Appendix D

Coastal Zone Consistency Determination

NEW YORK STATE COASTAL ZONE MANAGEMENT PROGRAM AND NEW YORK CITY WATERFRONT REVITALIZATION PROGRAM (WRP) CONSISTENCY DETERMINATION

Project: South Shore of Staten Island Coastal Storm Risk Management Project (Project). For a complete Project history and description refer to Chapters 1 and 2 of the Environmental Impact Statement (EIS).

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

Applicable Policies: Based on a review of the Coastal Management Program policies for New York, 20 state policies, 10 existing New York City policies, and 2 proposed New York City policies[1] were found to be potentially applicable to the proposed Project. These policies are listed below.

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

State Policy 1 – Restore, revitalize and redevelop deteriorated and underutilized waterfront areas for commercial, industrial, cultural, recreational and other compatible uses.

Also applicable: **NYC Policy 1 --** Support and facilitate commercial and residential redevelopment in areas well-suited to such development; and

NYC Policy 2 – Support water-dependent and industrial uses in New York City coastal areas that are well-suited to their continued operation.

Determination – Construction of the NED Plan would contribute to the revitalization of the waterfront area associated with the Project area. The Project would provide coastal storm risk management features forthe south shore of Staten Island (from Fort Wadsworth to Oakwood Beach), protecting life, existing property and infrastructure from storm damage and erosive forces from coastal storm events. The physical integrity of the south shore of Staten Island's coastline must be maintained to protect these uses. Therefore, the District has determined that the proposed NED Plan would be consistent with this policy.

State Policy 2 – Facilitate the siting of water dependent uses and facilities on or adjacent to coastal waters.

[1] "Proposed NYC policies" refer to the proposed amendments to The Waterfront Revitalization Program (WRP), which the New York City Council approved on October 30, 2013. On December 17, 2014, the draft of the proposed amendment to the NYC WRP was accepted by the New York State Department of State as complete and was made available for public comment. Following approval by the NYS Secretary of State, the NYS Department of State will request incorporation of the LWRP amendment into the State's Coastal Management Program by the federal Office for Coastal Management (OCM).

Determination – The area/land on which the Project's line of protection (LOP) is being built is publicly owned, and supports a variety of public recreational activities. Numerous water dependent uses, such as beaches, parks and small business which support the local economy are located within the project area. The project will help to stabilize the south shore of Staten Island, protecting it from storm damage and maintaining these uses. The without Project condition would eventually impact public recreational activities. The project will enable existing water dependent uses and facilities to remain. The District has determined that the NED Plan would be consistent with, and would advance, this policy.

State Policy 4 – Strengthen the economic base by encouraging the development and enhancement of those traditional uses and activities that have provided such areas with their unique maritime identity.

Determination – The NED Plan would insure that historic recreational use of the south shore of Staten Island beaches would be enhanced and preserved. The NED Plan would stabilize the shoreline and manage the risk from coastal storm damage to the surrounding area, thus enabling continued recreational enjoyment. Therefore, the District has determined that the NED Plan would be consistent with this policy.

State Policy 5 – Encourage the location of development in areas where public services and facilities essential to such development are adequate.

Determination – The NED Plan would manage the risk of coastal storm damage to existing infrastructure along the south shore of Staten Island from hurricane and storm surge flooding. The Plan would provide stability and enhancement to existing and future development Projects. The without Project condition would eventually impact development as if allowed to continue, the public services and required infrastructure would be negatively impacted in an unstable, unprotected environment. Therefore, the District has determined that the NED Plan would be consistent with this policy.

State Policy 7 – Significant coastal fish and wildlife habitats would be protected, preserved, and where practical, restored so as to maintain their viability as habitats.

Also applicable: **NYC Policy 4** – Protect and restore the quality and function of ecological systems within the New York City coastal area.

Proposed NYC Policy 4.4 – Identify, remediate, and restore ecological functions with Recognized Ecological Complexes.

NYC Policy 5 – Protect and improve water quality in the New York City coastal area.

Determination – The NED Plan will impact 144.64 acres of existing *Phragmites* monoculture low quality wetland habitat. Of this acreage, the impact of 10.89 acres is related to the fill associated with the LOP Project feature resulting in a permanent loss of the existing wetlands. There are 117.25 acres of impacts associated with the interior drainage project feature (within

Drainage Areas B, C, and E) being created for surface water detention as well as 16.5 acres of impact associated with the construction of the tidal wetland (mosaic of habitat) feature. Taken as a whole, the NED Plan would produce a net significant positive impact on wetland habitats and the quality of wetlands in the Project area. Overall, the NED Plan would improve wetland quality and enhance wetlands by increasing diversity with expanded open water (low-flow channels and ponds) and permanent pool (emergent wetlands) habitats. The NED Plan is also expected to result in improved water quality within the watershed. The proposed ponds will function as wetlands providing physical, chemical, and biological treatment of pollutants contained within runoff; attenuating flow rates of water into wetlands, allowing sediment and organic debris to settle. During this process, nutrients undergo both chemical and biological transformation. Nitrogen can be naturally altered into forms that are more favorable to uptake by wetland plants and phosphorus is readily precipitated out of water in many of its chemical forms, depending on the pH of the water and is also utilized by plants. Proposed ponds can also reduce fecal coliform concentrations by detaining water, allowing for die-off of microorganisms. Beneficial impacts to aquatic ecosystem would occur through improved habitats.

There are several Recognized Ecological Complexes in the Project area: Fort Wadsworth Beach, South Beach Northern Wetlands, Ocean Breeze Park, Sea View Avenue Wetlands, and Cedar Grove/South Beach Southern Wetlands/Oakwood Beach. To achieve the goal of habitat enhancements, natural features have been designed into the Project for the purposes of providing ecological diversity in addition to (and in support of) the functions of stormwater management and flood control. The objective of these diverse design elements of the NED Plan is to enhance the overall habitat complexity and ecological values in the Project area. A comprehensive assessment of potential project impacts to threatened and endangered species and habitats was conducted and is presented in the Environmental Impact Statement (EIS) prepared for the project. Accordingly, the District has determined that the NED Plan would be consistent with this policy.

State Policy 8 – Protect fish and wildlife resources in the coastal area from the introduction of hazardous wastes and other pollutants which bio-accumulate in the food chain or which cause significant sublethal or lethal effect on those resources.

Also applicable: **NYC Policy 7** – Minimize environmental degradation from solid waste and hazardous substances.

Determination – The NED Plan would involve the disturbance of soil and groundwater in areas where prior uses, regulatory database searches, and testing have indicated a potential for the presence of hazardous materials in the soil and/or groundwater. Under the NED Plan, these locations would be tested in accordance with NYCDEP protocols prior to construction. If contaminated materials are found, they would be removed and disposed of in accordance with all City, State, and Federal regulations. Accordingly, the District has determined that NED Plan would be consistent with this policy.

State Policy 11– Buildings and other structures will be sited in the coastal area so as to minimize damage to property and the endangering of human lives caused by flooding and erosion. (This policy relates to the placement of man-made structures.)

State Policy 12 – Activities or development in the coastal area would be undertaken so as to minimize damage to natural resources and property from flooding and erosion by protecting natural protective features including beaches, dunes, barrier islands and bluffs.
Also applicable:

> **NYC Policy 6** – Minimize loss of life, structures and natural resources caused by flooding and erosion.
>
> **Proposed NYC Policy 6.2** – Integrate the latest New York City projections of climate change and sea level rise (as published by the New York City Panel on Climate Change [NPCC], or any successor thereof) into the planning and design of all projects in the city's coastal zone.

Determination – The primary goal of the Project is to manage the risk of damages from hurricane and storm surge flooding along the south shore of Staten Island. The NED Plan involves the construction of a LOP consisting of a buried seawall/armored levee along a majority of the reach (approximately 80%) serving as the first line of defense against severe coastal surge flooding and wave forces. The remainder of the LOP would consist of a T-Type vertical floodwall, and earthen levee. The crest elevation of the LOP would be 18 feet NGVD29 to 20.5 feet NGVD29. The LOP would also include a closure structure at Hylan Boulevard, drainage control structures for existing storm water outfalls, tide gate structures, vehicle and pedestrian access structures, and demolition of the existing boardwalk. The NED Plan also involves excavation of interior areas to augment/create 10 ponds that would alleviate flooding that may subsequently occur from interior runoff. The NED plan would direct public funding for flood prevention or erosion control measures to a location where the investment will yield significant public benefit. USACE has concluded that the NED Plan would result in annual benefits of $29.5 million versus costs of $24.2million which equates to an annual benefit of $5.3 million and a benefit-to-cost ratio of 1.2.

With respect to climate change and sea level rise, as discussed in Section 4.2.4 of the EIS, the current guidance (ER 1100-2-8162) from USACE states that proposed alternatives should be formulated and evaluated for a range of possible future local relative sea level change rates. The relative sea level change rates shall consider as a minimum a low rate based on an extrapolation of the historic rate, and intermediate (Curve 1) and high (Curve III) rates which include future acceleration of the eustatic sea level change rate. These rates of change for this Project correspond to an increase in sea levels of 0.7 feet, 1.1 feet, and 2.6 feet over 50 years for the low, medium and high rates. The historic rate, 0.7 feet over 50 years, has been used as the basis of design for the flood protection structures (USACE 2015). The District acknowledges that in February 2015 the NPCC released a report (*Building the Knowledge Base for Climate Resiliency* [NPCC 2015]) which projects that sea level will rise in New York City of 11 to 21 inches by the 2050s. The District concludes that the NED Plan represents the type of infrastructure design and investment for the City that would be responsive to climate change. For example, the NED Plan design crest is only predicted to be overtopped by surge during the most restrictive combination of storm event and sea level change studied. Only the 500-year + the "high" rate of sea level change would overtop the minimum design crest elevation of 18 feet NGVD29. The NED Plan would also meet the overtopping requirements in the event of a 100-year storm in year 2069 for

the low, intermediate, and high predictions of sea level change. Beyond the 50-year period-of-analysis, the robust design of the NED Plan may support the added loads of structural expansion or adaptation to meet the needs of future sea level change. Additionally, the proposed ponds are designed to maximize stormwater management effectiveness in an existing low-lying developed coastal area where the street and property grades are essentially fixed and cannot be modified. In sum, the NED Plan would manage flood levels during storm events and operation of the proposed ponds would not be impacted by sea level rise. Therefore, the District has determined that the NED Plan would be consistent with this policy.

State Policy 13 – The construction or reconstruction of erosion protection structures shall be undertaken only if they have a reasonable probability of controlling erosion for at least 30 years as demonstrated in design and construction standards and/or assured maintenance or replacement programs.

Determination – The construction and maintenance of the LOP would provide coastal storm risk management for a minimum of 50 years after initial construction (note: 50 years was the minimum life of the Project analyzed by the District). Therefore, the District has determined that the NED Plan would be consistent with this policy.

State Policy 14 – Activities and development including the construction or reconstruction of erosion protection structures, shall be undertaken so that there would be no measurable increase in erosion or flooding at the site of such activities or development, or at other locations.

Determination – The primary goal of the Project is to manage the risk of damages from hurricane and storm surge flooding along the south shore of Staten Island. The LOP and interior ponds would alleviate flooding and reduce interior runoff by reducing water surface elevations. No structures that would generate increases in erosion or flooding will be constructed. Therefore, the District has determined that the NED Plan would be consistent with this policy.

State Policy 16 – Public funds shall only be used for erosion protective structures where necessary to protect human life, and new development which requires a location within or adjacent to an erosion hazard area to be able to function, or existing development; and only where the public benefits outweigh the long term monetary and other costs including the potential for increasing erosion and adverse effects on natural protective features.

Determination – The without Project alternative would result in increased flood risks and associated negative consequences to life, property and the environment. The NED Plan provides significant public benefits. The District has weighed the public costs of the Project against the benefits and has determined that the public benefits outweigh the public costs because beach protection would provide a significant reduction in damages to housing, infrastructure, and the environment. Additionally, the Project would improve water quality in the Project area, which would also be positive for recreation. Therefore, the District has determined that the NED Plan would be consistent with this policy.

State Policy 17 – Non-structural measures to minimize damage to natural resources and property from flooding and erosion shall be used whenever possible.

Determination – The NED Plan utilizes both structural and non-structural measures to minimize damage to natural resources and property from flooding and erosion. Non-structural measures alone would not provide the required coastal storm risk management. The policy explanation states that consistency with this policy requires the use of such non-structural measures when they are appropriate and available. Given the need to provide coastal storm risk management to the Project area, structural measures are required. Therefore, the District has determined that the NED Plan would be consistent with and would advance this policy.

State Policy 18 – To safeguard the vital economic, social and environmental interests of the state and of its citizens, proposed major action in the coastal area must give full consideration to those interests, and to the safeguards which the state has established to protect valuable coastal resource areas.

Determination – The area on which the LOP would be constructed is publicly owned and supports a variety of public recreational activities. The south shore of Staten Island's coastline must be maintained to protect these uses. The without Project condition would eventually impact public recreational activities. The Project would provide coastal storm risk management to an important public recreational area and adjacent commercial and residential properties with minimal short-term impacts to economic, social, and environmental resources. Therefore, the District has determined that the NED Plan would be consistent with this policy.

State Policy 19 – Protect, maintain, and increase the level and types of access to public water-related recreation resources and facilities.

Also applicable: **NYC Policy 8** – Provide public access to and along New York City's coastal waters.

Determination – The NED Plan would result in positive impacts on recreation as a result of improved water quality and better coastal storm risk management in the Project area. The without Project alternative would result in increased flood risks, increased erosion, and decreased water quality, thereby decreasing recreational potential in the area. The NED Plan would preserve existing open space, including wetlands and buffer areas, for habitats and stormwater management. The proposed LOP and all ponds would be compatible with adjacent land uses and activities. Implementation of the Project would provide a stormwater management plan for the Project area and would enhance natural resources through habitat restoration and protection. (See State Policy 20, below, regarding public access). Consequently, the District has determined that the NED Plan would be consistent with this policy.

State Policy 20 – Access to publicly-owned foreshore and to lands immediately adjacent to the foreshore or the water's edge that are publicly-owned shall be provided and it shall be provided in a manner compatible with adjoining uses.

Also applicable: **NYC Policy 8.1** – Preserve, protect and maintain existing physical, visual and recreational access to the waterfront.

Determination – The NED Plan would not adversely affect public access along the south shore of Staten Island. Fourteen (14) earthen ramps are proposed between Oakwood Beach and South Beach. These ramps would be designed for both pedestrian and vehicular access and meet the 1:12 maximum slope required by ADA guidelines. The ramps would be strategically located to provide beach access from existing roads and access paths. Pedestrian access points, spaced approximately every 500 feet, would be located along the Buried Seawall between Midland Beach and South Beach. There would be a total of 27 access points for pedestrians along the promenade. Because the Project would be compatible with adjoining uses and provides adequate public access, the District has determined that the NED Plan would be consistent with this policy.

State Policy 21 – Water-dependent and water-enhanced recreation would be encouraged and facilitated, and would be given priority over non-water related uses along the coast.

Determination – The NED Plan would result in providing positive benefits on recreation as a result of improved water quality and better coastal storm risk management in the Project area. The without Project alternative would result in increased flood risks, increased erosion, and decreased water quality, thereby decreasing recreational potential in the area. Consequently, the District has determined that the NED Plan would be consistent with the policy to encourage and enhance water-dependent and water-enhanced recreation.

State Policy 22 – Development when located adjacent to the shore would provide for water-related recreation whenever such use is compatible with reasonably anticipated demand for such activities, and is compatible with the primary purpose of the development.

Determination – The NED Plan would result in providing positive benefits to on recreation as a result of improved water quality and better coastal storm risk management in the Project area. The without Project alternative would result in increased flood risks, increased erosion, and decreased water quality, thereby decreasing recreational potential in the area. Consequently, the District has determined that the NED Plan would be consistent with this policy.

State Policy 23 – Protect, enhance and restore structures, districts, areas of sites that are of significance in history, architecture, archeology or culture of the State, its communities, or the Nation.

Also applicable: **NYC Policy 10** – Protect, preserve and enhance resources significant to the historical, archaeological, and cultural legacy of the New York City coastal area.

Determination – The NED Plan would provide coastal storm risk management features to the south shore of Staten Island. No New York City designated landmarks are present in the area. The alignment passes adjacent to, and at times crosses into, the Miller Army Airfield Historic District which is a National Register of Historic Places listed property. The NED Plan would impact Miller Field; however the District is working with the National Park Service and the New York State Historic Preservation Office on a Programmatic Agreement to mitigate any impacts. The NED Plan would protect the structures within the historic district from further flood damage.

The NED Plan would also manage risk identified in Policy 23; therefore, the District has determined that the NED Plan would be consistent with this policy.

State Policy 24 – Prevent impairment of scenic resources of statewide significance.

Also applicable: **NYC Policy 9** – Protect scenic resources that contribute to the visual quality of the New York City coastal area.

Determination – The NED Plan would help manage the risk of flood damages in the area, would enhance water quality, and would create more and improved wetland habitats. No known scenic resources of statewide significance exist in the immediate Project area, therefore, the District has determined that the proposed NED Plan would be consistent with this policy.

State Policy 25 – Protect, restore or enhance natural and man-made resources which are not identified as being of statewide significance, but which contribute to the overall scenic quality of the coastal area.

Determination – The NED Plan would help manage the risk of flood damages in the area, would enhance water quality, and would create more and improved wetland habitats. During construction, increased traffic, the presence of construction equipment, and the actual construction activities would create short-term, direct adverse impacts to aesthetics and scenic resources. Once constructed, the proposed LOP would generally blend with the surrounding natural and cultural landscapes, which are composed of existing linear features such as Father Capodanno Boulevard, the existing raised promenade and/or boardwalk, and the existing shoreline, including existing dunes. However, in the Midland Beach area, interior views along portions of the LOP would be partially blocked, particularly from ground-level indoor and outdoor views of residences adjacent to and behind (on the landward side of) the proposed LOP. To minimize visual and aesthetic impacts, the proposed LOP would utilize shapes and vegetation cover types which already exist within the surrounding natural and cultural landscapes. With regard to potential impacts associated with interior flood storage areas, these are generally characterized as open, natural areas covered with grasses, shrubs, and wetland vegetation, and containing occasional (storm event or seasonal) surface water ponding. Modifications to these areas to increase flood storage capacity, including excavation of existing low-lying areas for larger existing ponds or for new ponds, would result in landscape features and vegetation cover types that would remove many acres of *Phragmites* and create vistas different from existing conditions. The District is working closely with NYC Parks to avoid or minimize potential impacts to recreational impacts. The revitalized and protected beach would enhance the scenic quality of the coastal area, therefore, the District has determined that the NED Plan would be consistent with this policy.

State Policy 44 – Preserve and protect tidal and freshwater wetlands and preserve the benefits derived from these areas.

Determination – The NED Plan is expected to result in improved water quality in the watershed compared to the No-Action (without-project) Alternative. Without the NED Plan, runoff would

not be collected and directed to the proposed ponds. In contrast, proposed ponds function as wetlands that provide physical, chemical, and biological treatment of pollutants contained within runoff; flow rates into wetlands are attenuated, allowing sediment and organic debris to settle. During this process, nutrients undergo both chemical and biological transformation in a wetland. Nitrogen can be naturally altered into forms that are more favorable to uptake by wetland plants and phosphorus is readily precipitated out of water in many of its chemical forms, depending on the pH of the water and is also utilized by plants. Proposed ponds can also reduce fecal coliform concentrations by detaining water, allowing for die-off of microorganisms. The interior drainage features of the NED Plan would also improve wetland quality and enhance wetlands by increasing diversity with expanded open water (low-flow channels and ponds) and permanent pool (emergent wetlands) habitats. The District calculated that the NED Plan would reduce freshwater wetland acreage by approximately 10.9 acres and would result in the construction of approximately 46 acres of tidal wetlands. The proposed tidal gates associated with the LOP would remain open during normal tidal elevations to allow passage of saline tidewater into marsh areas and drainage of the interior runoff. No salinity effects are expected. Consequently, the District has determined that the NED Plan would be consistent with this policy.

REFERENCES

New York City Panel on Climate Change (NPCC). *Building the Knowledge Base for Climate Resiliency.* February 2015.

NYC Department of City Planning (NYCDCP), New York City Comprehensive Waterfront Plan: Vision 2020. 2011.

New York State Department of State (NYSDOS). Coastal Management Program, State Coastal Policies (Including Program changes from 1982-2006). 2006.

Appendix E

Distribution List

DISTRIBUTION LIST

The District provided access to an electronic copy of this Final EIS to Federal, state, and local elected and appointed government officials and agencies; interested organizations; and any individuals who requested the document. The District has posted this Final EIS on the Internet at http://www.nan.usace.army.mil/.

U.S. Senate
Senator Charles Schumer
Senator Kirsten Gillibrand

U.S. House of Representatives
Representative Daniel M. Donovan, Jr

Federal Agencies
Dan Montella, USEPA
Grace Musumeci, USEPA
Bob Nyman, USEPA
Steve Sinkevich, USFWS
Steve Papa, USFWS, NYFO
David Stilwell, USFWS, NYFO
Michael Ludwig, NMFS
Melissa Alvarez, NMFS
Joshua Laird, National Park Service
Jennifer Nersesian, NPS Gateway National Recreation Area
Barbara Repeta, NPS GNRA
Doug Adamo, NPS GNRA
Marilou Ehrler, NPS GNRA

State and Local Elected Officials
James Oddo, Borough President
Honorable Andrew J. Lanza, New York State Senate
Honorable Diane J. Savino, New York State Senate
Assemblyman Mathew Titone
Assemblyman Michael Cusick
Assemblyman Joseph Borrelli
Assemblywoman Nicole Malliotakis
Councilman Vincent Ignizio
Councilman Steve Matteo
Councilwoman Debi Rose

Robert Engulert, Office of Staten Island Borough President

State, City and Local Agencies

Susan McCormick, New York State Department of Environmental Conservation
Anna Servidone, NYSDEC
Susan Maresca, NYSDEC
Alan Fuchs, NYSDEC
Stephen Zahn, NYSDEC
Jeff Zappieri, NYS Department of State/Division of Coastal Resources
Terra Sturn, NYS Department of State/Division of Coastal Resources
Jeff Herter, NYS Department of State/Division of Coastal Resources
Ruth Pierpont, NYS Office of Parks, Recreation & Historic Preservation
Alex Zablocki, New York State Governor's Office of Storm Recovery
Daniel Greene, New York State Governor's Office of Storm Recovery
Curtis Cravens, NYC Mayor's Office of Recovery and Resiliency
Esther Brunner, NYC Mayor's Office of Recovery and Resiliency
Sarah Kogel-Smucker, NYC Mayor's Office of Recovery and Resiliency
Mike Marella, NYC Department of City Planning Waterfront
Mary Kimball, NYC Department of City Planning Waterfront
Suchi Sanagarapu, New York City Department of Transportation
Jim Garin, NYC Department of Environmental Protection
Dana Gumb, NYCDEP
Jannine McColgan, NYCDEP
Alan Cohn, NYCDEP
Elizabeth Jordan, NYC DPR
Bill Tai, NYC DPR/Planning
Sam Seo, NYCDPR
Fiona Akins, NYCDPR
Colleen Alderson, NYCPPR
Andrew Genn, NYC Economic Development Corporation
Amanda Sutphin, NYC Landmarks Preservation Commisssion
Daniel Jacobs, Staten Island Borough President's Office
Mark Matsil, Trust for Public Land
Jim Scarcella, Natural Resources Protection Association
Joseph Carroll, Community Board 1
Debra Derrico, Community Board 2
Charlene Wagner, Community Board 3

Consulting Tribes

Tamara Francis, The Delaware Nation
Blair Fink, The Delaware Tribe
Sherry White - Stockbridge-Munsee Community Band of Mohican Indians

Individuals and Others

New York Newsday
Staten Island Advance
Dee Vandenburg, SI Taxpayers Alliance

Barnett Shepherd, Preservation League of Staten Island
Dr. Thomas Matteo, Staten Island Historian
Elizabeth Egbert, Staten Island Museum
Ed Wiseman, Staten Island Historical Society

Appendix F

Programmatic Agreement

PROGRAMMATIC AGREEMENT
AMONG
THE U. S. ARMY CORPS OF ENGINEERS, NEW YORK DISTRICT,
THE NATIONAL PARK SERVICE, AND
THE NEW YORK STATE HISTORIC PRESERVATION OFFICE
REGARDING
THE SOUTH SHORE OF STATEN ISLAND
COASTAL STORM DAMAGE REDUCTION PROJECT
RICHMOND COUNTY, NEW YORK

WHEREAS, the U.S. Army Corps of Engineers, New York District, (New York District) proposes to construct Phase I of a coastal storm damage reduction project along the south shore of Staten Island, from just south of Fort Wadsworth to Oakwood Beach, Richmond County, New York; and

WHEREAS, the New York District was originally authorized to undertake a feasibility study by resolution of the US House of representatives Committee on Public Works and Transportation, adopted 13 May 1993; and

WHEREAS, conditional authorization to undertake construction of this Undertaking has been provided to the New York District under P.L. 113-2, the Disaster Relief Appropriations Act of 2013, following October 2012 Hurricane Sandy; and

WHEREAS, the Undertaking is proposed to include a buried seawall/armored levee along a majority of the reach (approximately 80%) serving as the first line of defense against severe coastal surge flooding and wave forces. The remainder of the Line of Protection (LOP) consists of a T-Type Vertical Floodwall, and Levee. The LOP also includes a closure structure at Hylan Boulevard, drainage control structures for existing storm water outfalls, tide gate structures, vehicle and pedestrian access structures, and replacement of existing boardwalk and the Interior Drainage Plan includes pond excavation, construction of tide gates and gate chambers along the LOP, road raisings, and other minor interior drainage facilities, environmental mitigation measures, as needed, may be included, as part of the South Shore of Staten Island Coastal Storm Damage Reduction Project (Undertaking) (Appendix A); and

WHEREAS, the New York District will implement the provisions of this Programmatic Agreement (PA) as funding for the project is appropriated in future years; and

WHEREAS, the New York District has defined the Area of Potential Effect (APE) for this Undertaking to include all areas impacted by activities required to construct the buried seawall/armored levee, floodwalls, levees, closure structure, drainage control structures, tide gate structures, vehicle and pedestrian access structures and any required environmental mitigation measures; the locations for some project features have yet to be determined; and

WHEREAS, the New York District is applying the National Register of Historic Places (NRHP) Criteria (Criteria) to properties identified within the APE on a phased basis, and to date has completed substantial surveys within the APE (Appendix B) which shall be hereafter referred to as the "Investigated Portion of the APE" with the recognition that additional identifications and evaluations are required for project actions which have not yet been finalized; and

WHEREAS, the New York District, NYSHPO and Federally Recognized Tribes have agreed that no Traditional Cultural Properties are known to be within the Investigated Portion of the APE; and

WHEREAS, the bungalow community at Cedar Grove was determined eligible for the NRHP by the New York State Historic Preservation Office (NYSHPO) in 2011and its proposed demolition was to be mitigated by the New York City Department of Parks and Recreation (NYCDPR) the property owner, and all but two structures were subsequently destroyed by the October 2012 Hurricane Sandy, and the remaining two are slated for demolition by NYCDPR, the New York District shall undertake no further work at Cedar Grove in relation to the bungalow community; and

WHEREAS, the LOP will cross lands owned by the National Park Service (NPS) at Gateway National Recreation Area (GNRA), which include the Miller Army Airfield Historic District, a NRHP-listed historic district and the 1943 World War II (WWII) Fire Control Tower, which requires further evaluation as to its eligibility; and

WHEREAS, the LOP will be constructed adjacent to lands owned by the NPS at the GNRA with Fort Wadsworth Historic District at one end and Great Kills at the other; and

WHEREAS, for the purposes of the Undertaking, the NPS and the New York District have agreed that the New York District will act as the lead for compliance with Section 106 on behalf of the NPS for the portion that crosses NPS lands [36 CFR 800.2(a)(2)], and the NPS will be a signatory to this PA; and

WHEREAS, much of the facilities required for the Interior Drainage Plan is within the New York City Department of Environmental Protection (NYCDEP) Staten Island Blue Belt Program for which a cultural resources study was completed resulting in no identified NRHP-eligible resources but included recommendations for archaeological testing in selected locations of high ground; and

WHEREAS, the New York District has invited the Advisory Council on Historic Preservation (ACHP), the Delaware Nation, The Delaware Tribe of Indians, the Stockbridge-Munsee Band of Mohican Indians, New York City Landmarks Preservation Commission (NYCLPC), the Staten Island Historical Society, The Staten Island Museum, the Staten Island Historian and the Preservation League of Staten Island to participate in the Section 106 consultation process. The ACHP has opted not to participate at this time; and

WHEREAS, the ACHP has opted to not participate in the agreement document. NYCLPC concurred with the recommendations and the direction the USACE would take on future studies as per the Draft PA and request being informed of the studies as they are undertaken. The Delaware Tribe and the Stockbridge-Munsee Mohican Tribe concurred with the Phase I recommendations for deep testing. The Delaware Nation indicated that the USACE should continue with the project as planned. The Preservation League of Staten Island expressed an interest in the Elm Tree Light; and

WHEREAS the New York District made the Draft PA available for public review in the Draft Environmental Impact Statement prepared under the National Environmental Policy Act which will serve as the District's Section 106 public coordination for this undertaking; and

WHEREAS, in accordance with 36 CFR Part 800.14, the New York District and the NYSHPO have determined that execution of this PA will establish alternative procedures to streamline the coordination of the Project; and

WHEREAS, the New York District shall continue to consult with the NYSHPO and the NPS for portions of the Undertaking that affect NPS land and resources, regarding plans and surveys to identify, evaluate and treat historic properties as the New York District implements all phases of the Undertaking; and

NOW, THEREFORE, the New York District, the NPS, and the NYSHPO agree that the Undertaking shall be administered in accordance with the following stipulations to satisfy the New York District's Section 106 responsibility for all individual actions of the Undertaking.

Stipulations

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

I. IDENTIFICATION AND EVALUATION

A. The New York District in consultation with the NYSHPO has determined that there is the potential to encounter deeply buried landforms and Native American sites in the APE which shall be investigated by the New York District through the excavation of borings along the project alignment in locations where construction techniques will entail ground disturbance in the form of open trenching. This work will be overseen by a geoarchaeologist who will determine the locations of the borings. The New York District shall consult with the NYSHPO to develop Archaeological Work Plans to address this work.

B. Should paleo-surfaces or archaeological remains be encountered through the work conducted under Stipulation 1(A), the New York District shall consult with the NYSHPO and other interested parties to develop plans to evaluate NRHP-eligibility of such

remains. If determined significant and avoidance is not feasible a data recovery plan will be developed as per Stipulation II (F).

C. The New York District will follow the recommendations contained in the NYCDEP Staten Island Blue Belt Program cultural resources study for areas where the interior drainage plan overlaps with the Blue Belt area.

D. The New York District shall consult with the NYSHPO to develop plans to complete the identification of historic properties within the uninvestigated portion of the Undertaking's APE (Appendix B).

E. The New York District shall revise plans to address comments and recommendations provided by the NYSHPO prior to proceeding with identification and evaluation activities.

