fishery Conservation and Management Act (1996 amendments), the New York District, U.S Army Corps of Engineers, is providing this assessment of the potential effects of beach renourishment, the rehabilitation of 17 groins and the construction of six new groins (two deferred) as part of the Storm Damage Reduction Project, Project area, NY on Essential Fish Habitat (EFH). The renourishment requires the dredging of an intermediate borrow area offshore of the proposed construction location. The National Marine Fisheries Service (NMFS) has identified EFH within two 10-minute x 10-minute squares (Table 3). The study area contains EFH for various life stages for 27 species of managed fish.

The councils, with assistance from NMFS, are required to delineate "essential fish habitat" for all managed species. EFH is defined as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." The regulations further clarify EFH by defining "waters" to include aquatic areas and their associated physical, chemical, and biological properties that are used by fish (either currently or historically) and their associated physical, chemical, and biological properties; "substrate" to include sediment, hard bottom, and structures underlying the water; and, areas used for spawning, breeding, feeding, and growth to maturity" to cover a species' full life cycle. Prey species are defined as being a forage source for one or more designated fish species, and the presence of adequate prey is one of the biological properties that can make a habitat essential. Federal agencies that fund, permit, or carry out activities that may adversely impact EFH are required to consult with NMFS regarding the potential effects of their actions on EFH. According to NMFS, the contents of an EFH assessment should include:

1) A description of the proposed action;
2) Analysis of the effects (including cumulative) of the proposed action on EFH, the managed fish species, and major prey species;
3) The federal agency's views regarding the effects of the action on EFH; and,
4) Proposed mitigation, if applicable.

This EFH assessment includes:
- a description of the proposed action;
- a description of the existing environment;
- a listing of EFH-designated species and life history stages for the three zones covered in this assessment;
- a summary of the diets and feeding habits of EFH species that are known or suspected to occupy proposed nearshore borrow areas in Long Beach;
- an analysis of the potential direct and indirect impacts of sand mining on EFH in the Borrow area;
- recommendations for minimizing potential impacts;
- a plan for monitoring changes benthic prey populations;

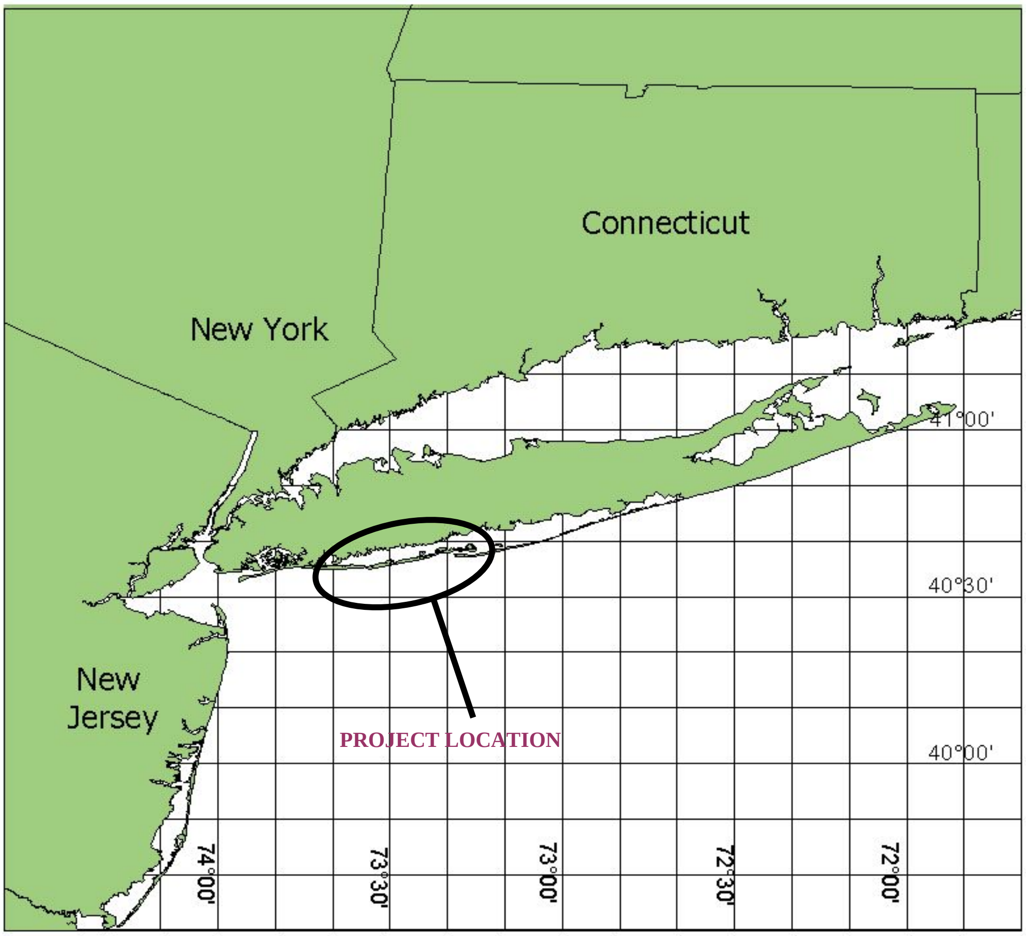


FIGURE 1

This EFH assessment includes all pelagic and benthic fish habitat in off of Project area 1,000 feet seaward of mean low water (MLW) and coastal and open Atlantic Ocean. This EFH assessment considers the effects that sand mining and placement could have on EFH within the Project area borrow area and project.

Project History and Authorization

The U.S. Army Corps of Engineers (USACE), New York District (District), is proposing to implement a cost-effective solution designed to restore the shoreline and provide shoreline protection for Project area, a barrier island located between Jones Inlet and East Rockaway Inlet, in Nassau County, New York (Figure 1). The Atlantic Coast of New York, Jones Inlet to East Rockaway Inlet, Project area, New York Storm Damage Reduction Project (Project), covers approximately 6.7 miles (of which 6.4 miles represents protection provided by the selected plan) of oceanfront along Project area, including the Town of Hempstead (Point Lookout and Lido Beach), Nassau County (Nickerson Beach), and the City of Long Beach.

In 1965, the USACE evaluated various storm protection options for the area and presented findings in the Beach Erosion Control and Interim Hurricane Study for the Atlantic Coast of Long Island, New York: Jones Inlet to East Rockaway Inlet (USACE 1965). Local interests did not support the plan and the project was terminated in 1971. Since that time, beach erosion and storm damage have continued in the area. At the request of the local interests following Hurricane Gloria in 1985, the USACE conducted a Reconnaissance Study (completed in 1989), and subsequently a Feasibility Study (completed in February of 1995), to evaluate an array of structural and non-structural measures to provide flood and storm protection for the Project area (USACE 1989, 1995, 1998, 1999).

As a result of the Feasibility Study, several alternatives were evaluated and a final plan was selected. The plan, as presented in the Final Feasibility Study and Final Environmental Impact Statement (FEIS) for the Project, included widening of the existing beach with the hydraulic placement of beach fill material, rehabilitation of 16 groins at Long Beach, construction of six new groins west of Point Lookout at Lido Beach, and construction/rehabilitation of numerous dune walkovers and dune access points (USACE 1995, 1998). The December 1998 Record of Decision (ROD) (filed in the Federal Register, January 1999) granted approval of the plan as presented in the 1998 FEIS and was signed on December 23, 1998.

Subsequent to the 1998 release of the FEIS for the Project, the proposed alternative was re-evaluated. The re-evaluation was conducted to address changes to the shoreline since the 1998 evaluation and changes in the Project scope (i.e., a reduction in the size of the Project area), and to address environmental concerns expressed by agencies and/or interest groups (USACE 1998). Furthermore, this re-evaluation allowed incorporation of advancements in engineering evaluation methods. As a result of project re-evaluation, several modifications were made to the plan that was selected in 1998 and are presented in the 2013 EA (USACE 2013). The proposed Project modification is intended to provide a long-term, cost-effective solution for reducing erosion and maintaining the protective dune and beach berm in this area.

When compared to the original Project that was presented in the 1998 FEIS and approved through a Record of Decision in 1999, the proposed Project modification includes several new structural features and activities that are in addition to those proposed in the original Project (Table 1). The currently proposed Project represents a modification to the original approved Project that has reduced the overall amount of beach fill, dune fill, dune plantings, sand fence, and fill required for renourishment activities. In addition, the proposed project modification also has excluded most Project activities within a 136-acre shorebird foraging/nesting area. Although, the Project has increased the number of proposed boardwalk walkovers and vehicular ramps and now includes a 100-foot extension of groin 58 (i.e., East Groin), these changes are overall insignificant relative to the original approved Project and will have no significant negative environmental impacts.

In the 1995 FEIS, it was determined that offshore, near shore and onshore components of the Project could potentially cause some minor adverse impacts to water quality, aquatic habitats and species (i.e., benthic organisms, fish and their habitat), potential threat to several endangered marine and terrestrial species (i.e., sea turtles, piping plover, sea beach amaranth), cultural resources (i.e., shipwrecks), and socio-economic impacts to recreational activities during construction (i.e., noise and restrictions to construction areas). Similar potential impacts are likely under the currently proposed Project. However, it is the physical extent (i.e., acreage of impacts) that has changed which translates to less overall impacts throughout the Project area relative to the original approved Project. No significant negative impacts, in addition to those described in the 1995 FEIS and highlighted below, are expected from the currently proposed Project modification. No new natural resources or endangered species have been identifying within the project area since the 1995 EIS.

The District has concluded that, similar to the original Project, the Project modification will still result in some short-term negative impacts to water quality, terrestrial and aquatic habitats and the species that utilize the habitats. There also is a possibility that cultural resources could be affected, however, studies to determine potential impacts are ongoing at this time. In addition, it has been determined that the proposed Project would exceed the Federal de minimis thresholds for NO_x air emissions and we are working with the state to obtain air credits to offset these impacts.

Impacts to other environmental resources in the proposed Project Area are expected to be minor and less than those that would have resulted from the original Project. Specifically, the modification will include the placement of unvegetated hard structures (buildings, groins, and beach access walkovers, ramps) in dune/upper beach, intertidal, and subtidal areas. These structures will permanently cover the substrate beneath the footprint and non-mobile benthic species and will limit the use of the area directly within the structure footprint for foraging by shorebirds and wading birds and some fish species. However, these impacts are not significant because of the followng: affected species will utilize other suitable habitat for foraging activities; the existing upper beach and dune areas in these locations are currently of relatively low value to most wildlife species and do not support any Federal or state-listed species; the direct loss of benthic species and vegetation will be minimal and would not affect populations; and groins are likely to reduce the overall rate of beach loss and erosion in the Project Area and will increase the forage base for many fish species by increasing invertebrate biomass. The changes in the conditions of the resources are not significant, and the proposed impacts on these resources as a result of the authorized project are not significantly different than those described in the FEIS which was approved for the original Project (USACE 1998).

The use of BMP construction procedures and mitigation measures, pre-construction surveys for species of special concern in the Project Area, post-construction surveys to monitor affects of groins on coastal processes and species, and avoidance of key breeding/nesting and spawning periods, will reduce potential for negative impacts. Furthermore, implementation of the proposed Project will have significant overall beneficial impacts to the environment and surrounding communities, including benefits to aquatic habitats and species, an increase in the availability of suitable habitat for Federal and state-listed species and a diversity of shorebird communities, improved shoreline stabilization and flood protection, and recreational opportunity.

Based on a thorough evaluation of potential impacts performed for the 1998 FEIS and this SEA, it has been determined that with the exception of anticipated high NO_x emission levels, there will be no significant adverse impacts due to implementation of the proposed Project modification. Comments from agencies and interested parties have been addressed and all practicable means to avoid or minimize adverse environmental effects have been incorporated into the recommended plan.

Purpose of Proposed Project

The purpose of the Project modifications are:
1) To reduce the threat of future damage to the shoreline due to wave attack, recession, and inundation from storms;
2) Mitigate or prevent the effect of long-term erosion;
3) Provide an economically justified plan;
4) Preserve, restore, and maintain existing ecological resources and habitats for native fish and wildlife, where possible; and,
5) Preserve or mitigate for the loss of historical, archaeological, and cultural resources in the Project area, if present.

Modifications to the Proposed Action

The recommended plan for this Project includes the preferred plan (identified in the 1995 Feasibility Report and subsequent 1998 FEIS filing) with post-Feasibility modifications as detailed in the EA (USACE 2013). The recommended plan provides the most comprehensive, effective, and cost-effective solution to provide storm protection in the Project area.

The proposed action is a modification to the Atlantic Coast of New York, Jones Inlet to East Rockaway Inlet, Island of Long Beach, New York Storm Damage Reduction Project that received a favorable Record of Decision (ROD) in 1998. When compared to the original Project, the Project modification entails an overall reduction in the Project area, which results in a reduction of 6,000 linear feet (lf) of project area, a reduction of 4,072,000 cy of fill material needed for initial beach fill and 341,000 cy per yr for renourishment activities, a reduction of five acres (ac) of dune plantings and a reduction of 15,000 lf of sand fence. Specifically, there will be a reduction of 110 ac of filling in the upper beach zone, 39 fewer acres of filling in the intertidal zone, and 35 fewer acres of filling in the sub-tidal zone.

The selected storm damage reduction plan including changes from the authorized project, comprises approximately 35,000 If of dune and beach fill and generally extends from the eastern end of the barrier island at Point Lookout to the western boundary of the City of Long Beach, including an incidental taper into East

Atlantic Beach. This component of the Project includes the following: 1) a dune with a top elevation of +14 ft above NAVD, a top width of 25 ft, and landward and seaward slopes of 1V:5H (1V:H3 on landward slope fronting the boardwalk) that will extend along the entire project area; 2) in Point Lookout, a beach berm extending a minimum of 110 ft from the seaward toe of the recommended dune at an elevation of +9 ft NAVD, then sloping at 1V:20H to intersection with existing bathymetry; 3) In the Nickerson Beach area in the Town of Hempstead, dune only (no berm) placed along approximately 5,000 lf of shoreline. Existing berm will remain undisturbed to allow for bird nesting and foraging; 4) In Lido Beach and the City of Long Beach, a stepped beach berm extending 40 ft. from the seaward toe of the recommended dune at an elevation of +9 ft NAVD, a 1V:10H slope downward to +7 ft NAVD, a 130 ft flat berm at +7 ft NAVD, then sloping 1V:30H to intersection with existing bathymetry; Total sand fill quantity of 4,720,000 cy for the initial fill placement, including tolerance, overfill and advanced nourishment (based on 2013 post-Hurricane Sandy survey); 5) planting of 34 acres of dune grass and installation of 75,000 lf of sand fence

In addition to the decrease in the size of the Project Area and the amount of sand material required for the Project, when compared to the original Project, the Project modification would result in minimal construction activities originally proposed within a 136-acre shorebird nesting/foraging area which will be excluded from the Project (Table 1). A comparison of components of the original selected plan and the proposed Project modification are shown in Table 1.

Table 1. Summary Comparison of the Original Proposed Project and the Currently Proposed Project Modifications.

Component	Original Project	Project Modification	Change
Beach fill material (for creation of beach berm, sand barrier and a dune)	41,000 linear feet (lf), some within shorebird nesting area	35,000 lf, none within shorebird nesting area	- 6,000 lf
Borrow area sand removal (i.e., total sandfill quantity, excluding 5-year renourishments)	8,642,000 cubic yards (cy)	4,720,000 cy	- 3,922,000 cy
Dune plantings	29 acres (ac)	34.0 ac	+5.0 ac
Sand fence	90,000 lf	75,000 lf	- 15,000 lf
Timber dune walkover ADA	13	12	-1
Timber Dune walkovers (from boardwalk) ADA	5	5	0
Timber Dune walkovers (from boardwalk) None ADA	0	6	+6
Timber non-ADA walkovers		23	+17
Timber Vehicle and pedestrian access from boardwalk	2	2	0

Gravel surface vehicle and pedestrian access way	2	9	+7
Extension of existing walkovers	12	8	-4
Raised timber vehicular access	1	0	-1
5-yr renourishment	2,111,000 cy/year (yr)	1,770,000 cy/yr	- 341,000 cy/yr
Rehab and 100 ft Extension of terminal groin	0	1	+ 1
New groins	6	4 (6 proposed, but 2 have been deferred)	0
Rehabilitation of existing groins	15	17	+ 2
Impacts to shorebird nesting/foraging area	136 ac	0 ac	No impacts

Beachfill

The selected storm damage reduction plan including changes from the authorized project, comprises approximately 35,000 lf of dune and beach fill and generally extends from the eastern end of the barrier island at Point Lookout to the western boundary of the City of Long Beach, including an incidental taper into East Atlantic Beach. This component of the Project includes the following: 1) a dune with a top elevation of +14 ft above NAVD, a top width of 25 ft, and landward and seaward slopes of 1V:5H (1V:H3 on landward slope fronting the boardwalk) that will extend along the entire project area; 2) in Point Lookout, a beach berm extending a minimum of 110 ft from the seaward toe of the recommended dune at an elevation of +9 ft NAVD, then sloping at 1V:20H to intersection with existing bathymetry; 3) In the Nickerson Beach area in the Town of Hempstead, dune only (no berm) placed along approximately 5,000 lf of shoreline. Existing berm will remain undisturbed to allow for bird nesting and foraging; 4) In Lido Beach and the City of Long Beach, a stepped beach berm extending 40 ft. from the seaward toe of the recommended dune at an elevation of +9 ft NAVD, a 1V:10H slope downward to +7 ft NAVD, a 130 ft flat berm at +7 ft NAVD, then sloping 1V:30H to intersection with existing bathymetry; Total sand fill quantity of 4,720,000 cy for the initial fill placement, including tolerance, overfill and advanced nourishment (based on 2013 post-Hurricane Sandy survey); 5) planting of 34 acres of dune grass and installation of 75,000 lf of sand fence

Rehabilitation of Existing Groins

Sixteen groins were proposed for rehabilitation in the plan selected in 1998. However, the existing groins within the Project were re-evaluated in September 2003. The groins were evaluated for structural condition, sand trapping effectiveness, and planform holding effectiveness. As a result of this survey, a total of 17 groins were recommended for rehabilitation, including 15 groins in Long Beach and two groins in Point Lookout.