F. The New York District shall ensure that qualified professionals meeting the NPS professional qualifications for the appropriate discipline National Park Service Professional Qualification Standards, Secretary of the Interior's Standards and Guidelines for Archaeology and Historic Preservation (48 FR 44738-39)] are used to complete all identification and evaluation plans related to this undertaking, to include archaeological surveys and testing, historic structure inventories, and documentation.

G. The New York District and the NYSHPO shall consider the views of the public or interested parties in completing its identification and evaluation responsibilities.

H. The New York District shall maintain records of all decisions it makes related to the NRHP eligibility of properties.

I. Application of Criteria

1. The New York District, in consultation with the NYSHPO, shall evaluate historic properties using the Criteria established for the NRHP [36 CFR 800.4(c)(1)]:
a. If the New York District and the NYSHPO, and NPS for properties on NPS land, agree that the Criteria apply or do not apply, in evaluating the NRHP eligibility of a property, the property shall be treated accordingly for purposes of this PA.
b. If the New York District and the NYSHPO disagree regarding NRHP eligibility, or if the ACHP or the NPS so request, prior to the start of any project-related work at the site or in the vicinity of the property, the New York District shall obtain a formal Determination of Eligibility (DOE) from the Keeper of the National Register (Keeper), National Park Service, whose determination shall be final.

2. Prior to the initiation of construction related activities which may affect historic properties, the New York District, in consultation with the NYSHPO, shall identify and evaluate:

a. Archaeological Sites

i. The New York District shall ensure that archaeological surveys within the uninvestigated portions of the APE are conducted in a manner consistent with the Secretary of the Interior's Standards and Guidelines for Identification (48 FR 44720-23) and the New York Archaeological Council Standards for Cultural Resource Investigations and the Curation of Archaeological Collections in New York State (1994, adopted by NYSHPO in 1995), and take into account the National Park Service publication The Archaeological Survey: Methods and Uses (1978) and the statewide historic contexts developed by the NYSHPO.

ii. The survey shall be conducted following consultation with the NYSHPO, and a report of the survey, consistent with the District's cultural resource report standards and format, shall be submitted to the NYSHPO for review and consultation.

b. Traditional Cultural Properties.

i. The New York District shall ensure that future surveys within the uninvestigated portions of the APE includes procedures to identify Traditional Cultural Properties and to consult with Federally Recognized Tribes and other affected parties in accordance with the guidelines provided by National Park Service Bulletin 38, Guidelines for Evaluating and Documenting Traditional Cultural Properties.

ii. In the event that a Federally Recognized Tribe or affected group contacts the New York District regarding its recognition of a Traditional Cultural Property, located within the APE, the New York District shall notify the NYSHPO, and NYCPLC and NPS as necessary, to initiate discussions with all parties to evaluate whether the property is a Traditional Cultural Property that meets the Criteria.

c. Buildings and Structures

i. The New York District shall ensure that surveys are conducted for buildings and structures in the Undertaking's uninvestigated portion of the APE in a manner consistent with the Secretary of the Interior's Standards and Guidelines for Identification (48 FR 44720-23) and which takes into account the statewide historic contexts developed by the NYSHPO. The survey shall be conducted following consultation with the NYSHPO, and a report of the survey, consistent with the NYSHPO's Recommended Standards for Historic Resources Surveys, shall be submitted to the NYSHPO for review and consultation.

ii. The New York District, in consultation with the NYSHPO, shall identify and evaluate buildings and structures that are located adjacent to listed or eligible NRHP Historic Districts to determine whether such properties should be considered as part of the Historic District or an expanded District.

d. Historic Landscapes and Viewsheds

i. The New York District shall consult with the NYSHPO to identify and evaluate historic landscapes and viewsheds located within the uninvestigated portion of the

Undertaking's APE. The New York District shall consult National Park Service Bulletins 18, How to Evaluate and Nominate Designed Historic Landscapes, and 30 Guidelines for Evaluating and Documenting Rural Historic Landscapes, National Park Service Preservation Brief 36, Protecting Cultural Landscapes, and other publications and materials made available by the NYSHPO to assist in defining the criteria that should be applied to such properties.

ii. The objective in conducting the surveys is to identity NRHP listed or potentially eligible Historic Landscapes and affected View Sheds within the project area that may be adversely affected by the Undertaking implementation, and to determine whether they meet the NRHP criteria set forth in 36 CFR Part 60.4.

3. The New York District shall ensure that the identification and evaluation of historic properties that may be affected by each phase of the Undertaking is completed prior to the initiation of any formal action by the Corps including rehabilitation, relocation, demolition, etc.

II. TREATMENT OF HISTORIC PROPERTIES.

The New York District shall adhere to the following treatment strategies in order to avoid adverse effect to historic properties.

A. The New York District, in consultation with the NYSHPO, shall develop appropriate treatment plans for historic properties identified within the APE which may be affected by the Undertaking. Unless the NYSHPO objects within 30 days of receipt of any plan, the New York District shall ensure that treatment plans are implemented by the New York District or its representative(s). The New York District shall revise Plans to address comments and recommendations provided by the NYSHPO.

B. The New York District shall ensure that qualified professionals meeting the NPS professional qualifications for the appropriate discipline [National Park Service Professional Qualification Standards, Secretary of the Interior's Standards and Guidelines for Archaeology and Historic Preservation (48 FR 44738-39)] are used to develop and implement all treatment plans.

C. Avoidance. The preferred treatment is avoidance of effects to historic properties. The New York District shall, to the extent feasible, avoid historic properties either through project design changes, use of temporary fencing or barricades, realignments, landscaping, or other measures that will protect historic properties. The New York District, and the NYSHPO shall consult to develop plans for avoiding effects to historic properties. The New York District shall incorporate feasible avoidance measures into project activities as part of the implementation of the Undertaking. If, in consultation with the NYSHPO, avoidance is determined to be infeasible, the New York District shall develop and implement treatment/mitigation plans consistent with Stipulation II of this PA.

D. Preservation in Place. When the New York District and NYSHPO agree that complete avoidance of historic properties is infeasible, the New York District shall explore preservation in place, if appropriate. Preservation in place may entail partial avoidance or protection of historic properties against project-related activities in proximity to the property. The New York District shall preserve properties in place through project design, i.e incorporating color, texture, scale, and/or materials which are compatible with the architectural or historic character of the historic property; use of fencing, berms or barricades; and/or preservation of vegetation including mature trees, landscaping and planting which screen the property. If the New York District, in consultation with the NYSHPO, determines that preservation in place is infeasible, the New York District shall develop and implement treatment/mitigation plans consistent with Stipulation II of this PA.

E. Buildings and Structures and Districts. The New York District, in consultation with the NYSHPO, shall determine the effect the Undertaking will have on listed or eligible historic building, district, and structure and ensure that a treatment plan be developed for these properties.

F. Archaeological Sites

a. Archaeological Data Recovery: The District shall develop a data recovery plan for archaeological sites eligible solely under NRHP Criterion D which the New York District and the NYSHPO agree cannot be avoided or appropriately preserved in place. The data recovery plan to retrieve significant archaeological information will be developed and implemented by the New York District or its representative(s), following approval from the NYSHPO and prior to the implementation of project-related activities within or in the vicinity of the archaeological sites.

b. The New York District shall ensure that the data recovery plan for each eligible site addresses substantive research questions developed in consultation with the NYSHPO, Federally Recognized Tribes and NYCLPC, as appropriate. The plan shall be consistent with the Secretary of the Interior's Standards and Guidelines for Archaeological Documentation (48 FR 44734-37) and take into account the ACHP's publication, Treatment of Archaeological Properties.

c. The New York District shall submit data recovery plans to the NYSHPO for review and approval. The New York District and NYSHPO shall consult to resolve any objections to the data recovery plan as proposed. The data recovery plan shall then be implemented by the New York District once approved by the NYSHPO. If no response is received from the NYSHPO after 30 days of receipt of adequate documentation, the New York District may assume the NYSHPO`s concurrence and proceed with implementation of the plan submitted.

G. Historic Landscapes

a. The New York District, in consultation with the NYSHPO, shall develop a plan to identify and evaluate design alternatives which will avoid, minimize, or compensate for impacts when it is determined that a historic landscape will be affected by Undertaking activities.

b. Treatment measures for historic landscapes shall consider, in order of priority, preservation, rehabilitation, restoration, reconstruction, and additions in accordance with The Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes (1996) and Protecting Cultural Landscapes, National Park Service Preservation Brief Number 36.

H. Curation and Dissemination of Information: The New York District or its designee, in consultation with the NYSHPO shall ensure that all materials and records resulting from the survey, evaluation, and data recovery conducted for the Undertaking will be curated in accordance with 36 CFR Part 79 "Curation of Federally-Owned and Administered Archaeological Collections" and ER 1130-2- 433 "Project Operations: Collections Management and Curation of Archaeological and Historical Data." All material and records recovered from non-Federally owned land shall be maintained in accordance with 36 CFR Part 79 until their analysis is complete and, if necessary, are returned to their owner(s). All material and records recovered from NPS lands shall be maintained in accordance with 36 CFR Part 79 until their analysis is complete and then returned to the NPS.

I. Disagreements on effect determinations. Should the New York District and NYSHPO disagree as to whether the criteria of adverse effect apply to the effects of the Undertaking on particular historic properties, the New York District will request the ACHP to review the finding and request their written opinion within 30 days, in accordance with 36 CFR 800.5(c). The New York District will take the ACHP's opinion into account when reaching a final decision.

III. RESOLUTION OF ADVERSE EFFECTS

A. When the New York District, in consultation with the NYSHPO, determines that Undertaking related activities cannot adhere to treatment plans developed in accordance with Stipulation II.E. or would otherwise have an adverse effect, the New York District shall:

1. Develop a Standard Mitigation Agreement (SMA) with the NYSHPO; or
2. Consult with the ACHP to develop a Memorandum of Agreement (MOA) in accordance with 36 CFR Part 800.6 (c).

B. The New York District shall invite the ACHP to participate in consultation when:

1. The New York District and SHPO determine that an agreement or a SMA cannot be reached;

2. a National Historic Landmark is involved;
3. human remains have been identified; or
4. there is widespread public interest in a historic property or properties.

C. The New York District and the NYSHPO, and interested parties as appropriate, shall consult to develop alternatives to mitigate or minimize adverse effects. The analysis of alternatives shall consider program needs, cost, public benefit and values, and design feasibility.

D. Development of Standard Mitigation Agreements (SMA).
The New York District, in consultation with the NYSHPO and interested parties, as appropriate, shall develop SMAs for historic properties which will be adversely affected by the Undertaking. The New York District shall submit the **S**MA to the NYSHPO for review and approval by certified mail. The NYSHPO shall have 30 days from receipt of adequate information in which to review and comment on the SMA(s). If the NYSHPO fails to respond within 30 days, or if there is disagreement, the New York District shall notify the ACHP and consult to develop the proposed SMA into an MOA and submit copies of background information and the proposed SMA to facilitate consultation to develop an MOA in accordance with 36 CFR Part 800. After signing by the New York District and NYSHPO, the New York District shall file all SMAs with the ACHP.

Standard Mitigation Agreements (SMA)
SMAs developed between the New York District and the NYSHPO may include one or more of the following stipulations which address routine adverse effects that may occur to historic properties as a result of project implementation.

1. Recordation. The New York District shall consult with the NYSHPO or Historic American Building Survey/Historic American Engineering Record (HABS/HAER) to determine the appropriate level and type of recordation for affected resources. For historic properties with state and/or local significance, recordation shall be consistent with the requirements and standards of the Department of the Interior (April 2003). All documentation must be submitted to NYSHPO and HABS/HAER for acceptance, prior to the initiation of project activities, unless otherwise agreed to by the NYSHPO or NPS.

3. Salvage and Donation of Significant Architectural Elements. Prior to demolition, partial demolition, or substantial alteration of historic properties, the New York District, in consultation with the NYSHPO, shall develop a salvage and donation plan to identify appropriate parties willing and capable of receiving and preserving the salvaged significant architectural elements. The New York District shall submit the plans to the NYSHPO for review and approval.

4. Alternative Treatments or Design Plan which meet the Standards. Prior to demolition partial demolition, or substantial alteration of historic properties, the New York District, in consultation with the NYSHPO, shall develop a plan identifying protocols for developing treatment guidelines and evaluating design standards for new construction within historic

districts in keeping with the Secretary's Standards. The New York District shall submit the plans to the NYSHPO for review and approval.

5. Data recovery for archaeological sites eligible under Criterion D and others and data recovery and treatment of archaeological sites where data recovery will not result in a finding of no adverse effect. The New York District shall conduct data recovery on archaeological sites following agreement on the prospective data recovery and treatment plans between the New York District and the NYSHPO when the archaeological sites are eligible for National Register inclusion under additional Criteria than Criterion D (for the information which they contain) or when the full informational value of the site cannot be substantially preserved through the conduct of appropriate research to professional standards and guidelines. To the maximum extent feasible, data recovery and treatment plans shall be developed to take into account and mitigate for the fullest range of archaeological site values and significance. Prior to construction, the New York District shall develop a data recovery plan for archaeological sites eligible under Criterion D and others. The New York District shall submit the plans to the NYSHPO for review and approval.

IV. DISCOVERY

A. If previously unidentified properties are discovered during Undertaking implementation, the New York District shall cease all work in the vicinity of the discovered property until it can be evaluated pursuant to the guidelines in Stipulation I of this PA. If the property is determined to be eligible, the New York District shall consult with the NYSHPO to develop a treatment plan or SMA in accordance with Stipulation II of this PA.

B. The New York District shall implement the treatment or SMA once approved by the NYSHPO.

V. TREATMENT OF HUMAN REMAINS:

If any human remains and/or grave-associated artifacts are encountered, the New York District, the NYSHPO and Tribes shall consult to develop a treatment plan that is responsive to the ACHP's "Policy Statement Regarding Treatment of Burial Sites, Human Remains and Funerary Objects" (February 23, 2007), the Native American Grave Protection and Repatriation Act, As Amended (PL 101-601, 25 U.S.C. 3001 et seq.) and, U.S. Army Corps of Engineers, Tribal Consultation Policy (4 October 2012) and the NYSHPO Human Remains Discovery Protocol (October 2013).

A. Human remains must be treated with the utmost respect and dignity. All work must stop in the vicinity of the find and the site will be secured.

B. The medical examiner/coroner, local law enforcement, the NYSHPO and tribes will be notified. The coroner and local law enforcement will determine if the remains are forensic or archaeological in nature.

C. If the human remains are determined to be Native American they shall be left in place and protected from further disturbance until a treatment plan has been developed and approved by the New York District, NYSHPO and Tribes.

D. If human remains are determined to be non-Native American, the remains will be left in place and protected from further disturbance until a plan for avoidance or removal is developed and approved by the New York District, NYSHPO, Federally Recognized Tribes and other parties, as appropriate.

E. Avoidance of human remains is the preferred treatment.

VI. ACTIVITIES ON NATIONAL PARK SERVICE LANDS

For those portions of the Undertaking which take place on NPS lands, the New York District will fully engage the NPS in all consultations and secure NPS concurrence for all decisions related to identification, evaluation, effect determinations, and treatment of adverse effects. USACE will submit all documentation and determination findings for properties on NPS land to NPS for review and concurrence prior to submission to NY SHPO or ACHP. All adverse effects on NPS land will be resolved through an MOA to which NPS will be a signatory. Such agreement documents will be developed and ratified by the 30% design of the specific project segment in which there is an adverse effect to NPS property. If the NPS, New York District, and NYSHPO cannot come to agreement on any such matters, the provisions of stipulations I.I (b), II.I, or VIII.B will apply, as most appropriate.

VII. ACTIVITIES ON NEW YORK CITY LANDS

For those portions of the Undertaking which take place on New York City (NYC) owned property, the New York District will fully engage the NYCLPC in all consultations and secure NYCLPC concurrence for all decisions related to identification, evaluation, effect determinations, and treatment of adverse effects. USACE will submit all documentation and determination findings for properties on NYC land to the NYCLPC for review and concurrence prior to submission to NYSHPO or ACHP. If the NYCLPC, New York District, and NYSHPO cannot come to agreement on any such matters, the provisions of stipulations I.I (b), II.I, or VIII.B will apply, as most appropriate.

VIII. ADMINISTRATIVE TERMS

A. REVIEW PERIODS

The NYSHPO, ACHP, the NPS, NYCLPC, the Delaware Nation, the Delaware Tribe of Indians, the Stockbridge-Munsee Community Mohican Band of Indians and any other interested party shall have 30 days to review and/or object to determinations, evaluations, plans, reports, and other documents submitted to them by the New York District.

B. DISPUTE RESOLUTION

1. The New York District and the signatories shall attempt to resolve any disagreement arising from implementation of this PA. If there is a determination that the disagreement cannot be resolved, the New York District shall request the ACHP`s recommendations or request the comments of the ACHP in accordance with 36 CFR Part 800.7.

2. Any ACHP recommendations or comments provided in response will be considered in accordance with 36 CFR Part 800.7, with reference only to the subject of the dispute. The New York District shall respond to ACHP recommendations or comments indicating how the New York District has taken the ACHP's recommendations or comments into account and complied with same prior to proceeding with Undertaking's activities that are subject to dispute. Responsibility to carry out all other actions under this PA that are not the subject of the dispute will remain unchanged.

C. TERMINATION

Any signatory to this PA may terminate it by providing thirty days notice to the signatories, provided that the signatories will consult during the period prior to termination by certified mail to seek agreement on amendments or other actions that would avoid termination. In the event of termination, the New York District will comply with 36 CFR Parts 800.4 through 800.6 with regard to individual Undertaking actions covered by this Agreement.

D. SUNSET CLAUSE

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

E. AMENDMENT

This PA may be amended upon agreement 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.

F. 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 New York District and the signatories as necessary.

Execution and implementation of this PA evidences that the New York District has satisfied its Section 106 responsibilities for all individual Undertakings of the Project, and that the New York District has afforded the ACHP an opportunity to comment on the Undertaking and its effects on historic properties.

U.S. ARMY CORPS OF ENGINEERS

By: _____ Date: 29 FEB 16
David A. Caldwell
Colonel, U.S. Army
Commander

NEW YORK STATE HISTORIC PRESERVATION OFFICE

By: _____ Date: 8/25/16
Ruth Pierpont
Deputy State Historic Preservation Officer

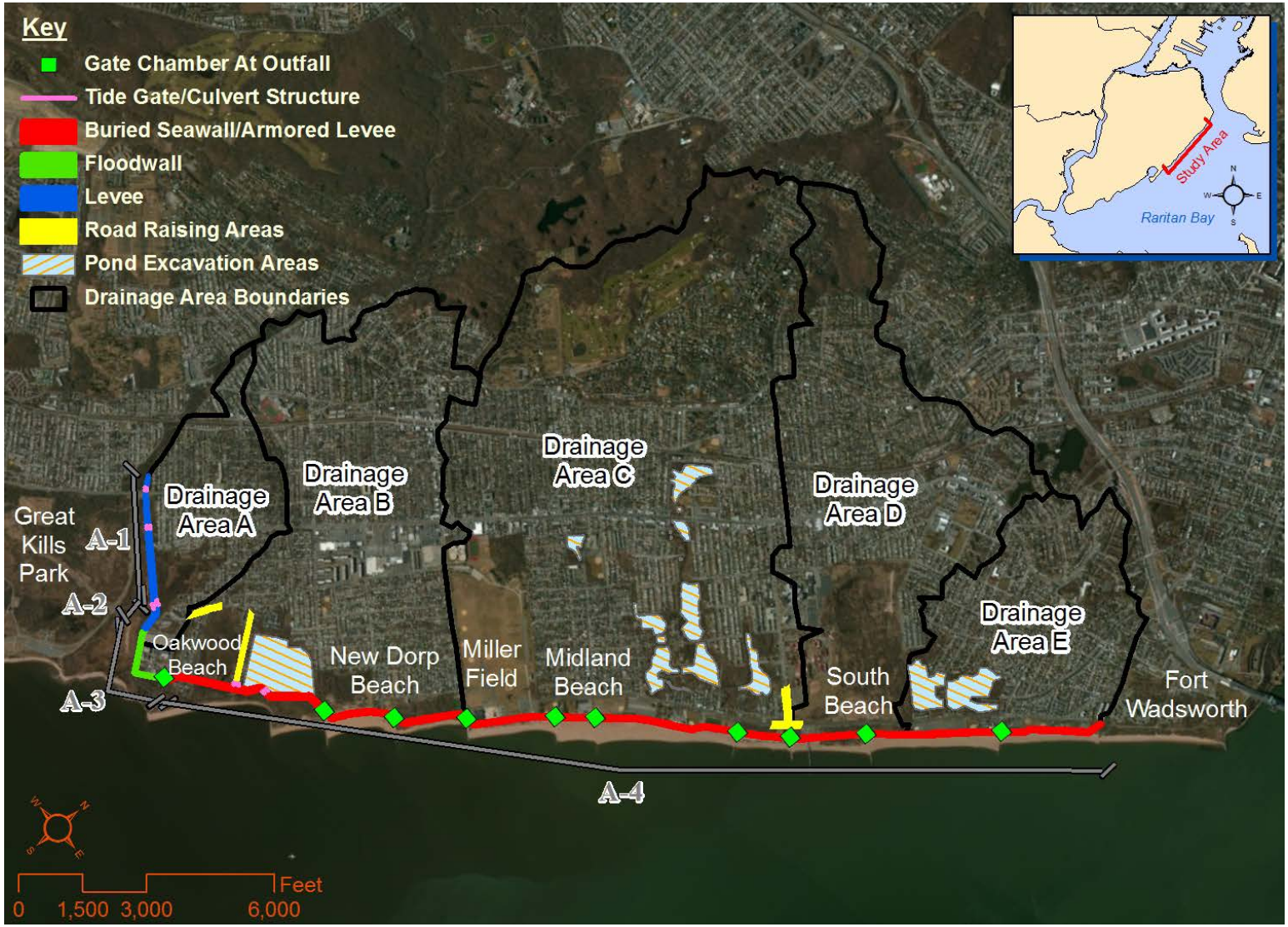
NATIONAL PARK SERVICE

By: _____ Date: 5.25.16
Jennifer T. Nersesian
Superintendent, Gateway National Recreation Area

APPENDIX A

PROPOSED PLANS

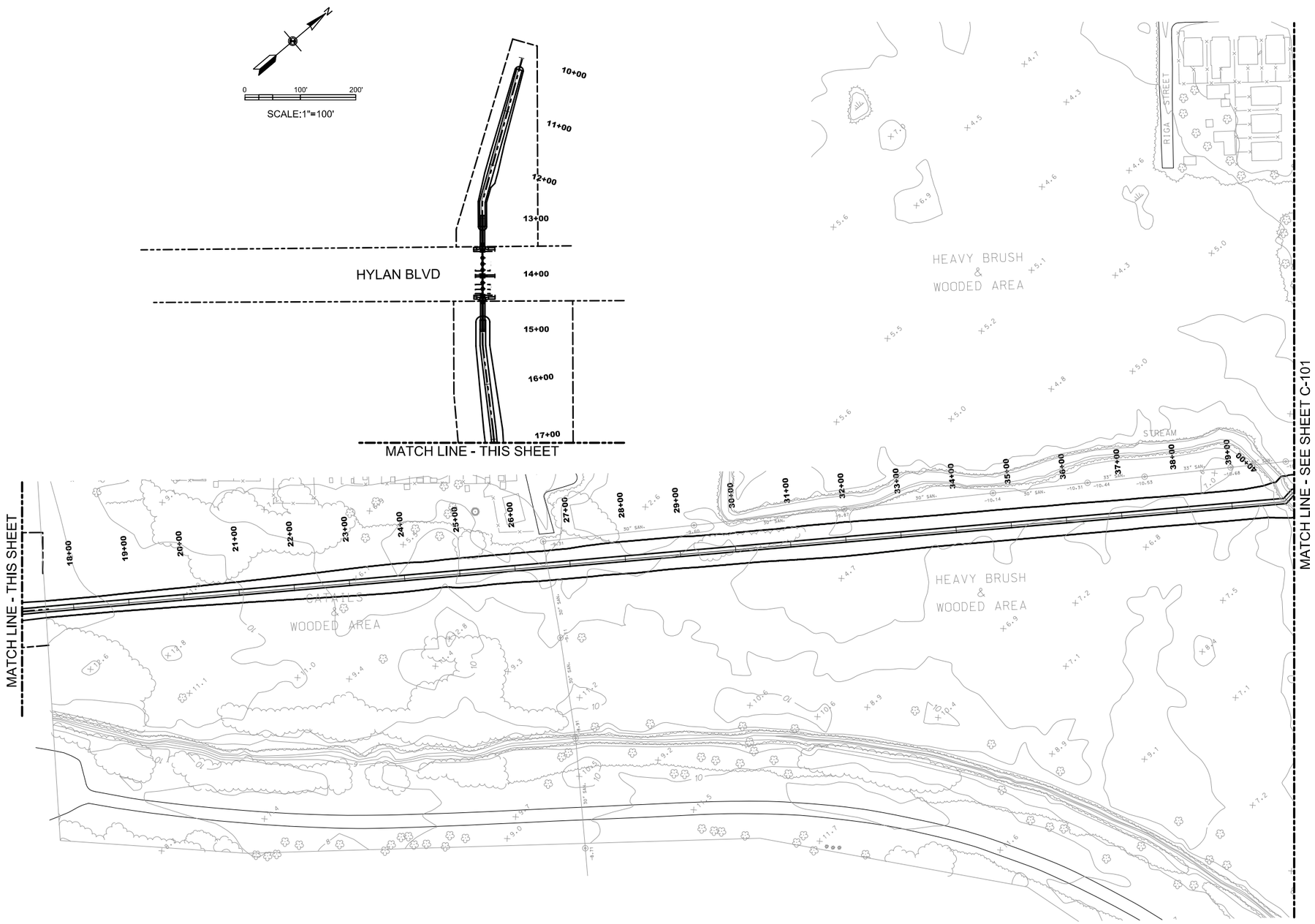
NOTE:
The alignment in green denotes previously proposed alignment.
The alignment in green was subject to a cultural resources survey (Panamerican Consultant's Inc. 2005).



Overview of Plan

NOTES

1. ALL ELEVATIONS REFERENCED TO NGVD 29.



KEY PLAN

SCALE:1"=100'

PRELIMINARY
NOT FOR CONSTRUCTION

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE	APPR.	MARK	DESCRIPTION	DATE	APPR.

U.S. ARMY CORPS OF ENGINEERS
U.S. ARMY ENGINEER DISTRICT
NEW YORK, NEW YORK

DESIGNED BY: DSGN | DWN BY: DJMac | CKD BY: MAP | SUBMITTED BY: MARK PIRELLO | PLOT SCALE: 1:100 | PLOT DATE: 7/16/2002 | SIZE: ANSI D | FILE NAME: 098705C-100.dgn | DATE: 2011/01/31 | SOLICITATION NO.: XXXX | CONTRACT NO.: XXXX | FILE NUMBER: XXXX

HURRICANE AND STORM DAMAGE REDUCTION FEASIBILITY STUDY FOR THE SOUTH SHORE OF STATEN ISLAND, NEW YORK

SITE PLAN (1 OF 11)

SHEET IDENTIFICATION
C-100
SHEET OF

LAST SAVED BY: JMACPHERSON, 1/31/2011 1:30:33 PM PLOTTED @ 2:37:37 PM P:\098705\cadd_Active_Preliminary\

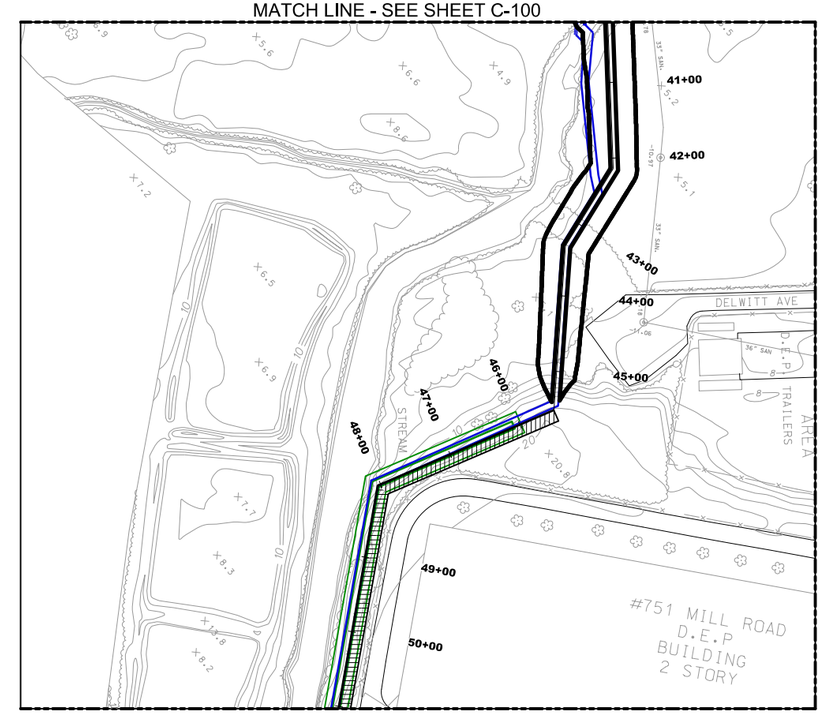
NOTES

1. ALL ELEVATIONS REFERENCED TO NGVD 29.

MATCH LINE - THIS SHEET

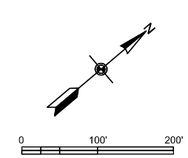
MATCH LINE - SEE SHEET C-102

MATCH LINE - SEE SHEET C-100



MATCH LINE - THIS SHEET

KEY PLAN



SCALE:1"=100'

PRELIMINARY
NOT FOR CONSTRUCTION

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE	APPR.	MARK	DESCRIPTION	DATE	APPR.

U.S. ARMY CORPS OF ENGINEERS
U.S. ARMY ENGINEER DISTRICT
NEW YORK, NEW YORK

DESIGNED BY: DSGN | DATE: 2011/01/31
DWN BY: DJMac | CKD BY: MAP | SOLICITATION NO.: XXXX
SUBMITTED BY: MARK PIRELLO | CONTRACT NO.: XXXX
PLOT SCALE: 1:1 | PLOT DATE: 2011/01/31 | FILE NUMBER: XXXX
SIZE: ANSI D | FILE NAME: 069870SC-101.dgn

HURRICANE AND STORM DAMAGE REDUCTION FEASIBILITY STUDY FOR THE SOUTH SHORE OF STATEN ISLAND, NEW YORK

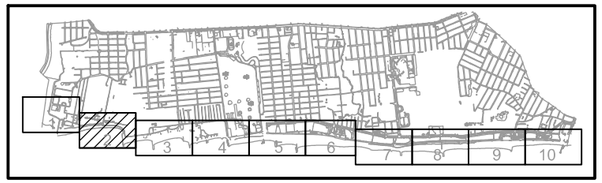
SITE PLAN (1 OF 10)

SHEET IDENTIFICATION
C-101
SHEET OF

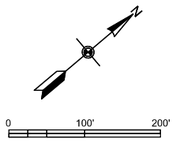
LAST SAVED BY: JMACPHERSON, 1/31/2011 1:30:33 PM PLOTTED @ 2:37:40 PM P:\69870-05\cadd_Active_Preliminary\

NOTES

1. ALL ELEVATIONS REFERENCED TO NGVD 29.



KEY PLAN



SCALE:1"=100'

PRELIMINARY
NOT FOR CONSTRUCTION

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE	APPR.	MARK	DESCRIPTION	DATE	APPR.