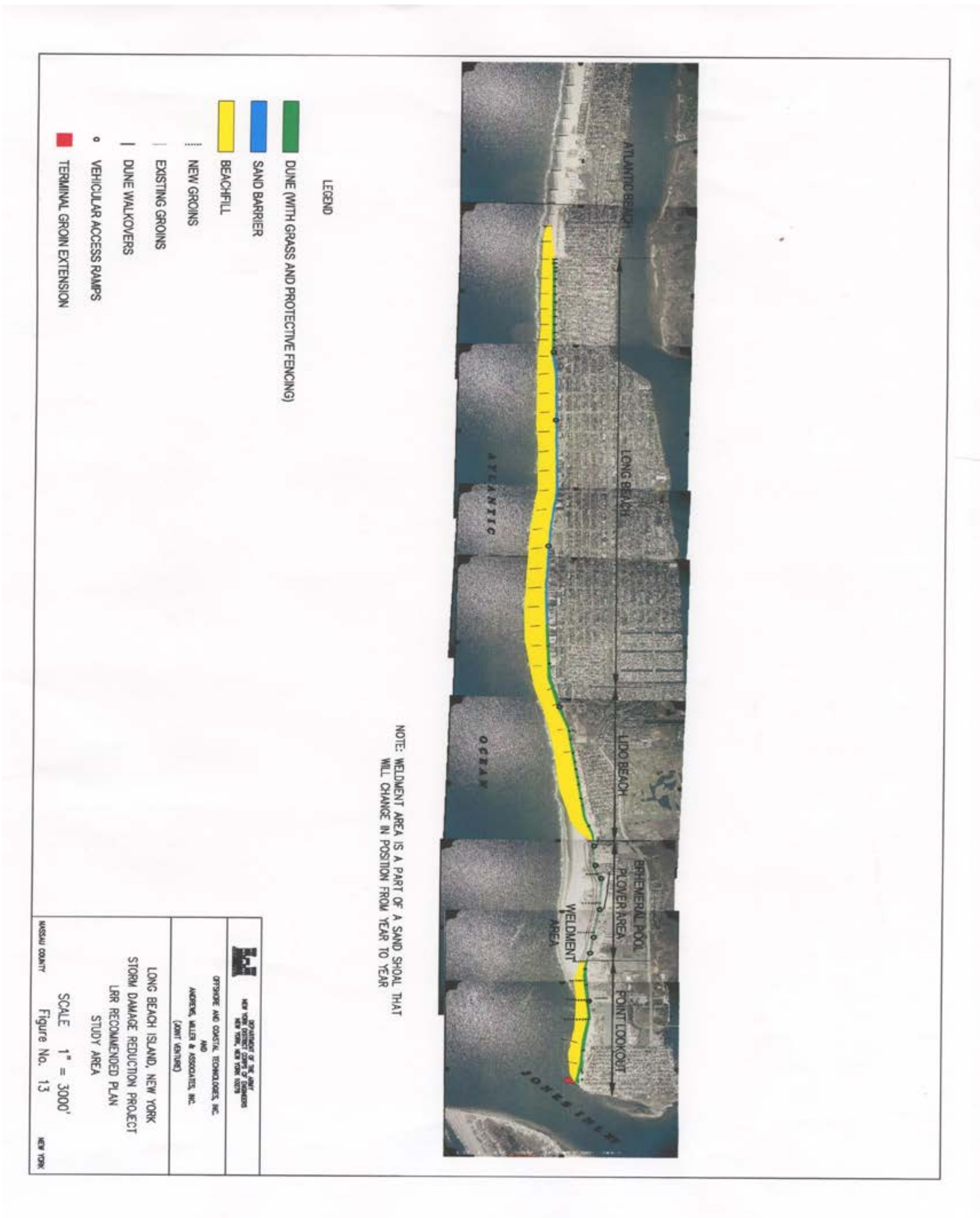
Rehabilitation was based on a condition survey of the existing groins conducted in September 2003, the plans for rehabilitation of existing groins in the Recommended Plan has been modified to include rehabilitation of those groins that were found in poor or fair condition that would be beneficial to the beach stability. Based on this evaluation, 15 of the 23 groins in the City of Long Beach and 2 groins in Point Lookout should be rehabilitated. The proposed rehabilitation would consist of repositioning existing armor stone and adding additional armor stone along the seaward 100-330 feet of each of the groins. A minimum constructible crest width of approximately 13 ft was selected with side slopes of 1V on 2H. A primary armor weight of approximately 5 tons was selected in order to approximately match the existing armor stone order to match the existing armor.

Construction of New Groins

The selected 1998 plan proposed eventual construction of seven new groins (all 765 ft long and 70 ft wide) at Point Lookout (USACE 1998). Currently only the first four groins are targeted for immediate construction, whereas the remaining three groins are proposed for deferred construction as needed based on the stability of the existing weldment area. However, based on subsequent re-evaluation of the area, some modifications to the original design of the four new groins have been proposed. The Project requires the immediate construction of a new groin field at Point Lookout that will contain seven groins that begin 800 feet west of existing Groin 55 in Point Lookout. The four groins would be constructed with tapered lengths and spaced at an interval of 800 feet (USACE 2004b). Groin lengths vary and range from 380 ft to 800 ft. Groin widths will be 13 ft.

A determination to construct the three westernmost groins will be triggered at a later date within the 50-year Project life and be based on monitoring data (USACE 2004b). The criterion for construction includes a change from an accreting beach to an eroding beach in the area where the structures are to be located (USACE 2004b). The criteria will be evaluated based upon field measurements and analysis (USACE 2004b).

Figure 2. Location of Elements Within the Project area Project Area



Point Lookout Terminal Groin Rehabilitation and Extension

During re-evaluation of the proposed Project, the USACE determined that Groin #58 (i.e., West Groin), the terminal groin in Point Lookout, required rehabilitation and extension (USACE 2004b). Accordingly, the District plans to rehabilitate the existing portion of the groin, extend the length an additional 100 feet (currently 200 ft), and extend the width to between 107 and 170 ft (currently widths range from 50 to 107 ft), in accordance with design specifications presented in the 1999 USACE Terminal Groin Rehabilitation and Extension at Jones Inlet, Long Beach Island, New York Report (Figure 2). Extending the terminal groin may decrease the amount of sediment lost toward the inlet after the beach fill component of the project is carried out (USACE 2004b). It will also possibly retain additional longshore sediment transport without causing large changes in inlet dynamics (USACE 2004b). The median armor weight for the rehabilitated and new portions of Groin #58 is approximately 10 to 10.75 tons (USACE 2004b).

Dune Walkovers and Vehicle Access Structures, and Boardwalk Extensions

Several dune walkovers, vehicle access points and boardwalk extensions are proposed for the City of Long Beach and the Town of Hempstead (USACE 2004b). Construction of these structures will allow the public to gain safe access to the beach without harming the existing and enhanced dune system.

A total of 57 timber dune walkovers (including 17 timber wheelchair accessible), 9 gravel surface vehicle and pedestrian walkovers, 29 timber non ADA compliant, two timber vehicular access ways from the boardwalk, eight extensions to existing walkovers, are currently proposed. Originally, 29 dune walkovers (both timber and gravel) and 12 vehicle access ramps were included in the selected plan (USACE 1995).

Bird Nesting and Foraging Area

The proposed Project modification has excluded Project activities from within a 93.4-acre ephemeral pool and a 42.3-acre tern/piping plover nesting area located in Point Lookout, near the Jones Inlet ebb shoal attachment point (USACE 2005a). Project activities were proposed within this area as part of the original plan that was selected in 1995. However, the USACE reevaluated proposed Project activities in direct response to concerns regarding shorebird habitat from Federal and State agencies and other interested parties (USACE 1998). As a result, construction of a beach berm within the bird nesting/foraging area has been eliminated from the proposed Project to allow for the continued unimpeded use of the area as shorebird nesting and foraging habitat. Two new groins were originally proposed within the ephemeral pool and tern/piping plover nesting area. However, based on a re-evaluation of the Project, construction of these groins has been deferred indefinitely, and is not part of the proposed Project modification. Supplemental NEPA documentation would be prepared to address construction of the two deferred groins as appropriate. No beach fill activities will take place within the bird foraging and nesting area.

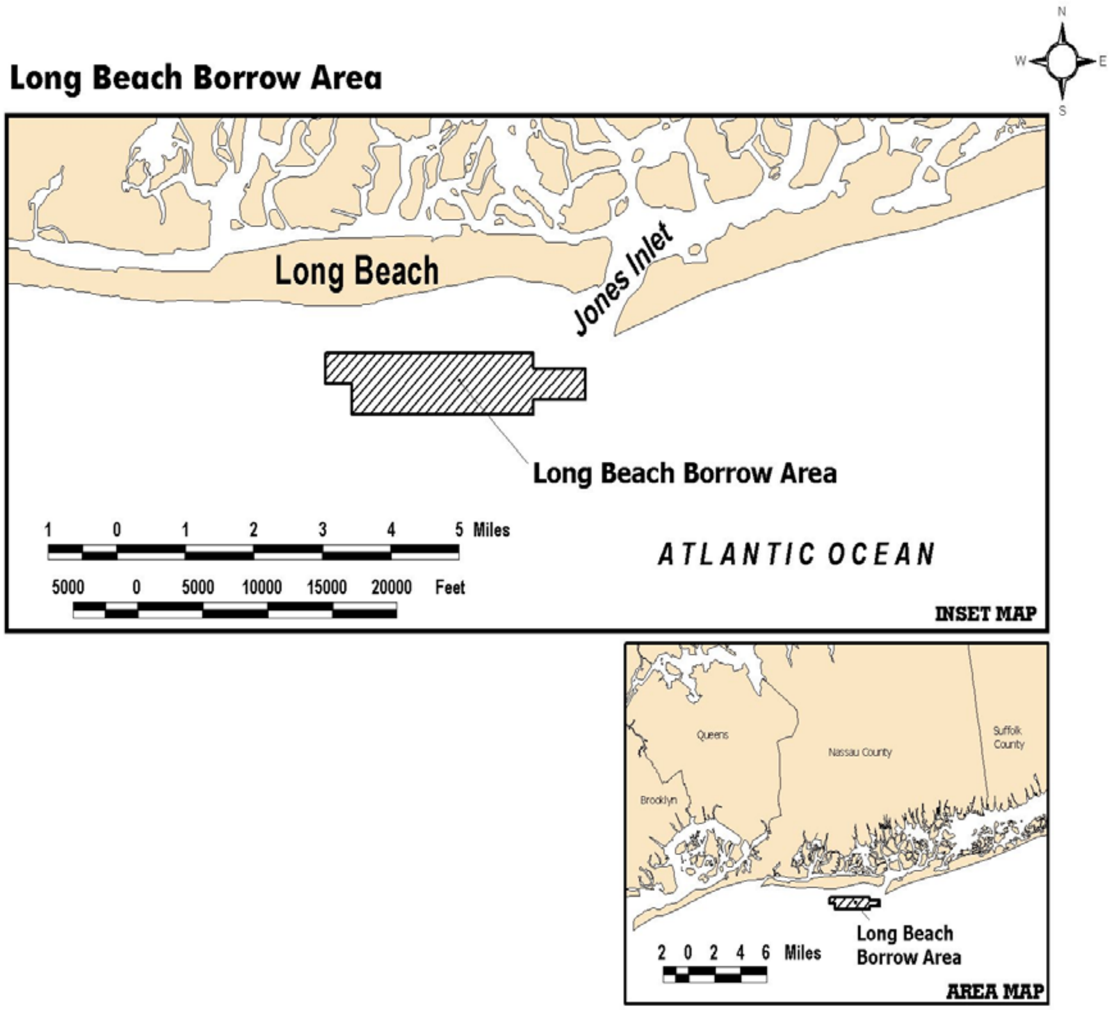
Sand Removal from Offshore Borrow Area

An offshore borrow area, located approximately 1.5 miles south of Long Beach Island (Figure 3) between 25 feet mean low water and about 60 feet mean low water, has been identified as a potential source of sand material for beach fill and dune construction activities (USACE 2004b). Approximately 4,720,000 cy of material will be removed from this area. The original plan selected in 1998 proposed 8,642,000 cy of sand removal (USACE 1998).

Habitat Characteristics – Borrow Area

The borrow site, where beach fill sediments will be dredged, is located in waters between 25 MLW to about 60 ft MLW. The sediments at the borrow site have been found to be predominantly fine to coarse sand typically with only a trace of silts. The important biological resources of this area are the benthos and fin-fisheries. This habitat supports diverse benthic fauna, which serve as prey for demersal fish species present in this area. The nearshore area provides a migratory pathway and spawning, feeding and nursery areas for many species common to the Mid-Atlantic region. Additionally, phytoplankton in this zone is an important food source for filter-feeding bivalves. A sand faunal community is found in the proposed borrow area sediments. Polychaetes worms and blue mussels are the most numerous macrobenthic organisms. The most import invertebrate is the commercially valuable surf clam (*Spisula solidissima*). Additionally, gastropods, amphipods, isopods, sand dollars, starfish, and decapod crustaceans are found in the site. Important recreational species found in the borrow area include Atlantic mackerel (S*comber scomblrus*), black sea bass (*Centropristes striatus*), winter flounder (*Psuedopleuronectes americanus*), summer flounder (*Paralichthys dentatus*) and scup (*Stenotumus chrysops*).

Figure 2



Effects on Habitat – Borrow Area

The physical effects of dredging would be the removal of existing sediments resulting in a depression or significant bathymetric low in the seafloor that may persist for several years, dependent on sediment availability and current dynamics in the area. Fine-grained sediments often collect within these lows resulting in a modified habitat for bottom-feeding benthic species, plus a change to epifaunal species that favor finer-grained sediments. In estuaries or embayments with constrained hydrodynamics, reduced bottom water flow may result in lowered dissolved oxygen levels, as could an increased organic content of muds. This may result in finfish populations avoiding this zone. Additionally, during the physical process of removing the sediments, the loss of benthic invertebrate prey species may occur. Small motile and sedentary epifaunal species (*e.g.,Polychaetes*), would be most vulnerable to hydraulic dredging, resulting in decreased prey in this area. A dynamic commercial surf clam industry is located along the south coast of Long Island, including the study zone. However, a stock assessment of the borrow area showed low surf clam population densities (USACE, 2003). However, advance notice of construction to fisherman should allow for a viable local harvest, thereby minimizing any financial impact to the industry. Additionally, allowable weekly vessel yields are tied to the NYSDEC-calculated stock size, maintaining a buffer population that protects both the resource and industry.

Due to the nature of the water quality (typically clean well-oxygenated), hydrodynamics (good tidal flow and periodic wind-driven bottom waters) and the sediments (fine-grained sands with trace quantities of silts), there should be minimal localized turbidity or decreases DO at the borrow area. Additionally, studies performed in the Lower Bay of New York Harbor have shown the benthic community structure is disrupted by dredging, but can reach a new equilibrium within 12 months (Conover *et al.*, 1995; Cerrato and Sheier, 1984).

Dredging Operation

The size of the offshore borrow area is approximately 1,194 acres; however, this entire area would not be needed for initial construction and renourishment operations, throughout the life of the project. Typically, dredging operations are configured to go no deeper than 20 feet below existing grade. Generally, dredging operations do not specifically contour slopes between the bottom contours, and the existing surface. Slopes are created by the natural slumping of material in response to the material type. As a result of dredging operations, the side slopes are expected to generally slope between 1V:3H and 1V:5H. The configuration of these side slopes would not be expected to interfere with gear used in commercial fishing operations. Based upon the available material within the borrow area, dredging operations could be configured as 5 to 10 foot dredge depths, and still allow for sufficient material for dredging operations. To determine the worst-case for impacts the physical, maximum area of disturbance was considered for initial construction 262 acres with a 33-advance fill.

The use of a cutterhead suction dredge will be the type of equipment used to gather the material and place it on the beach. There are two main components of a cutter suction dredger; the cutterhead and the dredging pump. The cutterhead, which is situated at the entrance of the suction pipe, is used to agitate soft materials or to cut harder materials in order that they may be in a suitable state for removal by hydraulic means.

The cutters are usually rotated at between 10 and 30 rpm, and the rotary motor is located either directly behind the cutter in a submersible drive unit, or with the main power unit of the dredger. The dredging pump in the body of the dredger creates a vacuum in the suction pipe and draws the material up the pipe and through the pump. The material is then discharged by being pumped through a pipeline.

When in operation the cutter suction dredger makes use of two stern spuds, which are arranged to allow the dredger to advance in steps towards the dredging face. In each dredging position the dredger is swung from side to side by means of side wires. The cutter suction dredger is connected to the shore by floating pipelines and this must be arranged so as to allow the dredger to advance forward as far as possible without having to stop dredging.

Effects on Designated EFH Species in Project Area

Summary of Essential Fish Habitat (EFH) Designation

Two 10’ x 10’ Square Coordinates:

Boundary	North	East	South	West
Coordinate	40 ☐ 40.0	73 ☐ 30.(	40 ☐ 30.0	73 ☐ 40.(
Boundary	North	East	South	West
Coordinate	40 ☐ 40.0	73 ☐ 40.(	40 ☐ 30.0	73 ☐ 50.(

Square Description (i.e. habitat, landmarks, coastline markers): Atlantic Ocean waters within the square within Great South Bay affecting the following: south of Jones Beach State Park, East Bay, Great I., Deep Creek Meadow, Sloop Channel, Cuba I., Big Crow I., Jones Inlet, Garrett I., Meadow I., High Meadow, Sea Dog I., Baldwin Bay, Merrick Bay, Middle Bay, Island Park, NY., eastern Long Beach, NY., Point Lookout, NY., Wantaugh Bellmoe, NY., Freeport, NY., Rockville Center, NY., Baldwin, NY., Lynbrook, NY., East Rockaway, NY., Smith Meadow, NY., Pettit Marsh, western Hempstead Bay, and Oceanside, NY. Atlantic Ocean waters within the square within Great South Bay estuary affecting the following: Western Long Beach, NY., Hewlett, NY., Woodmere, NY., Cedarhurst, NY., Lawrence, NY., Inwood, NY., Far Rockaway, NY., East Rockaway Inlet, eastern Jamaica Bay, Brosewere Bay, Grassy Bay, Head of Bay, Grass Hassock Channel, eastern Rockaway Beach, Atlantic Beach, Howard Beach, J. F. K. International Airport, Springfield, NY., and Rosedale, NY., along with many smaller islands.

Species	Eggs	Larvae	Juveniles	Adults
Atlantic salmon *(Salmo salar)*				X
Atlantic cod *(Gadus morhua)*				
haddock *(Melanogrammus aeglefinus)*				
pollock *(Pollachius virens)*			X	
whiting *(Merluccius bilinearis)*	X	X	X	
offshore hake *(Merluccius aProject areadus)*				
red hake *(Urophycis chuss)*	X	X	X	
witch flounder *(Glyptocephalus cynoglossus)*				
winter flounder *(Pleuronectes americanus)*	X	X	X	X

yellowtail flounder *(Pleuronectes ferruginea)*				
windowpane *(Scopthalmus aquosus)*	X	X	X	X
American plaice *(Hippoglossoides platessoides)*				
ocean pout *(Macrozoarces americanus)*				
Atlantic sea scallop *(Placopecten magellanicus)*				
Atlantic sea herring *(Clupea harengus)*			X	X
monkfish *(Lophius americanus)*	X	X		X
bluefish *(Pomatomus saltatrix)*			X	X
long finned squid *(Loligo pealei)*	n/a	n/a	X	
short finned squid *(Illex illecebrosus)*	n/a	n/a		
Atlantic butterfish *(Peprilus triacanthus)*	X	X	X	X
Atlantic mackerel *(Scomber scombrus)*	X	X	X	X
summer flounder *(Paralicthys dentatus)*			X	X
scup *(Stenotomus chrysops)*	n/a	n/a	X	X
black sea bass *(Centropristus striata)*	n/a		X	X
surf clam *(Spisula solidissima)*	n/a	n/a		
ocean quahog *(Artica islandica)*	n/a	n/a		
spiny dogfish *(Squalus acanthias)*	n/a	n/a		
tilefish *(Lopholatilus chamaeleonticeps)*				
king mackerel *(Scomberomorus cavalla)*	X	X	X	X
Spanish mackerel *(Scomberomorus maculatus)*	X	X	X	X
cobia *(Rachycentron canadum)*	X	X	X	X
sand tiger shark *(Odontaspis taurus)*		X		
blue shark (*Prionace glauca)*				X

dusky shark *(Charcharinus obscurus)*		X		
sandbar shark *(Charcharinus plumbeus)*		X	X	X
tiger shark *(Galeocerdo cuvieri)*		X		
Winter Skate			X	X
Little Skate			X	X

In general, adverse impacts to Federally managed fish species may stem from alterations of the bottom habitat, which result from dredging offshore in the borrow sites and beach fill placement in the intertidal zone and nearshore. EFH can be adversely impacted temporarily through water quality impacts such as increased turbidity and decreased dissolved oxygen content in the dredging and placement locations. These impacts would subside upon cessation of construction activities. More long-term impacts to EFH involve physical changes to the bottom habitat, which involve changes to bathymetry, sediment substrate, and benthic community as a food source.

One major concern with respect to physical changes involves the potential loss of prominent offshore sandy shoal habitat within borrow sites due to sand mining for the beach replenishment. It is generally regarded that prominent offshore shoals are areas that are attractive to fish including the Federally managed species, and are frequently targeted by recreational and commercial fishermen. Despite this, there is little specific information to determine whether shoals of this type have any enhanced value for fish. However, it is reasonable to expect that the increased habitat complexity at the shoals and adjacent bottom would be more attractive to fish than the flat featureless bottom that characterizes much of the mid-Atlantic coastal region (USFWS, 1999a).