U.S. ARMY CORPS OF ENGINEERS
U.S. ARMY ENGINEER DISTRICT
NEW YORK, NEW YORK

DESIGNED BY: DSGN	DWN BY: DJMac	CKD BY: MAP
SUBMITTED BY: MARK PRELLO	PLOT SCALE: 1:1000	PLOT DATE: 7/09/2009
SIZE: ANSI D	FILE NAME: 6987I05C-102.dgn	
DATE: 2011/01/31	SOLICITATION NO.: XXXX	CONTRACT NO.: XXXX
FILE NUMBER: XXXX		

HURRICANE AND STORM DAMAGE REDUCTION FEASIBILITY STUDY FOR THE SOUTH SHORE OF STATEN ISLAND, NEW YORK

SITE PLAN (2 OF 10)

SHEET IDENTIFICATION
C-102
SHEET OF

LAST SAVED BY: JMACPHERSON, 1/31/2011 1:30:33 PM PLOTTED @ 2:37:42 PM P:\6987-05\cadd_Active_Preliminary\

NOTES

1. ALL ELEVATIONS REFERENCED TO NGVD 29.

PRELIMINARY
NOT FOR CONSTRUCTION

KEY PLAN

0 100' 200'

SCALE:1"=100'

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE	APPR.	MARK	DESCRIPTION	DATE	APPR.

U.S. ARMY CORPS OF ENGINEERS
U.S. ARMY ENGINEER DISTRICT
NEW YORK, NEW YORK

DESIGNED BY: DSGN
DWN BY: DJMac
CKD BY: MAP
SUBMITTED BY: MARK PRELLO
PLOT SCALE: 1:200
PLOT DATE: 1/31/2011
DATE: 2011/01/31
SOLICITATION NO.: XXXX
CONTRACT NO.: XXXX
FILE NUMBER: XXXX
SIZE: ANSI D
FILE NAME: 69870SC-103.dgn

HURRICANE AND STORM DAMAGE REDUCTION FEASIBILITY STUDY FOR THE SOUTH SHORE OF STATEN ISLAND, NEW YORK

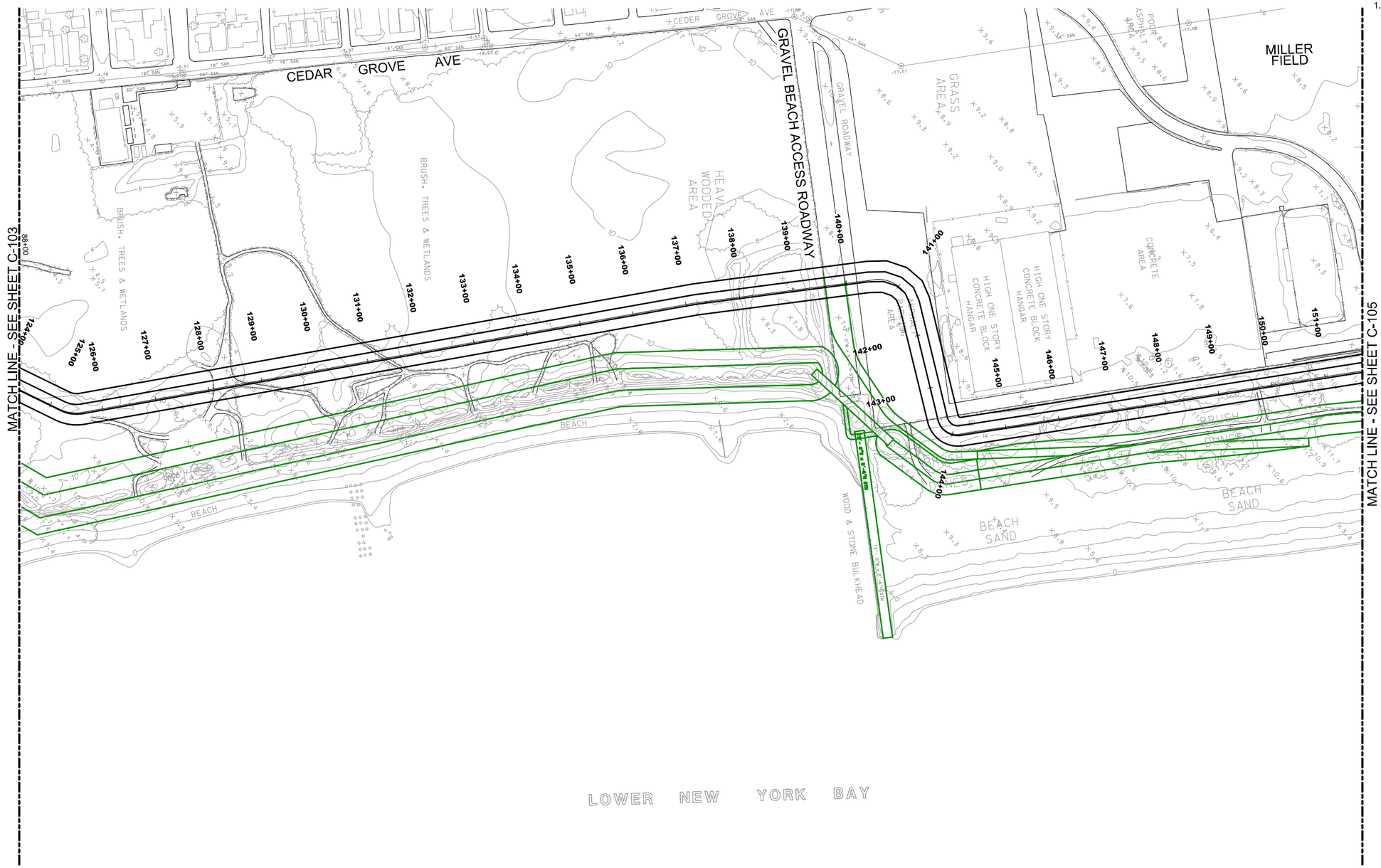
SITE PLAN (3 OF 10)

SHEET IDENTIFICATION
C-103
SHEET OF

LAST SAVED BY: JMACPHERSON, 1/31/2011 1:30:33 PM PLOTTED @ 2:47:40 PM P:\69870-05\cadd_Active_Preliminary\

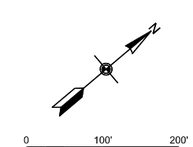
NOTES

1. ALL ELEVATIONS REFERENCED TO NGVD 29.



PRELIMINARY
NOT FOR CONSTRUCTION

KEY PLAN



SCALE:1"=100'

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE	APPR.	MARK	DESCRIPTION	DATE	APPR.

U.S. ARMY CORPS OF ENGINEERS
U.S. ARMY ENGINEER DISTRICT
NEW YORK, NEW YORK

DESIGNED BY: DSGN	DATE: 2011/01/31
DWN BY: DJMac	CKD BY: MAP
SOLICITATION NO.: XXXX	
SUBMITTED BY: MARK PIELLO	CONTRACT NO.: XXXX
PLOT SCALE: 1:100	PLOT DATE: 2/1/2011
FILE NUMBER: XXXX	
SIZE: ANSI D	FILE NAME: 6987050-104.dgn

HURRICANE AND STORM DAMAGE REDUCTION FEASIBILITY STUDY FOR THE SOUTH SHORE OF STATEN ISLAND, NEW YORK

SITE PLAN (4 OF 10)

SHEET IDENTIFICATION
C-104
SHEET OF

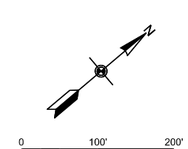
LAST SAVED BY: JMACPHERSON, 1/31/2011 1:30:33 PM PLOTTED @ 2:37:46 PM P:\6987-05\cadd_Active_Preliminary\

NOTES

1. ALL ELEVATIONS REFERENCED TO NGVD 29.

PRELIMINARY
NOT FOR CONSTRUCTION

KEY PLAN



SCALE:1"=100'

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE	APPR.	MARK	DESCRIPTION	DATE	APPR.

U.S. ARMY CORPS OF ENGINEERS
U.S. ARMY ENGINEER DISTRICT
NEW YORK, NEW YORK

DESIGNED BY: DSGN
DWN BY: DJMiic
CKD BY: MAP
SUBMITTED BY: MARK PIRELLO
DATE: 2011/01/31
SOLICITATION NO.: XXXX
CONTRACT NO.: XXXX
PLOT SCALE: 1:1000
PLOT DATE: 7/30/2008
FILE NUMBER: 0XXX
SIZE: ANSI D
FILE NAME: 0987050C-105.dgn

HURRICANE AND STORM DAMAGE REDUCTION FEASIBILITY STUDY FOR THE SOUTH SHORE OF STATEN ISLAND, NEW YORK

SITE PLAN (5 OF 10)

SHEET IDENTIFICATION
C-105
SHEET OF

LAST SAVED BY: JMACPHERSON, 1/31/2011 1:30:33 PM PLOTTED @ 2:37:48 PM P:\0987-05\cadd_Active_Preliminary\

NOTES

1. ALL ELEVATIONS REFERENCED TO NGVD 29.

PRELIMINARY
NOT FOR CONSTRUCTION

KEY PLAN

0 100' 200'

SCALE:1"=100'

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE	APPR.	MARK	DESCRIPTION	DATE	APPR.

U.S. ARMY CORPS OF ENGINEERS
U.S. ARMY ENGINEER DISTRICT
NEW YORK, NEW YORK

DESIGNED BY: DSGN
DWN BY: DJMac
CKD BY: MAP
SUBMITTED BY: MARK PRELLO
PLOT SCALE: 1:1000
PLOT DATE: 1/31/2011
DATE: 2011/01/31
SOLICITATION NO.: XXXX
CONTRACT NO.: XXXX
FILE NUMBER: 1XXX
SIZE: ANSI D
FILE NAME: 0987050C-106.dgn

HURRICANE AND STORM DAMAGE REDUCTION FEASIBILITY STUDY FOR THE SOUTH SHORE OF STATEN ISLAND, NEW YORK

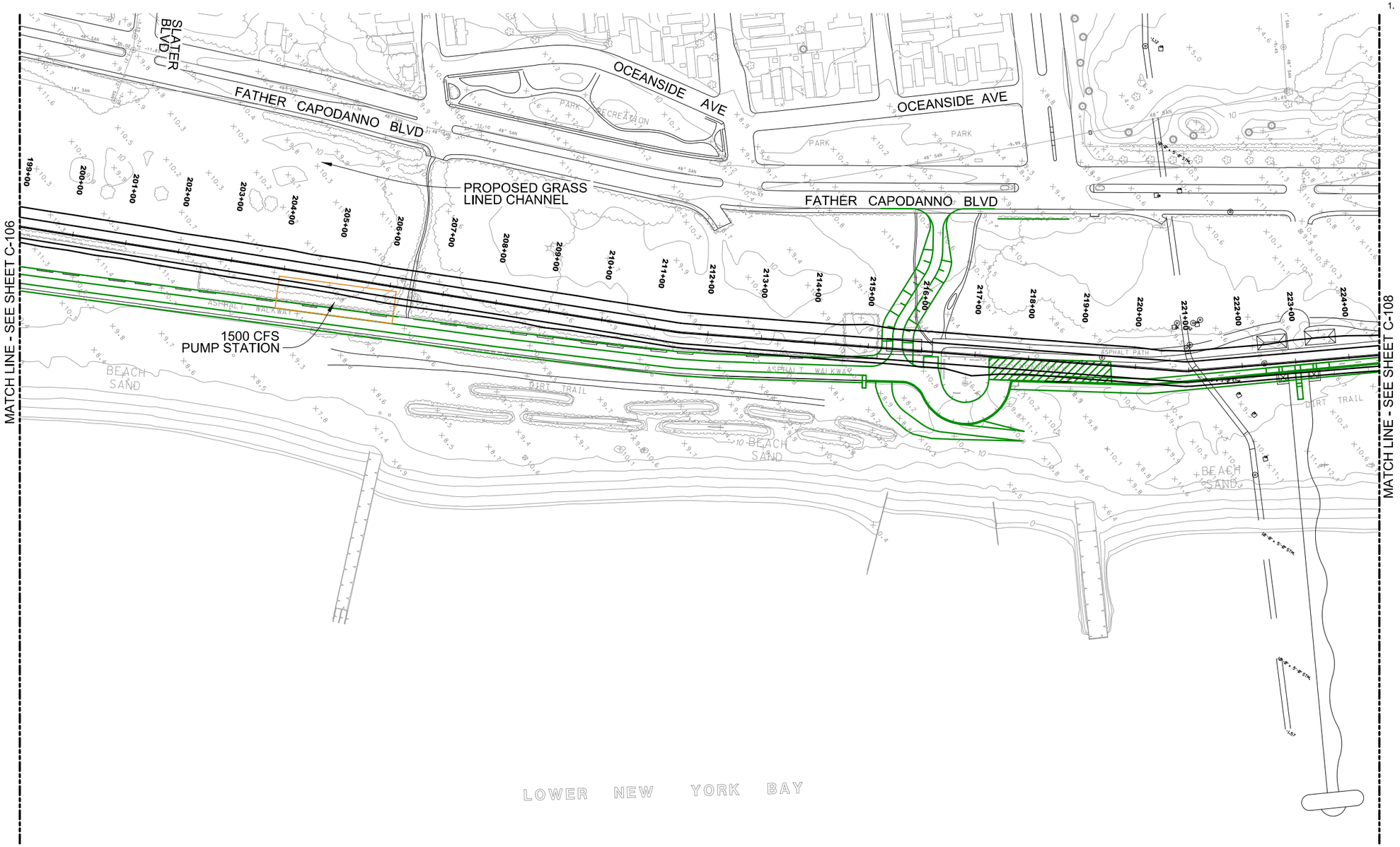
SITE PLAN (6 OF 10)

SHEET IDENTIFICATION
C-106
SHEET OF

LAST SAVED BY: JMACPHERSON, 1/31/2011 1:30:33 PM PLOTTED @ 2:37:49 PM
P:\0987-05\cadd_Active_Preliminary\

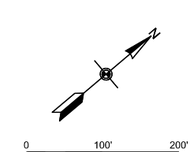
NOTES

1. ALL ELEVATIONS REFERENCED TO NGVD 29.



PRELIMINARY
NOT FOR CONSTRUCTION

KEY PLAN



SCALE:1"=100'

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE	APPR.	MARK	DESCRIPTION	DATE	APPR.

U.S. ARMY CORPS OF ENGINEERS
U.S. ARMY ENGINEER DISTRICT
NEW YORK, NEW YORK

DESIGNED BY: DJMac
DWN BY: MARK PIRELLO
CKD BY:
SUBMITTED BY:
PLOT SCALE: AS NOTED
PLOT DATE: 7/19/2010
SIZE: ANSI D
FILE NAME: 69870SC-107.dgn
DATE:
SOLICITATION NO.: XXXX
CONTRACT NO.: XXXX
FILE NUMBER:

HURRICANE AND STORM DAMAGE REDUCTION FEASIBILITY STUDY FOR THE SOUTH SHORE OF STATEN ISLAND, NEW YORK

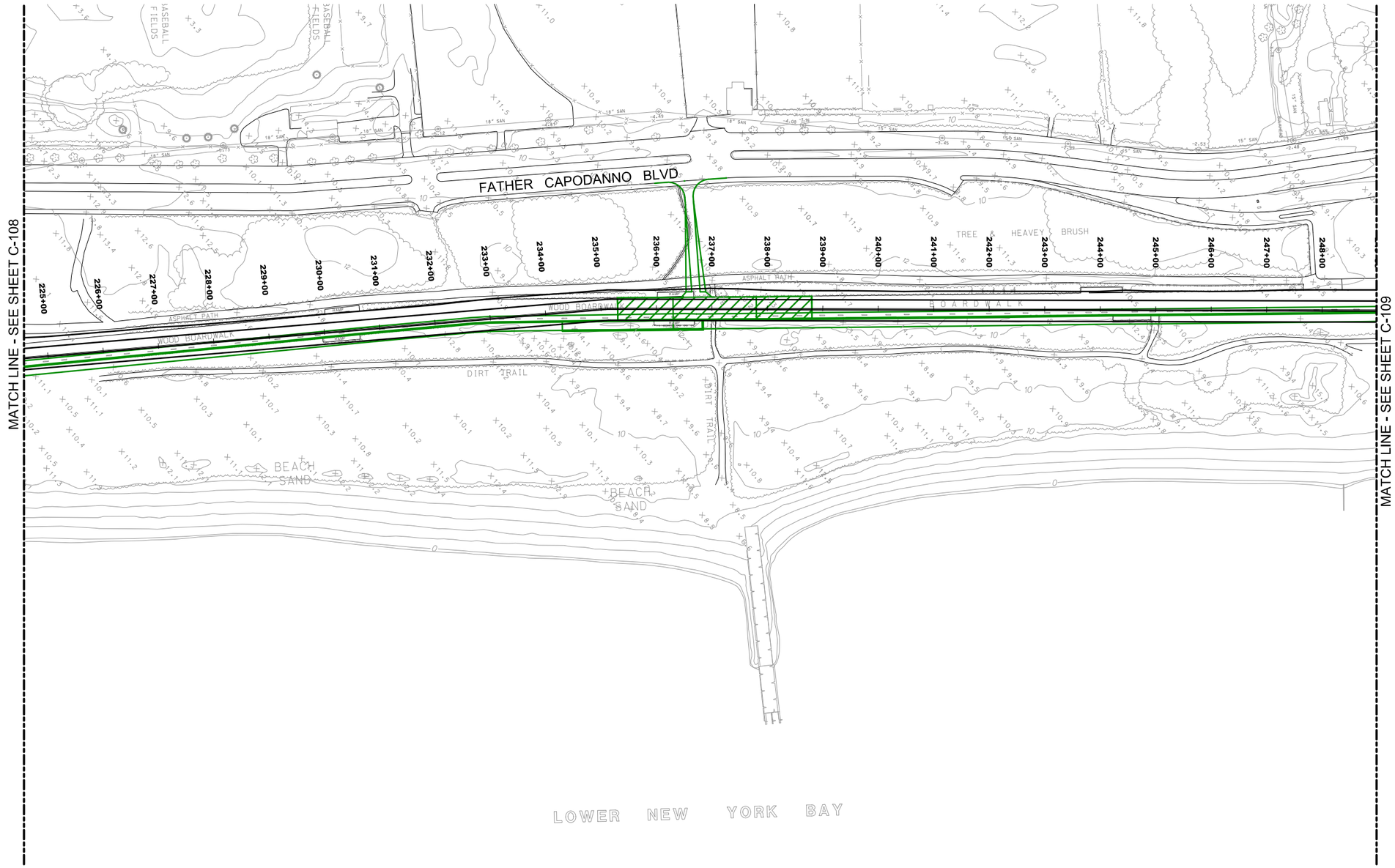
SITE PLAN (7 OF 10)

SHEET IDENTIFICATION
C-107
SHEET OF

LAST SAVED BY: JMACPHERSON, 1/31/2011 1:30:33 PM PLOTTED @ 2:56:19 PM P:\69870-05\cadd_Active_Preliminary\

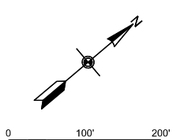
NOTES

1. ALL ELEVATIONS REFERENCED TO NGVD 29.



PRELIMINARY
NOT FOR CONSTRUCTION

KEY PLAN



SCALE:1"=100'

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE	APPR.	MARK	DESCRIPTION	DATE	APPR.

U.S. ARMY CORPS OF ENGINEERS
U.S. ARMY ENGINEER DISTRICT
NEW YORK, NEW YORK

DESIGNED BY: DSGN	DWN BY: DJMac	CKD BY: MAP
SUBMITTED BY: MARK PIRELLO	PLOT SCALE: 1:1000	PLOT DATE: 7/09/2011
SIZE: ANSI D	FILE NAME: 6987I05C-108.dgn	
DATE: 2011/01/31	SOLICITATION NO.: XXXX	CONTRACT NO.: XXXX
FILE NUMBER: XXXX		

HURRICANE AND STORM DAMAGE REDUCTION FEASIBILITY STUDY FOR THE SOUTH SHORE OF STATEN ISLAND, NEW YORK

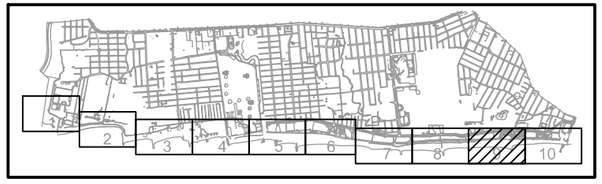
SITE PLAN (8 OF 10)

SHEET IDENTIFICATION
C-108
SHEET OF

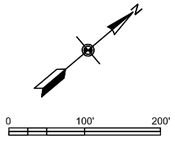
LAST SAVED BY: JMACPHERSON, 1/31/2011 1:30:33 PM PLOTTED @ 2:37:53 PM P:\6987-05\cadd_Active_Preliminary\

NOTES

1. ALL ELEVATIONS REFERENCED TO NGVD 29.



KEY PLAN



SCALE:1"=100'

PRELIMINARY
NOT FOR CONSTRUCTION

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE	APPR.	MARK	DESCRIPTION	DATE	APPR.

U.S. ARMY CORPS OF ENGINEERS
U.S. ARMY ENGINEER DISTRICT
NEW YORK, NEW YORK

DESIGNED BY: DSGN
DATE: 2011/01/31
DWN BY: DJMac
CKD BY: MAP
SOLICITATION NO.: XXXX
SUBMITTED BY: MARK PIELLO
CONTRACT NO.: XXXX
PLOT SCALE: 1:100000
PLOT DATE: 1/31/2011
FILE NUMBER: XXXX
SIZE: ANSI D
FILE NAME: 698709C-109.dgn

HURRICANE AND STORM DAMAGE REDUCTION FEASIBILITY STUDY FOR THE SOUTH SHORE OF STATEN ISLAND, NEW YORK

SITE PLAN (9 OF 10)

SHEET IDENTIFICATION
C-109
SHEET OF

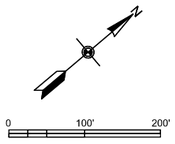
LAST SAVED BY: JMACPHERSON, 1/31/2011 1:30:33 PM PLOTTED @ 2:37:55 PM P:\69897-05\cadd_Active_Preliminary\

NOTES

1. ALL ELEVATIONS REFERENCED TO NGVD 29.

PRELIMINARY
NOT FOR CONSTRUCTION

KEY PLAN



SCALE:1"=100'

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE	APPR.	MARK	DESCRIPTION	DATE	APPR.

U.S. ARMY CORPS OF ENGINEERS
U.S. ARMY ENGINEER DISTRICT
NEW YORK, NEW YORK

DESIGNED BY: DSGN
DWN BY: DJMac
CKD BY: MAP
SUBMITTED BY: MARK PRELLO
PLOT SCALE: 1:100
PLOT DATE: 7/29/2011
SIZE: ANSI D
FILE NAME: 6987i05C-110.dgn
DATE: 2011/01/31
SOLICITATION NO.: XXXX
CONTRACT NO.: XXXX
FILE NUMBER: XXXX

HURRICANE AND STORM DAMAGE REDUCTION FEASIBILITY STUDY FOR THE SOUTH SHORE OF STATEN ISLAND, NEW YORK

SITE PLAN (10 OF 10)

SHEET IDENTIFICATION
C-110
SHEET OF

LAST SAVED BY: JMACPHERSON, 1/31/2011 1:30:33 PM PLOTTED @ 2:37:57 PM P:\6987-05\cadd_Active_Preliminary\

Drainage Area B - Minimum Facility (Tentatively Selected Plan)

Drainage Area C - Alternative 4: 377,200 CY, Seven Ponds
(Tentatively Selected Plan)

Drainage Area D - Minimum Facility (Tentatively Selected Plan)

Drainage Area E - Alternative 2: 227,720 CY, Two Ponds
(Tentatively Selected Plan)

APPENDIX B

INVESTIGATED PORTION OF THE
AREA OF POTENTIAL EFFECT (APE)
AND RECOMMENDATIONS

From:
Panamerican Consultants. Inc.
2005 Phase I Combined Erosion Control and Storm Damage Protection Feasibility Study, South Shore of Staten Island, Richmond County, New York. On file, U.S. Army Corps of Engineers, New York District.

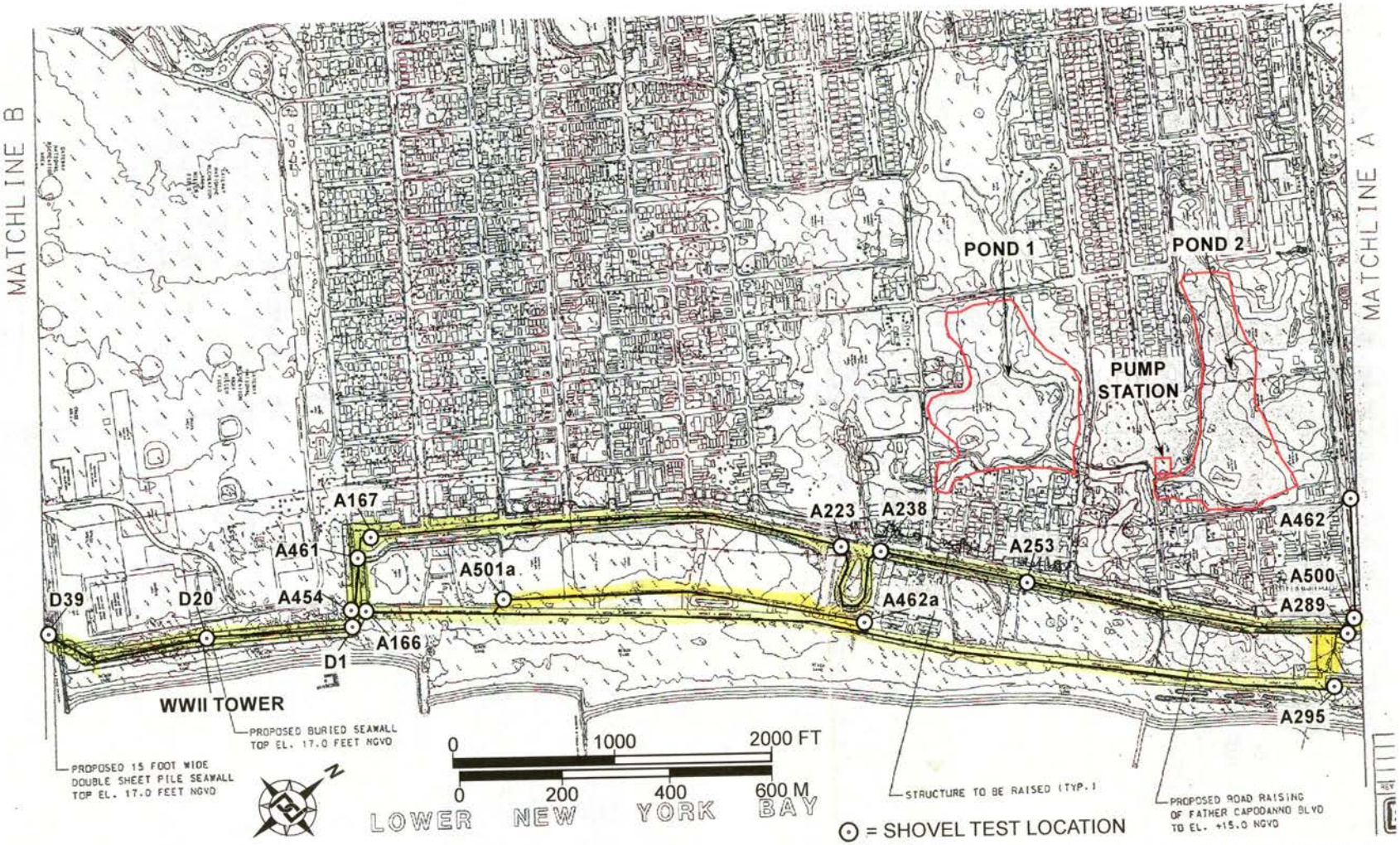


Figure 6.2. Study Areas A and B: shovel test and survey component locations. Erosion Control/Storm Damage Protection Feasibility Study, Richmond County, NY *(adapted from USACE 2002:Figure 20).*

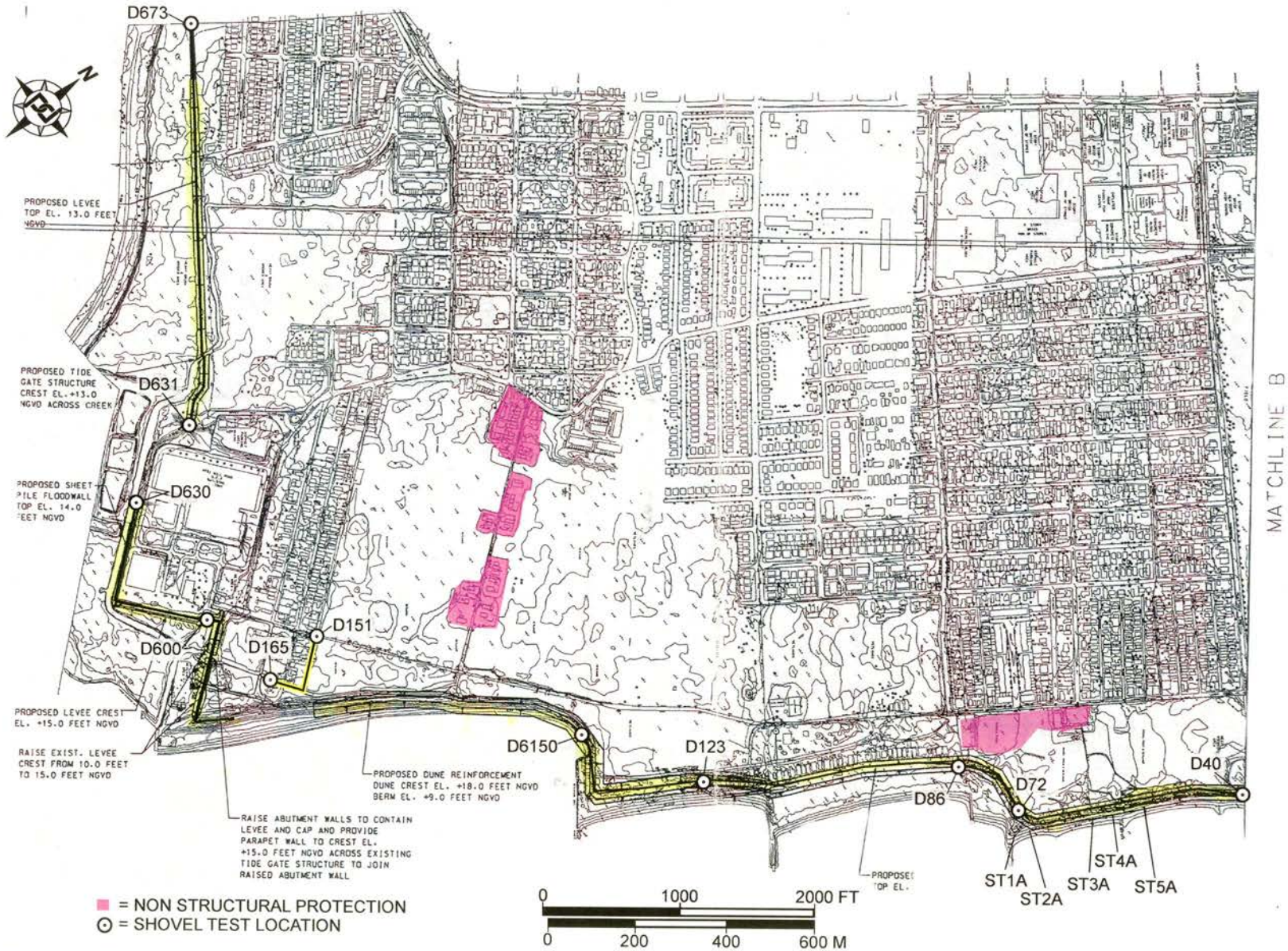


Figure 6.7 Study Area B Shovel Test and Survey Component Locations. Erosion Control/Storm Damage Protection Feasibility Study, Richmond County, NY *(adapted from USACE 2002: Figure C3).*

Investigated Portion of Area of Potential Effect and Recommendations from 2005 Phase I Report

Survey Component	Protection Measure	Impacts	Documented or Possible Resources	Survey Results	Recommendations (for all options unless otherwise specified0
Existing Structures landside of Father Capodanno Boulevard	Raising	Negative affect to integrity of historic structures	Possible NRHP eligible structures; OPRHP Building Inventory form for 93 Father Capodanno Boulevard, ca. 1900 residence	Primarily mid to late-1900s residences, commercial establishments, condominiums, and South Beach Psychiatric Center; 1920 to 1950 built residences at north end, typical of suburban dwellings normally with many modifications; ca 1900s residence not located, apparently demolished	No further work
Existing Structures seaside of Father Capodanno Boulevard	Raising and buried seawall; sheet pile seawall construction	Negative affect to integrity of historic structures or boardwalk and negative visual impact to Verrazano-Narrows Bridge	Possible NRHP eligible structures; Franklin Delano Roosevelt Boardwalk initially built 1935/1938; Verrazano-Narrows Bridge, NRHP eligible (USN 08501.002780)	Modern comfort, concession, maintenance buildings; current boardwalk and promenade a replacement for early 1900s alignment	No further work
North 300-foot end of boardwalk	Buried seawall	Stone/earth fill above ground; 3 feet (1 meter) below ground	Possible remains of: prehistoric Arrochar site; prehistoric and historic 1600s components at Walton Stillwell House	No prehistoric or historic resources; low density of mid-1900s to recent materials	No further work
Boardwalk	Sheet pile seawall	Above ground and several feet (meters) below ground sections	Late 1800s to early 1900s recreational development	*Near-surface*: No prehistoric resources; low density of primarily post-mid-1900s materials with minor historic component *Not tested* for possible deeply buried prehistoric resources	Borings along sheet pile seawall alignment; conditional upon construction techniques
Promenade Seaside	Elevation and buried seawall	New promenade above stone and earth fill above ground; 3 feet (1 meter) below ground	Late 1800s to early 1900s recreational development; later 1800s near shore structures on properties	No prehistoric resources; low density of primarily post-mid-1900s materials with minor historic component	No further work
Promenade Landside	Sheet pile seawall	Above ground and several feet (meters) below ground sections	Late 1800s to early 1900s recreational development	*Near-surface*: No prehistoric resources; low-moderate density of primarily post-mid-1900s materials with minor late 1800s to early 1900s component *Not tested* for possible deeply buried prehistoric resources	Borings along sheet pile seawall alignment; conditional upon construction techniques
Father Capodanno Boulevard	Road raising	Fill over broken current surface; upper 2 to 3 feet (0.6 to 1 meter)	Early historic settlement; Late 1800s to early 1900s recreational development	No prehistoric resources; low-moderate density of primarily post-mid-1900s materials with minor 1800s to early 1900s component; occasional higher artifact concentration loci	No further work

Boulevard to Miller Field Connect	Buried seawall	Stone/earth fill above ground; 3 feet (1 meter) below ground	Late 1800s to early 1900s recreational development	No prehistoric resources; primarily post-mid-1900s with very minor early 1900s component	No further work
Two turnarounds along Boulevard	Road raising	Fill over broken current surface; upper 2 to 3 feet (0.6 to 1 meter)	Late 1800s to early 1900s recreational development	No prehistoric resources; low density of primarily post-mid-1900s materials	No further work
Boulevard Access	Berm	Fill primarily above ground; 1 to 3 feet (0.3 to 1 meter)	Late 1800s to early 1900s recreational development	No prehistoric resources; low density of primarily post-mid-1900s materials with	No further work
Pond1	Inland water control	Excavation to 1 foot (0.3 meter)	Possible historic structures on higher adjacent ground	*Architectural Survey*: modern suburban residential development with one ca 1925 residence at 51 Graham Boulevard *Field Survey*: Visual Examination	Phase I shovel testing on adjacent higher ground
Pond 2	Inland water control	Excavation to 1 foot (0.3 meter)	Possible historic structures on higher adjacent ground	*Architectural Survey*: late 1900s residential structures *Field Survey*: Visual Examination	Phase I shovel testing on adjacent higher ground
Pond 1(3)	Inland water control	Excavation to 5 feet (1.5 meters)	Possible historic structures on higher adjacent ground	*Architectural Survey*: no structures within or immediately adjacent *Field Survey*: Visual Examination	Phase I shovel testing on adjacent higher ground and internally on any localized higher micro-landforms
Pump Stations	Inland water control	Estimate 1 to 3 feet (0.3 to 1 meter) below surface	Possible historic structures	*Architectural Survey*: no structures within (Pond 3) or late 1900s residences in vicinity (Pond 2) *Field Survey*: Visual Examination	Phase I testing at Ponds 2 and 3
Sea View Avenue	Road raising	Fill over broken current surface; upper 2 to 3 feet (0.6 to 1 meter)	Late 1800s to early 1900s recreational development	No prehistoric resources; low density of primarily or exclusively post-mid-1900s	No further work

Survey Component	Protection Measure	Impacts	Documented or Possible Resources	Survey Results	Recommendations
Miller Field or South Midland Beach	Buried seawall with or without raised promenade; double sheet pile seawall for 150 feet (46 meters)	Stone/earth fill above ground, 3 feet (1 meter) below ground for buried seawall; Above ground and several feet (meters) below ground sections for sheet pile seawall	1943 World War II Fire Control Tower associated with the Miller Army Air Field Historic District 90NR01020	*Architectural Survey*: Fire Control Tower of sufficient age to be considered as a National Register-eligible contributing element to the Miller Army Air Filed Historic District *Field Survey*: additional structural features in and around tower; primarily post-mid-1900s with minor early 1900s component; no prehistoric resources *Not tested* for possible deeply buried prehistoric resources	Phase II investigation of Fire Control Tower and the other structural features to determine their nature and National Register eligibility status in reference to the Miller Army Air Field Historic District No borings along double sheet pile seawall recommended
New Dorp Beach	Buried seawall with or without raised promenade	Stone/earth fill above ground; 3 feet (1 meter) below ground	Possible remains of: -Revolutionary War Fortifications -Late 1600s Britton Cottage -1780/1781 Barnes House	Five structural features located; Structures 1A and 2A at shoreline; Structures 3A, 4A, 5A on adjacent higher ground/berm, along with other reported domestic materials and structural features from two previous	Phase II field and documentary investigation to define specific structural features and make direct linkages with documented structures from the

			-1850s to mid-1900s Lighthouse complex -1874/1887 to mid 1900s Sea Side/St John's Hospital complex -Various post-1859 residences and resort facilities	surveys John Milner Associates 1978 and Lipson, et al. 1978; likely direct association between Structures 1A, 2A and SI- 15 (A085-01-0154) SI-16 (A085-01-0155) of Milner survey and St John's Hospital complex; Low density, primarily post-mid-1900s with minor late 1800s to early 1900s component; no prehistoric resources	shoreline inland to Cedar Grove Avenue
Cedar Grove Beach	Buried seawall with or without raised promenade	Stone/earth fill above ground; 3 feet (1 meter) below ground	Possible remains of 18501853 house and pier Existing and demolished 1910 to 1917 established Cedar Grove Beach Club community	*Architectural Survey*: visual inspection suggests Cedar Grove Beach Club community may be National Register eligible. *Field Survey*: former or demolished bungalows located; Low density, primarily post-mid-1900s with minor historic component	Phase II evaluation of Cedar Grove Beach Club community's National Register of Historic Places eligibility
Oakwood Beach Existing Dune	Reinforce	No direct impacts	Very low probability of prior prehistoric or historic resources	Not tested	No further work
Oakwood Beach landside	Internal levee	Earthen fill; most of levee above ground with portion up to 3 feet or 1 meter below ground	Very low probability of prehistoric resources; a few mid-1800s to early 1900s structures and bungalows	Low density, likely disturbed context; modern materials with very minor historic component	No further work
Oakwood Beach Existing Levee	Raising of crest and abutment walls	No direct impacts	Very low probability of prior prehistoric or historic resources	Not tested	No further work
Oakwood Beach Sewage Treatment Plant	Levee and sheet pile floodwall for 675 feet (206 meters)	Earthen fill; most of levee above ground with portion up to 3 feet (1 meter) below ground; vertical single sheet pile, 16 feet (4.9 meters) above and 22 feet (6.7 meters) below ground	Possible remains of 1700s and 1800s Lakes Mill and Millers House	*Architectural Survey:* mid to late 1900s structures including the Sewage Treatment Plant and near-by residences, the latter are not within the project area *Near-surface*: No prehistoric resources; Low density, primarily modern with minor early 1900s component from disturbed context *Not tested* for possible deeply buried prehistoric resources	Borings along sheet pile floodwall; conditional upon construction techniques
West of Oakwood Beach Sewage Treatment Plant	Levee	Earthen fill; most of levee above ground with portion up to 3 feet (1 meter) below ground	Very low probability of prehistoric or historic resources	Low density, primarily modern with minor early 1900s component	No further work

Appendix G

Project Correspondence

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Division of Water, Bureau of Flood Protection and Dam Safety
625 Broadway, Albany, New York 12233-3504
P: (518) 402-8185 | F: (518) 402-9029
www.dec.ny.gov

April 20, 2016

Colonel David A. Caldwell
Commander and District Engineer
United States Army Corps of Engineers
New York District
26 Federal Plaza
New York, New York 10278

RE: South Shore of Staten Island, New York, Coastal Storm Risk Management Project (Project)

Dear Colonel Caldwell,

The purpose of this letter is to confirm the New York State Department of Environmental Conservation's (Department) continued interest in participating in the South Shore of Staten Island, New York, Coastal Storm Risk Management Project as the non-Federal Sponsor. Furthermore, the Department supports the selected plan contained in the United States Army Corps of Engineers (Corps), South Shore of Staten Island, New York, Coastal Storm Risk Management, Interim Feasibility Study Report for Fort Wadsworth to Oakwood Beach dated March, 2016.

In order for the Department to take on the role of the non-Federal Sponsor, the Department's authority (Chapter 7 of Title 4 of the New York State Unconsolidated Laws) to participate in a project to arrest erosion and alleviate or prevent damage resulting from storms requires the Department to have a local sponsor that will share in the non-Federal Sponsor's costs and obligations. The City of New York has agreed to be the Department's local sponsor and supports the selected plan contained in the Corps, March 2016 South Shore of Staten Island, New York, Coastal Storm Risk Management, Interim Feasibility Study for Fort Wadsworth to Oakwood Beach Report as delineated in their letter dated April 18, 2016, copy enclosed.

This letter is not a commitment for the funding of any portion of the Project. The commitment can only be made when the proposed Project Partnership Agreement with the Corps for the Project is executed by the Office of the New York State Comptroller. The Department maintains that it is interested in being the Non-Federal Sponsor; however, the Department's participation will depend upon successful execution of a formal agreement with the local sponsor.

The Department awaits the Corps submittal of their Water Quality Certification (WQC) application. Based on the Department's review of the South Shore of Staten Island, New York, Coastal Storm Risk Management, Feasibility Study Report dated March, 2016, the Department does not foresee any problems that would preclude the issuance of the WQC. The Department will initiate the formal review process of the WQC once the Corps application is submitted.

The Department will continue working with the Corps to move the Project forward as expeditiously as possible in order to meet the Corps schedule. If you have any questions please contact me by e-mail at alan.fuchs@dec.ny.gov, or by telephone at (518) 402-8185.

Sincerely,

Alan A. Fuchs, PE
Director
Bureau of Flood Protection and Dam Safety

Enclosure: Letter from D. Zarrilli to Colonel Caldwell, dated April 18, 2016

Cc (w/Encl.)

A. Ciorra, USACE
F. Verga, USACE
D. Zarrilli, NYC
C. Cravens, NYC
J. Tierney, NYSDEC
S. Zahn, NYSDEC Reg.2
S. Watts, NYSDEC Reg.2
S. McCormick, NYSDEC
A. Servidone, NYSDEC

Office of the Mayor

Daniel A. Zarrilli, PE
Senior Director
Climate Policy and Programs

253 Broadway, 10th Floor
New York, NY 10007

212 788 8534 tel
347 865 0453 cell

dzarrilli@cityhall.nyc.gov
www.nyc.gov/OneNYC

April 18, 2016

Colonel David A. Caldwell
Commander and District Engineer
United States Army Corps of Engineers
New York District
26 Federal Plaza
New York, New York 10278

RE: South Shore of Staten Island, NY, Coastal Storm Risk Management Project

Colonel Caldwell:

Staten Island's coastal communities along the East and South Shores were devastated by Hurricane Sandy, tragically resulting in the deaths of 23 Staten Islanders and causing immense property damage and neighborhood disruptions, from which Staten Island continues to recover. With climate change, storms like Hurricane Sandy will become more frequent and more intense, and the City of New York is urgently acting to reduce these risks on Staten Island and across the city. Our continued partnership with the US Army Corps of Engineers (USACE) in this endeavor is greatly appreciated.

Very clearly, the City affirms its strong interest in participating as the Local Sponsor for the South Shore of Staten Island, NY, Coastal Storm Risk Management Project (the Project) to construct an armored levee, with related coastal protections and accompanying interior drainage along Staten Island's East Shore. The City supports the selected plan contained in the USACE's 2016 South Shore of Staten Island, NY, Coastal Storm Risk Management Feasibility Study Report.

On behalf of the City, the Mayor's Office of Recovery and Resiliency (ORR) is working in close partnership with three City agency partners whose assets and programs are directly impacted by the Project: the Department of Parks and Recreation; the Department of Environmental Protection; and the Department of Transportation. Their expertise and partnership have been instrumental in developing the scope of the Project.

ORR and partner agencies have identified specific concerns – such as ensuring that our beaches and recreational areas remain high-quality park assets upon completion of the project and that our Oakwood Beach Waste Water Treatment Plant is protected – and provided formal comments to the USACE during the development of the Project's feasibility study and Environmental Impact Statement (EIS) review process. The City understands that these concerns will be more thoroughly addressed and resolved during the upcoming pre-construction, engineering, and design phases of the Project. In particular, the City continues to express its desire for the National Park Service and the USACE to continue its aggressive resolution of site conditions in Great Kills that could impact the delivery of the Project.

© 30%

Prior to the execution of a binding Project Partnership Agreement (PPA) with the State of New York Department of Environmental Conservation (NYSDEC), in their capacity as Non-Federal Sponsor for the Project, there will need to be ongoing conversations around remaining issues of design, construction, and operations and maintenance of concern to the City. We fully expect that these issues can and will be resolved at that point.

The City would like to re-state how critical this project is to the safety of our Staten Island's coastal communities. We urge the Corps to quickly approve the feasibility study and to move into the design and construction process for the Project as soon as possible. These investments are long overdue.

The City appreciates the USACE's commitment to this project and to the long-term resiliency of all of the City's coastal communities. We look forward to continuing our work together.

Sincerely,

Daniel A. Zarrilli
Senior Director, Climate Policy and Programs

cc: A. Ciorra, USACE
F. Verga, USACE
S. Zahn, NYSDEC Reg.2
S. Watts, NYSDEC Reg.2
S. McCormick, NYSDEC
A. Servidone, NYSDEC

United States Department of the Interior

NATIONAL PARK SERVICE
Gateway National Recreation Area
210 New York Ave., Staten Island, N.Y. 10305

IN REPLY REFER TO:

April 18, 2016

Colonel David A. Caldwell
Commander and District Engineer
United States Army Corps of Engineers, New York District
26 Federal Plaza
New York, NY 10278-0090

RE: South Shore of Staten Island Coastal Risk Management Project

Colonel Caldwell:

The purpose of this letter is to confirm the National Park Service's (NPS) interest in partnering with the United States Army Corps of Engineers (USACE), New York State Department of Environmental Conservation, and The City of New York for the construction of the South Shore of Staten Island Coastal Risk Management Project. The NPS mission is to manage our lands for the preservation of and access to natural, cultural and recreational resources in perpetuity. Understanding that this Project is necessary for the protection of the adjacent communities, NPS is committed to working to avoid and minimize adverse impacts on our resources while advancing the goals of the Project. In addition, we will continue coordination with Project partners regarding the CERCLA response at Great Kills.

This letter is not a commitment for construction of any portion of the Project on NPS lands. Construction of the project on Gateway National Recreation Area's (GATE) land is contingent upon: an appropriate legal authority or instrumentation to authorize construction on NPS property; commitment of a non-federal sponsor for long-term maintenance obligations and liability and risk considerations for the project on NPS lands; and, appropriate off-sets for unavoidable Project impacts to GATE natural, cultural and recreational resources.

NPS will continue to work with USACE and other partners to move the Project forward. If you have any questions, please contact me by email at *jen_nersesian@nps.gov* or by telephone (718-354-4665).

Sincerely,

Jennifer T. Nersesian
Superintendent

Cc: Frank Verga, Project Manager, USACE
Peter Weppler, Chief, Environmental Analysis Branch, USACE Planning *(con't)*

Lynn Rakos, Archaeologist, USACE
Michael Caldwell, Regional Director, NPS Northeast Regional Office
Joshua Laird, Commissioner, National Parks of New York Harbor
Frank Hays, Associate Regional Director, NPS Northeast Regional Office
Carmen Chapin, Chief of Natural Resources, NPS Northeast Region
Jacqueline Katzmire, Regional Environmental Coordinator, NPS Northeast Region

STATE OF NEW YORK
DEPARTMENT OF STATE
ONE COMMERCE PLAZA
99 WASHINGTON AVENUE
ALBANY, NY 12231-0001
WWW.DOS.NY.GOV

ANDREW M. CUOMO
GOVERNOR

ROSSANA ROSADO
ACTING SECRETARY OF STATE

March 30, 2016

Catherine J. Alcoba, Biologist
U.S. Army Corps of Engineers
New York District
26 Federal Plaza – Room 145
New York, NY 10278-0090

F-2014-0788 (DA)
U.S. Army Corps of Engineers/ NY District
"South Shore of Staten Island Coastal Storm Risk Management (CSRM) Project" – Phase 1 -
Fort Wadsworth to Great Kills;
Borough of Staten Island,
County of Richmond, New York;
Lower New York Bay & Raritan Bay

Concurrence with Consistency Determination

Dear Ms. Alcoba:

The Department of State (DOS or "the Department") received your consistency determination (Corps of Engineers – New York District submission dated November 17, 2014) regarding the consistency of the above-referenced project and its component activities with the New York City Local Waterfront Revitalization Program (NYC LWRP) and the New York Coastal Management Program (NYSCMP).

Pursuant to 15 CFR 930.41(b), the DOS requested and received a fifteen (15) day extension of time for its review and decision-making period. Subsequently (during a conference call, January 20, 2015), the DOS requested and received verbal agreement from the Corps to stay the review period until such time as DOS would be able to receive and review the Draft Environmental Impact Statement (DEIS) and public comments in response to the document. This request was necessitated by the ongoing development of significant project details and the unavailability of the DEIS at the time the consistency determination was submitted. The Corps' response to the DOS request to review public comments was received on Feb. 23, 2016 and consists of letters of support from various public officials and comments received from individuals, informally recorded during two public information sessions held on Staten Island in August 2016.

The DOS consistency review involved a number of applicable policies. One of the more challenging to assess was NYC LWRP Policy #6.1, which states the following: "Minimize losses from flooding and erosion by employing non-structural and structural management measures appropriate to the condition and use of the property to be protected and the surrounding area." The intent of this policy is to prioritize primarily non-structural strategies where feasible and appropriate. As such, approaches to coastal storm risk management which, as a primary strategy, significantly employ long-term planning to develop the resilience of coastal communities and ecosystems to coastal hazards and which provide realistic means for strategic retreat and

improved adaptive capacity are emphasized, and should be initially evaluated and substantially eliminated before choosing more structural approaches.

As a large scale construction project, consisting of over 4.3 miles of flood protective structures, the project as it is currently described within the DEIS includes a number of non-structural components – e.g. the creation of forty-six acres of tidal wetland at Oakwood Beach; preservation of existing open spaces and parklands for public recreation; maintenance of State buyout areas as open space – as well as limited road-raising and green infrastructure elements to improve flood storage capacity of existing wetlands and facilitate the conveyance of storm water. However, while these measures serve to complement the proposed structural 'Line of Protection' (LOP), the preferred alternative has been developed largely from consideration of an array of structural responses to coastal storm risk management.

In evaluating the consistency of this action, we have considered that Staten Island presents a unique problem with respect to its exposure to coastal flooding and its enhanced vulnerability. The nature of tropical hurricanes and winter storms (or nor'easters) typically affecting the island, New Jersey, New York City, and into the northeast region is that they tend to be large storms, not as a result of their intensity, but in terms of the areal extent affected by the storm and the duration of the storm across its track. Thus, the geographic extent of coastal flooding is often extreme and is the cause to which the greatest damages are attributed.[1] Staten Island is a geographical area which is likely to experience high storm surge flooding due to exposure to these storm characteristics in combination with its long coastline and unique coastal features[2], importantly, having an especially low-lying topography landward of the bay facing beaches and dunes. Issues with storm water runoff and insufficient infrastructure to contain and direct storm water during heavy rains and coastal storm events compound the risk of damaging floods for Staten Island communities across the project area. These latter issues will be addressed and ameliorated through implementation of the Staten Island Blue Belt Plans by the borough and the New York City Department of Environmental Protection (DEP). However, this effort is expected to occur over many years and, despite such improvements, the principal neighborhoods of South Beach, Midland Beach, and New Dorp Beach, along with the remaining development at Oakwood Beach are still particularly exposed to inundation from coastal storm surges. Therefore, in light of the devastation resulting from the October 2012 storm 'Sandy', and in view of the circumstances faced by the residents of Staten Island, the Department of State has determined that project is consistent with this policy.

Furthermore, in giving due consideration to of all of the applicable coastal policies, the Department of State finds that the suite of proposed activities is generally consistent with the policies of the NYC LWRP and, where appropriate, the NYSCMP. The DOS understands that the project is intended to substantially enhance the protection of Staten Island neighborhoods from storm surge, to protect critical facilities including the Oakwood Beach Wastewater Treatment Plant, increase the flood storage capacity of interior land areas, improve storm water retention and drainage infrastructure, utilize and enhance wetlands, and generally create a more resilient condition for communities than what presently exists. Further, given its regional impacts, the project also advances NYSCMP General Policy 18: "*To safeguard the vital economic, social, and environmental interests of the State and its citizens, proposed major actions in the coastal area must give full consideration to those interests, and to the safeguards which the State has established to protect valuable coastal resource areas*".

Based upon the project information submitted and all information reviewed, the Department of State concurs with the U.S. Army Corps of Engineers consistency determination for this activity. This concurrence is without prejudice to and does not obviate the need to obtain all other applicable licenses, permits, or other forms of authorization or approval that may be required pursuant to existing State statutes.

---

[1] Karen Clark and Company (2015), Most Vulnerable U.S. Cities to Storm Surge Flooding

[2] Ibid

The Department strongly encourages the Corps to continue to seek and develop non-structural solutions to coastal storm risk management. Other CSRM projects are planned which are likely to present the same challenges. The risks associated with coastal hazards are endemic to living, working, and playing in a coastal environment. As climate changes are anticipated to continue to impact sea level and exacerbate our experiences with storms, the DOS asserts that the most comprehensive and sustainable solutions should be actively sought and given preference to the more traditional and reactionary ones.

Finally, DOS requests to continue to participate and to receive project materials as the design and planning progresses. Any future substantial modifications or additions to the proposed project are subject to further review and concurrence by the Department of State.

Sincerely,

Sandra Allen, Director
Office of Planning and Development

SA/ TS

cc: COE/ NY District – Steve Ryba; Frank Verga; Jeff Fry
DEC/ Region 2 – Steve Watts

United States Department of the Interior

FISH AND WILDLIFE SERVICE
3817 Luker Road
Cortland, NY 13045

March 31, 2016

Peter Weppler, Chief
Environmental Analysis Branch
U.S. Army Corps of Engineers
Jacob K. Javits Federal Bldg., Rm. 2151
26 Federal Plaza
New York, NY 10278-0090

Attn: Catherine Alcoba and Jeffrey Fry

Dear Mr. Weppler:

This letter is submitted by the U.S. Fish and Wildlife Service (Service) and the Department of the Interior pursuant to, and in accordance with, provisions of the Endangered Species Act (ESA) of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*). The Service has reviewed the U. S. Army Corps of Engineers (Corps) September 9, 2015, and December 3, 2015, letters regarding the proposed South Shore of Staten Island (SSSI) Coastal Storm Risk Management Project, Phase 1-Fort Wadsworth to Oakwood Beach. The project is located in Staten Island, Richmond County, New York. The project includes the construction of a Line of Protection (LOP) and interior drainage improvements. The Corps requested that the Service concur with their determination made in their September 9, 2015, letter that the proposed project "may affect, but is not likely to adversely affect" the red knot (*Calidris canutus rufa;* threatened). In their December 3, 2015, letter, the Corps also determined that the proposed action would have no effect on the northern long-eared bat (*Myotis septentrionalis*; threatened).

Proposed Action

The proposed project is intended to alleviate damages caused by erosion and storm events. The Corps has identified the Tentatively Selected Line of Protection Plan (TSP) which includes the following risk management features: buried seawall/armored levee (with a raised promenade); levees and a floodwall; and interior drainage measures (Figure 1).

The LOP generally consists of three structures which cover a total length of 5.5 miles. The Corps provided the following description of the project elements (U.S. Army Corps of Engineers 2015):

Shoreline Reaches A-1 and A-2: Earthen Levee (3,700 feet), with crest elevation of 18 feet and crest width that ranges from 10 to 15 feet. The levee terminates into high ground

northwest of Hylan Boulevard. A road closure structure at Hylan Boulevard will be deployed only during rare coastal storm events to prevent the flanking of tidal surge waters to the project area.

Shoreline Reach A-3: Vertical Floodwall (1,800 feet), consists of H-pile supported T-shaped concrete floodwall with top of wall elevations of 20.5 feet; a reinforced concrete floodwall is provided where a confined footprint is needed to minimize impacts to the Oakwood Beach wastewater treatment plant (WWTP). A fronting tidal wetland will attenuate the wave forces and preserve the functionality of the tidal creek through a tide gate to the freshwater wetlands that serve as part of the project's interior drainage.

Shoreline Reach A-4: Buried Seawall (22,700 feet), consists of a buried seawall with crest elevations of 20.5 feet National Geodetic Vertical Datum (NGVD) 1929 with a 10- to 18-feet wide crest and 1.5:1 side slopes. A 10- to 18-feet wide scour apron is incorporated into the seaside structure toe. The seaward face and/or the landward and seaward faces of the above-grade portions of the structure are covered with excavated material to support native beach vegetation. The material cover is used to visually integrate the buried seawall with surrounding topography. A functionally equivalent raised promenade atop the buried seawall is provided from Oakwood Beach to Miller Field (approximately 1.75 mile), while an approximately 2.5-mile long, 38-feet wide pile-supported functional equivalent boardwalk is provided between Miller Field and Fort Wadsworth.

The Interior Drainage Plans include the acquisition and preservation of open space, pond excavation, construction of tide gates and gate chambers along the Line of Protection, road raisings, and other minor interior drainage measures necessary to meet the minimum facility plan or supplement a selected Alternative with higher net benefits.

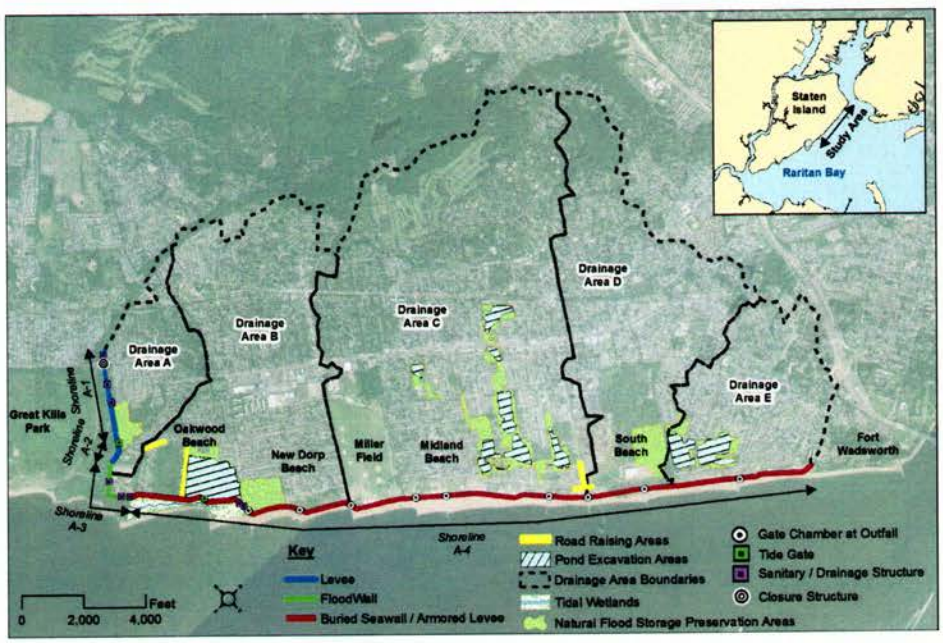


Figure 1. Overview of the U.S. Army Corps of Engineers' Tentatively Selected Plan.

Presence of Federally-listed Threatened and Endangered Species Within, and Adjacent to, the Project Area

Red Knot

The red knot breeds in the Canadian arctic and winters mainly in Tierra del Fuego, northern Brazil, or Florida, and migrates through New York, to and from its breeding sites in the spring and fall (U.S. Fish and Wildlife Service 2014). Red knots utilize coastal marine and estuarine habitats during the spring and fall migrations. Red knots show moderate fidelity to particular migration staging areas between years (U.S. Fish and Wildlife Service 2014). These habitats include high energy ocean or bay front shores, tidal flats in sheltered bays, and lagoons (U.S. Fish and Wildlife Service 2014). In North America, red knots are found along sandy, gravel, or cobble beaches; tidal mudflats; saltmarshes; shallow coastal impoundments and lagoons; and peat banks. Red knots use sandy beaches during both the spring and fall migration (U.S. Fish and Wildlife Service 2014).