Since mining of sand in shoals may result in a significant habitat alteration, it is proposed that these areas be avoided or the flatter areas surrounding the prominent shoals be mined. Prominent shoal habitat was avoided as part of the borrow site screening process. This was accomplished by avoiding sites with prominent shoal habitat such as the "Seaside Lumps" and "Fish Heaven", which are considered important sport and commercial fishing grounds (Long and Figley, 1982). Other physical alterations to EFH involve substrate modifications. An example would be the conversion of a soft sandy bottom into a hard clay bottom through the removal of overlying sand strata. This could result in a significant change in the benthic community composition after recolonization, or it could provide unsuitable habitat required for surf clam recruitment or spawning of some finfish species. This could be avoided by correlating vibracore strata data with sand thickness to restrict dredging depths to avoid exposing a different substrate. Based on vibracore data, dredging depths would be considered to minimize the exposure of dissimilar substrates.

Habitat Utilization of Identified EFH Species for Representative Life Stages

MANAGED SPECIES	EGGS	LARVAE	JUVENILES	ADULTS
Atlantic Salmon (*Salmo salar*) (Bigelow, 1963)				**Habitat**: Pelagic in Mid-Atlantic **Prey:** herring, alewives, smelts, capelin, small mackerel, sand lace, and small codshellfish.
Whiting (*Merluccius bilinearis*) (Morse et al. 1998)	**Habitat:** Pelagic continental shelf waters in preferred depths from 50-150 m.	**Habitat:** Pelagic continental shelf waters in preferred depths from 50-130 m. (Morse et al. 1998)	**Habitat:** Bottom (silt-sand) nearshore waters in preferred depths from 150-270 m in spring and 25-75 m in fall. **Prey:** fish, crustaceans (euphasids, shrimp), and squids (Morse et al. 1998)	
Red hake *(Urophycis chuss)* (Steimle et al. 1998)	**Habitat:** Surface waters, May – Nov.	**Habitat:** Surface waters, May –Dec. Abundant in mid-and outer continental shelf of Mid-Atl. Bight. **Prey:** copepods and other microcrustaceas under floating eelgrass or algae.	**Habitat:** Pelagic at 25-30 m and bottom at 35-40 m. Young inhabit depressions on open seabed. Older juveniles inhabit shelter provided by shells and shell fragments. **Prey:** small benthic and pelagic crustaceans (decapod shrimp, crabs, mysids, euphasiids, and amphipods) and polychaetes).	
Pollock (Pollachius virens) (Fahay, 1998)			**Habitat:** Bottom (rocks, pebbles, or gravel) winter for Mid-Atlantic **Prey:** shellfish, crabs, and other crustaceans (amphipods) and polychaetes, squid and fish (capelin redfish, herring, plaice, haddock	
Winter Flounder (Pseudopleuronectes americanus) (Pereira et. al., 1998)	**Habitat:** Been reported as sand, muddy sand,	**Habitat:** arvae are found inshore **Prey:**Nauplii, invertebrate	**Habitat:** Young of the year (YOY) are demersal, nearshore low	**Habitat:** Demersal offshore (in spring) except when spawning where they are in shallow inshore waters (fall). **Prey:** Amphipods, Polychaetes,

MANAGED SPECIES	EGGS	LARVAE	JUVENILES	ADULTS
	mud and gravel, although sand seems to be the most	eggs, protozoans, polychaetes	(primarily inlets and coves) energy shallows with sand, muddy sand, mud and gravel bottoms. **Prey:** YOY Amphipods and annelids JUV – Sand dollar, Bivalve siphons, Annelids, Amphipods	Bivalves or siphons, Capelin eggs, Crustaceans
Windowpane *(Scopthalmus aquosus)* (Chang, 1998)	**Habitat:** Surface waters <70 m, Feb-July; Sept-Nov.	**Habitat:** Initially in pelagic waters, then bottom <70m,. May-July and Oct-Nov. **Prey:** copepods and other zooplankton	**Habitat:** Bottom (fine sands) 5-125m in depth, in nearshore bays and estuaries less than 75 m **Prey**: small crustaceans (mysids and decapod shrimp) polychaetes and various fish larvae	**Habitat:** Bottom (fine sands), peak spawning in May , in nearshore bays and estuaries less than 75 m **Prey**: small crustaceans (mysids and decapod shrimp) polychaetes and various fish larvae
Atlantic mackerel (*Scomber scombus)*	**Habitat:** Eggs pelagic, distributed at depths ranging from 10- 325 m, majority from 30- 70 m; depth varies with season, egg diameter, thermocline.	**Habitat:** Most distributed at depths from 10-130 m, usually at < 50 m. Depth varies diurnally, also with age and with thermocline; i.e., newly hatched larvae found between 5-10 m during the day, however, as they grow they're at depths closer to the surface.	**Habitat:** Depth varies seasonally. Offshore in fall, most abundant at ~ 20-40 m, range from 0-320 m. In winter, 50-70 m. Spring, although dispersed through water column, concentrated 30-90 m. Move higher in summer to 20-50 m, range from 0-210m.	**Habitat:** Depth changes seasonally, perhaps influenced by prey availability. Fall: 10-340 m, > 50% at 60-80 m. Winter: ~ 50% at 20-30 m. Spring: down to 380 m, ~ 25% at 60-170 m. Summer: > 60% at 50-70 m. Larger fish deeper than smaller ones. Distribution may also be correlated with downwelling events and onshore advection of warm surface water.
Atlantic sea herring *(Clupea harengus)* (Reid et al., 1998)			**Habitat:** Pelagic waters and bottom, < 10 C and 15-130 m depths **Prey:** zooplankton (copepods, decapod larvae, cirriped larvae, cladocerans, and pelecypod larvae)	**Habitat:** Pelagic waters and bottom habitats; **Prey:** chaetognath, euphausiids, pteropods and copepods.

MANAGED SPECIES	EGGS	LARVAE	JUVENILES	ADULTS
Monkfish *(Lophius americanus)* (Steimle et al., 1998)	**Habitat:** Surface waters, Mar. – Sept. peak in June in upper water column of inner to mid continental shelf	**Habitat:** Pelagic waters in depths of 15 – 1000 m along mid-shelf also found in surf zone **Prey:** zooplankton (copepods, crustacean larvae, chaetognaths)		
Bluefish *(Pomatomus saltatrix)*			**Habitat:** Pelagic waters of continental shelf and in Mid Atlantic estuaries from May-Oct.	**Habitat:** Pelagic waters; found in Mid Atlantic estuaries April – Oct.
Long finned squid *(Loligo pealei)*	n/a	n/a	**Habitat:** Inhabit upper 10 m at depths of 50-100 m on continental shelf. Found in coastal inshore waters in spring/fall, offshore in winter. Migrate to surface at night. Ontogenetic descent: at 45 mm, chromatophores are concentrated on dorsal rather than ventral surface, indicating a change from inhabiting surface waters to demersal lifestyle. **Prey:** Primary prey varies with size: < 4.0 cm: plankton, copepods; 4.1-6.0 cm: euphausiids, arrow worms; 6.1-10.0 cm: crabs, polychaetes, shrimp. Cannibalism observed in specimens larger than 5 cm ML (small *Illex illecebrosus* were found in 49 of 322	

MANAGED SPECIES	EGGS	LARVAE	JUVENILES	ADULTS
			Loligo stomachs).	
Short finned squid *(Illex ilecebrosus)*	n/a	n/a		
Atlantic butterfish *(Peprilus tricanthus)*	**Habitat:** Surface waters from continental shelf into estuaries and bays; collected to about 60 m deep in shelf waters. Common in high salinity zone of estuaries and bays from MA through VA. MARMAP Survey: collected in surface waters in 10- 1250 m of water.	**Habitat:** Surface waters from continental shelf into estuaries and bays; collected to about 60 m deep in shelf waters; common in high salinity zone of estuaries and bays; may spend day deeper in the water column and migrate to the surface at night. MARMAP Survey: collected in surface waters in water 10-1750 m deep.	**Habitat:** Pelagic waters in 10 – 360 m **Prey:** Feed mainly on planktonic prey, including thaliaceans, squids, copepods, amphipods, decapods, coelenterates, polychaetes, small fishes, and ctenophores.	**Habitat:** From surface waters to depths of 270-420 m on continental shelf; into coastal bays and estuaries; common in inshore areas, including the surf zone, and in high salinity and mixed salinity zones of bays and estuaries. NEFSC Trawl Survey: collected on continental shelf in 10-360 m of water; most collected in < 180 m. **Prey:** Feed mainly on planktonic prey, including thaliaceans, squids, copepods, amphipods, decapods, coelenterates, polychaetes, small fishes, and ctenophores.
Summer flounder *(Paralicthys dentatus)*			**Habitat:** Demersal waters (mud and sandy substrates)	**Habitat:** Demersal waters (mud and sandy substrates). Shallow coastal areas in warm months, offshore in cold months
Scup *(Stenotomus chrysops)*	n/a	n/a	**Habitat:** Demersal waters	**Habitat:** Demersal waters offshore from Nov – April
Black sea bass *(Centropristus striata)*	n/a		**Habitat:** Demersal waters over rough bottom, shellfish and eelgrass beds, man-made structures in sandy-shelly areas and wintere off shore at depths of 1-38 m in shell beds and shell patches	**Habitat:** Demersal waters over structured habitats (natural and man-made), and sand and shell areas and winters off shore at depths of 25-50 m in shell beds and shell patches.
Sand tiger shark (*Odontaspis Taurus*)		**Habitat:** Shallow coastal waters, bottom or demersal		
Ocean quahog *(Artica islandica)*	n/a	n/a		
Spiny dogfish *(Squalus acanthias)*	n/a	n/a		
King mackerel *(Scomberomorus cavalla)*	**Habitat:** Pelagic waters with sandy shoals of capes	**Habitat:** Pelagic waters with sandy shoals of capes	**Habitat:** Pelagic waters with sandy shoals of capes	**Habitat:** Pelagic waters with sandy shoals of capes and offshore bars, high profile rocky bottom and barrier island

MANAGED SPECIES	EGGS	LARVAE	JUVENILES	ADULTS
	and offshore bars, high profile rocky bottom and barrier island ocean-side waters from the surf to the shelf break zone.	and offshore bars, high profile rocky bottom and barrier island ocean-side waters from the surf to the shelf break zone	and offshore bars, high profile rocky bottom and barrier island ocean-side waters from the surf to the shelf break zone	ocean-side waters from the surf to the shelf break zone
Spanish mackerel *(Scomberomorus maculates)*	**Habitat:** Pelagic waters with sandy shoals of capes and offshore bars, high profile rocky bottom and barrier island ocean-side waters from the surf to the shelf break zone. Migratory	**Habitat:** Pelagic waters with sandy shoals of capes and offshore bars, high profile rocky bottom and barrier island ocean-side waters from the surf to the shelf break zone. Migratory	**Habitat:** Pelagic waters with sandy shoals of capes and offshore bars, high profile rocky bottom and barrier island ocean-side waters from the surf to the shelf break zone. Migratory	**Habitat:** Pelagic waters with sandy shoals of capes and offshore bars, high profile rocky bottom and barrier island ocean-side waters from the surf to the shelf break zone. Migratory
Cobia *(Rachycentron canadum)*	**Habitat:** Pelagic waters with sandy shoals of capes and offshore bars, high profile rocky bottom and barrier island ocean-side waters from the surf to the shelf break zone. Migratory	**Habitat:** Pelagic waters with sandy shoals of capes and offshore bars, high profile rocky bottom and barrier island ocean-side waters from the surf to the shelf break zone. Migratory	**Habitat:** Pelagic waters with sandy shoals of capes and offshore bars, high profile rocky bottom and barrier island ocean-side waters from the surf to the shelf break zone. Migratory	**Habitat:** Pelagic waters with sandy shoals of capes and offshore bars, high profile rocky bottom and barrier island ocean-side waters from the surf to the shelf break zone. Migratory
Dusky shark *(Charcharinus obscurus)*		**Habitat:** Shallow coastal waters		
Sandbar shark *(Charcharinus plumbeus)*		**Habitat:** Shallow coastal waters	**Habitat:** Coastal and pelagic waters	**Habitat:** Shallow coastal waters
Tiger shark *(Galeocerdo cuvieri)*		**Habitat:** Shallow coastal waters	**Habitat:** Shallow coastal waters	**Habitat:** This sharks inhabits coastal waters close to shore to outer continental shelf and offshore including oceanic island groups.
Little skate (Leucoraja erinacea) (NEFMC 2004)			**Habitat:** bottom habitats with a sandy or gravelly substrate or mud, generally found from the shore to 137 meters, with the highest abundance from	**Habitat:** bottom habitats with a sandy or gravelly substrate or mud within the same range as the juveniles

MANAGED SPECIES	EGGS	LARVAE	JUVENILES	ADULTS
			73-91 meters. Most juveniles are found between 4-15 □C	
Winter skate (Leucoraja ocellata) (NEFMC 2004)			sand and gravel or mud. shoreline to about 400 meters and are most abundant at depths less than 111 meters. The temperature range for these skates is from -1.2 □ 21 □C, v most found from 4-16 □C, depending on the season.	**Habitat:** sand and gravel or mud substrate.found shoreline to 371 meters, but are most abundant at less than 111 meters. The temperature range is also very similar, with a range from –1.2 □ 20 □C, from with m 5-15 □C.

Biological impacts on EFH are more indirect involving the temporary loss of benthic food prey items or food chain disruptions. The following table provides a brief description of direct or indirect impacts on the designated Federally managed species and their EFH with respect to their life stage within the designated EFH squares that encompasses the entire project impact area.

As discussed in the Section, there are a number of Federally managed fish species where essential fish habitat (EFH) was identified for one or more life stages within the project impact areas. Fish occupation of waters within the project impact areas is highly variable spatially and temporally. Some of the species are strictly offshore, while others may occupy both nearshore and offshore waters. In addition, some species may be suited for the open ocean or pelagic waters, while others may be more oriented to bottom or demersal waters. This can also vary between life stages of Federally managed species. Also, seasonal abundances are highly variable, as many species are highly migratory.

Table 2 - Direct and Indirect Impacts on Identified EFH Species for Representative Life Stages

MANAGED SPECIES	EGGS	LARVAE	JUVENILES	ADULTS

MANAGED SPECIES	EGGS	LARVAE	JUVENILES	ADULTS
1. Atlantic Salmon *(Salmo salar)*				**Direct Impacts:** Adults are pelagic and highly migratory, therefore no adverse impacts are anticipated. **Indirect Impacts**: Minor indirect adverse effects on food chain through disruption of benthic community, however, salmon are highly migratory
2. Whiting (Merluccius bilinearis)	Eggs are pelagic and are concentrated in depth of 50 – 150 meters, therefore no direct or indirect effects are expected.	Larvae are pelagic and are concentrated in depth of 50 –150 meters, therefore no direct or indirect effects are expected.	**Direct:** Occur near bottom. Physical habitat in borrow site should remain basically similar to pre-dredge conditions. However, some mortality of juveniles could be expected from entrainment into the dredge. **Indirect:** Temporary disruption of benthic food prey organisms.	
3. Red hake *(Urophycis chuss)*	Eggs occur in surface waters; therefore, no direct or indirect effects are expected.	Larvae occur in surface waters; therefore, no direct or indirect effects are expected.	**Direct:** Physical habitat in borrow site should remain basically similar to pre-dredge conditions. However, some mortality of juveniles could be expected from entrainment into the dredge. **Indirect:** Temporary disruption of benthic food prey organisms.	
4. Pollock (Pollachius virens)			**Direct:** Physical habitat in borrow site should remain basically similar to pre-dredge conditions. However, some mortality of juveniles could be expected from entrainment into the dredge. **Indirec**t: Temporary disruption of benthic food prey organisms	
5. Winter flounder (Pseudop*leuronectes americanus*)	Eggs are demersal in very shallow waters of coves and inlets in Spring. Dredging may have some effect on eggs if construction occurs during Spring.	Larvae are initially planktonic, but become more bottom-oriented as they develop. Potential for some to become entrained during dredging in borrow areas.	**Direct:** Physical habitat in borrow site should remain basically similar to pre-dredge conditions. However, some mortality of juveniles could be expected from entrainment into the dredge. **Indirect:** Temporary disruption of benthic food prey organisms	**Direct:** Physical habitat in borrow site should remain basically similar to pre-dredge conditions. **Indirect:** Temporary disruption of benthic food prey organisms.
6. Windowpane flounder *(Scopthalmus*	Eggs occur in	Larvae occur in pelagic	**Direct:** Physical habitat	**Direct:** Physical habitat

MANAGED SPECIES	EGGS	LARVAE	JUVENILES	ADULTS
aquosus)	surface waters; therefore, no direct or indirect effects are expected.	waters; therefore, no direct or indirect effects are expected.	in borrow site should remain basically similar to pre-dredge conditions. However, some mortality of juveniles could be expected from entrainment into the dredge. **Indirect:** Temporary disruption of benthic food prey organisms.	in borrow site should remain basically similar to pre-dredge conditions. **Indirect:** Temporary disruption of benthic food prey organisms.
7. Atlantic Mackerel *(Scomber scombrus*	**Direct Impacts:** Eggs are pelagic, therefore no adverse impacts are anticipated. **Indirect Impacts:** None anticipated	**Direct Impacts:** Larvae are pelagic, therefore no adverse impacts are anticipated. **Indirect Impacts:** None anticipated.	**Direct:** Juvenile mackerel are pelagic species. No significant direct effects anticipated. **Indirect:** Temporary disruption of benthic food prey organisms	**Direct:** Physical habitat in borrow site should remain basically similar to pre-dredge conditions. **Indirect:** Temporary disruption of benthic food prey organisms
8. Atlantic sea herring *(Clupea harengus)*			**Direct:** Occur in pelagic and near bottom. Physical habitat in borrow site should remain basically similar to pre-dredge conditions. However, some mortality of juveniles could be expected from entrainment into the dredge. **Indirect:** None, prey items are planktonic	**Direct:** Occur in pelagic and near bottom. Physical habitat in borrow site should remain basically similar to pre-dredge conditions. **Indirect:** None, prey items are primarily planktonic
9. Monkfish *(Lophius americanus)*	Eggs occur in surface waters with depths greater than 75 ft; therefore, no direct or indirect effects are expected.	Larvae occur in pelagic waters with depths greater than 75 ft; therefore, no direct or indirect effects are expected.		
10. Bluefish *(Pomatomus saltatrix)*			**Direct:** Juvenile bluefish are pelagic species. No significant direct effects anticipated. **Indirect:** Temporary disruption of benthic food prey organisms.	**Direct:** Adult bluefish are pelagic species. No significant direct effects anticipated. **Indirect:** Temporary disruption of benthic food prey organisms.
11. Long finned squid *(Loligo pealei)*	n/a	n/a	**Direct:** squid tend to be demersal during the day and pelagic at night (Hammer, 2000). There is a potential for entrainment.	
12. Short finned squid *(Illex ilecebrosus)*	n/a	n/a		
13. Atlantic butterfish *(Peprilus tricanthus)*	**Direct Impacts:** Eggs are pelagic, therefore no adverse impacts are anticipated.	**Direct Impacts:** Larvae are pelagic, therefore no adverse impacts are anticipated. **Indirect Impacts:** None anticipated.	**Direct:** Juvenile butterfish are pelagic species. No significant direct effects anticipated. **Indirect:** Temporary	**Direct:** Physical habitat in borrow site should remain basically similar to pre-dredge conditions. Adults should be capable of

MANAGED SPECIES	EGGS	LARVAE	JUVENILES	ADULTS
	Indirect Impacts: None anticipated.		disruption of benthic food prey organisms.	relocating during impact. **Indirect:** Temporary disruption of benthic food prey organisms.
14. Summer flounder *(Paralicthys dentatus)*			**Direct:** Physical habitat in borrow site should remain basically similar to pre-dredge conditions. However, some mortality of juveniles could be expected from entrainment into the dredge. **Indirect:** Temporary disruption of benthic food prey organisms.	**Direct:** Physical habitat in borrow site should remain basically similar to pre-dredge conditions. **Indirect:** Temporary disruption of benthic food prey organisms.
15. Scup *(Stenotomus chrysops)*	N/a	n/a	**Direct:** Physical habitat in borrow site should remain basically similar to pre-dredge conditions. However, some mortality of juveniles could be expected from entrainment into the dredge. **Indirect:** Temporary disruption of benthic food prey organisms.	**Direct:** Physical habitat in borrow site should remain basically similar to pre-dredge conditions. Adults should be capable of relocating during impact. **Indirect:** Temporary disruption of benthic food prey organisms.
16. Black sea bass *(Centropristus striata)*	N/a		**Direct:** Physical habitat in borrow sites should remain basically similar to pre-dredge conditions. Offshore sites are mainly sandy soft-bottoms, however, some pockets of gravelly or shelly bottom may be impacted. Some mortality of juveniles could be expected from entrainment into the dredge. Some intertidal and subtidal rocky habitat may be impacted due to sand partially covering groins and potential shipwrecks along the shoreline. **Indirect:** Temporary disruption of benthic food prey organisms.	**Direct:** Physical habitat in borrow sites should remain basically similar to pre-dredge conditions. Offshore sites are mainly sandy soft-bottoms, however, some pockets of gravelly or shelly bottom may be impacted. Some intertidal and subtidal rocky habitat may be impacted due to sand partially covering groins and potential shipwrecks along the shoreline. **Indirect:** Temporary disruption of benthic food prey organisms.
17. Sand tiger shark *(Odontaspis taurus)*		**Direct:** Physical habitat in borrow site should remain basically similar to predredge conditions. Mortality from dredge unlikely because embryos are reported up to 39 inches in length (. Therefore, the newborn may be mobile enough to avoid a dredge or placement areas.		