The red knot is a specialized molluscivore, primarily eating hard-shelled mollusks and supplementing with softer invertebrate prey (U.S. Fish and Wildlife Service 2014). Red knots are restricted to foraging in the top 0.8 to 1.2 inches of sediment due to bill morphology (U.S. Fish and Wildlife Service 2014). Red knots forage on a number of prey, exhibiting preference for specific prey within specific stop-overs, during the spring and fall migrations and based on wintering location (U.S. Fish and Wildlife Service 2014). In New York, red knots in Moriches Bay exhibited preference of horseshoe crab eggs during the spring migration (U.S. Fish and Wildlife Service 2014). Red knots also forage on small periwinkles (*Littorina* spp.), tiny blue mussels and blue mussel spat (*Mytilus edulis),* gem clams (*Gemma gemma*) (not preferred), amphipods, naticid snails, polycheata worms, insect larvae, crustaceans, sand fleas (*Haustoriids* spp.), mole crabs (*Emerita talpoida*), dwarf surf clams (*Mulinia lateralis*), small bilvalves (*Tellina, Macoma, Donax, Gemmula, Iphigenia, Tivella, and Arca* spp.), and mud snails (*Peringia ulvae*) (U.S. Fish and Wildlife Service 2014).

The Service is not aware of site-specific surveys conducted to determine red knot presence at the project site. However, red knots have been documented utilizing extensive tidal flat areas for migratory stopover areas from May to September throughout Long Island at Jamaica Bay, and Rockaway, East Rockaway, Jones, Fire Island, Moriches, and Shinnecock Inlets. DeRose-Wilson *et al.* (2014) and Monk *et al.* (2015) documented red knot use of Old Inlet as a migratory stop-over area. Additionally, New York City Audubon documented foraging red knots at Plumb Beach during horseshoe crab surveys in 2009 and 2010 (New York City Audubon 2010). During the 2015 season, local birders reported seeing between 1 and 5 red knots using the mudflats in the north part of Great Kills Park. One of the reports indicated those red knots were observed in May and June (Frame 2015).

Horseshoe Crab Surveys

At Great Kills Park, National Park Service (NPS) biologists perform horseshoe crab surveys along the shoreline of the Park. NPS rangers conduct horseshoe crab surveys at Crookes Point where spawning occurs at the tip of the point and along the shoreline. During the 2015 season, NPS rangers counted 577 horse crabs, both along the shoreline and submerged, between May

and June 2015 (Frame 2015). Crookes Point is approximately 1.7 miles away from the southern boundary of the proposed project area. The area of concern, Oakwood Beach and the northern shoreline of Great Kills Park, is directly adjacent to the proposed project area. Surveys have not been conducted within this area; therefore, there are limited data available regarding both red knot presence and horseshoe crab spawning activity.

eBird

eBird is a real-time, online checklist program, managed by the Cornell Lab of Ornithology and National Audubon Society. eBird provides rich data sources for basic information on bird abundance and distribution at a variety of spatial and temporal scales. There were no documented observations within the project area on eBird; however, recent observations were documented in the area adjacent to the project area. Red knots were documented south of the project within Great Kills Park during the months of May and August in previous years (eBird 2015). Reports of individuals or several small groups of red knot have also been reported at beaches within 10 miles of the proposed project area at Breezy Point, New York, and Sandy Hook, New Jersey, in 2015; Dreier-Offerman Park, New York, in 2010; and Wolfes Pond Park, New York, in 2012 (eBird 2015).

Suitable red knot foraging habitat can be found along the lower New York Bay/Atlantic Ocean shoreline of Staten Island. Given the presence of suitable habitat and the documented presence of this species in the adjacent park, it is possible that red knot utilize habitat within and adjacent to the project site during the spring and fall migrations.

Northern Long-Eared Bat

There are no known occurrences of northern long-eared bats within the project area.

U.S. Army Corps of Engineers' Determination

Red Knot

The Corps requested that the Service concur with their determinations made in their September 9, 2015, letter that the proposed construction of the Line of Protection (LOP) and interior drainage project will not affect red knot (*Calidris canutus rufa*), but that the construction of tidal wetlands may affect, but is not likely to adversely affect, the red knot.

The basis for the Corps determination is that the LOP and the interior drainage components of the project are outside of the potential habitat suitable for foraging. The construction of the tidal wetland component of the project intersects with the mean high water line and could temporarily restrict access to potential foraging habitat. However, suitable foraging habitat would be available on either side of the construction area, red knot could move down the beach to avoid temporary disturbance from construction.

Please be advised that the Corps is required to consider the effects of full project implementation when making its effects determinations, rather than piece-mealing the project into components. Similarly, while conducting our analysis pursuant to section 7, the Service is also required to

consider all aspects of the project. Therefore, for the purposes of this consultation, the Service considers the Corps' has determined that the project, "may affect, but is not likely to adversely affect," the red knot.

Based on coordination between the Service and the Corps in February and March of 2016 and based on the potential for red knot presence within the project area and adjacently south of the proposed project, the Corps will implement a construction time-of-year restriction between May 1 to June 15 and July 15 to November 30 to avoid potential for disruption of foraging red knot in the project area. The Corps will undertake spring and fall survey efforts in 2017 and 2018 for red knot to obtain information on species' presence during the spring and fall migrations. The Corps and the Service will coordinate on the development of a survey protocol.

Northern Long-Eared Bat

The Corps originally determined that the project "may affect, but is not likely to adversely affect," the northern long-eared bat in their letter dated September 9, 2015. The Corps revised their determination for the northern long-eared bat and found that the proposed project is not likely to affect this species in their letter dated December 3, 2015. This revision was based on the fact that there are no known occurrences of the species in Richmond County, New York, as well as a lack of suitable habitat for the species within the project area and the project's proximity to urban areas.

Effects of Proposed Action on Red Knot

The red knot was listed on January 12, 2015. The main threats to red knot are: shoreline development; reduced food availability; disturbance and climate change. This project proposes to construct a 5.5 mile line of protection (LOP) along the shoreline of Staten Island. The proposed project may result in the direct disturbance (audio and visual) of red knot resulting from the construction. The Corps' Plan Sheets C-101 and C-102 were identified as the areas that are adjacent to the mudflats in Great Kills Park. Audio and visual disturbance resulting from the construction of the LOP at this area may disturb red knot and result changes to their behavior or departure from foraging and roosting habitat. Changes in behavior may result in a reduction in foraging (decreased food intake) and increased use of energy (time spent alert or relocating), hindering the red knot's ability to recuperate from migratory flights, maintain adequate weights, or build fat reserves for the next phase of their cycle (U.S. Fish and Wildlife Service 2014). Disturbance may exacerbate other threats and factors such as decreased prey availability, loss of habitat, competition with gulls, predation and asynchronies in the annual cycle (U.S. Fish and Wildlife Service 2014).

The construction of the LOP, a shore hardening structure, is proposed along the landward edge of the beach. The construction of shore hardening structures often eliminate existing intertidal habitats, and in many cases, cause the indirect effect of preventing the formation of new shorebird habitats (U.S. Fish and Wildlife Service 2014). The proposed action will preclude the formation of new shorebird habitat by preventing the landward migration of the beach. However, the proposed project area, as well as the surrounding adjacent areas, is within an urban setting with high density development, hence the purpose for this project. The population of the

study area is estimated to be over 30,000 people (U.S. Army Corps of Engineers 2015). The majority of land within the study area consists of residential development with the remaining lands characterized by commercial development, wetlands, forests, ponds, creeks, meadows, and beaches. Developed parks with large parking areas and shore-parallel boardwalks also line the beachfront. Coastal structures include revetments and groins containing drainage outlet (U.S. Army Corps of Engineers 2015).

The shoreline between Fort Wadsworth and Oakwood Beach consists entirely of city beaches and various segments of the Gateway National Recreation Area (GNRA) (U.S. Army Corps of Engineers 2015). The New York City Department of Parks and Recreation has estimated that average attendance has been increasing, with an observed ten-year average of approximately 250,000 to 300,000 visitors per year, with roughly 350,000 visitors in the year 2001. The Parks Department statistics cited that over 450,000 people visited Midland and South Beach in 2014 (U.S. Army Corps of Engineers 2014).

Since 1935, federal, state, and local agencies took action to stabilize the beach by constructing four projects within the proposed project area. Collectively, three of the four projects resulted in the construction of six timber and rock groins; a timber bulkhead; and the placement of 2,880,000 cubic yards of fill placed along 15,600 feet (50 percent) of the shoreline (U.S. Army Corps of Engineers 2014). The fourth project resulted in the construction of two earthen levee segments, one tide gate structure, underground storm water storage, and road-raising. After Hurricane Sandy, the City of New York (NYC) identified several initiatives as part of its *Special Initiative for Rebuilding and Resiliency* (SIRR) that included stabilization efforts including beach nourishment and dune construction, installation of armor stone shoreline protection (revetments) and the construction of high bulkheads (raising) (City of New York 2013).

In light of the heavily-recreated beach, the extensive development located immediately landward of the project location, and the past and likely future efforts to stabilize the project area shoreline, landward migration of the beach would be prevented by other authorizations/organizations. Direct impacts from audio and visual disturbance will be addressed through the implementation of the time of year restrictions.

Service Position

Red Knot

Based on the documented presence of red knot along the shoreline adjacent to the project area and the potential for red knot in the southern portion of the project area, the Corps will implement a no-construction window between May 1 to June 15 and July 15 to November 30 of each calendar year. The Corps will conduct shorebird surveys in 2017 and 2018 to determine red knot use of the site during the spring and fall migrations. The no-construction windows may be removed or modified as a result of the data collected during these surveys. Upon completion of the surveys, the Corps may reinitiate consultation to modify or remove the no construction windows.

Based on the status of red knot in the proposed project area, in addition to the proposed time-of-year restrictions and the anticipated shorebird surveys with details to be finalized through further coordination between the Corps and the Service, the Service concurs with the Corps' determination that the proposed project may affect, but is not likely to adversely affect the red knot.

Northern Long-Eared Bat

The Service acknowledges the Corps' determination that the preferred alternative will have no effect on the northern long-eared bat, due to the lack of known occurrences and lack of suitable habitat in the proposed project area.

Should project plans change, or if additional information on listed or proposed species or critical habitat becomes available, this determination may be reconsidered. Until the proposed project is complete, we recommend that you check our website every 90 days from the date of this letter to ensure that listed species presence/absence information for the proposed projects is current.

This concludes section 7 consultation on the South Shore of Staten Island Coastal Storm Risk Management Project, Phase 1-Fort Wadsworth to Oakwood Beach. If you have any more questions or concerns or for further information please contact Terra Gulden-Dunlop of the Long Island Field Office at (631) 286-0485.

Sincerely,

Patricia Cole

for David A. Stillwell
Field Supervisor

cc: NYSDEC, Region 2, Long Island City, NY (S. Zahn)
USFWS, Long Island Field Office, Shirley, NY

REFERENCES

DeRose-Wilson, A., J.D. Fraser, D.H. Catlin, and S.M. Karpanty. 2014. Shorebird Survey Report. Report submitted to U.S. Fish and Wildlife Service by Virginia Polytechnic Institute and State University, Blacksburg, VA. 12 pp.

eBird.org. 2015. eBird: An Online Database of Bird Distribution and Abundance [web application]. Cornell Lab of Ornithology, Ithaca, NY. Available at <http://www.ebird.org/>.

Frame, G. 2015. Personal Communication. Biologist, Natural Resources Management Division, Gateway National Recreation Area, Staten Island, NY.

Monk, J.D., A. DeRose-Wilson, J.D. Fraser, D.H. Catlin, and S.M. Karpanty. 2015. Migratory Shorebird Monitoring on Fire Island, NY. Report prepared for U.S. Fish and Wildlife Service by Virginia Polytechnic Institute and State University, Blacksburg, VA. 26 pp.

New York City Audubon. 2010. Shorebird and Horseshoe Crab Data Summary 2009 and 2010, Jamaica Bay, NY.

The City of New York. 2013. PlaNYC: "A Stronger, More Resilient New York". City of New York, Chapter 15.

U.S. Army Corps of Engineers. 2015. Draft Environmental Impact Statement, South Shore of Staten Island Coastal Storm Risk Management Project, Richmond County, New York. Preliminary Draft. New York District, Planning Division, New York, NY.

U.S. Fish and Wildlife Service. 2014. Rufa Red Knot Background Information and Threats Assessment Supplement to Endangered and Threatened Wildlife and Plants; Final Threatened Status for the Rufa Red Knot (*Calidris canutus rufa*). Federal Register/Vol. 79 No. 238, 50 CFR Part 17 [Docket No. FWS-R5-ES-2013-0097;4500030113]

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

6 March 2016

Environmental Analysis Branch

Jennifer T. Nersesian
Superintendent
Gateway National Recreation Area
210 New York Avenue
Staten Island, New York 10305

Dear Ms. Nersesian:

The U.S. Army Corps of Engineers, New York District (Corps), is pleased to submit a Programmatic Agreement (PA) among the United States Army Corps of Engineers, the National Park Service and the New York State Historic Preservation Officer regarding the South Shore of Staten Island Coastal Storm Damage Reduction Project, Richmond County, New York.

Please review the agreement which has been pre-coordinated with Marilou Ehrler of your staff. If you concur with its stipulations, please sign and date the PA and return it to the Corps to forward it to Ms. Ruth Pierpont, New York State Deputy Commissioner for Historic Preservation, for her dated signature to ratify the agreement. A copy of the signed document will be provided for your files.

Should you or your staff require additional information or have any questions, please contact Lynn Rakos, Project Archaeologist, at (917) 790-8629 or by email at Lynn.Rakos@usace.army.mil.

Sincerely,

Peter M. Weppler
Chief, Environmental Analysis Branch

Enclosure

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

April 29, 2015

Environmental Assessment Section
Environmental Analysis Branch

Ms. Sherry White
Tribal Historic Preservation Officer
Stockbridge-Munsee Community
Band of Mohican Indians
W13447 Camp 14 Road
Bowler, WI 54416

Dear Ms. White:

The U.S. Army Corps of Engineers, New York District, (Corps), is authorized to undertake construction of the South Shore of Staten Island Hurricane and Storm Risk Management Project, Richmond County, New York under P.L. 113-2, the Disaster Relief Appropriations Act of 2013, following Hurricane Sandy in October 2012. The Corps is presently completing the feasibility study of the Phase I portion of the project which runs from just south of Fort Wadsworth to Oakwood Beach (Enclosure 1). The recommended Line of Protection Plan (LOP) consists of a buried seawall/armored levee along a majority of the reach (approximately 80%) serving as the first line of defense against severe coastal surge flooding and wave forces. The remainder of the LOP consists of a T-Type Vertical Floodwall and Levee. The LOP also includes a stoplog closure structure at Hylan Boulevard, drainage control structures for existing storm water outfalls, tide gate structures, vehicle and pedestrian access structures, and demolition of the existing boardwalk. The Interior Drainage Plan includes pond excavation, construction of tide gates and gate chambers along the LOP, road raisings, and other minor interior drainage facilities. The Area of Potential Effect (APE) for this undertaking includes all areas impacted by activities required to construct the above listed features as well as construction access and staging areas and, if required, environmental mitigation measures. The locations of some of these features have yet to be determined. Maps and proposed plans are contained in the enclosed Preliminary Case Report and Programmatic Agreement (PA) referenced below.

As a federal agency the USACE has certain responsibilities for the identification, protection and preservation of cultural resources that may be located within the area of potential project effect (APE) associated with the proposed South Shore of Staten Island project. Present statutes and regulations governing the identification, protection and preservation of these resources include the National Historic Preservation Act of 1966 (NHPA), as amended through 2006; the National Environmental Policy Act of 1969; Executive Order 11593; and the regulations implementing Section 106 of the NHPA (36 CFR Part 800, Protection of Historic Properties, August 2004). Significant cultural resources include any material remains of human activity eligible for inclusion on the National Register of Historic Places (NRHP).

Much of the project's APE has been subject cultural resource surveys by the Corps or by others including a Phase I survey completed for the Corps in 2005. A CD containing the final Phase I report is enclosed (Enclosure 2). This work included archaeological testing and an historic architectural survey. The resulting report recommended further work in selected locations along the proposed project alignment. No Native American sites were identified however the Corps will excavate borings along the project alignment where construction by open trenching is proposed to provide an understanding of shoreline development as sea level rose and to determine areas sensitive for deeply buried landforms and Native American resources. No borings will be conducted where construction will entail just pile driving. The locations and number of borings will be determined by a geoarchaeologist or a geomorphologist with archaeological experience. Archaeological testing of high ground adjacent to proposed ponding areas and pump stations is also recommended.

A Preliminary Case Report was prepared which summarizes all cultural resources work conducted to date and outlines future work (Enclosure 3). The Corps has prepared a Draft PA which stipulates further studies the Corps will undertake. The draft PA for your review and comment is included as Enclosure 7 in the Preliminary Case Report. This document is being coordinated with the State Historic Preservation Office, National Park Service, New York City Landmarks Preservation Commission and other interested parties. We invite you to consult with us on this project and the PA. If you have questions please contact the project archaeologist, Ms. Lynn Rakos at (917)790-8629 or by email at Lynn.Rakos@usace.army.mil.

Sincerely,

Peter M. Weppler
Chief, Environmental Branch

Enclosures

Andrew M. Cuomo
Governor

Rose Harvey
Commissioner

New York State Office of Parks, Recreation and Historic Preservation

Division for Historic Preservation
Peebles Island, PO Box 189, Waterford, New York 12188-0189
518-237-8643
www.nysparks.com

December 16, 2014

Ms. Lynn Rakos
Project Archaeologist
US Army Corps of Engineers
CENAN-PL-EA
26 Federal Plaza
New York, NY 10278

Re: CORPS
South Shore of Staten Island - Combined Erosion Control & Storm Damage Protection
southern shoreline of Staten Island from Fort Wads
05PR04225

Dear Ms. Rakos:

Thank you for continuing to consult with the New York State Historic Preservation Office (SHPO). We have reviewed the provided information in accordance with Section 106 of the National Historic Preservation Act of 1966. These comments are those of the SHPO and relate only to Historic/Cultural resources. They do not include other environmental impacts to New York State Parkland that may be involved in or near your project. Such impacts must be considered as part of the environmental review of the project pursuant to the National Environmental Policy Act and/or the State Environmental Quality Review Act (New York Environmental Conservation Law Article 8).

We have reviewed the updated submitted information and the Draft Programmatic Agreement. We offer the following comments with regards to the PA:

1. Second to last WHEREAS – "WHEREAS, the New York District shall provide the NYSHPO all documents, which may include but not limited to all reports, comments and notifications by *certified mail*; and" SHPO requests that certified mail be deleted and that CRIS be inserted. The Cultural Resource Information System (CRIS) is now online for submission of documents.

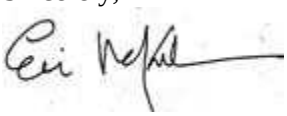
2. Stipulation I.A., SHPO requests clarification regarding whether the results of the borings will be used to plan additional archaeological investigation should paleo-surfaces or archaeological materials be encountered. SHPO requests that the last sentence is revised to "The New York District shall consult with the NYSHPO to develop *archeological work plans* to address this work."

3. SHPO recommends that specific language be included regarding procedures to be undertaken should evidence of human remains be encountered during any aspect of the investigation or subsequent construction activities. SHPO's Human Remains Discovery Protocol is enclosed to provide suggested language.

We look forward to continuing to review the draft PA.

If further correspondence is required regarding this project, I can be reached at (518) 237-8643, ext. 3260 or at eric.kuchar@parks.ny.gov. Please be sure to refer to the Project Review (PR) number noted above.

Sincerely,



Eric N. Kuchar
Historic Preservation Technical Specialist via e-mail only

Enc: NYSHPO Human Remains Discovery Protocol

State Historic Preservation Office/ New York State Office of Parks, Recreation and Historic Preservation Human Remains Discovery Protocol (October 2013)

In the event that human remains are encountered during construction or archaeological investigations, the New York State Historic Preservation Office (SHPO) recommends that the following protocol is implemented:

- At all times human remains must be treated with the utmost dignity and respect. Should human remains be encountered work in the general area of the discovery will stop immediately and the location will be immediately secured and protected from damage and disturbance.

- Human remains or associated artifacts will be left in place and not disturbed. No skeletal remains or materials associated with the remains will be collected or removed until appropriate consultation has taken place and a plan of action has been developed.

- The county coroner/medical examiner, local law enforcement, the SHPO, the appropriate Indian Nations, and the involved agency will be notified immediately. The coroner and local law enforcement will make the official ruling on the nature of the remains, being either forensic or archaeological.

- If human remains are determined to be Native American, the remains will be left in place and protected from further disturbance until a plan for their avoidance or removal can be generated. Please note that avoidance is the preferred choice of the SHPO and the Indian Nations. The involved agency will consult SHPO and appropriate Indian Nations to develop a plan of action that is consistent with the Native American Graves Protection and Repatriation Act (NAGPRA) guidance. Photographs of Native American human remains and associated funerary objects should not be taken without consulting with the involved Indian Nations.

- If human remains are determined to be non-Native American, the remains will be left in place and protected from further disturbance until a plan for their avoidance or removal can be generated. Please note that avoidance is the preferred choice of the SHPO. Consultation with the SHPO and other appropriate parties will be required to determine a plan of action.

Landmarks Preservation Commission

1 Centre Street
9th Floor North
New York, NY 10007

Voice (212)-669-7700
Fax (212)-669-7960
http://nyc.gov/landmarks

ENVIRONMENTAL REVIEW

Project number: US ARMY CORPS OF ENGINEERS / 106-R
Project: SOUTH SHORE SI COASTAL STORM DAMAGE REDUCTION
Date received: 11/14/2014

The LPC is in receipt of the, "Cultural Resources Summary and Preliminary Case Report for the South Shore of Staten Island Hurricane and Storm Risk Management Project, Staten Island, Richmond County, New York," prepared by the USACE and dated October 2014 and the "Phase I Combined Erosion Control and Storm Damage Protection Feasibility Study, South Shore of Staten Island, Richmond County, New York and Appendices," prepared by Panamerican Consultants, Inc and dated July 2005. The LPC concurs with the architectural and archaeological findings and would like to be consulted about the subsequent archaeology and geoarchaeology.

cc: NYSHPO

Gina Santucci 11/21/2014

SIGNATURE DATE
Gina Santucci, Environmental Review Coordinator

File Name: 30047_FSO_GS_11212014.doc

Landmarks Preservation Commission

1 Centre Street
9th Floor North
New York, NY 10007

Voice (212)-669-7700
Fax (212)-669-7960
http://nyc.gov/landmarks

ENVIRONMENTAL REVIEW

Project number: US ARMY CORPS OF ENGINEERS / 15ACE001R
Project: SOUTH SHORE SI COASTAL STORM DAMAGE REDUCTION
Date received: 12/4/2014

Comments:

The LPC is in receipt of the DEIS of November, 2014. The text is acceptable for historic and cultural resources.

LPC would like to be consulted regarding archeological work conducted as part of this project.

Cc: SHPO

Gina Santucci 12/11/2014

SIGNATURE DATE
Gina Santucci, Environmental Review Coordinator

File Name: 30047_FSO_GS_12112014.doc

The Delaware Nation
Cultural Preservation Office
P.O. Box 825 - 31064 State Highway 281- Anadarko, OK 73005
Phone: 405/247-2448 – Fax: 405/247-8905

NAGPRA ext. 1403
Section 106 ext. 1181
Museum ext. 1181
Library ext. 1196
Clerk ext. 1182

December 5, 2014

RE: Cultural Resource Summary and Preliminary Case Report, the South Shore of Staten Island Hurricane and Storm Risk Management Project, Staten Island, Richmond County, NY

Ms. Rakos,

The Delaware Nation Cultural Preservation Department received correspondence regarding the above referenced project. Our office is committed to protecting sites important to tribal heritage, culture and religion. Furthermore, the tribe is particularly concerned with archaeological sites that may contain human burials or remains, and associated funerary objects.

As described in your correspondence and upon research of our database(s) and files, we find that the Lenape people occupied this area either prehistorically or historically. However, the location of the project does not endanger cultural or religious sites of interest to the Delaware Nation. Please continue with the project as planned. However, should this project inadvertently uncover an archaeological site or object(s), we request that you halt all construction and ground disturbance activities and immediately contact the appropriate state agencies, as well as our office (within 24 hours).

Please Note the Delaware Nation, the Delaware Tribe of Indians, and the Stockbridge Munsee Band of Mohican Indians are the only Federally Recognized Delaware/Lenape entities in the United States and consultation must be made only with designated staff of these three tribes. We appreciate your cooperation in contacting the Delaware Nation Cultural Preservation Office to conduct proper Section 106 consultation. Should you have any questions regarding this email or future consultation feel free to contact our offices at 405-247-2448 or by email nalligood@delawarenation.com.

Sincerely,

Nekole Alligood
Director

Delaware Tribe Historic Preservation Representatives
Department of Anthropology
Gladfelter Hall
Temple University
1115 W. Polett Walk
Philadelphia, PA 19122
temple@delawaretribe.org

November 27, 2014

Department of the Army
Attn: Lynn Rakos
New York District, Corps of Engineers
Jacob K. Javits Federal Building
New York, N.Y. 10278

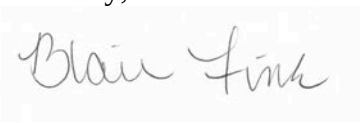
Re: South Shore of State Island Hurricane and Storm Risk Management Project

Dear Lynn Rakos,

Thank you for informing the Delaware Tribe regarding the above referenced project. We concur with the recommendations given in the Phase 1 Archaeological Survey. Borings along the project alignment will help to determine deeply buried landforms. We also concur with the recommendation for additional archaeological testing in areas of higher ground adjacent to proposed ponding areas and pump stations. We wish to continue as a consulting party on this project and look forward to receiving a copy of the additional survey report if one is performed. We appreciate your cooperation and look forward to working together on our shared interests in preserving Delaware cultural heritage.

If you have any questions, feel free to contact this office by phone at (609) 220-1047 or by e-mail at temple@delawaretribe.org.

Sincerely,



Blair Fink
Delaware Tribe Historic Preservation Representatives
Department of Anthropology
Gladfelter Hall
Temple University
1115 W. Polett Walk
Philadelphia, PA 19122

Stockbridge-Munsee Tribal Historic Preservation

Main Office
W13447 Camp 14 Rd
Bowler, WI 54416

New York Office
P.O. Box 718
Troy, NY 12181

Lynn Rakos
Project Archaeologist
US Army Corps of Engineers
Jacob K. Javits Federal Building
New York, NY 10278-0090
Via email only

May 15, 2015

RE: South Shore of Staten Island Hurricane & Storm Risk Management Project
Richmond County, NY
Comment by Stockbridge-Munsee Mohican Tribe

Dear Ms. Rakos:

I am in receipt of cultural resource materials sent dated 4/29/15 sent for review by Stockbridge-Munsee Mohican Tribe for the South Shore of Staten Island Hurricane and Storm Risk Management Project. I received a letter, Cultural Resource Summary and Preliminary Case Report with draft PA, and a Phase 1 survey on a CD. The materials were forwarded to me here in Troy, NY where I conduct reviews such as this from a satellite office for our tribe.

Thank you to USACE for initiating consultation for this project.

On behalf of Stockbridge-Munsee Mohican Tribe I offer the following comments:

- We concur with the recommendations of the 2005 Phase 1 Report which indicate several locations for borings to assess the potential for deeply buried prehistoric resources. We further concur with the recommendation for additional testing in select areas in the project alignment, including areas of high ground adjacent to proposed poinding areas and pump stations.
- We do not wish to be a signatory to the PA, though we do not have concerns with it, and instead would prefer to continue to receive cultural resource reports for the above remaining areas to be tested.

Thank you & Kind regards,

B. Hartley

Bonney Hartley
Tribal Historic Preservation Officer
New York Office

(518) 326-8870 *Email: bonney.hartley@mohican-nsn.gov*

Preserving America's Heritage

December 5, 2014

Mr. Peter Weppler
Chief, Environmental Analysis Branch
U.S. Army Corps of Engineers - Planning
26 Federal Plaza - Room 2151
New York, NY 10278-0090

Ref: Proposed Construction of South Shore of Staten Island Coastal Storm Damage Reduction Project Richmond County, New York

Dear Mr. Weppler:

On November 20, 2014, the Advisory Council on Historic Preservation (ACHP) received your notification and supporting documentation regarding the development of a programmatic agreement to address the potential adverse effects for the referenced project. Based upon the information you provided, we have concluded that Appendix A, *Criteria for Council Involvement in Reviewing Individual Section 106 Cases*, of our regulations, "Protection of Historic Properties" (36 CFR Part 800), does not apply to this undertaking. Accordingly, we do not believe that our participation in the consultation to resolve adverse effects is needed. However, if we receive a request for participation from the State Historic Preservation Officer, Tribal Historic Preservation Officer, affected Indian tribe, a consulting party, or other party, we may reconsider this decision. Additionally, should circumstances change, and you determine that our participation is needed to conclude the consultation process, please notify us.

Pursuant to 36 CFR §800.6(b)(1)(iv), you will need to file the final programmatic agreement (PA), developed in consultation with the New York State Historic Preservation Office (SHPO) and any other consulting parties, and related documentation with the ACHP at the conclusion of the consultation process. The filing of the PA and supporting documentation with the ACHP is required in order to complete the requirements of Section 106 of the National Historic Preservation Act.

If you have any questions or require further assistance, please contact Brian Lusher at 202-517-0221, or via email at blusher@achp.gov.

Sincerely,

Raymond V. Wallace

Raymond V. Wallace
Historic Preservation Technician
Office of Federal Agency Programs

Landmarks Preservation Commission

1 Centre Street
9th Floor North
New York, NY 10007

Voice (212)-669-7700
Fax (212)-669-7960
http://nyc.gov/landmarks

ENVIRONMENTAL REVIEW

Project number: US ARMY CORPS OF ENGINEERS / 106-R
Project: SOUTH SHORE SI COASTAL STORM DAMAGE REDUCTION
Date received: 11/14/2014

The LPC is in receipt of the, "Cultural Resources Summary and Preliminary Case Report for the South Shore of Staten Island Hurricane and Storm Risk Management Project, Staten Island, Richmond County, New York," prepared by the USACE and dated October 2014 and the "Phase I Combined Erosion Control and Storm Damage Protection Feasibility Study, South Shore of Staten Island, Richmond County, New York and Appendices," prepared by Panamerican Consultants, Inc and dated July 2005. The LPC concurs with the architectural and archaeological findings and would like to be consulted about the subsequent archaeology and geoarchaeology.

cc: NYSHPO

Gina Santucci 11/21/2014

SIGNATURE DATE
Gina Santucci, Environmental Review Coordinator

File Name: 30047_FSO_GS_11212014.doc

Landmarks Preservation Commission

1 Centre Street
9th Floor North
New York, NY 10007

Voice (212)-669-7700
Fax (212)-669-7960
http://nyc.gov/landmarks

ENVIRONMENTAL REVIEW

Project number: US ARMY CORPS OF ENGINEERS / 15ACE001R
Project: SOUTH SHORE SI COASTAL STORM DAMAGE REDUCTION
Date received: 12/4/2014

Comments:

The LPC is in receipt of the DEIS of November, 2014. The text is acceptable for historic and cultural resources.

LPC would like to be consulted regarding archeological work conducted as part of this project.

Cc: SHPO

Gina Santucci 12/11/2014

SIGNATURE DATE
Gina Santucci, Environmental Review Coordinator

File Name: 30047_FSO_GS_12112014.doc

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

Joe Martens
Commissioner

December 02, 2014

Peter Weppler
U.S. Army Corps of Engineers, New York District
Jackb K. Javits Federal Building
New York, NY 10278

Re: South Shore of Staten Island Coastal Storm Risk Management Project
Town/City: New York. County: Richmond.