MANAGED SPECIES	EGGS	LARVAE	JUVENILES	ADULTS
		Indirect: Temporary disruption of benthic food prey organisms and food chain within borrow and placement sites.		
18. Ocean quahog *(Artica islandica)*	n/a	n/a		
19. Spiny dogfish *(Squalus acanthias)*	n/a	n/a		
20. King mackerel *(Scomberomorus cavalla)*	**Direct Impacts:** Eggs are pelagic, therefore no adverse impacts are anticipated. **Indirect Impacts:** None anticipated.	**Direct Impacts:** Larvae are pelagic, therefore no adverse impacts are anticipated. **Indirect Impacts:** None anticipated.	**Direct Impacts:** Juveniles are pelagic, therefore no adverse impacts are anticipated. **Indirect Impacts:** Minor indirect adverse effects on food chain through disruption of benthic community, however, mackerel are highly migratory.	**Direct Impacts:** Adults are pelagic and highly migratory, therefore no adverse impacts are anticipated. **Indirect Impacts:** Minor indirect adverse effects on food chain through disruption of benthic community, however, mackerel are highly migratory.
21. Spanish mackerel *(Scomberomorus maculatus)*	**Direct Impacts:** Eggs are pelagic, therefore no adverse impacts are anticipated. **Indirect Impacts:** None anticipated.	**Direct Impacts:** Larvae are pelagic, therefore no adverse impacts are anticipated. **Indirect Impacts:** None anticipated.	**Direct Impacts:** Juveniles are pelagic, therefore no adverse impacts are anticipated. **Indirect Impacts:** Minor indirect adverse effects on food chain through disruption of benthic community, however, mackerel are highly migratory.	**Direct Impacts:** Adults are pelagic and highly migratory, therefore no adverse impacts are anticipated. **Indirect Impacts:** Minor indirect adverse effects on food chain through disruption of benthic community, however, mackerel are highly migratory.
22. Cobia *(Rachycentron canadum)*	**Direct Impacts:** Eggs are pelagic, therefore no adverse impacts are anticipated. **Indirect Impacts:** None anticipated.	**Direct Impacts:** Larvae are pelagic, therefore no adverse impacts are anticipated. **Indirect Impacts:** None anticipated.	**Direct:** Cobia are pelagic and migratory species. No significant direct effects anticipated. **Indirect:** Temporary disruption of benthic food prey organisms.	**Direct:** Cobia are pelagic and migratory species. No significant direct effects anticipated. **Indirect:** Temporary disruption of benthic food prey organisms.
23. Dusky shark *(Charcharinus obscurus)*		**Direct:** Physical habitat in borrow site should remain basically similar to predredge conditions. Mortality from dredge unlikely because embryos are reported up to 3 feet in length (McClane, 1978). Therefore, the newborn may be mobile enough to avoid a dredge or placement areas. **Indirect:** Temporary disruption of benthic food prey organisms and food chain within borrow and placement sites.		
24. Sandbar shark *(Charcharinus plumbeus)*		**Direct:** Physical habitat in borrow site should remain basically similar to pre-dredge conditions. However, some mortality of larvae	**Direct:** Physical habitat in borrow site should remain basically similar to pre-dredge conditions. Juveniles are mobile and are	**Direct:** Physical habitat in borrow site should remain basically similar to pre-dredge conditions. Adults are highly mobile and are

MANAGED SPECIES	EGGS	LARVAE	JUVENILES	ADULTS
		may be possible from entrainment into the dredge or burial in nearshore, but not likely since newborns are approx. 1.5 ft in length (pers. conv. between J. Brady-USACE and H.W. Pratt-NMFS) and are considered to be mobile. **Indirect:** Temporary disruption of benthic food prey organisms and food chain within borrow and placement sites.	capable of avoiding impact areas. **Indirect:** Temporary disruption of benthic food prey organisms and food chain within borrow and placement sites.	capable of avoiding impact areas. **Indirect:** Temporary disruption of benthic food prey organisms and food chain within borrow and placement sites.
25. Tiger shark *(Galeocerdo cuvieri)*		Physical habitat in borrow site should remain basically similar to pre-dredge conditions. Mortality from dredge or fill placement unlikely because newborn are reported up to 1.5 feet in length (McClane, 1978). Therefore, the newborn may be mobile enough to avoid a dredge or placement areas. **Indirect:** Temporary disruption of benthic food prey organisms and food chain within borrow and placement sites.		
26. Little Skate			**Direct:** Juvenile skate are pelagic species. No significant direct effects anticipated. **Indirect:** Temporary disruption of benthic food prey organisms.	**Direct:** Physical habitat in borrow site should remain basically similar to pre-dredge conditions. Adults should be capable of relocating during impact. **Indirect:** Temporary disruption of benthic food prey organisms.
27. Winter Skate			**Direct:** Juvenile butterfish are pelagic species. No significant direct effects anticipated. **Indirect:** Temporary disruption of benthic food prey organisms.	**Direct:** Physical habitat in borrow site should remain basically similar to pre-dredge conditions. Adults should be capable of relocating during impact. **Indirect:** Temporary disruption of benthic food prey organisms.

*Sharks are neonate = larvae

Of the 27 species identified with Fishery Management Plans, the proposed project could have immediate direct impacts on habitat for winter flounder eggs and larval stages and entrainment of juvenile black sea bass, whiting, red hake, pollock, winter flounder, windowpane, atlantic sea herring, long finned squid, summer flounder, and scup. This is attributable to the benthic or demersal nature of these species and their affected life stages. However, the affect on benthic food-prey organisms present in the borrow areas and sand placement areas is considered to be temporary as benthic studies have demonstrated recolonization following dredging operations within 13 months to 2 years. Minor elevation differences resulting from dredging may even serve to enhance bottom habitat for a number of these species.

Published information on life history and habitat requirements for EFH-designated species or life history stages that were not collected in bottom trawl surveys of the borrow areas was compiled in order to provide a more complete listing of species to include in this assessment. Based on this information the following EFH-designated species and life history stages were identified as probable occupants of the borrow area:

- Adult scup are often caught over soft, sandy bottoms (Steimle *et al*. 1999a) and most scup occupying Sandy Hook Bay in the summer are young adults (Wilk and Silverman 1976);
- Adult butterfish are common in nearshore open coastal areas, including the surf zone, and occur in sheltered bays and estuaries in the mid-Atlantic region during the summer (Cross *et al*. 1999);
- Juvenile and adult Atlantic mackerel (*Scomber scombrus*) are found in bays and estuarine waters from New Jersey to Canada and are common in saline waters of the PROJECT AREA in the spring and fall (Studholme *et al*. 1999);
- Adult Atlantic herring are common in PROJECT AREA in the winter and early spring (Reid *et al*. 1999);
- Adult and early juvenile sandbar sharks (*Charcharinus obscurus*) can occur in shallow, intertidal waters and bear live young in shallow bays and estuaries of the east-central U.S. in the summer (Compagno 1984);
- Juvenile red hake are found in Sandy Hook Bay during the spring and early summer, in much reduced numbers (Able and Fahay 1998) and Reid *et al.* (1979) suggest that juveniles in Long Island Sound prefer silty, fine sand sediments;
- Adult hake occur in the project area during the cooler months (Stone *et al.* 1994) and are abundant in offshore waters of Raritan Bay (Wilk *et al.* 1998);
- Adult Atlantic herring occupy mid-Atlantic continental shelf waters in the winter and early spring;

The species and life history stages that are not believed to occupy the proposed borrow areas are king mackerel juveniles and adults, adult spanish mackerel, adult cobia, and early juvenile dusky shark (*Charcharinus obscurus*). King mackerel (*Scomberomorus cavalla*), cobia, and spanish mackerel are southern species that are near the northern limit of their range and rare in project area. They would therefore be rare in project area and only occur in the warmer months, but are not common in estuarine embayments like RBSHB (Reid *et al*. 1999). Reproducing dusky sharks tend to avoid estuaries (Compagno 1984).

DIETS AND PREY FOR EFH-DESIGNATED SPECIES

Project area

Polychaete annelids and amphipods are primary food items for winter flounder and scup (Table 3). These prey organisms were commonly found in the propose project borrow area offshore surveys conducted in June of 1993, (Appendix). The tube-dwelling polychate *Asabellides oculata* sp., was the most abundant species collected in the June 1993 survey and the second most abundant species collected was *Gammarus lawrencius sp.* Small benthic crustaceans are also an important food source for many EFH designated fish species like windowpane, scup, black sea bass, and red hake. Piscivorous (fish-eating) EFH species like bluefish and summer flounder also have an abundant supply of small forage fish such as bay anchovies (*Anchoa mitchilli*), atlantic menhaden (*Brevoortia tyrannus*), silversides (*Menidia menidia*), and alewives (*Alosa pseudoharengus*) in Project area. These species were commonly caught in bottom trawls in Project area borrow area in 1985-86 (NYSOGS, 1992).

Table 3. Prey Species for Primary EFH-Designated Species

Species	**Life Stage**	**Principal Prey**	**Source**
Bottom Feeders			
Winter Flounder	J, A	Polychaetes, amphipods, (*Ampelisca abdita*) and small crustaceans (*Crangon*), sand dollars, and bivalves	Pereira et al. (1999)
Windowpane	J,A	Small crustacean, (mysids, decapod shrimp) and fish larvae	Chang et al. (1999)
Pollock	J,A	Benthic invertebrates: decapod crustaceans polychaetes, amphipods, pandalid shrimp	Fahay et al. (1999)
Sandbar shark	J,A	Small bottom fishes, small mollusks and crustacean	Compagno (1984)
Winter skate	J	Polychaetes and amphipods are the most important prey items, followed by decapods, isopods, bivalves and fish	Packer et al. (2003)
Winter skate	A	Polychaetes and amphipods are the most important prey items, followed by decapods, isopods, bivalves and fish.	Packer et al. (2003)
Little skate		Invertebrates: decapod crustaceans and amphipods are the most important prey items, followed by polychaetes. Isopods, bivalves, and fishes are of minor importance	Packer et al. (2003)
Little skate	J	Invertebrates: crustaceans and amphipods are the most important prey items for the little skate, followed by polychaetes. Isopods, bivalves, and fishes are of minor importance	Packer et al. (2003)

Bottom and Pelagic Feeders			
Summer flounder	J	YOY (<100mm) polychaetes, small crustaceans. Older juveniles same plus small fish	Packer et al. (1999)
Summer flounder	A	Crustaceans, bivalves, marine worms, sand dollars, hydroids & variety of fish	Packer et al. (1999)
Scup	J	Polychaetes, amphipods, small crustaceans, small mollusks, fish eggs and larvae	Steimle et al. (1999)
Scup	A	Small crustacean, polychaetes, mollusks, small squid, hydroids, sand dollars, and small fish	Steimle et al. (1999)
Black sea bass	J	Small crustacean (isopods, amphipods, small crab sand shrimp, copepods, mysids) and small fish	Steimle et al. (1999)
Black sea bass	A	Crabs, mysids, polychaetes, caridean shrimp, and small bait fish	Steimle et al. (1999)
Red hake	J	Polychaetes and small benthic & pelagic crustaceans (decapods, shrimp, crabs, mysids, euphausids, and amphipods	Steimle et al. (1999)
Atlantic salmon	A	Variety of fish, including some that are bioluminescent. smolts eat zooplankton (euphasids, amphipods, decapods, etc.); at sea the diet consisting primarily of sand lance, herring, capelin and shrimp.	Atlantic salmon unlimited
Pelagic Feeders			
Whiting	J	Crustaceans, other small fish (mackerel, menhaden and squid)	Morse et al. (1999)
Bluefish	J	Polychaetes and crustaceans but mainly a variety of fish species	Fahay (1999)
Bluefish	A	Variety of fish species	Fahay (1999)
Butterfish	J,A	Zooplankton	Cross et al. (1999)
Atlantic herring	J,A	Zooplankton	Reid et al. (1999)
Atlantic mackerel	J	Small crustaceans (copepods, amphipods, mysids shrimp, and decapod larvae.	Studholme et al. (1999)
Atlantic mackerel	A	Small crustaceans (copepods, amphipods, mysids shrimp, and decapod larvae, also squid and a variety of fish species.	Studholme et al. (1999)
King mackerel	J,A	A variety of pelagic fish species	Godcharles and Murphy (1983)
Spanish mackerel	J,A	A variety of pelagic fish species	Godcharles and Murphy (1983)
Cobia	J,A	Variety of fish, squid, and crustaceans	National Audubon Society (1983)
Longfin squid	J	Crustaceans, small fish, and even smaller members of it's own species.	Cargnelli *et al.* 1999

A – Adult J – Juvenile

Potential Direct/Indirect Impacts, Cumulative, and Mitigation

Dredging and placement activities in the project area are not expected to have any significant or long-term lasting effects on the "spawning, breeding, feeding, or growth to maturity" of the designated EFH species that occupy the borrow areas. However, the proposed activity would have immediate, short-term, direct and indirect impacts on EFH for some of the designated fish species and life history stages that occur in the immediate vicinity of the borrow and placement areas. This section identifies the direct and indirect impacts that could result from dredging and makes recommendations for minimizing these impacts.

Direct Impacts

Due to the mobility of larger fish, direct impacts from suction dredging and placement would be limited to eggs, larvae, small fish, and benthic invertebrates which would be removed by the dredge. The EFH designated species most likely to suffer mortality from dredging are juvenile winter flounder and windowpane. Mortality of young-of-the-year (YOY) juvenile windowpane and winter flounder would be highest in the spring, just after they settle to the bottom and metamorphose. During that time of year, YOY juveniles are <50 millimeters (mm) long and not capable of avoiding a suction dredge. Mortalities of small flounder would be minimized if dredging was restricted to the fall (October-December), after they are larger and start to move into deeper water (Pereira *et al*. 1999) and would be less plentiful on shallow borrow areas. Dredging in the fall would also minimize any possible impacts on pelagic fish eggs and larvae produced by EFH-designated species since most of them spawn in the spring.

Unlike any of the other EFH-designated species winter flounder deposit their eggs on the bottom in nearshore waters in depths of 1 to 15 ft on mud, sand, and gravel substrates along the Atlantic coast of New York during the winter (peak spawning in February and March) (Pereira *et al.* 1999). There is a high probability that dredging on borrow areas in the winter would cause the mortality of winter flounder eggs. If dredging was restricted to the fall October- December), any risk of removing winter flounder eggs would be eliminated. Borrow pits left behind after dredging ceases would eventually provide good spawning habitat for winter flounder since the sand that would accumulate in them is substrate for eggs.

Indirect Impacts

As a result of sand removal (suction dredging) and placement of the material, the most immediate, indirect effect on EFH areas would be the loss of benthic invertebrate prey species. Small motile and sedentary epifaunal species (*e.g.*, small crabs, snails, tube-dwelling amphipods), and all infaunal species (*e.g.*, polychaetes), would be most vulnerable to suction dredging and burial.

The EFH-designated species most vulnerable to the loss of prey organisms are winter flounder, windowpane, scup, and black sea bass. Winter flounder are obligate bottom feeders, preying primarily on infaunal polychaetes and tube-dwelling amphipods. The removal of benthic prey organisms will affect them more directly than any other EFH species. Windowpane have larger mouths than winter flounder and feed primarily on small crustaceans (*i.e.*, mysid and decapod shrimp) and fish larvae. These are motile prey organisms that live in the water column or near the bottom and could, to some extent, avoid being removed by the dredge. Scup and black sea bass feed on a variety of benthic infaunal and epifaunal organisms that would be affected by dredging. The immediate impact of prey removal would be negligible since bottom feeding EFH species would re-locate to nearby areas with intact benthic food resources. It would also be a temporary condition, lasting only as long as it takes for benthic organisms to re-colonize the dredged area. In addition, the dislocation of some benthic prey organisms into the water column by the dredge will attract fish to the area to feed (Brinkhuis 1980).

The removal of sand leaves a depression or hole (borrow pit) in the sea floor that can persist for years. The rate at which borrow pits fill up will depend on the amount of sediment that is available and the direction and strength of currents in the area. Borrow pits can modify the habitat for benthic, bottom-feeding fishes since they are deeper than the surrounding sea floor and act as traps for fine grained sediments. Accumulation of mud can cause a change in benthic community structure that favors certain species of fish. Also, if circulation of bottom water in the pits is reduced, DO can fall to low enough levels (<2-3 ppm) that fish will avoid them all together. High organic contents of mud accumulating in pits could also cause oxygen depletion.

Studies performed in the Lower Bay of New York Harbor have shown that benthic community structure is disrupted by dredging, but can reach a new equilibrium fairly rapidly. Cerrato and Scheier (1984) found that the borrow pits on the West Bank of the Ambrose Channel had distinctly different habitats from a nearby undredged control site. The benthic fauna at the control site was more diverse (*i.e.*, more species) and, in general, more stable (less susceptible to seasonal shifts in species composition and abundance) through time, whereas there were fewer species in the borrow pits, but some of them were very abundant. In a related study, Conover *et al.* (1985) found that fish, including some EFH-designated species, were actually more abundant in borrow pits. Of the EFH designated species, butterfish (mostly juveniles) were more abundant in the borrow pits, as were winter flounder (in the fall). Red hake were more abundant in one of the borrow pits and the largest catches of windowpane were made in one of the pits in the spring. Summer flounder were generally more abundant in the borrow pits.

In addition, Conover *et al.* (1985) also examined the stomach contents of winter flounder in the three sampling sites and related them to benthic populations identified by Cerrato and Scheier (1984). The results indicated that, despite changes in the species composition of benthic communities after dredging, the feeding success of winter flounder in the pits was not affected. Winter flounder, like many other bottom-feeding species, are selective feeders that adapt their diets to whatever prey species are readily available. These results suggest that the feeding success of other bottom-feeding EFH species is also likely to not be affected by changes in benthic community structure caused by dredging.