Dear Peter Weppler :

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

Enclosed is a report of rare or state-listed animals and plants, and significant natural communities, which our databases indicate occur, or may occur, on your site or in the immediate vicinity of your site.

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

Our databases are continually growing as records are added and updated. If this proposed project is still under development one year from now, we recommend that you contact us again so that we may update this response with the most current information.

Sincerely,

Nicholas Conrad
Information Resources Coordinator
New York Natural Heritage Program

1217

The following rare plants and rare animals have been documented at your project site, or in its vicinity.

We recommend that potential onsite and offsite impacts of the proposed project on these species be addressed as part of any environmental assessment or review conducted as part of the planning, permitting and approval process, such as reviews conducted under SEQR. Field surveys of the project site may be necessary to determine the status of a species at the site, particularly for sites that are currently undeveloped and may still contain suitable habitat. Final requirements of the project to avoid, minimize, or mitigate potential impacts are determined by the lead permitting agency or the government body approving the project.

The following animals, while not listed by New York State as Endangered or Threatened, are of conservation concern to the state, and are considered rare by the New York Natural Heritage Program.

COMMON NAME	*SCIENTIFIC NAME*	*NY STATE LISTING*	*HERITAGE CONSERVATION STATUS*
Birds			
Barn Owl	*Tyto alba*	Protected Bird	Critically Imperiled in NYS

Breeding

Miller Field, 2002-06-15: The nest was found in a tower at Miller Field, a large manicured field. The field is bordered by abandoned buildings, a stand of pines and extensive residential area, a beach, and a small patch of deciduous trees and houses. (Near **STA 153** on plan maps.) 11357

Dragonflies and Damselflies			
Needham's Skimmer	*Libellula needhami*	Unlisted	Vulnerable in NYS

Interior Drainage Area C, Seavers Creek at Olympia Boulevard, 1997-07-11: The dragonflies were observed on both sides of the road along a creek bordered by thick stands of Phragmites. 11184

The following plants are listed as Endangered or Threatened by New York State, and/or are considered rare by the New York Natural Heritage Program, and so are a vulnerable natural resource of conservation concern.

COMMON NAME	*SCIENTIFIC NAME*	*NY STATE LISTING*	*HERITAGE CONSERVATION STATUS*
Vascular Plants			
Green Milkweed	*Asclepias viridiflora*	Threatened	Imperiled in NYS

Ocean Breeze Park, South Beach, near Quintard Street near its end, 1998-07-22: Open grassland habitat on artifically deposited sand, now resembling a maritime grassland. Grassland about 175+ acres surrounded by heavy development. Grassland varies in quality, but the highest quality is located along the northeast side. **Near Interior Drainage Area D.** 7904

Globose Flatsedge	*Cyperus echinatus*	Endangered	Critically Imperiled in NYS

Ocean Breeze Park, South Beach, near Quintard Street near its end, 1998-07-22: Large open grassland outlined by major roads. Soil is very sandy. **Near Interior Drainage Area D.** 7425

This report only includes records from the NY Natural Heritage databases. For most sites, comprehensive field surveys have not been conducted, and we cannot provide a definitive statement as to the presence or absence of

all rare or state-listed species. Depending on the nature of the project and the conditions at the project site, further information from on-site surveys or other sources may be required to fully assess impacts on biological resources.

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

Information about many of the rare animals and plants in New York, including habitat, biology, identification, conservation, and management, are available online in Natural Heritage's Conservation Guides at www.guides.nynhp.org, from NatureServe Explorer at www.natureserve.org/explorer, and from USDA's Plants Database at http://plants.usda.gov/index.html (for plants).

The following rare plants have historical records at your project site, or in its vicinity.

The following rare plants were documented in the vicinity of the project site at one time, but have not been documented there since 1919 or earlier, and/or there is uncertainty regarding their continued presence. There is no recent information on these plants and animals in the vicinity of the project site and their current status there is unknown. In most cases the precise location of the plant or animal in this vicinity at the time it was last documented is also unknown.

We provide this information for your general reference. If suitable habitat for these plants or animals is present in the vicinity of the project site, it is possible that they may still occur there. We recommend that any field surveys to the site include a search for these species, particularly at sites that are currently undeveloped and may still contain suitable habitat.

COMMON NAME	*SCIENTIFIC NAME*	*NYS LISTING*	*HERITAGE CONSERVATION STATUS*	
Vascular Plants				
Straw Sedge	*Carex straminea*	Endangered	Critically Imperiled in NYS	
1915-06-13: South Beach.				1889
Straw Sedge	*Carex straminea*	Endangered	Critically Imperiled in NYS	
1896-06-15: Grant City.				5017
Primrose-leaf Violet	*Viola primulifolia*	Threatened	Imperiled in NYS	
1907-05-30: Grant City. Open moist soil.				6294
Downy Carrion-flower	*Smilax pulverulenta*	Endangered	Critically Imperiled in NYS	
1919-05-17: Grant City.				8699
Spring Ladies'-tresses	*Spiranthes vernalis*	Endangered	Critically Imperiled in NYS	
1892-08-07: South Beach				7984

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

Information about many of the rare animals and plants in New York, including habitat, biology, identification, conservation, and management, are available online in Natural Heritage's Conservation Guides at www.guides.nynhp.org.

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

Environmental Analysis Branch

December 3, 2015

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

Dear Mr. Stilwell:

The U.S. Army Corps of Engineers New York District (District) has continued to coordinate on South Shore of Staten Island Coastal Storm Risk Management Project with Mr. Steven Sinkevich and Ms. Terra Gulden-Dunlop of your Long Island Field Office since our 9 September 2015 letter transmitting the District's Endangered Species Act (ESA) determination and assessment for Red Knot (Calidris canutus rufa) and Northern Long-Eared Bat (Myotis septentrionalis) to fulfill Section 7 consultation under the ESA of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq).

In our 9 September 2015 letter, the District determined that because the proposed construction of the Line of Protection and interior drainage project features are outside of the potential habitat suitable for red knot foraging, those project features will not affect red knot. Construction of the tidal wetland at Oakwood Beach project feature "May Affect but is not Likely to Adversely Affect" the red knot.

Additionally, by this letter, the District is amending our determination and assessment for the Northern Long-Eared Bat and finds that construction of the recommended alternative for the SSSI project has "No Effect" on the northern long-eared bat based on no known occurrences of the species in Richmond County, New York as well as a lack of suitable habitat for the species and the project's proximity to urban areas.

The District looks forward to continuing to work with you and your staff on this effort. If you should have any questions, please contact Ms. Catherine J. Alcoba of my staff at 917-790-8216

Peter Weppler, Chief
Environmental Analysis Branch

Copy Furnished:
USFWS, LI Field Office

Endangered Species Act (ESA) determination and assessment for red knot (*Calidris canutus rufa*) and Northern Long-Eared Bat (*Myotis septentrionalis*)

Red knot (*Calidris canutus rufa*)

Species Information

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

On the breeding grounds, the red knot's diet consists mostly of terrestrial invertebrates such as insects and other arthropods.

Geolocator and resightings data show definitively that the *rufa* nonbreeding range includes the entire Atlantic and Caribbean coasts of South America and the Caribbean islands.

Coastal habitats used by red knots in migration and wintering areas are similar in character, generally coastal marine and estuarine (partially enclosed tidal area where fresh and salt water mixes) habitats with large areas of exposed intertidal sediments. Migration and wintering habitats include both high-energy ocean- or bay-front areas, as well as tidal flats in more sheltered bays and lagoons. Preferred wintering and migration microhabitats are muddy or sandy coastal areas, specifically, the mouths of bays and estuaries, tidal flats, and unimproved tidal inlets. Along the U.S. Atlantic coast, dynamic and ephemeral (lasting only briefly) features are important red knot habitats, including sand spits, islets, shoals, and sandbars, features often associated with inlets. In many wintering and stopover areas, quality high-tide roosting habitat (i.e., close to feeding areas, protected from predators, with sufficient space during the highest tides, free from excessive human disturbance) is limited (USFWS 2014).

South Shore of Staten Island (SSSI) Project

Red knot migrate through the SSSI project area in the Spring and the Fall. The project area contains suitable habitat for foraging. Red knot may forage along the shoreline in Staten Island, but do not breed in the area.

Construction of the SSSI Line of Protection (LOP) is not directly at the shoreline, but is set back from the mean high water line. Construction of the SSSI interior drainage areas landward of the LOP and therefore further set back from the shoreline. Table 1 below shows how many feet landward the LOP is from mean high water at selected locations. These components of the SSSI project (LOP and interior drainage) are outside of the potential habitat suitable for foraging and will not affect the red knot.

Construction of the SSSI Tidal Wetland at Oakwood Beach intersects with the mean high water line and could temporarily restrict potential foraging habitat for red know. However, suitable foraging habitat would be available on either side of the construction area, red knot could move down the beach to avoid the temporary disturbance from construction. For this reason, the SSSI project "May Affect but is not Likely to Adversely Affect" red knot.

Table 1: SSSI Line of Protection Distance from Mean High Water

Line of Protection Location	Station location	Distance landward of Mean High Water (ft)
Oakwood Beach WWTP	60+00	640
Oakwood Beach	85+00	250
New Dorp Beach	135+00	155
Miller Field	158+00	250
South Beach	195+00	230
South Beach	221+00	225
Fort Wadsworth Area	288+00	150

Northern Long-Eared Bat (*Myotis septentrionalis*)

Species Information

The northern long-eared bat is a medium-sized bat with a body length of 3 to 3.7 inches but a wingspan of 9 to 10 inches. Their fur color can be medium to dark brown on the back and tawny to pale-brown on the underside. This bat is distinguished by its long ears, particularly as compared to other bats in its genus (USFWS 2015).

Northern long-eared bats spend winter hibernating in caves and mines, called hibernacula. They use areas in various sized caves or mines with constant temperatures, high humidity, and no air currents. Within hibernacula, they are found hibernating most often in small crevices or cracks, often with only the nose and ears visible. During the summer, northern long-eared bats roost singly or in colonies underneath bark, in cavities or in crevices of both live trees and snags (dead trees) (USFWS 2015) if trees are greater than 3 inches in diameter (Sinkevich *pers. comm.* 2015).

Northern long-eared bats emerge at dusk to feed. They primarily fly through the understory of forested areas feeding on moths, flies, leafhoppers, caddisflies, and beetles, which they catch while in flight using echolocation or by gleaning motionless insects from vegetation.

The northern long-eared bat's range includes much of the eastern and north central United States, and all Canadian provinces from the Atlantic Ocean west to the southern Yukon Territory and

eastern British Columbia. The species' range includes 37 States (including New York and New Jersey) and the District of Columbia, (USFWS 2015).

South Shore of Staten Island (SSSI) Project

The SSSI Project area is included in the range for the northern long-eared bat, however there have been no know occurrences of the species or the presence of suitable habitat found in the project area.

Staten Island is an urban environment characterized by mostly developed residential as well as by commercial development, forests, meadows, beaches, ponds, creeks, and wetlands. In addition, open lands have been preserved in several locations along the shoreline in the form of developed parks with large parking areas, boardwalks, and promenades that parallel the beach.

Vegetated upland areas located in the interior drainage features of the Project area can be characterized as isolated islands of habitat distributed amongst these other land use types. The majority of upland vegetation in these areas consists of non-native species that are commonly found in highly disturbed areas. Black locust and tree of heaven dominate highly disturbed areas that have reverted to forest (USACE 2015). The limited native upland forest areas that do exist are dominated by oaks (*Quercus* spp.), sassafras (*Sassafras albidum*), and black cherry (*Prunus serotina*) in relatively undisturbed areas.

Native trees in the project area, as described above, are predominantly not found in stands large enough to create an understory of forested area for feeding or are less than 3 inches in diameter. The small pockets of forested areas are predominantly non native species. For this reason, construction of the SSSI Project will have "No Effect" on the northern long-eared bat.

References

Sinkevich, 2015 — Sinkevich, Steven. 2015. Personal Communication. U.S. Fish and Wildlife Service. Long Island Field Office. Shirley, NY.

USACE, 2015 — U.S. Army Corps of Engineers South Shore of Staten Island Coastal Storm Risk Management Project Draft Environmental Impact Statement. June 2015.

USFWS, 2014 — RUFA RED KNOT BACKGROUND INFORMATION AND THREATS ASSESSMENT SUPPLEMENT TO Endangered and Threatened Wildlife and Plants; Final Threatened Status for the Rufa Red Knot (Calidris canutus rufa)[Docket No. FWS–R5–ES–2013–0097; RIN AY17]

http://www.fws.gov/northeast/redknot/pdf/20141125_REKN_FL_supplemental_doc_FINAL.pdf

USFWS, 2015 Northern Long-Eared Bat (Myotis septentrionalis) Fact Sheet. USFWS website accessed 14 July 2015. http://www.fws.gov/midwest/endangered/mammals/nleb/nlebFactSheet.html

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

September 9, 2015

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

Subject: South Shore of Staten Island Coastal Storm Risk Management Project

Dear Mr. Stilwell:

The U.S. Army Corps of Engineers New York District (District) received the U.S. Fish and Wildlife Service's (Service) Draft Planning Aid Letter (PAL) for the South Shore of Staten Island (SSSI) Coastal Storm Risk Management Project, Phase 1 - Fort Wadsworth to Oakwood Beach, dated 27 March 2015.

The District has reviewed the PAL and in coordination with Mr. Steven Sinkevich of your Long Island Field Office has incorporated five of the six Service Recommended Conservation Measures from the PAL into the SSSI Project, including 1) burial of the exposed seawall, 2) planting of wetland vegetation/increase in diversity in excavated wetland and upland areas, 3) monitoring and maintenance of all restored wetlands, 4) restoration of some wetlands not originally proposed for excavation (in the form of a buffer area around the areas originally proposed for excavation and 5) providing the results of sampling for contaminants that will be conducted during the Planning, Engineering and Design (PED) phase of the project. The only Recommended Conservation Measure that the District was not able to incorporate is the construction of bio-filtration basins/swales in upland areas to provide primary treatment of storm water run-off. This measure would have required acquisition of additional land and therefore greatly increased the project cost. In addition, this measure to pre-treat run off for water quality purposes would have been too far outside of the authorized scope of the project.

The PAL also noted the Service's position that mitigation for the acres of wetland filled from construction of the Line of Protection (LOP) will be achieved through the project feature to excavate upland areas supporting interior drainage, which includes the removal of invasive non-native vegetation, the seeding and planting of native wetland vegetation and the creation of emergent wetlands.

The draft Feasibility Study and draft Environmental Impact Statement for the South Shore of Staten Island Coastal Storm Risk Management Project are currently in the public review period.

In response to public request, the public review period (originally 45 days) was extended an additional 30 days, and will now close on 9 September 2015.

Enclosed is the District's Endangered Species Act (ESA) determination and assessment for Red Knot (*Calidris canutus rufa*) and Northern Long-Eared Bat (*Myotis septentrionalis*) to fulfill Section 7 consultation under the ESA of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq).

The District determined that because the proposed construction of the LOP and interior drainage project features are outside of the potential habitat suitable for red knot foraging, those project features will not affect red knot. Construction of the tidal wetland at Oakwood Beach project feature "May Affect but is not Likely to Adversely Affect" the red knot. Additionally, the District finds that construction of the recommended alternative for the SSSI project "May Affect but is not Likely to Adversely Affect" the northern long-eared bat.

The District looks forward to continuing to work with you and your staff on this effort. If you should have any questions, please contact Ms. Catherine J. Alcoba of my staff at 917-790-8216.

Sincerely,

Peter Weppler
Chief, Environmental Analysis Branch

cc: USFWS, LI Field Office

Endangered Species Act (ESA) determination and assessment for red knot (*Calidris canutus rufa*) and Northern Long-Eared Bat (*Myotis septentrionalis*)

Red knot (*Calidris canutus rufa*)

Species Information

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

On the breeding grounds, the red knot's diet consists mostly of terrestrial invertebrates such as insects and other arthropods.

Geolocator and resightings data show definitively that the *rufa* nonbreeding range includes the entire Atlantic and Caribbean coasts of South America and the Caribbean islands.

Coastal habitats used by red knots in migration and wintering areas are similar in character, generally coastal marine and estuarine (partially enclosed tidal area where fresh and salt water mixes) habitats with large areas of exposed intertidal sediments. Migration and wintering habitats include both high-energy ocean- or bay-front areas, as well as tidal flats in more sheltered bays and lagoons. Preferred wintering and migration microhabitats are muddy or sandy coastal areas, specifically, the mouths of bays and estuaries, tidal flats, and unimproved tidal inlets. Along the U.S. Atlantic coast, dynamic and ephemeral (lasting only briefly) features are important red knot habitats, including sand spits, islets, shoals, and sandbars, features often associated with inlets. In many wintering and stopover areas, quality high-tide roosting habitat (i.e., close to feeding areas, protected from predators, with sufficient space during the highest tides, free from excessive human disturbance) is limited (USFWS 2014).

South Shore of Staten Island (SSSI) Project

Red knot migrate through the SSSI project area in the Spring and the Fall. The project area contains suitable habitat for foraging. Red knot may forage along the shoreline in Staten Island, but do not breed in the area.

Construction of the SSSI Line of Protection (LOP) is not directly at the shoreline, but is set back from the mean high water line. Construction of the SSSI interior drainage areas landward of the LOP and therefore further set back from the shoreline. Table 1 below shows how many feet landward the LOP is from mean high water at selected locations. These components of the SSSI project (LOP and interior drainage) are outside of the potential habitat suitable for foraging and will not affect the red knot.

Construction of the SSSI Tidal Wetland at Oakwood Beach intersects with the mean high water line and could temporarily restrict potential foraging habitat for red know. However, suitable foraging habitat would be available on either side of the construction area, red knot could move down the beach to avoid the temporary disturbance from construction. For this reason, the SSSI project 'May Affect but is not Likely to Adversely Affect" red knot.

Table 1: SSSI Line of Protection Distance from Mean High Water

Line of Protection Location	Station location	Distance landward of Mean High Water (ft)
Oakwood Beach WWTP	60+00	640
Oakwood Beach	85+00	250
New Dorp Beach	135+00	155
Miller Field	158+00	250
South Beach	195+00	230
South Beach	221+00	225
Fort Wadsworth Area	288+00	150

Northern Long-Eared Bat (*Myotis septentrionalis*)

Species Information

The northern long-eared bat is a medium-sized bat with a body length of 3 to 3.7 inches but a wingspan of 9 to 10 inches. Their fur color can be medium to dark brown on the back and tawny to pale-brown on the underside. This bat is distinguished by its long ears, particularly as compared to other bats in its genus (USFWS 2015).

Northern long-eared bats spend winter hibernating in caves and mines, called hibernacula. They use areas in various sized caves or mines with constant temperatures, high humidity, and no air currents. Within hibernacula, they are found hibernating most often in small crevices or cracks, often with only the nose and ears visible. During the summer, northern long-eared bats roost singly or in colonies underneath bark, in cavities or in crevices of both live trees and snags (dead trees) (USFWS 2015) if trees are greater than 3 inches in diameter (Sinkevich *pers. comm.* 2015).

Northern long-eared bats emerge at dusk to feed. They primarily fly through the understory of forested areas feeding on moths, flies, leafhoppers, caddisflies, and beetles, which they catch while in flight using echolocation or by gleaning motionless insects from vegetation.

The northern long-eared bat's range includes much of the eastern and north central United States, and all Canadian provinces from the Atlantic Ocean west to the southern Yukon Territory and eastern British Columbia. The species' range includes 37 States (including New York and New Jersey) and the District of Columbia, (USFWS 2015).

South Shore of Staten Island (SSSI) Project

The SSSI Project area is included in the range for the northern long-eared bat.

Staten Island is an urban environment characterized by mostly developed residential as well as by commercial development, forests, meadows, beaches, ponds, creeks, and wetlands. In addition, open lands have been preserved in several locations along the shoreline in the form of developed parks with large parking areas, boardwalks, and promenades that parallel the beach.

Vegetated upland areas located in the interior drainage features of the Project area can be characterized as isolated islands of habitat distributed amongst these other land use types. The majority of upland vegetation in these areas consists of non-native species that are commonly found in highly disturbed areas. Black locust and tree of heaven dominate highly disturbed areas that have reverted to forest (USACE 2015). The limited native upland forest areas that do exist are dominated by oaks (*Quercus* spp.), sassafras (*Sassafras albidum*), and black cherry (*Prunus serotina*) in relatively undisturbed areas.

Native trees in the project area, as described above, are predominantly not found in stands large enough to create an understory of forested area for feeding or are less than 3 inches in diameter. The small pockets of forested areas are predominantly non native species. For this reason, construction of the SSSI Project 'May Affect but is not Likely to Adversely Affect" northern long-eared bat.

References

Sinkevich, 2015 — Sinkevich, Steven. 2015. Personal Communication. U.S. Fish and Wildlife Service. Long Island Field Office. Shirley, NY.

USACE, 2015 — U.S. Army Corps of Engineers South Shore of Staten Island Coastal Storm Risk Management Project Draft Environmental Impact Statement. June 2015.

USFWS, 2014 — RUFA RED KNOT BACKGROUND INFORMATION AND THREATS ASSESSMENT SUPPLEMENT TO Endangered and Threatened Wildlife and Plants; Final Threatened Status for the Rufa Red Knot (Calidris canutus rufa)[Docket No. FWS–R5–ES–2013–0097; RIN AY17] http://www.fws.gov/northeast/redknot/pdf/20141125_REKN_FL_supplemental_doc_FINAL.pdf

USFWS, 2015 — Northern Long-Eared Bat (Myotis septentrionalis) Fact Sheet. USFWS website accessed 14 July 2015. http://www.fws.gov/midwest/endangered/mammals/nleb/nlebFactSheet.html

United States Department of the Interior

FISH AND WILDLIFE SERVICE
3817 Luker Road
Cortland, NY 13045

March 27, 2015

Colonel Paul E. Owen
District Engineer, New York District
U.S. Army Corps of Engineers
Jacob K. Javits Federal Bldg., Rm. 2109
26 Federal Plaza, Rm. 2131
New York, NY 10278-0090

Dear Colonel Owen:

This is the U.S. Fish and Wildlife Service's (Service) Draft Planning Aid Letter (PAL) for the U.S. Army Corps of Engineers' (Corps) South Shore of Staten Island Coastal Storm Risk Management Project. This PAL is intended as a supplement and update to our Fish and Wildlife Coordination Act Section 2(b) Report (FWCAR) for this project, prepared and dated January of 2006, based upon the project description provided in the Corps' 2004 Alternatives Feasibility Report and 2005 preliminary Draft Environmental Impact Statement. The Service had concluded in our 2006 FWCAR that project implementation, involving the construction of sea walls, sheet pile walls, levees (features designed to protect the shoreline, referred to as the Line of Protection [LOP]) and the excavation of wetlands to increase flood storage capacity, coupled with adoption of our recommendations, had the potential to result in positive effects to the aquatic ecosystem. The Service's 2006 FWCAR is hereby incorporated by reference.

The Corps completed a post-Hurricane Sandy assessment of the South Shore of Staten Island Coastal Storm Risk Management Project to: update an inventory of flood control structures; revise design water level elevations based on updated Federal Emergency Management Agency (FEMA) analyses; refine the LOP; and identify an optimal Post-Sandy tentatively selected plan, in September of 2014 (U.S. Army Corps of Engineers 2014).

The Corps has provided the Service with a preliminary/general project design and description (U.S. Army Corps of Engineers 2014). The final project design is contingent upon additional Corps site investigations (soil borings, etc.) and further coordination with the New York State Department of Environmental Conservation and the New York City Department of Environmental Protection (NYCDEP). The Corps requested this PAL in draft form to assist in their planning process with the understanding that the final PAL will reflect any project revisions/refinements as the final design is developed.

Project Purpose, Scope, and Authority

Refer to the Service's 2006 FWCAR for a description of the project purpose, scope, and authority. The following information is provided as an update that relates to Superstorm Sandy that occurred in October of 2012.

The South Shore of Staten Island was one of the hardest hit areas during Superstorm Sandy. High water marks and storm tide gauges deployed by the U.S. Geological Survey (USGS) show that maximum water levels during Sandy reached 13 to 16 feet National Geodetic Vertical Datum (NGVD) (U.S Geological Survey 2014) with flooding depths up to 9 feet above the local ground level. Twenty-three individuals lost their lives as a result of the storm in Staten Island. Along the study area, residences, businesses, and cars were heavily damaged and whole blocks of homes were removed from their foundations (U.S. Army Corps of Engineers 2014).

The federal government initially authorized the study of the problem and potential solutions along the 13 mile long south shoreline of Staten Island via a United States House of Representatives Committee on Public Works and Transportation resolution dated May 13, 1993 (U.S. Fish and Wildlife Service 2006). The Post-Sandy tentatively selected plan was authorized by the Disaster Relief Appropriations Act of 2013 (U.S. Army Corps of Engineers 2014).

Study Area

Refer to the Service's 2006 FWCAR for a description of the Study Area.

The Service conducted a site inspection on November 5, 2014. The Service observed extensive post-Superstorm Sandy storm damage protection efforts within the project area along the lower New York Bay/Atlantic Ocean shoreline during the site inspection. These efforts included large sand bag placement and dunes/levees constructed by New York City with FEMA funding (Alcoba *pers. comm.* 2014).

Fish and Wildlife Resources in Project Area

The Service identified four ecological communities within the project/study area in our 2006 FWCAR, including disturbed uplands, tidal wetlands, freshwater wetlands, and maritime beach. Refer to our 2006 FWCAR for a detailed description of these communities, including dominant vegetation, avian fauna, finfish, shellfish, herpto-fauna, mammals, and threatened and endangered species.

The ecological communities, observed during the November 5, 2014, site inspection, remain relatively the same as described in our 2006 FWCAR. Dominant vegetation observed during the inspection include: maintained lawn, common reed (*Phragmites australis*), goldenrod (*Solidago* spp.), and black cherry (*Prunus serotina*) in the disturbed upland community; common reed in both the freshwater and tidal wetlands; and American beachgrass (*Ammophila breviligulata*) and seaside goldenrod (*Solidago semipervirens*) in the maritime beach community.

The majority of wetlands within the project area are degraded or of low quality due to the dominance of an invasive common reed monoculture (U.S. Fish and Wildlife Service 2006).

Red Knot

While this report does not constitute a Biological Opinion under Section 7 of the Endangered Species Act (ESA) of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*), the following is provided as an update to the information included in the 2006 FWCAR regarding threatened and endangered species.

The Service's 2006 FWCAR was prepared well before the red knot (*Calidris canutus rufa*) was granted federal protection as a threatened species under the ESA in December of 2014. The red knot breeds in the Canadian arctic and winters mainly in Tierra del Fuego, northern Brazil, or Florida, and migrates through Staten Island, to and from its breeding sites in the spring and fall (New Jersey Department of Environmental Protection 2007).

The Service is not aware of site-specific surveys conducted to determine red knot presence; however, there are records of red knot presence on the mudflats at Great Kills Park, located adjacent to the project area to the south, during the months of May and August in past years (Ebird 2015). The most recent sighting (one red knot) at Great Kills Park was in August of 2013 (Ebird 2015). The project site does provide suitable red knot foraging habitat along the lower New York Bay/Atlantic Ocean shoreline. As such, it is likely that the red knot does frequent the project site during the spring and fall migrations.

The Section 7 consultation shall be conducted and documented in a separate document and will be contingent upon the Service's receipt of a Corps ESA determination and assessment.

New York City Bluebelt Program

The Corps' revised project design is being proposed within the context of the NYCDEP's Bluebelt program, initiated in the late 1980's but accelerated within the project area due to damages associated with Hurricane/Superstorm Sandy. This program involves stormwater management for approximately one third of Staten Island's land area. The program preserves natural drainage corridors, called Bluebelts, including streams, ponds, and other wetland areas. Preservation of these wetland systems allows them to perform their functions of conveying, storing, and filtering stormwater, as opposed to using stormwater culverts and other man-made structures. The Bluebelt program is proposing wetland restoration within the project area, and includes the creation of a mosaic of habitats (upland islands, ephemeral pools, emergent wetlands, and open water) and the plantings of appropriate native species within several of the wetlands proposed for excavation as part of this project (New York City Department of Environmental Protection 2013). The Corps has indicated that the Bluebelt-recommended measures would be implemented by the NYCDEP either once the Corps project is complete or completed concurrently. However, the Service must assess the impacts of the federal project and any associated mitigative measures proposed by the Corps. Any mitigative/beneficial measures proposed and implemented by other organizations/agencies will not be accredited to the Corps. The Corps could choose to implement, or assist in the funding of, wetland enhancement projects

identified by the Bluebelt program and receive credit to compensate for impacts of the proposed action (further described in the Mitigation Recommendations section below).

Proposed Action

The South Shore of Staten Island Coastal Risk Management Project has been developed to include a LOP and interior drainage improvements. The primary revisions to the project design from the project proposed in 2006 are included as follows:

- Shifting of the southern portion of the LOP (Oakwood Beach to New Dorp Beach) alignment landward; reduction of the crest elevations/footprint to create uniformity of structure design and minimize beach maintenance;

- Lowering of the crest elevation at New Dorp Beach and Oakwood Beach by 6-8 feet;

- Increase in the amount of excavation of existing ponds within 3 of the 5 drainage/wetland areas (further described in "Project Impacts" section); revision of the excavated wetland design from an open water habitat to an emergent wetland habitat.

- The levee and seawall proposed at Crescent Beach in the pre-Sandy project are not included in the post-sandy project. No work is proposed at Crescent Beach at this time.

Table 1 provides a comparison of the LOP parameters of the pre-Sandy and post-Sandy plans (refer to U.S. Army Corps of Engineers 2014 for map depicting reaches).

Table 1. Key LOP Parameter Comparison of Pre-Sandy and Post-Sandy Plans

Corps Reach No.	Location	Type of Structure	Length (feet)	Crest Elevation Pre-Sandy (feet, NGVD)	Crest Elevation Post-Sandy (feet, NGVD)
A-4	Fort Wadsworth to Oakwood Beach	Buried Seawall	22,700	20-28.5	20.5
A-3	Oakwood Beach Treatment Plant (southern portion)	Vertical Floodwall	1,800	26	20.5
A-2	Oakwood Beach Treatment Plant (northern portion)	Earthen Levee	600	23	18
A-1	Oakwood Beach Landward	Earthen Levee	2,800	17	18

The seawall proposed in the New Dorp Beach to Oakwood Beach section of the project, currently dominated by common reed, was initially proposed to be buried with sand excavated from the project area. However, the Corps is concerned that sand in this area is likely to contain

common reed rhizomes which, if placed over the seawall, could cause the further spread of the invasive common reed. As such, the Corps is now proposing to leave the armor stone seawall in this section of the project area exposed and to not be buried.

The post-Sandy Project involves the placement of the LOP further inland in the area between New Dorp and Oakwood Beach when compared to the pre-Sandy project. This project design revision would preserve the hydrological connection between the Lower Bay and tidal wetlands that would remain seaward of the seawall and reduce turbidity impacts, allow for lower crest elevations, increase the protective buffer between the ocean and LOP, and potentially lower maintenance costs (U.S. Army Corps of Engineers 2014). Decreasing the amount of maintenance also results in decreasing the amount of future disturbance and associated environmental impacts.