The degree to which water quality is degraded, or temperature and salinity changes in borrow pits depends on the depth of the pit, the circulation of water through the pit, and the amount of fine sediment and organic matter that accumulates in the pit. Conover *et al*. (1985) determined that summer water temperatures tended to be lower in borrow pits and salinities consistently higher (generally by 1-3 ppt, but by 7.3 ppt in January). More importantly, DO concentrations measured between June and November did not vary between sites.

Bottom currents along the project area shore are strong, thus it is likely that DO levels near the bottom of borrow pits in project area would not be reduced, There is, in fact, so much sand that is transported west along the outer New York coast that any hole created by dredging would fill in naturally within a very short time. If fine sediments accumulate in them, the benthic invertebrate community will change from a sand-dominated to a mud-dominated fauna. However, as long as water quality is not degraded, there would be no adverse impact on EFH. In fact, if summer water temperatures in borrow pits are lower than on adjacent shoal areas, EFH might be improved. Monitoring of DO levels in borrow pits would indicate whether or not remedial action needs to be taken to improve habitat quality. Limiting the depth to which dredging would proceed and/or filling the borrow pits, partially or totally, with clean fill when oxygen concentrations drop to unacceptable levels after dredging would reduce the possibility of DO concentration levels falling below 2-3 ppm.

Cumulative Impacts

Given the growth capacity of EFH-designated fish populations within project borrow area and the expected recolonization rates of benthic prey species, there would be no expected cumulative effects from dredging of the borrow area. Cumulative impacts can be avoided by dredging at times of year when EFH-designated species are not spawning.

The cumulative impacts on Essential Fish Habitat (EFH) are not considered significant. Like the benthic environment, the impacts to EFH are temporary in nature and do not result in a permanent loss in EFH. The borrow sites proposed for this project do not contain prominent shoal habitat features, wrecks and reefs, or any known hard bottom features that could be permanently lost due to the impacts from dredging. These types of habitat were avoided through careful site selection and coordination with fishery resource agencies. Some minor and temporary impacts would result in a loss of food source in the affected areas with each periodic nourishment. This impact would affect demersal or bottom-feeding EFH species such as summer flounder and windowpane. Cumulative losses of EFH can be avoided by not dredging deep holes, and leaving similar sandy substrate (w/ 3 feet of sand or more) for recruitment.

It should be noted, however, that some fishery habitat might be slightly impacted over time in the nearshore area. As previously discussed, 17 nearshore groins will be rehabilitated and 4 new groins will be constructed along with the extension of the terminal groin 58 which will provide some form of hard structure for fish habitat. These targets could be impacted over time as the construction template stabilizes into the design template to meet existing conditions. This is accomplished through the migration of sand from the placement site seaward. This migration of sand has the potential to cover part, or all of any hardened structure within the nearshore area. It is anticipated that these impacts would be minor and would most likely only result in an accumulation of sand around the bottom of any given structure.

Steps taken to minimize impacts during construction are also fairly standard among the District's beach restoration projects. Dredging windows are employed when necessary, dredging is conducted in a manner to avoid creating deep pits, dredging locations within borrow areas are rotated when possible to reduce impacts, buffer areas are established around cultural targets within borrow areas, and borrow areas are chosen to minimize impacts to shellfish and fisheries resources. With the inclusion of these measures in all projects, cumulative impacts for the District activities are expected to be minimized to the greatest extent possible.

Monitoring

The District plans to conduct a biological monitoring program (BMP) to evaluate the effects of dredging clean sand for flood control/shoreline stabilization construction activities for five years. The offshore area to be evaluated is the borrow area (Figure 2) and it will be compared to the 1994 date collected as well as comparing the date to East Rockaway benthic date. The offshore and nearshore components will focus on benthic infauna, grain size, and water quality. The following provides a brief outline of the District's proposed BMP for the offshore borrow areas in the project area. A more detailed plan will be developed prior to implementation.

The collection of benthic fauna is scheduled to occur every spring and fall for five continuous years: one year of pre-construction, one year during construction, and three years of post construction. The BMP will involve establishing fifty evenly-spaced sampling stations in the borrow area. Prior to the initial sampling events, Differential Georeferenced Positioning System (DGPS) coordinates will be established to ensure that subsequent sampling events will be conducted at the same locations. At each benthic station, water quality will be collected (at the bottom, mid-depth, and surface) and one benthic and grain size sample will be collected using a ¼ cubic yard Smyth-MacIntyre spring-loaded benthic grab. Each benthic sample will be preserved in a 10% formaldehyde solution and shipped to a pre-approved laboratory for analysis. The laboratory will sort, identify, weigh, and numerate species to the lowest practicle identification level (LPIL). Grain size samples will be analyzed to determine the percentage of sand, silt, and clay.

Appendix

Plan Sheets

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DEPARTMENT OF THE ARMY
NEW YORK DISTRICT, CORPS OF ENGINEERS
JACOB K. JAVITS FEDERAL BUILDING
NEW YORK, N.Y. 10278-0090

REPLY TO
ATTENTION OF
Environmental Analysis Branch

August 12, 2013

Mr. Christopher Boelke
Field Office Supervisor
NOAA/NMFS/Habitat Conservation Division
55 Great Republic Drive
Gloucester, MA 01930-2276

Subject: **Atlantic Coast of Long Island, Jones Inlet to East Rockaway Inlet, Long Beach Island, New York Storm Damage Reduction Project**

Dear Mr. Boelke:

With the passage of the Hurricane Sandy Disaster Relief Appropriations Act of 2013 (Public Law 113-2), the U.S. Army Corps of Engineers has been given the authority and funding to complete ongoing coastal storm damage risk reduction projects and studies in the Northeast. As part of the planning and implementation process for the Atlantic Coast of Long Island, Jones Inlet to East Rockaway Inlet, Long Beach Island, New York, Storm Damage Reduction Project, the New York District will be updating prior engineering and design efforts, physical surveys, and environmental compliance.

Your office last reviewed and concurred on an Essential Fish Habitat (EFH) report for the above project in accordance with the Magnuson-Stevens Act, as amended by the Sustainable Fisheries Act of 1996 (PL 104-267) in September 2005. This letter is a request for your office to provide an update to the original EFH assessment. Please find attached the updated plans and specifications and project description for your review. The District recognizes your heavy workload and appreciates your prompt response to the project description and the required funding to complete your reassessment. Please review the information and provide any comments regarding any new potential project impacts on Essential Fish Habitat.

I look forward to working with you and your staff on this effort. If you should have any questions, please contact Mr. Robert J. Smith of my staff at 917 790-8729.

Sincerely,

Leonard Houston
Chief, Environmental Analysis Branch

Attachments

APPENDIX H

ENVIRONMENTAL COMPLIANCE STATEMENT

Environmental Compliance

Federal Policies	Compliance
Abandoned Shipwreck Act of 1987	Full
Archaeological and Historic Preservation Act of 1979, as amended	Full
CBRA	Ongoing
Clean Air Act OF 1977, as amended	Full
Clean Water Act of 1977, as amended	Full
Coastal Zone Management Act of 1972, as amended	Full
Endangered Species Act of 1973, as amended	Full
Estuary Protection Act (PL 90-454)	N/A
Federal Water Project Recreation Act, as amended	N/A
Fish and Wildlife Coordination Act 0f 1958, as amended	Ongoing
Floodplain Management (E.O.11988)	N/A
Gateway National Recreation Area 1972 Legislation	N/A
Land and Water Conservation Fund Act of 1965, as amended	Full
Marine Protection, Research and Sanctuary Act of 1969, as amended	N/A
National Environmental Policy Act of 1969, as amended	Full
National Historic Preservation Act of 1966, as amended	Ongoing
Rivers and Harbors Appropriation Act of 1899, as amended	N/A
Toxic Substances Control Act (PL-94-469), as amended	N/A
Watershed Protection and Flood Prevention Act, as amended	N/A
Wild and Scenic River Act, as amended	N/A

Executive Orders, Memoranda

Protection of Wetlands (E.O. 11990)	Full
Environmental Effects Abroad of Major Federal Actions (E.O. 12114)	N/A
Impacts Upon Prime and Unique Farmlands (CEQ Memo 8-30-76)	N/A
Protection and Enhancement of the Cultural Environment (E.O. 11593)	N/A

APPENDIX I

PROJECT MAILING LIST

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Field Supervisor
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Long Island City NY 11101
Hunters Point Plaza

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Office of the Nassau County Executive
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Ruth Pierpont
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Recreation & Historic Preservation
Historic Preservation
Field Services Bureau
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Greg Bunker
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Bowler, WI 54416

APPENDIX J

NOAA BA APPENDIX

U.S. ARMY CORPS OF ENGINEERS
NEW YORK DISTRICT

BIOLOGICAL ASSESSMENT FOR: THE POTENTIAL IMPACTS TO FEDERAL ENDANGERED AND THREATENED SPECIES FROM BEACH NOURISHMENT PROJECTS UTILIZING THE LONG BEACH OFFSHORE BORROW AREA: LONG BEACH, NEW YORK

February 2014

TABLE OF CONTENTS

1.0 INTRODUCTION

This Biological Assessment (BA) is submitted to the National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NMFS) by the U.S. Army Corps of Engineers (USACE)-New York District (District) as part of the formal consultation process under Section 7 of the Endangered Species Act (ESA), as amended November 10, 1978. As a result of the severe impacts of Hurricane Sandy (October 29, 2012) in the District's Area of Responsibility (AOR), Congressional funding was provided to several authorized but unconstructed projects, leading to accelerated schedules of many projects. This BA assesses the potential impacts to threatened and endangered species from one of the authorized but unconstructed proposed projects: The Atlantic Coast of New York, Jones Inlet to East Rockaway Inlet, Long Beach Island, New York Coastal Storm Risk Management Project (Long Beach).

This project is a congressionally authorized Federal project lead by the District and sponsored by the New York State. The project proposes to nourish the beach using sand from the Long Beach Offshore Borrow Area (LBOBA) located approximately 1.5 miles south of Long Beach Island, NY. The project also proposes to construct and repair groins along the shoreline, and ultimately aims to reduce damages from storm events.

Section 7 of the ESA requires that a BA be prepared for all major Federal actions when a federally listed or proposed endangered or threatened species may be affected. In 1995, a BA for whales and sea turtles was completed for similar beach nourishment projects on the South Shore of Long Island and the northern New Jersey (NJ) shore, including Long Beach. The purpose of this BA is to: address potential impacts to the Atlantic sturgeon, which was recently listed under the ESA (Federal Register Vol 77, No. 24, Monday February 6, 2012; 50 CFR Part 224); to update the existing beach nourishment consultation to include the Long Beach project for listed sea turtles and whales; and to acknowledge the change to the listing of loggerhead sea turtles[1].

2.0 PROJECT BACKGROUND AND GENERAL DESCRIPTION OF THE PROJECT

Since the 1950's, USACE has been involved in the construction of shore protection projects (USACE-ERDC 2007). The impacts of Hurricane Sandy resulted in severe damage to the coastline, including the area covered by the project discussed in this BA, thereby increasing the risks and vulnerability of the shore communities from future storm events (ASA 2013). In response and with the aid of the Disaster Relief Appropriations Act of 2013 (DRAA), the USACE has accelerated the schedules of many authorized coastal storm risk management projects, including Long Beach.

This assessment covers one project in New York: Long Beach. The project proposes to dredge sand from a borrow area for placement on the shoreline, and would construct and rehabilitate hard structures along the shoreline.

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[1] *On March 16, 2010, NOAA published a proposed rule to list two distinct population segments (DPS) of loggerhead sea turtles as threatened and seven distinct population segments of loggerhead sea turtles as endangered (75 FR 12598). On September 16, 2011, a final listing determination was made designating the Northwest Atlantic Ocean DPS, South Atlantic Ocean DPS, Southeast Indo-Pacific Ocean DPS, and the Southwest Indian Ocean DPS as threatened. The Northeast Atlantic Ocean DPS, Mediterranean Sea DPS, North Indian Ocean DPS, North Pacific Ocean DPS, and South Pacific Ocean DPS have been designated as endangered (76 FR 58868). The listing became effective October 24, 2011, at which time, the species of loggerhead likely to be present in the action area went from globally listed threatened loggerhead, to the threatened Northwest Atlantic distinct population segment of loggerhead.*

2.1 LONG BEACH, NY

The District is proposing to implement a coastal storm risk management project designed to restore the shoreline and provide shoreline protection features against wave attack and inundation for homes and businesses on Long Beach Island, a barrier island located between Jones Inlet and East Rockaway Inlet, in Nassau County, New York (Figure 1). The Long Beach barrier island is approximately 10 miles long and varies in width from 1,500 to 4,000 ft. The island is separated from the mainland by bays. The Project area covers approximately 6.4 miles, of the Long Beach barrier island and includes the developed community of Point Lookout and adjacent beaches owned by the Town of Hempstead, which includes Nassau Beach, Lido Beach and the City of Long Beach.

Significant beach erosion and deterioration of protective coastal structures has occurred along the densely populated southern coast of Long Beach Island, and erosion has reduced the width of the protective beachfront, exposing properties to a high risk of damage from ocean flooding and wave attack. Over time, the area has experienced significant sand loss (USACE 1998 and 2004). Existing groins and jetties along the island have deteriorated and are becoming less effective at reducing sand loss along the shoreline and providing wave protection. Continuation of the trend in sand loss will increase the potential for economic losses and threat to human health and safety (USACE 1998, 2004b). A Final Environmental Impact Statement (EIS) for the project was completed in February 1995, with a Record of Decision (ROD) issued in January 1999. A supplemental Environmental Assessment is underway to address minor changes in the project since the EIS was developed. A separate Biological Assessment will be provided to the US Fish and Wildlife Service to address potential impacts of this project to land based species, including the piping plover and seabeach amaranth.

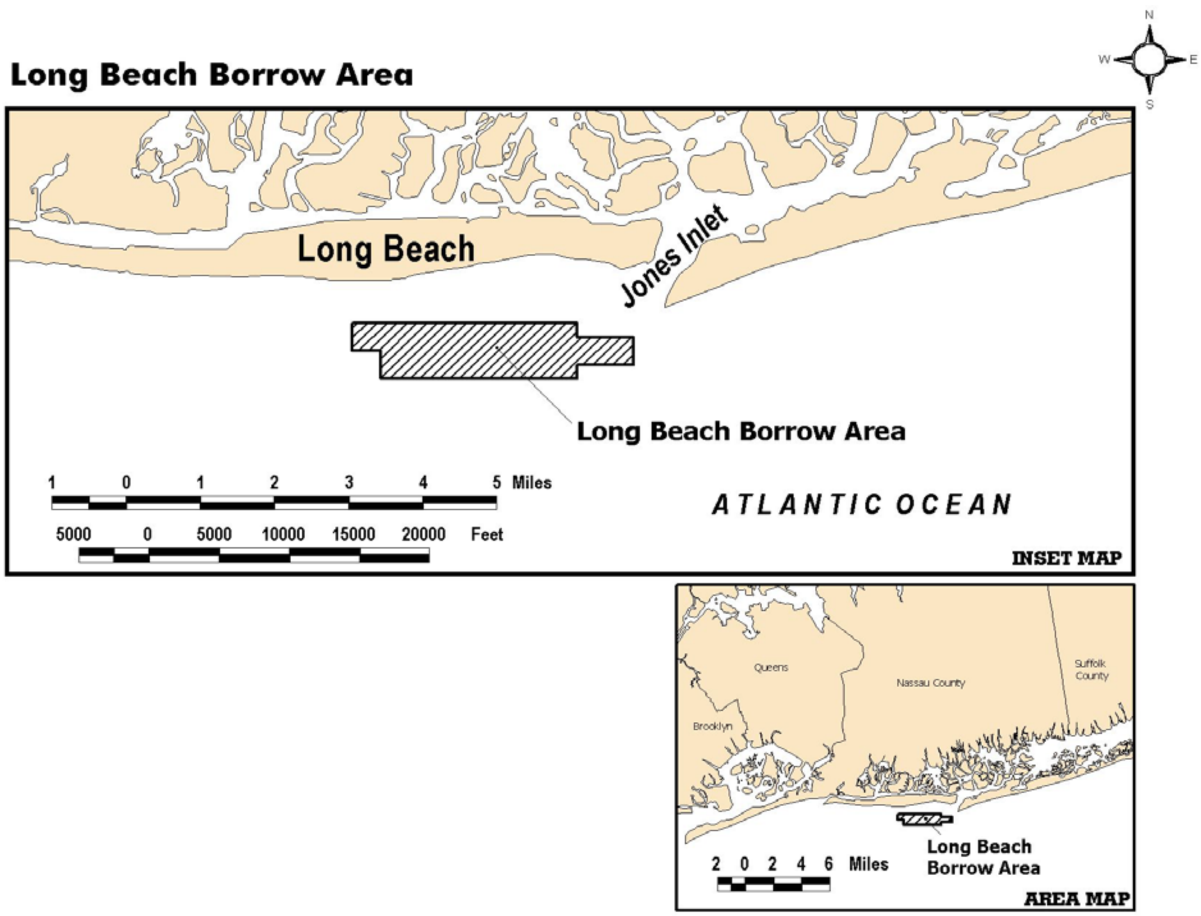

Figure 1: Location of the Long Beach Island Barrier Island and proposed Long Beach Offshore Borrow Area.

The proposed project includes beach nourishment, and combines new construction features with the modification of existing structures (Table 1). At the time this document was developed (November 2013), the construction award for this project was anticipated to be early October 2014, with construction starting in November 2014 and ending in approximately March of 2019; however, the schedule and project duration could change based on contractual issues, inclement weather, equipment failures or other unforeseen circumstances. Based on initial recommendations from USFWS, construction activities would be restricted to September 1 through April 15 to avoid direct adverse impacts to threatened shorebirds.

Construction Feature	Total Number/ Total Volume	Area Construction to Take Place

Beach fill material (for creation of beach berm, sand barrier and a dune)	35,000 linear feet	Typical Scenario: Pumping of sand on to berm area; Spreading of sand mainly on land
Borrow area sand removal (i.e., total sandfill quantity, excluding 5-year renourishments)	4,720,000 cubic yards	Dredging to occur in water at the borrow area; transport of material via dredge to pump-out location near shoreline
Dune plantings	34.0 acres	On land
Sand fence	75,000 linear feet	On land
Timber dune walkover ADA	17	On land
Timber non-ADA walkovers	29	On land
Timber vehicle and pedestrian access from boardwalk	2	On land
Extension of existing walkovers	8	On land
Gravel surface combined vehicular and pedestrian access	9	On land
5-yr renourishment over 50 years	1,770,000 cubic yards every 5 years	Dredging to occur in water at the borrow area; transport of material via dredge to pump-out location near shoreline
Rehab and 100 ft Extension of terminal groin	1	Depends on method contractor chooses. Method could be in water or on top of existing groin structure.
New groins	4 (6 proposed, but 2 have been deferred)	Depends on method contractor chooses. Method could be in water or on top of existing groin structure.
Rehabilitation of existing groins	17	Depends on method contractor chooses. Method could be in water or on top of existing groin structure.

Table 1: Proposed Construction Features of the Long Beach Coastal Risk Management

The following construction features from Table 1 have the potential to impact marine based endangered species and will therefore be discussed in more detail. Construction of the remaining features described in Table 1 would occur completely on land, and construction equipment is not anticipated to have any impacts on the surrounding Bay or Atlantic Ocean, where endangered turtles, sturgeon or whales may occur in the project area.