The proposed action would remove invasive, non-native vegetation and increase the flood storage capacity of the excavated wetlands. The Corps has indicated that they will grade and seed the excavated wetlands to create emergent wetlands that will have open water present primarily during storm events. If these wetlands function as intended, this project would restore these wetlands by removing invasive species, while also improving the flood storage capacity and wildlife habitat functions. The Corps is also proposing to utilize sediment and erosion control practices (silt fencing, hay bales, etc.) to minimize the input of sediments into wetlands during construction activities and the clear marking and fencing of wetland edges to avoid un-intended intrusions of construction equipment into wetlands.

The Corps is also proposing the enhancement of tidal wetlands at Oakwood Beach, including the removal of common reed, planting of native vegetation, and grading of 18.9 acres, resulting in 12.9 acres of low marsh and 6 acres of high marsh (U.S. Army Corps of Engineers 2015). While this measure does not create additional wetlands, it will result in a net gain in wetland functional values (biological productivity/ecological value and flood storage) in these tidal wetlands.

Project Impacts

The project impacts described in our 2006 FWCAR that are still applicable for the post-Sandy project are summarized as follows:

- Preclusion of the formation of maritime beach and wetland habitats;
- Maritime beach and wetland habitat modification and/or loss.
- Burial of benthic organisms; and
- Increase in turbidity of aquatic habitats.

Refer to the Service's FWCAR for a detailed description of these impacts. In 2006, the Service identified the most significant impact of the proposed action was the loss of vegetated wetlands as a result of the conversion of these wetlands, albeit degraded, to open water habitat.

Table 2 provides a comparison of the interior drainage excavations proposed for the pre-Sandy and post-Sandy plans in cubic yards (refer to U.S. Army Corps of Engineers 2014 for map depicting drainage areas).

Table 2. Comparison of Excavations proposed in Pre-sandy and Post-Sandy Plans

Corps Drainage Area	Pre-Sandy Plan (cubic yards)	Post-Sandy Plan (cubic yards)	Post-Sandy Increase (cubic yards)
A	0	0	0
B	0	204,000	204,000
C	252,000	382,000	130,000
D	0	0	0
E	164,000	228,000	64,000

The post-Sandy plan calls for a net increase of 398,000 cubic yards of excavation in wetland areas within the project area. The Service estimated in our 2006 FWCA that a total of 85 acres of wetlands were to be excavated. The post-Sandy design now involves the excavation of approximately 117 acres of wetlands, an increase of 32 acres. The pre-Sandy plan included 5.18 acres of wetland fill from the construction of the LOP, as compared to the 10.89 acres of wetlands proposed to be filled in the post-Sandy plan. The increase in wetland fill is attributed to the moving of the LOP landward and the revision of the LOP design from the more narrow sheet pile seawall to the wider buried seawall (Alcoba *pers. comm.* 2014). The construction of the LOP will result in the net loss of 10.89 acres of wetlands. However, the post-Sandy project also involves the excavation of 11.34 acres of uplands, which, if properly graded and planted with appropriate vegetation to provide a mosaic of wetland habitats (open water, emergent and/or scrub/shrub wetlands), could be considered compensatory mitigation and be accredited towards, the 1:1 mitigation ratio described in the Service's 2006 FWCAR.

The placement of exposed armor stone associated with the LOP would directly modify the wetland habitats between New Dorp Beach to Oakwood Beach (see page 9 of U.S. Army Corps of Engineers 2014). Artificial habitats typically do not support the same assemblages, often supporting fewer native and more exotic species (Chapman and Blockley 2009). Additionally, the exposed armor stone could segment the habitat and limit or prevent access to terrestrial species that traverse through wetland habitats as part of their life cycle (Sheridan 2010). For example, the diamondback terrapin (*Malaclemys terrapin*) was identified in our 2006 report as a reptile that occurs in the project area. This species requires sandy beaches for breeding and salt marsh for feeding and growth (Maryland Diamondback Terrapin Task Force 2001). The placement of the exposed armor stone could prevent or limit access between the two habitats, thereby limiting habitat suitability for this and other species that traverse through these habitats (Maryland Diamondback Terrapin Task Force 2001).

Mitigation Recommendations

Previously Proposed Mitigation Measures

Refer to the Service's 2006 FWCAR (pp. 35-41) for a description of recommended mitigative measures, which are still applicable for this revised project design.

One of the primary mitigative measures recommended in the Service's 2006 FWCAR was an overall compensatory mitigation plan that provided a ratio of 1:1 to compensate for the conversion of vegetated wetlands to open water (pond) areas.

The post-Sandy project is designed to create emergent wetlands (consisting of native vegetation) in the excavated areas, as opposed to the permanent open water habitats envisioned in the Service's 2006 report. Provided the excavated areas function as emergent wetlands, the post-Sandy project would result in a net benefit to wetland functions and values at this site due to the removal of invasive species, while also improving the flood storage capacity and wildlife habitat functions. In this case, the 1:1 mitigation ratio recommended in the 2006 FWCAR would be met. However, note that should the excavated areas not function as emergent wetlands (if common reed intrusion occurs or areas become permanent open water habitats with only fringe vegetation or if areas are too dry to support wetland habitats), either (1) remedial actions (invasive species removed, re-grading, supplemental plantings, etc.) should occur so that the functions and values of emergent wetlands are reestablished; or (2) the 1:1 compensation ratio should be followed. Listed below are mitigative measures recommended to improve the likelihood of wetland restoration success.

The Service notes that the 1:1 mitigation ratio is still required for the filling of 10.89 acres from the construction of the LOP. This mitigation can be attained through the creation of wetlands resulting from the excavation of upland areas described in "Project Impacts" section.

Service Recommended Conservation Measures for the Post-Sandy Project

The following measures are recommended in addition to those described in the Service's 2006 FWCAR.

Burial of the exposed seawall: In regards to the plan to leave the seawall exposed between New Dorp and Oakwood Beach, the Service recommends that the seawall be buried to allow for movement of terrestrial species that traverse the wetlands. Common reed is an invasive species that is already dominant in this wetland. A monitoring and maintenance program should be implemented to insure that common reed is removed and does not expand beyond the buried seawall. Additionally, as further described below, the Service recommends the restoration, of wetlands not proposed for excavation, including the removal of common reed.

Planting of wetland vegetation/increase in diversity in excavated wetland and upland areas: Due to the potential of seeds to be transported by storm water away from intended locations, the Service recommends that seeding efforts are supplemented with plantings as well. As stated above, the Service recommends that only native species be seeded or planted. Such plantings should occur in both existing wetlands and any additional wetlands created in excavated uplands. Additionally, as stated above, excavated uplands can also be properly graded and planted with appropriate vegetation to provide a mosaic of wetland habitats (open water, emergent and/or scrub/shrub wetlands) and be accredited towards the 1:1 mitigation ratio described in the Service's 2006 FWCAR.

Monitoring and maintenance of all restored wetlands: Wetland areas restored as part of this project should be monitored for at least 5 years to insure that they function as designed - as emergent freshwater wetlands in the excavated areas and as tidal wetlands in the enhanced area. There should be little (no more than 5 percent coverage) or no common reed present and at least 85 percent coverage of native herbaceous/shrub layer vegetation. Should the excavated areas not function as emergent wetlands (if common reed intrusion occurs or areas become permanent open water habitats with only fringe vegetation or if areas are too dry to support wetland habitats), either remedial actions (invasive species removal, re-grading, supplemental plantings, etc.) should occur so that the excavated areas do function as emergent wetlands or the 1:1 compensation ratio should be followed.

Restoration of wetlands not proposed for excavation: Extensive wetland areas dominated by an extensive monoculture of common reed exist within the project study area. Wetland areas not proposed for excavation could be restored - including the removal of common reed, planting of native wetland vegetation, and repair/removal of hydrological impediments (if applicable).

Contaminants: The Service recommends that the Corps conduct a sampling effort to evaluate hazardous substances in sediment at the surface and at the depth of excavation. This effort should sample for organochlorine pesticides and PCBs (polychlorinated biphenyls), metals, and polycyclic aromatic hydrocarbons (PAHs) to determine if there are contaminants present at concentrations which could be exposed and harmful to fish and wildlife resources. Should such contaminants be present, the Corps should coordinate with the Service on a course of action, which may include site remediation (removal of contaminated soils and backfill of clean material), treatment of surface waters or consideration of alternate sites.

Creation of bio-filtration basins/swales: The Corps should consider the creation of biofiltration basins and/or swales in upland areas to provide primary treatment of storm water run-off prior to entry into wetlands (New York State Department of Environmental Conservation 2001).

Service Position

When compared to the originally proposed project in 2006, the revised proposed action would result in an increase in: the amount of material to be excavated from existing wetlands (a net increase of 398,000 cubic yards); the acreage of wetlands to be excavated (increase of 32 acres); and the area of wetlands to be filled (an increase in 5.71 acres).

However, nearly all of the wetlands to be excavated and/or filled consist of a monoculture of the invasive common reed which is of limited ecological value. The removal of invasive non-native vegetation, the seeding and planting of native wetland vegetation and the creation of emergent wetland in the excavated wetlands would improve the ecological value of those habitats. Additionally, the enhancement of 18.9 acres of tidal wetlands at Oakwood Beach will also improve the ecological value of those wetlands. Finally, the excavation, grading and planting of 11.34 acres of uplands converted into freshwater wetlands could also be accredited towards and attain the 1:1 mitigation ratio described in the Service's 2006 FWCAR. Provided the wetland enhancements function as designed/intended, the proposed action would result in no net loss of wetland acreage and in a net increase in wetland functional values.

As such, the Service concludes, provided the Service-recommended measures are implemented, that the proposed action will not have significant adverse impacts on fish and wildlife resources in the project area.

The Service appreciates the Corps' assistance during the completion of this document. If you have any questions or require additional information, please contact Mr. Steven Sinkevich of the Long Island Field Office at 631-286-0485.

Sincerely,

for Patricia Cole
David A. Stilwell
Field Supervisor

cc: NYSDEC, Region 2, Long Island City, NY (S. Zahn)
USFWS, Long Island Field Office, Shirley, NY

LITERATURE CITED

Alcoba, Catherine. 2015. Personal Communication. U.S. Army Corps of Engineers, New York District, New York, NY.

Chapman, M.G. and D.J. Blockley. 2009. Engineering Novel Habitats on Urban Infrastructure to Increase Intertidal Biodiversity. Centre for Research on Ecological Impacts of Coastal Cities, School of Biological Sciences A11, University of Sydney, Sydney, Australia. Oecologia 161:625-635.

Ebird. 2015. http://ebird.org/ebird/subnational2/US-NY-085?yr=all&m=&rank=mrec

Maryland Diamondback Terrapin Task Force. 2001. Maryland Diamondback Terrapin Task Force Recommendations. Final Report to the Secretary of the Maryland Department of Natural Resources.

New Jersey Department of Environmental Protection. 2007. Status of Red Knot (*Calidris canutus rufa*) in the Western Hemisphere. Division of Fish and Wildlife, Endangered and Nongame Species Program, Trenton, NJ.

New York City Department of Environmental Protection. 2013. Final Environmental Impact Statement, Staten Island Bluebelt Drainage Plans for Mid-Island Watersheds. CEQR No. 07DEP063R.

New York State Department of Environmental Conservation. 2001. Stormwater Management Design Manual. Albany NY.

Sheridan, Claire M. 2010. Mating System and Dispersal Patterns in the Diamondback Terrapin (*Malaclemys terrapin*). Drexel University Dissertation.

U.S. Army Corps of Engineers. 2015. Draft Environmental Impact Statement, South Shore of Staten Island Coastal Storm Risk Management Project, Richmond County, New York. Preliminary Draft. New York District, Planning Division, New York, NY.

U.S. Army Corps of Engineers. 2014. South Shore of Staten Island Coastal Storm Risk Management, Richmond County, New York, Post-Sandy Design Modifications. New York District, Planning Division, New York, NY.

U.S. Fish and Wildlife Service. 2006. Draft Fish and Wildlife Coordination Act 2(b) Report Beach Erosion Control and Storm Damage Reduction Project, South Shore of Staten Island, Richmond County, New York. Long Island Field Office, Shirley, NY.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
3817 Luker Road
Cortland, NY 13045

March 15, 2016

Mr. Peter Weppler
U.S. Army Corps of Engineers - Planning
26 Federal Plaza, Room 2151
New York, NY 10278-0090

Attn: Catherine Alcoba

Dear Mr. Weppler:

This is the U.S. Fish and Wildlife Service's (Service) Final Planning Aide Letter (PAL) for the U.S. Army Corps of Engineers' (Corps) South Shore of Staten Island Coastal Storm Risk Management Project. This PAL is intended as a supplement and update to our Fish and Wildlife Coordination Act (FWCA) section 2(b) Report (FWCAR) for this project, prepared and dated January of 2006, based upon the project description provided in the Corps' 2004 Alternatives Feasibility Report and 2005 preliminary Draft Environmental Impact Statement. The Service had concluded in our 2006 FWCAR that project implementation, involving the construction of sea walls, sheet pile walls, levees (features designed to protect the shoreline, referred to as the Line of Protection [LOP]) and the excavation of wetlands to increase flood storage capacity, coupled with adoption of our recommendations, had the potential to result in positive effects to the aquatic ecosystem. The Service's 2006 FWCAR is hereby incorporated by reference and included in Attachment A.

The Corps completed a post-Hurricane Sandy assessment of the South Shore of Staten Island Coastal Storm Risk Management Project to: update an inventory of flood control structures; revise design water level elevations based on updated Federal Emergency Management Agency (FEMA) analyses; refine the LOP; and identify an optimal post-Sandy tentatively-selected plan, in September of 2014 (U.S. Army Corps of Engineers 2014).

The Corps has provided the Service with a preliminary/general project design and description (U.S. Army Corps of Engineers 2014). The final project design is contingent upon additional Corps site investigations (soil borings, etc.) and further coordination with the New York State Department of Environmental Conservation and the New York City Department of Environmental Protection (NYCDEP). The Corps requested a PAL to assist in their planning process and provide recommended mitigation measures. The Corps has provided their

comments to the draft PAL which, the Service has addressed in this final document (the Corps' comments are included as Attachment B).

Additionally, the Corps released the South Shore of Staten Island Coastal Storm Risk Management Draft Environmental Impact Statement (Corps' DEIS) which acknowledges the need for site testing of contaminants within the project area due to historical uses and information retained from regulatory databases (U.S. Army Corps of Engineers 2015). As specified below, the Corps agreed to conduct contaminant investigations and provide the results of these investigations to the Service as the final project design is refined and developed. As the project development proceeds, the Service will address contaminants issues upon the Corps' completion of their analysis. Depending upon the extent of contamination, the Service may recommend remedial actions which may include (but is not limited to) removal of contaminated soils and backfill of clean material, treatment of surface waters or consideration of alternate sites.

Project Purpose, Scope, and Authority

Refer to the Service's 2006 FWCAR for a description of the project purpose, scope, and authority. The following information is provided as an update that relates to Superstorm Sandy that occurred in October of 2012.

The South Shore of Staten Island was one of the hardest hit areas during Superstorm Sandy. High water marks and storm tide gauges deployed by the U.S. Geological Survey show that maximum water levels during Sandy reached 13 to 16 feet National Geodetic Vertical Datum (NGVD) (U.S. Army Corps of Engineers 2014), with flooding depths up to nine feet above the local ground level. Twenty-three individuals lost their lives as a result of the storm in Staten Island. Along the study area, residences, businesses, and cars were heavily damaged and whole blocks of homes were removed from their foundations (U.S. Army Corps of Engineers 2014).

The federal government initially authorized the study of the problem and potential solutions along the thirteen-mile long south shoreline of Staten Island via a United States House of Representatives Committee on Public Works and Transportation resolution dated May 13, 1993 (U.S. Fish and Wildlife Service 2006). The post-Sandy tentatively-selected plan was authorized by the Disaster Relief Appropriations Act of 2013 (U.S. Army Corps of Engineers 2014).

Study Area

Refer to the Service's 2006 FWCAR for a description of the Study Area.

The Service conducted a site inspection on November 5, 2014. The Service observed extensive post-Superstorm Sandy storm damage protection efforts within the project area along the lower New York Bay/Atlantic Ocean shoreline during the site inspection. These efforts included large sand bag placement and dunes/levees constructed by New York City with FEMA funding (Alcoba 2015).

Fish and Wildlife Resources in Project Area

The Service identified four ecological communities within the project/study area in our 2006 FWCAR, including disturbed uplands, tidal wetlands, freshwater wetlands and maritime beach. Refer to our 2006 FWCAR for a detailed description of these communities, including dominant vegetation, avian fauna, finfish, shellfish, herpto-fauna, mammals, and threatened and endangered species.

The ecological communities, observed during the November 5, 2014, site inspection, remain relatively the same as described in our 2006 FWCAR. Dominant vegetation observed during the inspection include: maintained lawn, common reed (*Phragmites australis*), goldenrod (*Solidago* sp.), and black cherry (*Prunus serotina*) in the disturbed upland community; common reed in both the freshwater and tidal wetlands; and American beachgrass (*Ammophila breviligulata*) and seaside goldenrod (*Solidago semipervirens*) in the maritime beach community.

The majority of wetlands within the project area are degraded or of low quality due to the dominance of an invasive common reed monoculture (U.S. Fish and Wildlife Service 2006).

Red Knot

While this report does not constitute a Biological Opinion under section 7 of the Endangered Species Act (ESA) of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*), the following is provided as an update to the information included in the 2006 FWCAR regarding threatened and endangered species. The section 7 consultation shall be conducted and documented in a separate document and will be contingent upon Service receipt of a Corps ESA determination and assessment.

The Service's 2006 FWCAR was prepared well before the red knot (*Calidris canutus rufa*) was granted federal protection as a threatened species under the ESA in December of 2014. The red knot breeds in the Canadian arctic and winters mainly in Tierra del Fuego, northern Brazil, or Florida, and migrates through Staten Island, to and from its breeding sites in the spring and fall (U.S. Fish and Wildlife Service 2014).

The Service is not aware of site-specific surveys conducted to determine red knot presence at the project site. However, on Long Island, red knots have been documented utilizing extensive tidal flat areas for migratory stopover areas from May to September within Jamaica Bay, Rockaway Inlet, East Rockaway Inlet, Jones Inlet, Fire Island Inlet, Moriches Inlet, and Shinnecock Inlet. DeRose-Wilson *et al.* (2014) and Monk *et al.* (2015) documented red knot use of Old Inlet as a migratory stopover area. Additionally, New York City Audubon documented foraging red knots at Plumb Beach during horseshoe crab surveys in 2009 and 2010 (New York City Audubon 2010).

Red knot presence has also been documented on the mudflats at Great Kills Park, located adjacent to the project area to the south, during the months of May and August in past years (Ebird 2015). The project site does provide suitable red knot foraging habitat along the lower New York Bay/Atlantic Ocean shoreline.

Given the presence of suitable habitat and the documented presence of this species nearby, it is likely that the red knot does occur at the project site during the spring and fall migrations.

New York City Bluebelt Program

The Corps' revised project design is being proposed within the context of the NYCDEP's Bluebelt program, initiated in the late 1980's but accelerated within the project area due to damages associated with Hurricane/Superstorm Sandy. This program involves stormwater management for approximately one-third of Staten Island's land area. The program preserves natural drainage corridors, called Bluebelts, including streams, ponds, and other wetland areas. Preservation of these wetland systems allows them to perform their functions of conveying, storing, and filtering stormwater, as opposed to using stormwater culverts and other man-made structures. The Bluebelt program is proposing wetland restoration within the project area, and includes the creation of a mosaic of habitats (upland islands, ephemeral pools, emergent wetlands, and open water) and the plantings of appropriate native species within several of the wetlands proposed for excavation as part of this project (New York City Department of Environmental Protection 2013).

The Corps has indicated that the Bluebelt-recommended measures would be implemented by the NYCDEP either once the Corps project is complete or completed concurrently. However, the Service must assess the impacts of the federal project and any associated mitigative measures proposed by the Corps. Any mitigative/beneficial measures proposed and implemented by other organizations/agencies will not be credited to the Corps. The Corps could choose to implement, or assist in the funding of, wetland enhancement projects identified by the Bluebelt program and receive credit for compensation for impacts of the proposed action (further described in the "Mitigation Recommendations" section below).

Proposed Action

The South Shore of Staten Island Coastal Risk Management Project has been developed to include a LOP and interior drainage improvements. The primary revisions to the project design from the project proposed in 2006 are included as follows:

- Shift the southern portion of the LOP (Oakwood Beach to New Dorp Beach) alignment landward, reduction in crest elevations/footprint to create uniformity of structure design and minimize beach maintenance;

- Lower the crest elevation at New Dorp Beach and Oakwood Beach by 6 to 8 feet;

- Increase the amount of excavation of existing ponds within 3 of the 5 drainage/wetland areas (further described in "Project Impacts" section). Revise the excavated wetland design from an open water habitat to an emergent wetland habitat.

- The levee and seawall proposed at Crescent Beach in the pre-Sandy project are not included in the post-Sandy project. No work is proposed at Crescent Beach at this time.

Table 1 provides a comparison of the LOP parameters of the pre-Sandy and post-Sandy plans (refer to U.S. Army Corps of Engineers 2014 for map depicting reaches).

Table 1. Key LOP Parameter Comparison of Pre-Sandy and Post-Sandy Plans

Corps Reach No.	Location	Type of Structure	Length (feet)	Crest Elevation Pre-Sandy (feet, NGVD)	Crest Elevation Post-Sandy (feet, NGVD)
A-4	Fort Wadsworth to Oakwood Beach	Buried Seawall	22,700	20-28.5	20.5
A-3	Oakwood Beach Treatment Plant (southern portion)	Vertical Floodwall	1,800	26	20.5
A-2	Oakwood Beach Treatment Plant (northern portion)	Earthen Levee	600	23	18
A-1	Oakwood Beach Landward	Earthen Levee	2,800	17	18

The seawall proposed in the New Dorp Beach to Oakwood Beach section of the project, currently dominated by common reed, was initially proposed to be buried with sand excavated from the project area. However, the Corps is concerned that sand in this area is likely to contain common reed rhizomes which, if placed over the seawall, could cause the further spread of the invasive common reed. As such, the Corps is now proposing to leave the armor stone seawall in this section of the project area exposed and not be buried.

The post-Sandy Project involves the placement of the LOP further inland in the area between New Dorp and Oakwood Beach when compared to the pre-Sandy project. This project design revision would preserve the hydrological connection between the Lower Bay and tidal wetlands that would remain seaward of the seawall and reduce turbidity impacts, allow for lower crest elevations, increase the protective buffer between the ocean and LOP and potentially lower maintenance costs (U.S. Army Corps of Engineers 2014). Decreasing the amount of maintenance also results in decreasing the amount of future disturbance and associated environmental impacts.

The proposed action would remove invasive, non-native vegetation and increase the flood storage capacity of the excavated wetlands. The Corps has indicated that they will grade and seed the excavated wetlands to create emergent wetlands that will have open water present primarily during storm events. If these wetlands function as intended, this project would restore these wetlands by removing invasive species, while also improving the flood storage capacity and wildlife habitat functions. The Corps is also proposing to utilize sediment and erosion control practices (silt fencing, hay bales, etc.) to minimize the input of sediments into wetlands during construction activities and the clear marking and fencing of wetland edges to avoid un-intended intrusions of construction equipment into wetlands.

The Corps is also proposing the enhancement of tidal wetlands at Oakwood Beach, including removal of common reed, planting of native vegetation, and grading of 18.9 acres, resulting in 12.9 acres of low marsh and 6 acres of high marsh (U.S. Army Corps of Engineers 2015). While this measure does not create additional wetlands, it will result in a net gain in wetland functional values (biological productivity/ecological value and flood storage) in these tidal wetlands.

Project Impacts

The project impacts described in our 2006 FWCAR that are still applicable for the post-Sandy project are summarized as follows:

- Preclusion of the formation of maritime beach and wetland habitats;
- Modification and/or loss of maritime beach and wetland habitat;
- Burial of benthic organisms; and
- Increase in turbidity of aquatic habitats.

Refer to the Service's FWCAR for a detailed description of these impacts. In 2006, the Service identified the most significant impact of the proposed action was the loss of vegetated wetlands as a result of the conversion of these wetlands, albeit degraded, to open water habitat.

Table 2 provides a comparison of the interior drainage excavations proposed for the pre-Sandy and post-Sandy plans in cubic yards (refer to U.S. Army Corps of Engineers 2014 for map depicting drainage areas).

Table 2. Comparison of Excavations proposed in Pre-sandy and Post-Sandy Plans

Corps Drainage Area	Pre-Sandy Plan (cubic yards)	Post-Sandy Plan (cubic yards)	Post-Sandy Increase (cubic yards)
A	0	0	0
B	0	204,000	204,000
C	252,000	382,000	130,000
D	0	0	0
E	164,000	228,000	64,000

The post-Sandy plan calls for a net increase of 398,000 cubic yards of excavation in wetland areas within the project area. The Service estimated in our 2006 FWCA that a total of 85 acres of wetlands were to be excavated. The post-Sandy design now involves the excavation of approximately 117 acres of wetlands, an increase of 32 acres. The pre-Sandy plan included 5.18 acres of wetland fill from the construction of the LOP, as compared to the 10.89 acres of wetlands proposed to be filled in the post-Sandy plan. The increase in wetland fill is attributed to the moving of the LOP landward and the revision of the LOP design from the more narrow sheet pile seawall to the wider buried seawall (Alcoba 2015). The construction of the LOP will result in the net loss of 10.89 acres of wetlands. However, the post-Sandy project also involves the excavation of 11.34 acres of uplands, which, if properly graded and planted with appropriate vegetation to provide a mosaic of wetland habitats (open water, emergent and/or scrub/shrub

wetlands), could be considered compensatory mitigation and be credited towards, the 1:1 mitigation ratio described in the Service's 2006 FWCAR.

The placement of exposed armor stone associated with the LOP would directly modify the wetland habitats between New Dorp Beach to Oakwood Beach (see page 9 of U.S. Army Corps of Engineers 2014). Artificial habitats typically do not support the same assemblages, often supporting fewer native and more exotic species (Chapman and Blockley 2009). Additionally, the exposed armor stone could segment the habitat and limit or prevent access to terrestrial species that traverse through wetland habitats as part of their life cycle (Sheridan 2010). For example, the diamondback terrapin (*Malaclemys terrapin*) was identified in our 2006 report as a reptile that occurs in the project area. This species requires sandy beaches for breeding and salt marsh for feeding and growth (Maryland Diamondback Terrapin Task Force 2001). The placement of the exposed armor stone could prevent or limit access between the two habitats, thereby limiting habitat suitability for this and other species that traverse through these habitats (Maryland Diamondback Terrapin Task Force 2001).

Mitigation Recommendations

Previously Proposed Mitigation Measures

> Refer to the Service's 2006 FWCAR (pp. 35-41) for a description of recommended mitigative measures, which are still applicable for this revised project design.

One of the primary mitigative measures recommended in the Service's 2006 FWCAR was an overall compensatory mitigation plan that provided a ratio of 1:1 to compensate for the conversion of vegetated wetlands to open water (pond) areas.

The post-Sandy project is designed to create emergent wetlands (consisting of native vegetation) in the excavated areas, as opposed to the permanent open water habitats envisioned in the Service's 2006 report. Provided the excavated areas function as emergent wetlands, the post-Sandy project would result in a net benefit to wetland functions and values at this site due to the removal of invasive species, while also improving the flood storage capacity and wildlife habitat functions. In this case, the 1:1 mitigation ratio recommended in the 2006 FWCAR would be met. However, note that should the excavated areas not function as emergent wetlands (if common reed intrusion occurs or areas become permanent open water habitats with only fringe vegetation or if areas are too dry to support wetland habitats), either (1) remedial actions (invasive species removal, re-grading, supplemental plantings, etc.) should occur so that the functions and values of emergent wetlands are reestablished; or (2) the 1:1 compensation ratio should be followed. Listed below are mitigative measures recommended to improve the likelihood of wetland restoration success.

The Service notes that the 1:1 mitigation ratio is still required for the filling of 10.89 acres from the construction of the LOP. This mitigation can be attained through the creation of wetlands resulting from the excavation of upland areas described in "Project Impacts" section.

Service Recommended Conservation Measures for the Post-Sandy Project

The following measures are recommended in addition to those described in the Service's 2006 FWCAR.

Bury the exposed seawall: In regards to the plan to leave the seawall exposed between New Dorp and Oakwood Beach, the Service recommends that the seawall be buried to allow for movement of terrestrial species that traverse the wetlands. Common reed is an invasive species that is already dominant in this wetland. A monitoring & maintenance program should be implemented to insure that common reed is removed and does not expand beyond the buried seawall. Additionally, as further described below, the Service recommends the restoration, of wetlands not proposed for excavation, including the removal of common reed.

In response to the draft report (Attachment A), the Corps has stated that they will incorporate and implement this measure into the South Shore of Staten Island (SSSI) project.

Plant wetland vegetation/increase diversity in excavated wetland and upland areas: Due to the potential of seeds to be transported by storm water away from intended locations, the Service recommends that seeding efforts be supplemented with plantings as well. As stated above, the Service recommends that only native species be seeded or planted. Such plantings should occur in both existing wetlands and any additional wetlands created in excavated uplands. Additionally, as stated above, excavated uplands can also be properly graded and planted with appropriate vegetation to provide a mosaic of wetland habitats (open water, emergent and/or scrub/shrub wetlands) and be accredited towards the 1:1 mitigation ratio described in the Service's 2006 FWCAR.

In response to the draft report (Attachment A), the Corps has stated that they will incorporate and implement this measure into the SSSI project.

Monitoring and maintenance of all restored wetlands: Wetland areas restored as part of this project should be monitored for at least 5 years to insure that they function as designed- as emergent freshwater wetlands in the excavated areas and as tidal wetlands in the enhanced area. There should be little (no more than 5 percent coverage) or no common reed present and at least 85 percent coverage of native herbaceous/shrub layer vegetation. Should the excavated areas not function as emergent wetlands (if common reed intrusion occurs or areas become permanent open water habitats with only fringe vegetation or if areas are too dry to support wetland habitats), either remedial actions (invasive species removed, re-grading, supplemental plantings, etc.) should occur so that the excavated areas do function as emergent wetlands or the 1:1 compensation ratio should be followed.

In response to the draft report (Attachment A), the Corps has stated that they will incorporate and implement this measure into the SSSI project.

Restoration of wetlands not proposed for excavation: Extensive wetland areas dominated by an extensive monoculture of common reed exist within the project study area. Wetland areas not

proposed for excavation could be restored - including the removal of common reed, planting of native wetland vegetation and repair/removal of hydrological impediments (if applicable).

In response to the draft report (Attachment A), the Corps has stated that they will incorporate and implement this measure into the SSSI project.

Contaminants: The Service recommends that the Corps conduct a sampling effort to evaluate hazardous substances in sediment at the surface and at the depth of excavation. This effort should sample for organochlorine pesticides and PCBs (polychlorinated biphenyls), metals, and polycyclic aromatic hydrocarbons (PAHs) to determine if there are contaminants present at concentrations which could be exposed and harmful to fish and wildlife resources. Should such contaminants be present, the Corps should coordinate through the FWCA consultation process with the Service on a course of action, which may include site remediation (removal of contaminated soils and backfill of clean material), treatment of surface waters or consideration of alternate sites.

In response to the draft report (Attachment A), the Corps has stated that they will incorporate and implement this measure into the SSSI project.