- <u>Beach fill material for creation of beach berm, sand barrier and a dune:</u>
- Material would be collected via a hopper dredge from an offshore borrow area located approximately 1.5 miles south of Long Beach Island (Figure 1, "Long Beach Borrow Area"). The borrow area is approximately 1,550 acres. Based on a post-Hurricane Sandy survey (2013), approximately 4,720,000 cubic yards (cy) of material would be removed from the borrow area and placed along approximately 35,000 lf of beach extending from approximately the eastern end of the barrier island at Point Lookout to the western boundary of the City of Long Beach, including an incidental taper into East Atlantic Beach.
- The hopper would dredge the material from the borrow area, sail to a pumpout area, and connect to a pumpout barge where it would pump the material from the hopper onto the shoreline via a pipeline. *The hopper dredge would not be equipped with an Unexploded Ordnance (UXO) Screen.* The approximate distance from the borrow area to the pump out station is anticipated to be approximately1.7 miles. The duration of actual dredging at the borrow area would vary depending on the method used by the Contractor, including the number of dredges and size of the dredges. The dredge would vary from medium sized (e.g., the Padre Island and Dodge Island) to a larger sized dredge operating with two drag arms (e.g., The Terrapin Island). There are too many variables involved to predict the exact way in which the Contractor would carry out the sand nourishment operation (i.e., the dredge size or capacity to hold sand; the number of dredges; the distance of the pump-out equipment from shore; the type of pump-out equipment used, etc), including the duration of each segment of the operation (e.g., dredge sand at the borrow area; transport of dredge to the pump-out station; hook-up of dredge to pump-out equipment; and transfer of sand from the dredge to the pump-out equipment for placement on the beach). A beach nourishment project for Keansburg, NJ, which borders Port Monmouth, was recently awarded. Based on this project, and as an example of a construction scenario that may occur for a beach nourishment project, the Contractor has chosen to use one large hopper dredge. In one day, the amount of time the hopper spends dredging at LBOBA is approximately 4-6 hours. It takes the dredge approximately 3-6 hours per day to transport the sand from SBOBA to the pump-out equipment and back to the SBOBA. The remaining time is used for other work associated with the dredging equipment, but does not involved actual movement of the dredge vessel. This other work includes such tasks as: connecting and disconnecting the dredge to the pump-out equipment; and the transfer of sand from the dredge through the pump-out equipment into the project area. Typically, dredging operations occur 24 hours per day, but can vary depending on weather conditions and equipment break-down.
- Re-grading of sand after placement on the beach would occur with equipment such as bulldozers. This equipment may work in the surf zone, having some contact with the water.
- The approximate and typical transit speed during the nourishment projects operating in the New York area are expected to be: 9.8-10.8 mph (8.5-9.4 knots) between the borrow area to Long Beach; and 2-3 mph (1.7-2.6 knots)

while dredging. The area of the borrow area to be impacted by the dredge would be approximately 6 acres, with an average of 8 feet of dredged material to be removed.

  - Beach Renourishment: Material would be collected via hopper dredge from the LBOBA every 5 years or as needed to replenish sand in the project area. It is anticipated that 1,770,000 cubic yards of sand would be needed every 5 years over a 50 year period (see Table 2 for a break-down and summary of total quantities). Construction methods are anticipated to be similar to that described in 1b.-d. above.
  - Groin Rehabilitation: A total of 17 groins are proposed for rehabilitation.
  - Fifteen of the existing 23 groins in the City of Long Beach and 2 groins in Point Lookout would be rehabilitated.
  - The proposed rehabilitation would consist of repositioning existing armor stone and adding additional armor stone along the seaward 100-330 feet of each of the groins. A minimum constructible crest width of approximately 13 ft with side slopes of 1V on 2H is proposed. A primary armor weight of approximately 5 tons would be used in an attempt to match the existing armor.
  - The stone placement method would not be dictated in the contract for the project. It is possible for the Contractor to begin rehabilitation of the groin at the furthest point from the shoreline using a barge and tugboat but not likely or cost effective; alternatively, they may choose to begin construction from the landward side. If the landward side is chosen, typically all construction equipment would be initially placed on land and then on top of the groin to continue building the structure. Potential equipment in both cases could include cranes, front end loaders and dozers. If constructed from the water, a crane mounted barge and excavator with a tugboat could be used to reposition the existing armor and place new stones. Since the stones have to be placed in a precise manner, and to avoid fracturing the rock, the speed of equipment (tugboat/barge, and equipment used to place the stones from land or water) should be minimal. Additionally, since the stones stretch continuously along the groin structure, the barge/tugboat speed would be very slow while relocating to a new position to place new layers of stones.
- Construction of New Groins: A total of seven groins are proposed for construction.
  - Current plans target four groins for immediate construction, whereas the remaining three groins are proposed for deferred construction as needed based on the stability of the existing weldment area. The seven groins would be placed at Point Lookout and would begin 800 feet west of existing Groin 55. The four groins would be constructed with tapered lengths and spaced at an interval of 800 feet. Groin lengths vary and range from 380 ft to 800 ft. Groin widths would be 13 ft.
  - A determination would be made at a later date to construct the three westernmost groins based on the 50-year project life and on monitoring data (USACE 2004b). The criterion for construction includes a change from an accreting beach to an eroding beach in the area where the structures would be located and would be evaluated based upon field measurements and analysis (USACE 2004b).
  - The stone placement method would not be dictated in the contract for the

project. However, construction scenarios would be similar to that described in

- <u>Terminal Groin Rehabilitation and Extension:</u> The terminal groin at Point Lookout (Groin # 58) requires rehabilitation and extension (USACE 2004b). The District proposes to rehabilitate the existing portion of the groin, extend the length an additional 100 feet (currently 200 ft), and extend the width to between 107 and 170 ft (currently widths range from 50 to 107 ft). The median armor weight for the rehabilitated and new portions of Groin #58 is approximately 10 to 10.75 tons (USACE 2004b). The stone placement method would not be dictated in the contract for the project. However, construction scenarios would be similar to that described in 2c.

Through the contracting process, the mechanism in which the project components are built are not dictated by the District to the Contractor. In general, it is up to the Contractor to decide what equipment will be used and when the equipment will be deployed to accomplish the work. However, the District has developed an example of a potential **scenario** for this project, based on the assumption that the groin would be constructed prior to sand placement:

Groin Construction – it is possible that the groin may be constructed prior to sand placement. In this case, starting in March 2014, the District estimates months 1-2 could be utilized for mobilization of equipment and to purchase the stone for the groin structure. Months 24-36 could be used to build the groin structure, with demobilization occurring in month 7.

Dredging of Sand at SBOBA with placement of sand at Port Monmouth (to include sand replenishment at the beach, plus dune and berm construction): Mobilization of equipment could occur in months 6-7, with sand placement, dune and berm construction occurring in months 8-9. It is estimated that it would take approximately 260 days to dredge the material and place at the project site. Month 10 may be used for demobilization of equipment.

In summary, the total amount of beach fill required for the Long Beach project is as follows:

Projected Construction Year	**Estimated Beach Fill Quantity (CY)***	**Source of Sand**
Initial Construction – 2014	4,720,000 cubic yards	Long Beach Offshore Borrow Area
5 Years Post Initial Construction	1,770,000 cubic yards	Long Beach Offshore Borrow Area
10 Years Post Initial Construction	1,770,000 cubic yards	Long Beach Offshore Borrow Area
15 Years Post Initial Construction	1,770,000 cubic yards	Long Beach Offshore Borrow Area
20 Years Post Initial Construction	1,770,000 cubic yards	Long Beach Offshore Borrow Area
25 Years Post Initial Construction	1,770,000 cubic yards	Long Beach Offshore Borrow Area
30 Years Post Initial Construction	1,770,000 cubic yards	Long Beach Offshore Borrow Area
35 Years Post Initial Construction	1,770,000 cubic yards	Long Beach Offshore Borrow Area
40 Years Post Initial Construction	1,770,000 cubic yards	Long Beach Offshore Borrow Area
45 Years Post Initial Construction	1,770,000 cubic yards	Long Beach Offshore Borrow Area
50 Years Post Initial Construction	1,770,000 cubic yards	Long Beach Offshore Borrow Area

TOTAL	22,420,000	

Table 2: Estimated dredged quantities for Long Beach beach fill.
*Quantities based on surveys Post-Sandy (2013) and could be updated prior to construction.

3.0 HISTORY OF HOPPER DREDGING PROJECTS WITH THREATENED AND ENDANGERED SPECIES OBSERVERS

Numerous hopper dredging projects have been completed by the District to deepen or maintain navigation channels, and for borrowing sand to source beach nourishment projects. Table 3 shows a list of completed District hopper dredging projects that had a certified threatened and endangered species observer onboard, as well as recent dredging projects from the New England District (NED). Project and observer data from the NED and District were grouped because sea turtle ecology, including abundance, is regionally similar but distinct from USACE Districts south of NY/NJ. The dredged quantities in Table 3 are based on dredging that occurred during May 1 through November 15[2] during the year(s) of operation. Since the recent 2012 listing of Atlantic sturgeon, the table also includes dredged quantities for the Harbor Deepening Project (HDP) following the October 2012 BO requirement to including monitoring for Atlantic sturgeon take. In the cases where monthly quantities were not available, an average monthly quantity was calculated over the life of the project and multiplied by the number of months that dredging occurred during the turtle season to determine the total dredged quantity. It is important to note that for all the projects monitored in Table 3, only one take of a threatened turtle has ever been recorded for a total of approximately 23.45 million CY dredged from 1993 – 2013.

Project Name or Location	**Year(s) of Operation**	**Project Type**	**Dredged Quantity (CY)**	**Turtle/ Sturgeon Take?**	**UXO Screen?**
Plumb Beach	Oct 2012	Beachfill	130,000	No	No
Monmouth Beach (Contract 3)	Nov 2011-Jan 2012	Beachfill	820,000	No	Yes
S-AM-3a	2011-2012	Channel Deepening	1,906,635	No	Yes
S-AM-3b	2011-2013	Channel Deepening	1,844,840	1 sub-adult Atlantic Sturgeon	Yes
Sandy Hook, NJ	October 2008	Maintenance Channel Dredging	3,138 (this represents one load from channel to HARS)	Sturgeon (species not identified)*	Unknown
S-AM-1, Ambrose Channel	2006 – 2008	Channel Deepening	2,449,038	No	Yes
S-AM-2b, S-AN-1B, Ambrose and Anchorage Channels	2009 – 2010	Channel Deepening	827,615	No	Yes
Buttermilk Channel, NY	2000	Maintenance Channel Dredging	95,000	No	Unknown
Buttermilk Channel, NY	2005	Maintenance Channel Dredging	78,000	No	Unknown
Westhampton, NY	1993	Beachfill	1,455,071	No	No

[2] *Turtles are known to be present in the NY/NJ area from June through October. NMFS monitoring requirements extend from May 1 through November 15.*

Westhampton, NY	1996	Beachfill	2,518,592	No	No
Westhampton, NY	1997	Beachfill	884,571	No	No
East Rockaway, NY	1995	Channel Deepening/ Maintenance	412,000	No	No
East Rockaway, NY	1996	Beachfill	2,685,000	No	No
East Rockaway, NY	2002	Channel Deepening/ Maintenance	140,000	No	No
Sea Bright, NJ	1996	Beachfill	2,058,333	No	Yes
Asbury, NJ	1999 – 2000	Beachfill	1,268,182	No	Yes
Kennebeck River, New England	2003	Maintenance Channel Dredging	57,469	No	No
Kennebeck River, New England	2003	Emergency Channel Dredging	22,310	No	No
Asbury Park, NJ	1997	Beachfill	3,758,333	1 Loggerhead	Yes

Table 3: Hopper Dredging Projects with sea turtle and Atlantic sturgeon take based on dredged quantity in the NY, NJ and New England region.
** Found in turtle cage during dredged material inspection and was noted on the disposal log sheets from Dredged Material Inspectors, who accompany all vessels disposing dredged material at the HARS. Dredging was East of Sandy Hook between coordinates: 40.41087, -73.88474 to 40.41080, -73.88464.*

4.0 SPECIES OF CONCERN: ATLANTIC STURGEON (*Acipenser oxyrinchus oxyrinchus*)

4.1 GENERAL ATLANTIC STURGEON INFORMATION

NMFS has determined that Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*) is comprised of five distinct population segments (DPSs) that qualify as listed species under the ESA: Gulf of Maine (GOM), NY Bight (NYB), Chesapeake Bay (CB), Carolina, and South Atlantic. The Northeast Region of NMFS has listed the GOM DPS as threatened, and the NYB and CB DPSs as endangered. The proposed shore protection project covered in this BA falls within the boundaries of the NYB population, although the marine range for all DPSs extends from Canada to Florida and it is therefore possible that any DPS may be present in/around the project areas.

The 2012 HDP BO (NMFS 2012A) contains a detailed outline of known Atlantic sturgeon life history characteristics and is incorporated by reference in this BA. A summary of the most relevant information to the proposed project is provided in this document.

Atlantic sturgeon are anadromous, spending the majority of their adult phase in marine waters, migrating up rivers to spawn in fresh water and migrating to brackish waters in the juvenile growth phases (Bain 1997).The NYB DPS includes all Atlantic sturgeon whose range occurs in watersheds that drain into coastal waters, including Long Island Sound, the NYB, and Delaware Bay, from Chatham, MA to the Delaware-Maryland border on Fenwick Island. Within this range, Atlantic sturgeon have been documented from the Hudson and Delaware Rivers, at the mouth of the Connecticut and Taunton Rivers, and throughout Long Island Sound, (ASSRT 2007, as cited by USACE-NAP 2011).

There is little information on the behavior of the sturgeon in marine waters (Bain 1997). More recently, attention is being focused on understanding how oceanic habitat is used by migrant Atlantic sturgeon (Dunton et al. 2010, Erickson et al. 2011). By examining five fishery-independent surveys of Atlantic sturgeon, Dunton et al. (2010) determined potential coastal migration pathways for northerly summer and southerly winter migrations. Although Atlantic sturgeon are highly migratory, primary juvenile habitat and migrations are limited to narrow corridors in waters less than 20 m deep (Dunton et al., 2010). A hotspot of juvenile Atlantic sturgeon captures was found in waters less than 20 m along the eastern side of Sandy Hook, NJ and off of Rockaway, NY. The authors suggest that depth restricts movements, aggregations are related to food availability, and movement is triggered by temperature cues.

The Hudson River population of Atlantic sturgeon is one of two U.S. populations for which there is an abundance estimate (approximately 870 spawning adults/year, 600 males and 270 females; Kahnle et al. 2007) and it is considered one of the healthiest populations in the U.S. (ASSRT 2007). The Hudson River is the most significant spawning system within the NYB DPS (Erickson et al. 2011).

Adult females migrate to spawning grounds, which are deep, channel or off-channel habitats within the Hudson River Estuary starting in mid-May (Dovel and Berggren 1983), spawn from May through July or possibly August, and return to marine habitat the following fall (Dovel and Berggren 1983, Van Eenennaam et al. 1996). Mature males are present in the Hudson River from April to November (Dovel and Berggren 1983) and appear at spawning sites in association with females, suggesting they search for females while moving about in the river (Van Eenennaam et al. 1996).

4.2 DISTRIBUTION OF ATLANTIC STURGEON IN AND AROUND THE PROJECT AREA – NEW YORK DISTRICT SURVEYS

As part of a project specific Aquatic Biological Survey (ABS) conducted by the District, there have been several sightings of sturgeon in Upper, Lower and Raritan Bays. From 1998 through 2011, bottom trawl surveys were conducted as part of the HDP from December to June. Throughout the 13-year sampling period, two Atlantic sturgeon were captured (Table 3). The first Atlantic sturgeon was captured in June 2005 at a non-channel station in the Upper Bay. It measured 790 mm total length and presumably was a late juvenile (Table 3). The other Atlantic sturgeon captured in the ABS surveys was 638 mm total length (an intermediate juvenile, Table 3) and was captured in December of 2009 at a channel station in the Lower Bay.

Bottom trawl surveys were also conducted in the fall of 2008 near the approach to Ambrose channel in Lower Bay as part of an investigation of a navigational hazard. Two Atlantic sturgeon were captured in October 2008 (Table 4). The first Atlantic sturgeon measured 1,220 mm and the second measured 1,180 mm.

Another extensive Biological Monitoring Program was conducted by the District for the Atlantic Coast of NJ (USACE-NYD 2001B). A total of 300 tows were made during spring and fall 1995-1999. During this program, only 2 sturgeon were captured.

Observations of Atlantic sturgeon during the District's biological sampling programs and random sightings aboard USACE vessels are summarized in Table 4. Throughout these investigations, only 6 Atlantic sturgeon were observed over 17 years (1995-2011).

Species	**Date**	**Location**	**Length**	**Data Source/Comments**
Sturgeon (species not identified – may be a shortnose or Atlantic)	September 2010	1 1/2 miles south of the Verrazano Bridge and 1/2 mile east of Hoffman Island near coordinate 40.57917, -74.04017	42"- 48" long (estimate)	Injured sturgeon (head injury) spotted by USACE vessel while conducting routine drift patrol
Atlantic sturgeon	December 2009	Lower Bay(chapel hill south channel)	638 mm	HDP ABS program
Atlantic sturgeon	October 2008	Lower Bay near approach to Ambrose Channel (between 40.457833, -73.89633 and 40.46117, -73.90267	1220 mm	Investigation near navigational obstruction
Atlantic sturgeon	October 2008	Lower Bay near approach to Ambrose Channel (between 40.457833, -73.89633 and 40.46117, -73.90267	1180 mm	Investigation near navigational obstruction
Sturgeon (species not identified – likely Atlantic based on habitat requirements)	October 2008	East of Sandy Hook between coordinates: 40.41087, -73.88474 to 40.41080, -73.88464	not recorded	Found in turtle cage during dredged material inspection. Noted on disposal log sheets from Dredged Material Inspectors, who accompany all vessels disposing dredged material at the HARS)
Atlantic sturgeon	June 2005	Port Jersey (east of Liberty Golf Course)	790 mm	HDP ABS program
Sturgeon (species not identified - may be a shortnose or Atlantic)*	October 1998	Port Jersey (adjacent and east of Global Marine Terminal)	not recorded	HDP ABS program

Species	Date	Location	Length	Data Source/Comments
Atlantic sturgeon	1995-1998	Not recorded	Not recorded	Biological Monitoring program, Atlantic Coast of NJ: Asbury Park to Manasquan
Atlantic sturgeon	1995	borrow area (BBA-5), between Belmar and Manasquan	Not recorded	Biological Monitoring program, Atlantic Coast of NJ: Asbury Park to Manasquan

Table 4: Sturgeon observations in and around the New York District's AOR

4.3 FOOD RESOURCES

Overall, sturgeon appear to feed indiscriminately throughout their lives (Bigelow and Schroeder 1953, Vladykov and Greeley 1963, Murawski and Pacheco 1977, van den Avyle 1984, as cited by Gilbert 1989) and are generally characterized as bottom feeding carnivores (Bain 1997). Adult Atlantic sturgeon feed on polychaetes, oligochaetes, amphipods, isopods, mollusks, shrimp, gastropods, and fish (Johnson et al. 1997, Haley 1998, Bigelow and Schroeder 1953, Vladykov and Greeley 1963, Smith 1985b, as cited in Gilbert 1989).

5.0 GENERAL FACTORS THAT MAY AFFECT ATLANTIC STURGEON

As described in Section 4.1, five Distinct Populations Segments (DPS) of Atlantic sturgeon were listed as threatened or endangered under the Endangered Species Act, including a NYB DPS. Known spawning populations for the NYB DPS exist in two rivers: the Hudson and Delaware Rivers. However, since the marine range for all DPSs extends from Canada to Florida, this assessment is applicable to all DPSs. In the Hudson River estuary, spawning, rearing, and overwintering habitats were reported to be intact by Bain (1997), supporting the largest remaining Atlantic sturgeon stock in the U.S., however, a population decline from overfishing has also been observed for this area (Bain 1997, Bain 2001, Peterson et al. 2000).

This section describes the general factors that may affect Atlantic sturgeon, many of which are not relevant to the project assessed in this BA. However, this section is included to demonstrate the variety of threats to Atlantic sturgeon, most of which pose greater challenges to the species than the project assessed in this BA.

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 (ASSRT, 2007, as cited by USACE-NAP 2011). Atlantic sturgeon also exhibit life history characteristics that make them particularly vulnerable to population collapse from overfishing (Boreman 1997, as cited by Bain 1997), 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" (Winemiller and Rose 1992, as cited by Bain 1997). 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 (which is not within the habitat being assessed in this BA). Hydraulic dredges can directly impact sturgeon and other fish by entrainment in the dredge (ASSRT 2007, as cited by USACE-NAP 2011). According to Smith and Clugston (1997, as cited by USACE-NAP 2011), dredging may also impact important habitat features of Atlantic sturgeon if these actions disturb benthic fauna, or alter rock substrates (which does not occur in the project area). 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.

Atlantic sturgeon have been harvested for years. Many authors have cited commercial over-harvesting as the single greatest cause of the decline in abundance of Atlantic sturgeon (Ryder 1890, Vladykov and Greely 1963, Hoff 1980, ASMFC 1990, and Smith and Clugston 1997, as cited in ASSRT 2007 and USACE-NAP 2011). Even though the fishery has been closed coast-wide since 1995, poaching of Atlantic sturgeon continues and is a potentially significant threat to the species, but the magnitude of the impact is unknown (ASSRT 2007, as cited by USACE-NAP 2011).

Although little is known about natural predators of Atlantic sturgeon, there are several documented fish and mammal predators, such as sea lampreys, striped bass, common carp, minnow, smallmouth bass, walleye, grey seal, and fallfish (ASSRT 2007). There are some concerns that predation may adversely affect sturgeon recovery efforts in fish conservation and restoration programs, and by fishery management agencies (Brown et al. 2005, and Gadomski and Parsley 2005, as cited by ASSRT 2007; ASSRT 2007); however, further research is needed.

Atlantic sturgeon may compete with other bottom feeding species for food, although there is "no evidence of abnormally elevated interspecific competition" (ASSRT 2007), and it has been suggested by van den Avyle (1984, as cited by Gilbert 1989) that "non-selective feeding of juvenile and adult sturgeons may reduce the potential for competition with other fish species".

6.0 POTENTIAL PROJECT IMPACTS TO ATLANTIC STURGEON

6.1 POTENTIAL PHYSICAL INJURY AND BEHAVIORAL IMPACTS AT THE LONG BEACH OFFSHORE BORROW AREA

Direct potential impacts linked to dredging at LBOBA include physical injury or mortality of adult or sub-adult Atlantic sturgeon due to drag head strikes, entrainment or vessel strikes. Other direct impacts may include avoidance behavior due to noise disturbance or impacts associated with increased turbidity from re-suspension of sediments. Re-suspension of sediments has the potential to cause respiratory impacts (gill abrasion). There would be no dredging related impacts to spawning activities since the closest known spawning site is in the Hudson River (i.e., km 60 – 148, Dovel and Berggren 1983), which is up-current from the projects and given the substantial spatial buffer, would have no direct impacts to spawning areas.

It is possible for Atlantic sturgeon to be entrained in a dredge via physical contact with a hopper dredge's drag-arm and impeller pumps. A minimum take of 0.6 Atlantic sturgeon per year in the Atlantic and Gulf coasts was estimated based on hopper dredge takes since 1995 and assuming dredging efforts were relatively similar among years (USACE-NYD 2006, as cited by ASSRT 2007). Dickerson (2006, as cited by USACE-NAP 2011) summarized sturgeon takes from Atlantic and Gulf Coast dredging activities conducted by the USACE between 1990 and 2005, which documented takes of 24 sturgeons (2 – Gulf, 11- Shortnose, and 11-Atlantic). The majority of the interactions were with a hopper dredge: sixteen takes with a Hopper dredge; five takes with a cutterhead dredge; and three takes with a mechanical dredge. Fifteen of the sturgeons were reported as mortalities, eight as alive, and one as unknown. These documented takes occurred during dredging operations in rivers and harbors, mainly in waterways along the eastern coast that, from the map in the report, appear to be more narrow than the wide pathways available to Atlantic sturgeon in the Raritan and Lower Bays and Atlantic Ocean off the coast of NJ (i.e., compared to Delaware River, Savannah Harbor, etc). However, the risk still exists for Atlantic sturgeon to become entrained in a hopper dredge during mining of sand at the LBOBA. The LBOBA occupies 0.35%[3] compared with the surrounding area, a small percentage of the open water habitat available for migration. Although dredging would occur in a small area, this area is relatively close to the Rockaway hotspot for juvenile Atlantic sturgeon captures and is potentially within the sturgeon's migratory pathway.

Although the ASSRT (2007) reports that dredging activities impact sturgeon by disrupting spawning migrations and through dredge noise disturbance, it does not clearly state what the cause and rationale are for this threat, or specify the type of dredging equipment; however, this seems more relevant to narrow channels and rivers. In the case of the LBOBA, a noisy underwater environment is typical since dredging activities have been ongoing for over 100 years (e.g., for shore protection, and deepening and maintenance of navigation channels), and constant large vessel ship traffic to and from the NY/NJ Harbor is part of the ambient conditions. Despite a noisy aquatic environment (even greater in the harbor), the Hudson River population of Atlantic sturgeon is considered one of the healthiest populations in the U.S. (ASSRT 2007). Therefore, it would appear that Atlantic sturgeon are still finding and utilizing pathways through the NYB, including the Lower Bay off the coast of Long Beach to reach spawning grounds in the Hudson River. This is likely because the waterways available for migration extending from the mouth of the Hudson River to the marine environment are sufficiently deep enough and wide enough to permit Atlantic sturgeon to avoid potential

[3] *This percentage was calculated based on the following approximate values: LBOBA area of 2.42 square miles (1,500 acres) vs. Raritan Bay area of 61.6 square miles + Lower NY Bay area of 45 square miles + a polygon bordered by Sandy Hook, NJ north to Breezy Point, NY and east to Fire Island, NY of 580 square miles (371,732 acres). Except for the LBOBA, all other values were calculated in Google Earth. Maps of Lower NY Bay and Raritan Bay were outlined based on definition/ maps in Wikipedia.*

dredging-related disturbances, including active dredges and any associated noise, and that long-term impacts to their habitat and food source are not adversely affecting the population.

6.2 POTENTIAL HABITAT IMPACTS AT THE LBOBA

The potential impacts of dredging to Atlantic sturgeon habitat may include loss of habitat, prey resources and water quality changes. If sturgeon are present during changes to water quality this represents a direct impact while changes to depth, sediment type and prey resources are secondary.

At the LBOBA, there may be the potential for Atlantic sturgeon to be temporarily impacted by water quality changes, such as from increased turbidity and decreased dissolved oxygen content. Significant changes in turbidity due to dredging, such as sediment plumes, have only been observed with mechanical dredges working in areas that contain a majority of fine particles such as muds and clays. Hydraulic dredges removing coarse sands, as is the case for the Long Beach project, have not been shown to create significant turbidty increases. Similarly benthic disturbances that can lead to decreases in dissolved oxygen are related to microbial decay (and respiration) of resuspended organic materials associated with fine sediments. Again, this would not occur with the coarse sands required for beach nourishment.

By definition, beach fill sediment must contain less than 10% fine particles (USACE-NYD 2011), therefore making the dredged sediment a majority of coarser material (sand). Also, hopper dredges draw in sand via suction while in contact with the sea floor, consequently there is very little re-suspended sediment or creation of turbidity related to the sediment removal process. An insignificant amount of very localized and temporary turbidity may be created by the mechanical action of the drag head running across the sand. However, re-suspension of sediment would not disperse to any degree. Any localized turbidity is not anticipated to impact Atlantic sturgeon since they are highly mobile and the areas in question are not restrictive in nature, providing much space within which to avoid a plume by moving away from the source. Even if Atlantic sturgeon movement is altered, it is unlikely that any temporary and localized suspended sediment would have a long term and adverse impact on Atlantic sturgeon migration to/from spawning grounds, or in the ability to find other food resources outside of the dredged area, which is small compared to the entire area available in the Raritan Bay, Lower Bay and Atlantic Ocean. Also, since Atlantic sturgeon are indiscriminate feeders, any turbidity would likely have little or no effect on finding alternate feeding grounds.

6.3 POTENTIAL IMPACTS TO FOOD RESOURCES AT THE LBOBA

Atlantic sturgeon are primarily benthic feeders and changes in bottom habitat that alter the benthic faunal community could result in a subsequent temporary loss of, or change in, prey resources. Sturgeon generally feed when the water temperature is greater than 10^{o}C (Dadswell 1979, and Marchette and Smiley 1982, as cited by USACE-NAP 2011) and in general, feeding is heavy immediately after spawning in the spring and during the summer and fall, and lighter in the winter. Haley and Bain (1997, as cited in ASSRT 2007) retrieved primarily polychaetes and isopods from Atlantic sturgeon in the Hudson River. The LBOBA represents a small area compared with the surrounding area in which additional resources are available for feeding; therefore, adverse significant impacts are not anticipated.

In 1989, the District conducted an investigation to characterize the infauna and epifauna resources at the SBOBA. Results revealed a diversity of species including those types considered primary prey species for Atlantic sturgeon. During the District's NJ Biological Monitoring Program (NJ BMP; USACE-NYD 2001B), multiple borrow sites were monitored for benthic characterization and showed similar faunal species including those considered sturgeon prey base. The NJ BMP also analyzed impacts of dredging on recovery times of the impacted habitat. The study concluded that in terms of abundance, diversity and biomass, the infauna resources are expected to recover and recolonize to pre-dredge condition in approximately 8 months, except for sand dollars biomass, which takes about 2 to 2.5 years to recover.

A comparison of the NJ BMP borrow areas to the SBOBA (Ray 2010) concluded that the infauna communities at the SBOBA and at the other NJ offshore borrow areas were very similar. Since the habitats and fauna are comparable it's reasonable to conclude that impacts to the SBOBA fauna community and their subsequent recovery and re-colonization rate are also analogous to the results of the BMP study.

In general, the changes in the benthic community observed between pre- and post-dredging time periods is typical of benthic responses to disturbance in which larger, longer-lived species are initially replaced by smaller, opportunistic taxa prior to full recovery. These studies have also shown that borrow area habitats and the regions that surround them support abundant and diverse communities of typical sturgeon prey species. Because these habitats supporting sturgeon prey exist on a regional scale temporary impacts to localized portions of the SBOBA over the duration of the projects describe would not significantly reduce the availability of prey resources of resident or migratory Atlantic sturgeon.

6.4 POTENTIAL IMPACTS DURING SHORELINE CONSTRUCTION (PLACEMENT AND STRUCTURES)

6.4.1 POTENTIAL PHYSICAL INJURY AND BEHAVIORAL IMPACTS DURING SHORELINE CONSTRUCTION

There is the potential for sturgeon to be directly impacted by transiting hopper dredges or other vessels that may be associated with the project. Most reported sturgeon vessel strikes have been associated with relatively confined areas. A study conducted in the Delaware estuary concluded that vessel strikes accounted for 50% of Atlantic sturgeon mortalities (Brown and Murphy 2010, as cited by USACE-NAP 2011). However, since the Delaware estuary is narrower and shallower than the area in which the dredge would travel for the proposed project (e.g., LBOBA to Long Beach for pump out), it is less likely that the dredge would strike an Atlantic sturgeon.

Potential direct impacts to Atlantic sturgeon due to placement in intertidal and littoral nearshore waters may consist of impacts related to an increase in suspended sediment; however, since sturgeon do not typically utilize the intertidal and very shallow nearshore waters, it is unlikely that any turbidity would affect sturgeon. Impacts from increased suspended sediments and resultant turbidity could include physical damage to gill structures, or avoidance behavior and movement away from the disturbance. Movement out of the area would minimize any physiological impacts.

Potential direct physical impacts to Atlantic sturgeon may also include direct contact with one or more pieces of construction equipment and movement of sediment, both of which are highly unlikely to occur. Since sand is carried to the beach and deposited on the dry beach by a stationary pipe, there is no threat of impact from the pump out equipment. Bulldozers, front-end loaders and similar equipment that could be used to re-grade the sand would have minimal contact with the swash zone making impacts with sturgeon unlikely, especially since sturgeon, adults or juveniles are not known to inhabit this zone. However unlikely, there is always the small possibility of a (small) sturgeon moving into this area but their ability to avoid the slow moving construction equipment that could be used to re-grade the sand (<5 mph), or from the sand that is being moved, makes any contact doubtful. Consequently, contact or burial due to equipment or movement of sand into the intertidal and adjacent near shore zone is not expected to occur.

Features of the Long Beach project include the modification of several existing groins, as well as the construction of several new groins. Construction of these features, as described in Section 2.1, is extremely unlikely to cause any significant impacts to sturgeon given the types and speed at which these kinds of construction activities would take place. If an Atlantic sturgeon is present, its mobility would allow it to easily avoid contact with stones being placed in the slow and precise manner required to avoid fracturing during construction of the groin. Although some of the construction equipment associated with building of the groin and pier may create a new and temporary sound source in the project area, this equipment is not known to create sounds/vibrations that would be harmful or disturbing to Atlantic sturgeon, as is the case with explosives and pile driving equipment. Also, the shallow nature of portions of the project site may greatly reduce the probability of sturgeon from being in the area.

6.4.2 POTENTIAL HABITAT IMPACTS DURING SHORELINE CONSTRUCTION

Results of the area wide and site intensive beach nourishment placement TSS monitoring (Sea Bright to Manasquan, N.J. USACE 1994-2000) yielded the following results with respect to temporal and spatial scales of sediment dispersal along ocean beaches. Placement operations resulted in short-term increases in turbidity/TSS conditions limited to a relatively localized area (less than 500 m) from the discharge point. Sediment dispersal was strongly influenced by prevailing surf and turbulence conditions, as well as by long shore currents. Long shore currents in the vicinity of Sandy Hook run predominantly to the north. Dispersal of suspended sediments was prominent in the swash zone in the immediate vicinity of the discharge operations. Observed elevated concentrations decline rapidly with dispersal through the surf zone. Another mitigating factor is the relatively low fractions of silts and clays of the sediments excavated from the borrow areas, generally less than 10 percent by weight. Slightly elevated turbidities/TSS (from ambient) extended into the surf zone along a narrow swath of beach, and into the near shore bottom portion of the water column.

The maximum TSS values measured near the fill operations were not outside the range that organisms would be exposed to during periods of high wave energies. With the exception of swash zone samples, the magnitude of elevation above ambient TSS conditions appears to be negligible. Measured TSS concentrations outside the swash zone seldom exceeded 25 mg/l, which can be considered the low end of the range of ambient TSS concentrations that many marine/estuarine species of the northern New Jersey shore, including Atlantic sturgeon, experience in estuaries including the Hudson-Raritan estuary. Ranges of ambient TSS within the Hudson estuary range from 20 to 60 mg/L (USACE Kate and PJ etc). Atlantic sturgeon within the Hudson/Raritan estuary experience ambient TSS/turbidity conditions generally much greater than those measured during fill activities along the Atlantic coast of NJ, except for the within the surf/swash zone. It is expected that the mobile behavior of the sturgeon would serve to limit the duration of exposure to any exceptionally elevated levels of TSS/turbidity.

Monitoring of NJ beaches, including both re-nourished beaches and reference beaches during strong storms revealed elevated TSS levels that extended well past the near shore zone to an extent much greater than the dispersal distances measured during placement activities. During storms, elevated TSS levels were often an order of magnitude greater than levels measured during placement activities, and, unlike the very localized affects seen during fill operations, these higher concentrations occurred over *regional coastal areas*.

In summary, the spatial scales of elevated turbidity/TSS associated with beach fill operations are relatively small. Likewise, the increment of suspended sediment concentrations above ambient attributable to fill operations is relatively small once sediments have dispersed outside the swash zone. No adverse affects to dissolved oxygen were observed in the surf or near shore zones during TSS and water quality monitoring during fill activities. TSS samples collected during or immediately after storm events showed that even mildly strong storms or wind events produce much greater impacts related to TSS or turbidity increases relative to beach fill operations.

6.4.3 POTENTIAL IMPACTS TO FOOD RESOURCES DURING SHORELINE CONSTRUCTION

Loss of the benthic community is anticipated to occur within the foot print of the fill, which would include intertidal areas and the nearshore littoral immediately adjacent. However, the area’s temporary loss of benthic organisms is mitigated by the fact that this is a small percentage of available, comparable shore line environment and, sturgeon are not known to frequent or forage in this extremely shallow and energetic ocean environment.

7.0 OTHER SPECIES OF CONCERN

The remaining federally listed species that may occur in the project areas are: the endangered Northwest Atlantic Ocean DPS of the loggerhead turtle (*Caretta caretta*); the endangered Kemp's ridley turtle (*Lepidochelys kempi*); the endangered green turtle (*Chelonia mydas*); the endangered leatherback turtle (*Dermochelys coriacea*); the endangered North Atlantic right whale (*Eubalaena glacialis*); the endangered humpback whale (*Megaptera novaeangliae*); and the endangered fin whale (*Balaenoptera physalus*).

NMFS issued a Biological Opinion (BO) to the District in 1995 to address the impacts of beach nourishment projects along the South Shore of Long Island and the Northern NJ Shore Sandy Hook to Manasquan) for sea turtles and whales, including Long Beach. The biological information is still relevant, and the conclusions are not anticipated to drastically change.

7.1 SEA TURTLES

7.1.1 GENERAL SEA TURTLE INFORMATION

In general, listed sea turtles are seasonally distributed in coastal US Atlantic waters, migrating to and from habitats extending from Florida to New England, with overwintering concentrations in southern waters.

As water temperatures rise in the spring, some of these turtles begin to move northward and reside in relatively shallow inshore waters of the north east to take advantage of abundant forage. As temperatures begin to decline rapidly in the fall, turtles in the north east Atlantic begin to migrate back to southern waters. Sea turtles can be expected to be in the vicinity of the LBOBA when the water temperature surpasses 15 C (60 F) which generally coincides with June 1. However, the window of residence for the 4 listed species is considered to be May1 through November 30. Southern migration begins when the water drops below 15 C. Turtles are migrating out of the NYB by the beginning of November. Future warming ocean trends may cause this window to be expanded.

Life history descriptions for each of the 4 listed sea turtle species were described in the NYD 1995 BA and the 1999 Harbor Deepening BA and are incorporated here by reference. There have been no significant changes to the distribution, population size, food availability requirements etc. of any of the species since that time. However, since the 1995 consultation, a change in the listing of loggerhead turtles has occurred, as described in Footnote 1 of Section 1.1.

7.1.2 POTENTIAL DREDGING IMPACTS AT THE LBOBA

Direct entrainment of sea turtles during hopper dredging at the LBOBA is a possibility during the season in which they are present in NY waters (May through November). However, the likelihood of a migrating turtle being impacted by a hopper dredge is remote; only one take has been documented since monitoring procedures have been established in the NYB in 1993 (Table 3), during which approximately 23.45 million cy of material has been dredged from the navigation channels and borrow sites. Also, the bathymetry and topography of the project site also differs greatly from those confined areas where turtles have been most commonly encountered by hopper dredges in the south east.

Loggerhead and Kemp’s ridley turtles, which normally spend much time at or near the bottom feeding on benthic invertebrates, would be less vulnerable to contact with a draghead when they are migrating. Green turtles, which are the least common turtles in the north east, forage on submerged aquatic vegetation (SAV). This species is also expected to be only passing through the vicinity of the borrow area, not spending much time on or near the bottom due to the lack of sea grasses or other SAV. Leatherback turtles are fast swimming pelagic organisms and the least likely to be found in near shore coastal waters, especially at or near the bottom. This species feeds in the water column where it forages for jellyfish which is its primary prey.

The risk of injury or mortality due to contact during transit of the hopper exists for this project. However, the magnitude of risk to any of the populations of loggerhead, leatherback, green, and Kemp's ridley sea turtles is so small that it is unlikely to jeopardize the continued existence of the populations of sea turtles that seasonally inhabit NYB waters. Best management practices under the guidance of NMFS would be implemented to assure minimization of direct risk to sea turtles during construction of these projects.

Boat strikes and propeller hits are probably the greatest source of injury and mortality to sea turtles in coastal areas in the northeast. Most of these are due to the abundance of speeding recreational boats. An injurious strike by a much slower moving hopper dredge is far less likely but possible.

Dredging sand from a portion of the LBOBA would temporarily remove all non-mobile benthic fauna from the action footprint. Swimming crabs such as the blue claw *Callinectes sapidus* and the lady crab *Ovalipes occletus* are likely capable of avoiding the draghead. Slower moving crabs including spider crabs may be entrained or crushed. Bivalves, other infauna and non mobile epi-fauna would be lost. Crabs, both swimming and walking are important proponents of the diets of the loggerhead and Kemp’s ridley turtles. These young turtles are known to be migrating through and tracking them via satellite has shown that they do not linger in these coastal oceanic waters. Finding prey during their migration would simply be a matter of foraging anywhere along their route outside the dredge footprint, which makes up a very small portion of the overall habitat available for foraging. As was also established previously, benthic recovery within the dredge footprint is relatively rapid and, more mobile species such as crabs are likely to re-occupy those areas within days.

7.1.3 POTENTIAL IMPACTS DURING SHORELINE CONSTRUCTION

Nesting is unlikely to occur in the Project area because these species of sea turtles nest south of the Project area (NMFS 1993).

In the event that a loggerhead or Kemp’s ridley sea turtle would migrate or forage close to shore during placement of sand, there is little probability that impacts might arise from direct contact with equipment utilized for placement, and/or potential burial from placement of sand. Reasons for this are similar to those predicted for sturgeon. Studies in the north east have shown that turtles spend almost all of their time in waters greater than 15’ which would put them well out of harm’s way in Long Beach. Coastal migratory corridors have also been observed to be in waters much greater than 15’, again keeping them well offshore. Generally speaking a healthy turtle would not be in the surf zone, which is the only area where it might come in contact with placement machinery. It is possible that a sea turtle may encounter a zone of increased turbidity along the Atlantic coast during placement. Chances of this might increase under certain (weather) conditions. However, no significant impacts would be encountered since turtles are visual predators and they would likely move off into waters with better visibility.

As analogously discussed for sturgeon, Long Beach groin construction methods, depth of water, and sea turtle mobility and behavior leads to similar expectations of no significant impacts. Turtles are not likely to be found in these shallow areas but in the unlikely case that they are, they would be able to avoid any direct impacts by moving away from the potential danger.

7.2 WHALES

7.2.1 POTENTIAL IMPACTS TO WHALES IN THE PROJECT AREAS

As described in the 1995 NY and NJ beach nourishment BO and 2012 HDP BO, several species of whales may occur in the NYB:

- Right whales in the NYB are primarily transiting the area on their way to more northerly feeding and concentration areas. During late winter and early spring, they begin moving north along the coast past Cape Hatteras and near the Long Island Coast. Individuals have been sighted along the south shore of Long Island, Block Island Sound, Gardiners Bay and south shore inlets and bays. They are most likely to occur around the project areas from November 1 – April 30.
- Humpback whale presence in the northwestern Atlantic is variable and probably a response to the changing distribution of preferred food sources. For the most part, humpbacks are in transit through the NY area from June through September on their northward migration to summering areas in the Gulf of Maine.
- Finback whales occupy both deep and shallow waters and are probably the most abundant large cetacean in NY waters. They are most abundant in spring and summer, but do have some presence during the winter months.

Impacts to listed species of whales during sand mining are unlikely because the hopper dredge would move very slowly at $\leq$ 2.6 knots, a speed at which whales can avoid contact with the dredge. On the other hand, collisions with a transiting hopper dredge between LBOBA and the project area might occur An analysis by Vanderlaan and Taggart (2006, as referenced in HDP BO) showed that at speeds greater than 15 knots, the probability of a ship strike resulting in death of a whale increases asymptotically to 100%. At speeds below 11.8 knots, the probability decreases to less than 50%, and at ten knots or less, the probability is further reduced to approximately 30%. The speed of the dredge in the proposed project area is not expected to exceed 2.6 knots while dredging and 9.4 knots while transiting to/from the LBOBA and shoreline, thereby reducing the likelihood of vessel collision impacts.

The proposed projects would cause a small, temporary increase in vessel traffic within the action area. This increase is not expected to significantly increase the risk of a collision relative to the existing vessel traffic traversing in and out of the Port of NY and NJ, which enters the Harbor through the Ambrose Channel. The approach areas to the channel are shown as shaded in pink in Figure 2. Vessels using the channel and approach areas should not cross paths with the dredge while transiting from the LBOBA to the project areas. There are no NY Waterway or Department of Transportation ferries that operate near the project area. A temporary landing was established after Hurricane Sandy and is located in Rockaway, but it is on the north side of the island. There are marinas for private boats along the Brooklyn, Queens and Long Island shoreline. Although vessel strikes are acknowledged as being one of the primary known sources of whale mortality in the northeast, ship strikes remain relatively rare events and a small increase in vessel traffic within the project area does not necessarily translate into an increase in ship strike events (NMFS Consultation Letter to USACE, NYD, Daniel S. Morris 1/20/2012).

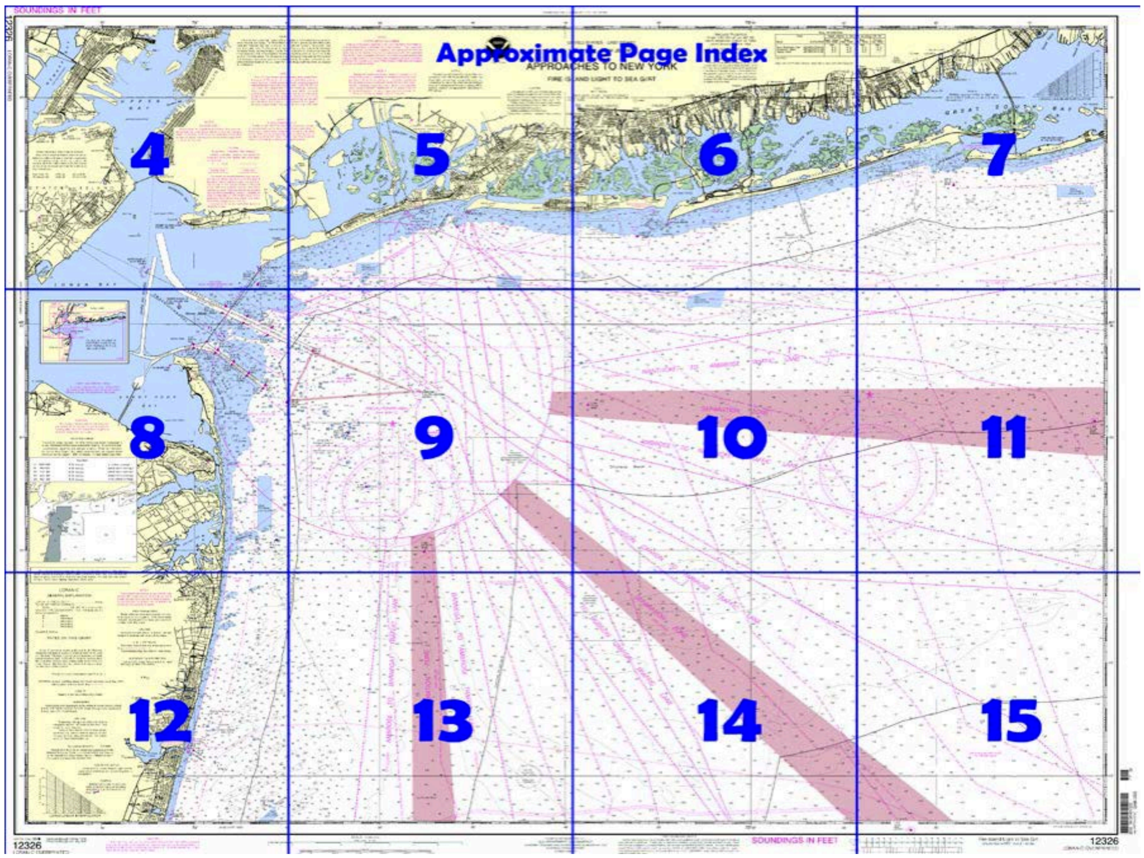

Figure 2: Approach areas, shaded in pink, to the Ambrose Shipping Channel. Source: *http://ocsdata.ncd.noaa.gov/BookletChart/12326_BookletChart.pdf*

Noise from the construction of the groins described in Section 2.1 is not anticipated to cause a significant adverse impact to whales. Although some of the water based construction equipment that may be associated with building of the groins may create a new and temporary sound source in the project area, this equipment is not known to create sounds/vibrations that would be harmful or disturbing to whales, as is the case with explosives and pile driving equipment. Also, the stones for the groins are anticipated to be smoothly placed into the water to avoid fracturing, reducing the noise impact.

8.0 CUMULATIVE EFFECTS

In the 2012 HDP BO, NMFS outlined the cumulative effects associated with sources of human-induced mortality, injury, and/or harassment of Atlantic sturgeon, whales, or sea turtles. In the BO, the definition of cumulative effects was referenced in 50 CFR 402.02 to include "*the effects of future State or private activities, not involving Federal activities, that are reasonably* *certain to occur within the action area. Future Federal actions are not considered in the definition of cumulative effects."* The following provides an excerpt from the BO, as it is applicable to this document.

> *"Sources of human-induced mortality, injury, and/or harassment of Atlantic sturgeon, whales, or sea turtles' resulting from future State, tribal, local or private actions in the action area that are reasonably certain to occur in the future include incidental takes in state-regulated fishing activities, pollution, global climate change, and vessel collision. While the combination of these activities may affect Atlantic sturgeon, whales, or sea turtles, preventing or slowing the species' recovery, the magnitude of these effects in the action area is currently unknown...*
>
> *State Water Fisheries-Fishing activities are considered one of the most significant causes of death and serious injury for sea turtles. A 1990 National Research Council report estimated that 550 to 5,500 sea turtles (juvenile and adult loggerheads and Kemp's ridleys) die each year from all other fishing activities besides shrimp fishing. Fishing gear in state waters, such as bottom trawls, gillnets, trap/pot gear, and pound nets, take sea turtles each year… Action has been taken by some states to reduce or remove the likelihood of sea turtle takes in one or more gear types. However, given that state managed commercial and recreational fisheries along the Atlantic coast are reasonably certain to occur within the action area in the foreseeable future, additional takes of sea turtles in these fisheries are anticipated. There is insufficient information by which to quantify the number of sea turtle takes presently occurring as a result of state water fisheries as well as the number of sea turtles injured or killed as a result of such takes. While actions have been taken to reduce sea turtle takes in some state water fisheries, the overall effect of these actions on reducing the take of sea turtles in state water fisheries is unknown, and the future effects of state water fisheries on sea turtles cannot be quantified.*
>
> *Right and humpback whale entanglements in gear set for state fisheries are also known to have occurred (e.g., Waring et ai. 2007; Glass et ai. 2008). Actions have been taken to reduce the risk of entanglement to large whales, although more information is needed on the effectiveness of these actions. State water fisheries continue to pose a risk of entanglement to large whales to a level that cannot be quantified.*
>
> *Information on interactions with Atlantic sturgeon with state fisheries operating in the action area is not available, and it is not clear to what extent these future activities will affect listed species…*
>
> *Vessel Interactions-…private vessel activities in the action area may adversely affect listed species in a number of ways, including entanglement, boat strike, or harassment. As vessel activities will continue in the future, the potential for a ·vessel to interact with a listed species exists; however, the frequency in which these interactions will occur in the future is unknown and thus, the level of impact to sea turtle, whale, or Atlantic sturgeon populations cannot be projected…*
>
> *Pollution and Contaminants -Human activities in the action area causing pollution are reasonably certain to continue in the future, as are impacts from them on Atlantic sturgeon, sea turtles, or whales. However, the level of impacts cannot be projected. Sources of contamination in the action area include atmospheric loading of pollutants, stormwater runoff from coastal development, groundwater discharges, and industrial development. Chemical contamination may have an effect on listed species reproduction*

and survival…"

9.0 DISCUSSION/CONCLUSION

From reviewing the best available information on the life history and behavior of the threatened and endangered species that may be present in and around the proposed project area, the following species may be affected:

- Atlantic sturgeon: may be present in the vicinity of the project area in three major capacities: as adults primarily while migrating between spawning grounds in the Hudson River and oceanic environments; migrating throughout their marine range as adults of any DPS; and as juveniles in waters less than 20 m off of Rockaway, NY, possibly aggregating due to food availability.
- Sea Turtles: due to the feeding behavior of green and leatherback turtles, it is unlikely that either species would be encountered during construction of the proposed project. However, migrating loggerhead and Kemp's Ridley turtles may be present within the project area during May through November.
- Whales: construction of the project is anticipated to occur over approximately 4.5 years, therefore right, humpback or fin whales may be present in/around the project area.

9.1 ATLANTIC STURGEON

Based on the information contained in this BA, several direct and indirect impacts to the Atlantic sturgeon from the proposed beach nourishment project was identified. However, as summarized below, the threats are not likely to jeopardize the continued existence and recovery of the species.

As the dredge travels to/from the LBOBA to the shoreline for sand placement, it could encounter a migratory sturgeon. Although vessel strikes are possible, they are more common in narrower and shallower areas (e.g., Delaware estuary) compared to the wide-open areas in/around the Long Beach shoreline; it is also anticipated that an Atlantic sturgeon would avoid a slower moving dredge. Therefore, it is unlikely that injury or death from a dredge strike would occur.

A temporary and short-term loss and/or shift in the benthic communities within a localized area of LBOBA and at the sand placement site the project area would occur. Given the nature of the impact, the availability of resources surrounding the area of impact (i.e., the Lower Bay, Raritan Bay and Atlantic Ocean), and that Atlantic sturgeon are indiscriminate feeders, the impact of dredging on benthic resources is unlikely to have an adverse impact on the species.

Impacts to water quality from dredging activities at the LBOBA and at the sand placement site are not anticipated to impact Atlantic sturgeon. Re-suspension of sediment (e.g., sand) would not disperse to any degree. Any localized turbidity that might be encountered by a sturgeon in the offshore borrow area could be avoided since they are highly mobile and capable of avoiding the tiny amount of re-suspended sediment that might form from dredging coarse sand. Impacts at the near shore placement sites are unlikely as sturgeon do not typically utilize the intertidal and very shallow nearshore waters.

Direct impacts to Atlantic sturgeon during construction at the shoreline are possible, but unlikely since they do not normally frequent such a shallow and high energy zone, equipment is largely confined to upland or intertidal portions of the placement site, and most equipment is stationary or would operate at slow speeds (see Section 2.1). Further, it is highly unlikely that impacts would arise from direct contact with one or more pieces of equipment used for placement, from potential burial or displacement during sand deposition, or during construction of the groin structures. It is anticipated that Atlantic sturgeon would avoid any equipment, structures, or sand that is being moved to make any contact unlikely.

The greatest potential risk to Atlantic sturgeon from the proposed activity is entrainment during dredging activities, however even this is a very unlikely occurrence. Since the LBOBA and sand placement sites in the proposed project area represents a small portion of the surrounding Atlantic Ocean, Lower and Raritan Bays, there are many opportunities available for Atlantic sturgeon to avoid active dredges. Despite this, an interaction between an Atlantic sturgeon and the draghead of a hopper dredge is possible. As per the conditions outlined in the NMFS 1995 (beach nourishment) and 2000 (channel deepening) BOs, the District equips the draghead of all hopper dredges with sea turtle deflectors during the turtle season. This measure is meant to reduce the risk of interaction with sea turtles that may be present in the impact area, and is expected to operate in a similar manner for encounters with migrating Atlantic sturgeon.

Additionally, as part of the Terms and Conditions of the 1995 and 2000 BOs, USACE has been required to use NMFS-approved sea turtle observers to monitor for sea turtle take onboard hopper dredges. Since UXO screens would not be required for this project, observers would be an effective method for monitoring take of both sea turtles and Atlantic sturgeon.

In addition to the limited impacts of dredging activities in the District's AOR, and as described in Section 4.0, there are a variety of other factors that may contribute to the vulnerability of Atlantic sturgeon to habitat impacts and potential further population collapse, many of which are more likely to impact the Atlantic sturgeon than a dredging project exercising prudent measures to avoid/minimize take. These include: their unique life history characteristics, vessel strikes, overfishing, dam construction and operation, water quality modifications, bycatch and poaching. In order for recovery efforts to succeed, it is vital to practically address all potential threats to Atlantic sturgeon.

9.2 SEA TURTLES

Based on the information contained in this BA, direct and indirect impacts to the leatherback and green turtles from the proposed beach nourishment project is unlikely. The more pelagic offshore nature and water column feeding habits of the leatherback and the lack of vegetative forage at the project site required by green turtles all but remove these two species from the potential dangers of entrainment. Also, disruption of the existing benthic habitat would not affect the foraging of these two species as it does not provide them with a significant food source. Thus, the proposed actions are not likely to jeopardize the continued existence of these sea turtle populations.

Direct and indirect impacts to Kemp's ridley and the Northwest Atlantic DPS of loggerhead sea turtles during dredging at SBOBA are possible, but limited to a very low risk of entrainment by hopper dredge or by collision with a transiting hopper from the SBOBA to the pump out station. The potential for indirect impacts also exist via a temporary loss and/or shift in benthic community abundance, diversity, or habitat within the dredging footprint; however, these impacts are offset by the abundance of prey in the surrounding areas and relatively quick re-colonization times.

Based on the many years of documented sea turtle observer data (1993-2013), there was only one observed loggerhead turtle take out of approximately 23.45 million CY of dredged material in NY, NJ and New England. The take was considered a freak incidence and occurred during a beach re-nourishment project along the Sandy Hook to Barnegat Inlet in 1997 (Long Branch borrow area), which is along the NJ shore. Also, when compared to other dredging projects along the East Coast (see Sea Turtle Warehouse at: http://el.erdc.usace.army.mil/seaturtles), the overwhelming majority of turtle takes has been in the Gulf (208 takes) and South Atlantic Regions (481 takes) where sea turtles may cluster in channels to over winter, not in the North Atlantic (68) or in the District (1) where juveniles migrate to feed. Based on this information, observed take appears to be a rare occurrence within the District and should be an indication that sea turtle occurrence is rare in the District project areas.

The District acknowledges that even though the probability of negatively impacting a sea turtle is rare, the possibility still exists and some level of protection is warranted. Therefore, turtle deflectors would continue to be used as well as sea turtle observers since a UXO screen would not be deployed on the hopper dredge for this project.

Impacts from direct contact with equipment utilized for placement at the project area, construction/modification of groins, and/or potential burial or displacement related to deposition of sand is unlikely since turtles have the ability to avoid these project elements and are unlikely to be in very shallow water where much of the construction activity would occur. Consequently, significant adverse impacts are not anticipated.

The proposed actions are not likely to jeopardize the continued existence of Kemp's ridley and Northwest Atlantic Ocean distinct population segment of loggerhead sea turtles.

9.3 WHALES

Impacts to listed species of whales during the dredging operation is unlikely because during sand mining a hopper dredge moves very slowly (≤2.6 knots) and it is anticipated that whales can avoid contact with the dredge. Collisions with a transiting hopper might occur, but the suggested reduced speed (10 knots) during transit lessens the probability of a ship strike resulting in death. Although vessel strikes are acknowledged as being one of the primary known sources of whale mortality in the northeast, ship strikes remain relatively rare events and a small increase in vessel traffic within the project area does not necessarily translate into an increase in ship strike events (NMFS Consultation Letter to USACE, NYD, Daniel S. Morris 1/20/2012). The use of observers would also reduce the risk of vessel-whale collisions. If an observer identifies a whale in the vicinity of the vessel during transit throughout the project area, maximum vessel speeds would be limited to 10 knots. If a Right Whale is observed, the vessel would maintain a 500 yard buffer from the whale. For all other whale species, a 100 yard buffer would be maintained. Therefore, the proposed actions are not likely to jeopardize the continued existence of these marine mammal populations.

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