Create bio-filtration basins/swales: The Corps should consider the creation of biofiltration basins and/or swales in upland areas to provide primary treatment of storm water run-off prior to entry into wetlands (New York State Department of Environmental Conservation 2001).

In response to the draft report (Attachment A), the Corps has stated that they will not incorporate this measure into the SSSI project. The Corps stated that the construction of bio-filtration basin/swales in upland areas would require acquisition of additional land and would greatly increase the cost of the project. The Corps also indicates that this measure would be too far outside the authorized scope of the project.

While the Service recognizes the financial limitations of the project, we do not agree that improving the quality of the storm water entering the wetlands is outside the scope of the project. As such, the Service continues to recommend that this measure be considered.

Service Position

When compared to the originally proposed project in 2006, the revised proposed action would result in an increase in: the amount of material to be excavated from existing wetlands (a net increase of 398,000 cubic yards); the acreage of wetlands to be excavated (increase of 32 acres); and the area of wetlands to be filled (an increase in 5.71 acres).

However, nearly all of the wetlands to be excavated and/or filled consist of a monoculture of the invasive common reed which is of limited ecological value. The removal of invasive non-native vegetation, the seeding and planting of native wetland vegetation and the creation of emergent wetland in the excavated wetlands would improve the ecological value of those wetlands. Additionally, the enhancement of 18.9 acres of tidal wetlands at Oakwood Beach will also improve the ecological value of those wetlands. Finally, the excavation, grading, and planting of

11.34 acres of uplands converted into freshwater wetlands could also be accredited towards and attain the 1:1 mitigation ratio described in the Service's 2006 FWCAR. Provided the wetland enhancements function as designed/intended, the proposed action would result in no net loss of wetland acreage and in a net increase in wetland functional values. As stated above, should agreed-upon post-construction monitoring indicate that the excavated areas are not functioning as emergent wetlands (*e.g.*, if significant common reed intrusion occurs; areas become permanent open water habitats with only fringe vegetation; or if areas are too dry to support wetland habitats), remedial actions (invasive species removal, re-grading, supplemental plantings, etc.) should occur so that the excavated areas do function as emergent wetlands or the 1:1 compensation ratio should be followed. This should be included in the project planning and design.

As such, the Service concludes that, provided the Service-recommended measures are implemented the proposed action will not have significant adverse impacts on fish and wildlife resources in the project area. Should the results of contamination studies indicate that the level or type of contaminants may be harmful to fish and wildlife trust resources, the Corps should consult with the Service to determine a course of action to address contaminant issues.

The Service appreciates the Corps' assistance during the completion of this document. If you have any questions or require additional information, please contact Mr. Steven Sinkevich or Ms. Terra Gulden-Dunlop of the Long Island Field Office at 631-286-0485.

Sincerely,

for Patricia Cole

David A. Stilwell
Field Supervisor

cc: NYSDEC, Region 2, Long Island City, NY (S. Zahn)
USFWS, Long Island Field Office, Shirley, NY

LITERATURE CITED

Alcoba, C. 2015. Personal Communication. U.S. Army Corps of Engineers' New York District, New York, NY.

Chapman, M.G., and D.J. Blockley. 2009. Engineering Novel Habitats on Urban Infrastructure to Increase Intertidal Biodiversity. Centre for Research on Ecological Impacts of Coastal Cities, School of Biological Sciences A11, University of Sydney, Sydney, Australia. Oecologia 161:625-635.

DeRose-Wilson, A., J.D. Fraser, D.H. Catlin, and S.M. Karpanty. 2014. Shorebird Survey Report. Report submitted to U.S. Fish and Wildlife Service by Virginia Polytechnic Institute and State University, Blacksburg, VA. 12 pp.

Ebird. 2015. http://ebird.org/ebird/subnational2/US-NY-085?yr=all&m=&rank=mrec

Maryland Diamondback Terrapin Task Force. 2001. Maryland Diamondback Terrapin Task Force Recommendations. Final Report to the Secretary of the Maryland Department of Natural Resources.

Monk, J.D., A. DeRose-Wilson, J.D. Fraser, D.H. Catlin, and S.M. Karpanty. 2015. Migratory Shorebird Monitoring on Fire Island, NY. Report prepared for U.S. Fish and Wildlife Service by Virginia Polytechnic Institute and State University, Blacksburg, VA. 26 pp.

New York City Audubon. 2010. Shorebird and Horseshoe Crab Data Summary 2009 and 2010, Jamaica Bay, NY.

New York City Department of Environmental Protection. 2013. Final Environmental Impact Statement, Staten Island Bluebelt Drainage Plans for Mid-Island Watersheds. CEQR No. 07DEP063R.

New York State Department of Environmental Conservation. 2001. Stormwater Management Design Manual. Albany NY.

Sheridan, Claire M. 2010. Mating System and Dispersal Patterns in the Diamondback Terrapin (*Malaclemys terrapin*). Drexel University Dissertation.

U.S. Army Corps of Engineers. 2015. Draft Environmental Impact Statement, South Shore of Staten Island Coastal Storm Risk Management Project, Richmond County, New York. Preliminary Draft. New York District, Planning Division, New York, NY.

U.S. Army Corps of Engineers. 2014. South Shore of Staten Island Coastal Storm Risk Management, Richmond County, New York, Post-Sandy Design Modifications. New York District, Planning Division, New York, NY.

U.S. Fish and Wildlife Service. 2014. Final Rule, Endangered and Threatened Wildlife and Plants; Threatened Species Status for the Rufa Red Knot. Federal Register/Vol. 79 No. 238, 50 CFR Part 17 [Docket No. FWS-R5-ES-2013-0097; 4500030113]

U.S. Fish and Wildlife Service. 2006. Draft Fish and Wildlife Coordination Act 2(b) Report Beach Erosion Control and Storm Damage Reduction Project, South Shore of Staten Island, Richmond County, New York. Long Island Field Office, Shirley, NY.

Attachment A

USFWS Fish and Wildlife Coordination Act 2(b) Report
Beach Erosion Control and Storm Damage Reduction Project South Shore of Staten Island,
Richmond County, New York - January 2006

DRAFT

Fish and Wildlife Coordination Act 2(b) Report
Beach Erosion Control and Storm Damage Reduction Project
South Shore of Staten Island, Richmond County, New York

Prepared for:
U.S. Army Corps of Engineers

New York District
New York, New York

Prepared by:
Department of the Interior
U.S. Fish and Wildlife Service
Ecological Services
Long Island Field Office
Islip, New York

Preparer: Jill A. Olin

Long Island Field Office Supervisor: Rosemarie Gnam

January 2006

EXECUTIVE SUMMARY

This is the U.S. Fish and Wildlife Service's (Service) Draft Fish and Wildlife Coordination Act Report for the U.S. Army Corps of Engineers' (Corps) proposed project entitled, "South Shore of Staten Island, New York Beach Erosion Control and Storm Damage Reduction Project." Pursuant to the Fish and Wildlife Coordination Act (FWCA) of 1958, as amended (87 Stat. 401, as amended; 16 U.S.C. 661 *et seq.*), the Corps is consulting with the Service to ensure equal consideration for fish and wildlife resources during the planning of the proposed storm damage reduction project.

The Service identifies major ecological communities and significant habitats in the Corps' study area, the species using those habitats, and the potential impacts to those species and habitats resulting from implementation of the proposed project (also referred to as preferred alternative). The study area includes Fort Wadsworth to Oakwood Beach and Great Kills Harbor to Crescent Beach. The preferred alternative includes the placement of buried sea walls, sloped sea walls, double sheet pile seawalls, dune reinforcement, levees, flood walls, and pond creation.

The proposed project area supports many locally, regionally, and nationally important avifauna, fish, and invertebrate species, including several species considered in various local, State, and Federal conservation plans. Therefore, the Service recommends a number of measures the Corps should incorporate in their project design, local cost-sharing agreement, plans and specifications, as well as the operations and maintenance agreements to avoid, minimize, or compensate for potential impacts to Service trust resources including migratory birds and wetland habitats. The Service recommends that the Corps undertakes a number of measures to avoid, minimize, or compensate for the potential impact on fish and wildlife resources from the construction of this project. Accordingly, the Service believes that, with the incorporation of the recommended mitigation measures, the proposed action will not significantly impact fish and wildlife resources in the project area.

INTRODUCTION 1

PROJECT PURPOSE, HISTORY, AND AUTHORITY 1

Purpose 1

History 2

Authority 4

FISH AND WILDLIFE RESOURCE CONCERNS AND PLANNING OBJECTIVES 5

DESCRIPTION OF EVALUATION METHODS 6

SITE DESCRIPTION 8

Fort Wadsworth to Oakwood Beach 9

Crescent Beach 10

ENVIRONMENTAL SETTING 10

Upland Vegetation 11

Tidal and Freshwater Wetlands 12

Maritime Beach 13

Fish and Wildlife Resources 14

Avian Fauna 14

Finfish and Shellfish 15

Herpto-Fauna 16

Mammals 17

Threatened and Endangered Species 17

FUTURE WITHOUT PROJECT CONDITIONS 19

PROJECT ALTERNATIVES 20

Reach 1: Fort Wadsworth to Oakwood Beach 21

Line of Protection (Alternative # 4) 21

Reach 2: Great Kills Harbor to Crescent Beach 21

Line of Protection (Alternative # 1) 22

PROJECT IMPACTS 22

Direct and Indirect Impacts 23

Habitat Modification 23

Burial of Benthic Resources 26

Preclusion of Habitat Formation 29

Construction Activities 31

Turbidity 32

Cumulative Impacts 34

MITIGATION 35

SUMMARY OF FINDINGS AND SERVICE POSITION 41

FISH AND WILDLIFE ENHANCEMENT OPPORTUNITIES 42

LITERATURE CITED 42

FIGURES

Figure 1: Location of Project Area on the South Shore of Staten Island.

Figure 2: Fort Wadsworth to Midland Beach Project Area.

Figure 3: New Dorp Beach to Crescent Beach Project Area.

Figure 4: South Shore of Staten Island National Wetland Inventory Map.

Figure 5: Typical Buried Seawall and Typical Raised Promenade.

Figure 6: Typical Floodwall/Seawall.

Figure 7: Typical Floodwall/Seawall.

Figure 8: Typical Double Sheet Pile Wall.

Figure 9: Proposed Line of Protection and Interior Drainage Facilities at Oakwood Beach.

Figure 10: Proposed Line of Protection and Interior Drainage Facilities at Midland Beach.

Figure 11: Proposed Line of Protection and Interior Drainage Facilities at South Beach.

Figure 12: Typical Cross-Section of Seawall at Crescent Beach and Extension of Goodall Outfall.

Figure 13: Typical Levee.

Figure 14: Proposed Line of Protection and Interior Drainage Facilities at Crescent Beach.

INTRODUCTION

This is the U.S. Fish and Wildlife Service's (Service) Draft Fish and Wildlife Coordination Act (FWCA) Section 2 (b) Report describing the potential impacts on fish and wildlife resources resulting from the U.S. Army Corps of Engineers' (Corps) "South Shore of Staten Island Beach Erosion Control and Storm Damage Reduction Project, Staten Island, Richmond County, New York." This document constitutes the report of the Secretary of the Interior as required by Section 2(b) of the FWCA (48 Stat. 401, as amended; 16 U.S.C. 661 *et seq.*).

This report describes the project's potential impacts upon fish and wildlife resources and recommends measures to conserve and protect fish and wildlife resources. This analysis incorporates existing information about significant fish and wildlife resources for the project area and discusses related resource concerns; evaluates direct, indirect, and cumulative impacts on significant fish and wildlife resources; provides mitigation recommendations to avoid, minimize, or compensate for impacts resulting from the proposed alternatives; and identifies fish and wildlife enhancement opportunities.

PROJECT PURPOSE, HISTORY, AND AUTHORITY

Purpose

The primary objective of this project is to address the issues of severe beach erosion and storm events associated with the southern shoreline of Staten Island, as identified by Federal, State, and

local interests. The proposed work is intended to alleviate damages caused by erosion and storm events, through the development of sound engineering solutions. These solutions include land acquisition and the following structural components: levees and floodwalls, dune reinforcement through seawalls and sheet-pile, and road raising. Without the implementation of these new storm protection measures, the Corps determined that flooding resulting from storm events is expected to continue to cause damage to homes, businesses, and property along the southern shoreline of Staten Island.

History

Despite the previous beach erosion control and storm damage protection projects implemented along the south shore of Staten Island, properties along the southeastern Staten Island shoreline and inland areas continue to be susceptible to damages as a result of periodic, severe tropical storms, hurricanes, and nor-easters. In the years between 1932 and 1993, at least ninety hurricanes, tropical storms, or nor-easters have significantly impacted the New York City area, often causing storm surges more than four feet in elevation (U.S. Army Corps of Engineers 2002). These storms that wielded the most damage along the south shore of Staten Island include:

- Hurricane of November 25, 1950;
- Tropical storm of November 6-7, 1953;
- Hurricane Donna, September 12, 1960;
- Nor-easter of March 6-8, 1962;

- Storm of January 23, 1966;
- Storm of November 11, 1977;
- Nor-easter of December 11-12, 1992; and
- Storm of March 1993.

Consequently, Federal, State, and local governments have been involved in developing actions to minimize or inhibit these erosion problems, as described in the table below.

Location	Year	Agency	Protection
South Beach	1936-1937	Federal	Shore
South Beach	1937	Federal	Shore
Great Kills Park	1935-1948	Federal	Shore
Oakwood Beach	1952	City	Shore
Midland Beach	1955	State and City	Shore
Midland Beach	1955-present	Private	Shore
Prince's Bay	1960	Private	Shore
Oakwood Beach	1999	Federal	Tidal flooding
Cedar grove Beach	1992	City	Shore
Cedar grove Beach	~1992	City	Shore
Oakwood Beach	~1992	City	Shore
Oakwood Beach	~1992	City	Shore
Oakwood Beach	~1992	Federal	Shore
Crescent Beach	~1992	City	Tidal flooding

Storm data supplied by the Corps (2002) references storms only until 1993. In order to properly address the need for the proposed beach erosion control and storm damage reduction project, the Service recommends that the Corps provide an updated list of storms between 1993 and 2005 that have caused damage to the south shore of Staten Island in their Environmental Impact Statement (EIS).

Authority

The Federal government authorized the study of the problem and potential solutions along the thirteen-mile long south shoreline of Staten Island via a United States House of Representatives Committee on Public Works and Transportation resolution dated May 13, 1993. This resolution states:

> *"The Secretary of the Army, acting through the Chief of Engineers, is requested to review the report of the Chief of Engineers on the Staten Island coast from Fort Wadsworth to Arthur Kill, New York, published as House Document 181, eighty-ninth congress, First Session, and other pertinent reports, to determine whether modifications of the recommendations contained therein are advisable at the present time, in the interest of beach erosion control, storm damage reduction and related purposes on the South Shore of Staten Island, New York, particularly in and adjacent to the communities of New Dorp Beach, Oakwood Beach, and Annadale Beach, New York."*

FISH AND WILDLIFE RESOURCE CONCERNS AND PLANNING OBJECTIVES

The purpose of consultation under the FWCA is to ensure equal consideration of fish and wildlife resources in the planning of water resource development projects. The Service's

emphasis in this regard is to identify means and measures to mitigate for the adverse impacts of the proposed project, as well as to make positive contributions to the fish and wildlife resources in the project area.

This report is intended to be released along with the Corps' Draft EIS to the public, as it will serve as the basis for the Service's public meeting statement and the comments on the Corps' Feasibility Report.

From the Service's perspective, a desired output of the feasibility study is to ensure the safety and protection of the human population, while simultaneously protecting the health of marine, estuarine, and terrestrial ecological communities. Specifically, the Service recommends that conservation of fish and wildlife resources be accomplished by: (1) ensuring that the feasibility study evaluates alternatives which achieve and maintain high biological diversity; (2) ensuring that natural areas are protected and monitored throughout the life of the project; (3) ensuring that construction designs promote high value habitats for Service trust species; (4) establishing conservation easements over the life of the project; and (5) incorporating education and outreach activities into the project to inform the public about the uniqueness and fragility of the coastal ecosystem.

Ultimately, the Service's Mitigation Policy (January 23, 1981, Federal Register v. 46 n. 15 pp. 7644-7663) establishes a number of criteria which, if met, would allow the Service to support a water resource development project. These criteria are:

1) The projects are ecologically sound.

2) The least environmentally damaging alternative is selected.

3) Every reasonable effort has been made to avoid or minimize damage or loss of fish and wildlife resources and uses.

4) All mitigation recommendations have been adopted with guaranteed implementation to satisfactorily compensate for unavoidable damage or loss consistent with the appropriate mitigation goal.

5) For wetlands and shallow water habitats, the proposed activity is clearly water dependent and there is a demonstrated public need.

DESCRIPTION OF EVALUATION METHODS

The Corps' planning schedule and funding limitations precluded the Service from having sufficient time and staff resources to propose, design, and/or conduct extensive field surveys and investigations to establish or verify the presence of important trust wildlife resources, such as migratory birds, in the study and FWCA analysis areas. As a result, descriptions of natural resources are based on previous studies for similar projects; relevant grey and peer-reviewed literature; local, State, and Federal fish and wildlife reports and plans; and personal communications with knowledgeable biologists, planners, coastal geologists, and engineers. As expressed in earlier correspondence, it is critical for the Service to be given the opportunity to participate early in the planning process, particularly via participation on the Project Delivery Team, in order to be able to provide input into the needed scope of fish and wildlife surveys and investigations that are required under the FWCA. Such surveys are critical, for example, to meet the objectives of Executive Order 13186, Responsibilities of Federal Agencies to Protect Migratory Birds, the intent and requirements of the FWCA and Migratory Bird Treaty Act (16

U.S.C. 703 *et seq.*). In addition, up-to-date surveys would reduce the risks of uncertainty in projecting the future without project conditions, which the Corps believes is critical to making predictions about impacts attributable to project alternatives. Finally, early coordination will prevent delays in project planning, and would provide an opportunity to ensure that appropriate studies can and will be conducted so that they are available for synthesis, analysis, and incorporation into planning documents in a timely manner.

In this report, the Service provides a discussion of Federal trust resources, including migratory birds, wetlands, endangered species, finfish, and shellfish, which use the three major ecological systems (marine, estuarine, and terrestrial) found in the most ecologically significant land and water complexes of the proposed project area. Ecosystem classifications follow Cowardin *et al.* (1979). However, our analysis focuses on maritime beach and wetland habitats because the Corps will likely have to complete an Essential Fish Habitat Assessment for a number of marine shellfish and finfish species during consultation with National Oceanic and Atmospheric Administration / Fisheries (NOAA/F). In addition, consultation under the Endangered Species Act (ESA) will be required for marine Federally-listed species in the proposed project area. A description of coastal habitats of the south shore of Staten Island area is provided, and the ecosystem classification follows Cowardin *et al.* (1979). Digital data for wetland habitats was obtained from the Service's National Wetlands Mapper found on the Service's National Wetlands Inventory (NWI) website, www.nwi.fws.gov.

In developing mitigation recommendations, the Service relied on staff's expertise, literature searches, and local, State, and Federal conservation plans (e.g. bird conservation plans, and local, State, and Federal land and water conservation plans) and special designations (e.g. State- and

Federally-identified Significant Fish and Wildlife Habitat Complexes) to develop appropriate recommendations for mitigation and fish and wildlife enhancement opportunities.

Finally, fish and wildlife enhancement opportunities which would benefit trust resources and the habitats in the study area are recommended.

SITE DESCRIPTION

The project area consists of an approximately 6.5-mile long area along the southern shoreline of Staten Island, entirely within the Borough of Staten Island, City of New York, Richmond County, NY. The project area is adjacent to the Lower New York Bay and the Raritan Bay, and extends southwesterly from Fort Wadsworth near the Verrazano Narrows Bridge to Crescent Beach, located just southwest of Great Kills Harbor. On the landward side, the project area generally is bounded by Fort Wadsworth on the northeast, Hylan Boulevard on the north, and Richmond Avenue in the community of Great Kills/Annadale on the southwest. Hylan Boulevard is aligned parallel to the shoreline, and is located approximately 0.9-miles inland. The project area encompasses several neighborhood communities including South Beach, Midland Beach, New Dorp Beach, Oakwood Beach, Great Kills, and Crescent Beach (Figure 1).

An approximately 1.7-mile section of essentially undeveloped land along the 6.5-mile long project area consists of Great Kills Park, which is a component of the Gateway National Recreation Area (NRA). Although this segment of shoreline is eroded like the rest of the project area, it has been excluded from the area of planned shoreline protection and storm damage

reduction measures at the request of the National Park Service (NPS) (U.S. Army Corps of Engineers 2002). Therefore, in order to more effectively focus planning and analysis efforts, the project are was divided into two project areas: 1) Fort Wadsworth to Oakwood Beach and 2) Crescent Beach.

The project area lies within the Atlantic Coastal Plain Province. This region is characterized by low topographic relief. The topography of the Staten Island project area is nearly level with elevations ranging from sea level to almost 100 feet above sea level (U.S. Army Corps of Engineers 1995).

Fort Wadsworth to Oakwood Beach

Terrain in the Fort Wadsworth to Oakwood Beach portion of the project area generally consists of a relatively wide, low beach intersected by a number of drainage system structures contained in groins (Figures 2 and 3). The shoreline is uneven or jagged as a result of localized sand erosion and accretion on either side of the groins. The shoreline in this area consists entirely of city-owned beaches and lands of the Gateway NRA, owned by the Federal government and administered by the NPS. A long boardwalk and hard-surface promenade walkway extends approximately 2.75 miles along the beach from South Beach to Midland Beach, ending at Miller Field. In addition to these public parks and recreation areas, landward of the beaches are low-lying, densely developed, primary residential properties, as well as a number of commercial properties located along Hylan Boulevard. Furthermore, the project area contains several large,

undeveloped tidal and freshwater wetlands. A sewage treatment plant is located approximately 0.25 miles from the shore in Oakwood Beach, along Oakwood Creek.

Crescent Beach

Terrain in the Crescent Beach portion of the project area (south of the Great Kills Harbor) consists of a narrow beach adjacent to an approximately ten-foot high bluff (Figure 3). Behind the bluff, there are several residential properties, in addition to undeveloped forest, scrub-shrub, and freshwater wetland areas. A seawall exists between the beach and the developed residential properties. A clam flat and sand bar is located along Crescent Beach near the mouth of Great Kills Harbor. A boat marina is located in the Great Kills Harbor at the northwest end of the Crescent Beach area.

ENVIRONMENTAL SETTING

Upland Vegetation

Vegetated uplands are located in the Fort Wadsworth to Oakwood Beach reach of the project area, and can be characterized as isolated islands of habitat, scattered residential and commercial developments, and areas developed for recreational use. The majority of upland vegetation in these areas consists of non-native species that are commonly found in highly disturbed areas. Herbaceous species inhabiting these areas include goldenrod (*Solidago* spp.), common reed (*Phragmites australis*), common ragweed (*Ambrosia artemisiifolia*), common mugwort

(*Artemisia vulgaris*), and poison ivy (*Toxicodendron radicans*). The upland scrub-shrub areas are dominated by honeysuckle (*Lonicera* spp.), multifora rose (*Rosa multiflora*), Japanese knotweed (*Polygonum cuspidatum*), common pokeweed (*Phytolacca americana*), winged sumac (*Rhus copallina*), and black locust (*Robinia pseudoacacia*). Finally, upland forests areas are dominated by oaks (*Quercus* spp.), sassafras (*Sassafras albidum*), and black cherry (*Prunus serotina*). In the disturbed areas that have reverted back to forest habitat, black locust and tree of heaven (*Ailanthus altissima*) dominate (U.S. Fish and Wildlife Service 1997; U.S. Army Corps of Engineers 2005).

The majority of upland vegetation in the Crescent Beach area is herbaceous and generally occurs on disturbed land. These areas are dominated by goldenrod, various grasses, legumes, and forbes, as well as common reed. The upland scrub-shrub areas are dominated by bayberry (*Myrica pennsylvanica*), beach plum (*Prunus maritime*), sumac (*Rhus* spp.), hackberry (*Celtis occidentalis*), and black cherry. Finally, the upland forests are dominated by black cherry, oak, and hickory (*Carya* spp.), in addition to red maple (*Acer rubrum*), sweetgum (*Liquidambar styraciflua*), and pitch pine (*Pinus rigida*) (U.S. Fish and Wildlife Service 1997; U.S. Army Corps of Engineers 2005).

Tidal and Freshwater Wetlands

A number of freshwater wetland complexes were identified and delineated (U.S. Army Corps of Engineers 2005) within the interior drainage portion of the project area. These include: five estuarine, intertidal, narrow-leaved persistent emergent, irregularly-flooded wetlands (E2EM5P)

in drainage area A; four palustrine narrow-leaved emergent, seasonally-flooded/saturated (PEM5E) wetland, one palustrine unconsolidated bottom, semi-permanently-flooded (PUBF) wetland, and five E2EM5P wetlands in drainage area C; one palustrine emergent, persistent seasonally-flooded (PEM1C) wetland in drainage area D; and one palustrine narrow-leaved emergent, semi-permanently-flooded wetland (PEM5F) in drainage area E (Cowardin *et al.* 1979).

Wetlands along the line of protection from Fort Wadsworth to Oakwood Beach include six E2EM5P wetlands located in drainage A; one PEM5F wetland located in drainage E along the road raising alternative on Father Cappodano Boulevard; and one PEM5E wetland located southeast of drainage area C along the road raising alternative on Father Cappodano Boulevard. The herbaceous layer in emergent portions of the estuarine and palustrine wetlands is dominated by dense strands of common reed, with lesser amounts of goldenrod, purple loosestrife (*Lythrum salicaria*), and soft rush (*Juncus effusus*). Black willow (*Salix nigra*) and silver maple (*Acer saccharinum*) are the dominant tree species in the forested components of the wetlands.

NWI (Figure 4) maps indicated that estuarine, intertidal persistent emergent, regularly-flooded (E2EM1N), estuarine, intertidal, unconsolidated shore, irregularly-flooded (E2US2P), and palustrine, narrow-leaved persistent emergent, semi-permanently-flooded (PEM1F) wetland types occur along the shoreline of the Crescent Beach project area. Typical vegetation in the E2EM1N marsh includes a predominance of saltmarsh cordgrass (*Spartina alterniflora*), salt meadow grass (*Spartina patens*), and common reed. The E2US2P habitats are the upper portions of the beach with little or no vegetation. The PEM1F wetland vegetation is dominated by common reed, and hedge bindweed (*Calystegia sepium*), and slippery elm (*Ulmus rubra*). The

habitat at Great Kills Harbor and Park, part of the Gateway NRA, includes large areas of disturbed marsh, dominated by common reed, with grassland and shrub thicket habitat at Crookes Point dominated by bayberry (*Myrica pennsylvanica*), beach plum (*Prunus maritima*), sumac (*Rhus* spp.), hackberry (*Celtis occidentalis*), and black cherry. The outer shoreline follows a narrow, sandy, groined beach (U.S. Army Corps of Engineers 2005; U.S. Fish and Wildlife Service 1997).

Maritime Beach

The majority of the maritime beach within the two project reaches is heavily used for recreation. As a result of this, the beach is subject to vegetation removal techniques (including beach raking) and is generally devoid of all vegetation. Some vegetation occurs along the dunes from Fort Wadsworth to Oakwood Beach. The dune vegetation includes American beachgrass (*Ammophila breviligulata*), seaside goldenrod (*Solidago sempervirens*), sandbur (*Cenchrus* spp.), and beachheather (*Hudsonia* spp.). In addition, sparse patches of vegetation in the beach/upland transition zones of Crescent Beach area consist mostly of American beachgrass.

Beginning in 1966, there have been at least seventeen major sediment-benthic macrofauna sampling efforts in the Raritan Bay area (Reid *et al.* 1991). A study conducted by Cerrato *et al.* (1989) found amphipods (*Ampelisca abdita*, *Corophium tuberculatum*, and *Elasmopus levis*), blue mussel (*Mytilus edulis*), polychaete worms (*Asabellides oculata* and *Heteromastus filiformis*), slipper shell (*Crepidula fornicata*), razor clam (*Ensis directus*), barnacle (*Balanus* spp.), sea lettuce (*Ulva lactuca*), and shore shrimp (*Palaemontes* spp.).

Fish and Wildlife Resources

Avian Fauna

The *Atlas of Breeding Birds in New York State* (Andrle and Carroll 1988; New York State Department of Environmental Conservation 2004) lists sixty-seven waterfowl and shorebird species, and eighty-four upland bird species as either observed or expected to occur along the south shore of Staten Island.

The configurations of the shorelines of Raritan Bay, both the south shore in Monmouth County, New Jersey, and the Staten Island, New York, result in a concentration of migratory shorebirds and neo-tropical migrant land birds. Shorebird surveys done in the early 1980s have documented the importance of the greater Raritan Bay for spring and fall shorebird migration with seasonal totals of over 20,000 birds, based on weekly surveys. The peak months are June and August, and the primary concentration areas are Great Kills on Staten Island, the flats inside Sandy Hook, and the south shore between Chingora Creek and Conaskonk Point. Three species, sanderling (*Calidris alba*), ruddy turnstone (*Arenaria interpres*), and semi-palmated sandpiper (*Calidris pusilla*), make up about 85 percent of the total of migratory shorebirds using this area. The nearshore open waters provide habitat for species such as Canada goose (*Branta canadensis*), American black duck (*Anas rubripes*), mallard (*Anas platyrhynchos*), green-winged teal (*Anas crecca*), blue-winged teal (*Anas discors*), and gadwall (*Anas strepera*). Several species of wading birds may also occur in the area, including glossy ibis (*Plegadis falcinellus*), great blue heron (*Ardea herodias*), snowy egret (*Egretta thula*), and black-crowned night heron (*Nycticorax*

nycticorax) (Andrle and Carroll 1988; New York State Department of Environmental Conservation 2004; U.S. Fish and Wildlife Service 1997).

Finfish and Shellfish

Lower Bay and Raritan Bay support a diverse assemblage of fish and shellfish. Historically an important area for commercial and recreational fisheries, the site has now has seen a decline in the fishery abundance, as a result of heavy fishing, diminished water quality, decreased food supply, and reduction in suitable spawning and nursery areas (Berg and Levinton 1985). Common species observed using the area include bluefish (*Pomatomus saltatrix*), weakfish (*Cynoscion regalis*), winter flounder (*Pseudopleuronectes americanus*), summer flounder (*Paralichthys dentatus*), stiped bass (*Morone saxatilis*), and scup (*Stenotomus chrysops*) (Figley and McCloy 1988; U.S. Army Corps of Engineers 1995). Additionally, anadromous species such as American shad (*Alosa sapidissima*), alewife (*Alosa pseudoharengus*), Atlantic herring (*Clupea harengus*), Atlantic menhaden (*Brevoortia tyrannus*), and blueback herring (*Alosa aestivalis*), as well as the common forage species Atlantic silverside (*Menidia menidia*), bay anchovy (*Anchoa mitchilli*), and mummichug (*Fundulus heteroclitus*) are found in nearshore waters.

Raritan Bay supports several shellfish species that are commercially- and recreationally-fished. These species include the American lobster (*Homerus americanus*), American oyster (*Crassostrea virginica*), bay scallop (*Argopecten irradiens*), hard-shelled clam (*Mercenaria mercenaria*), horseshoe crab (*Limulus polyphemus*), soft-shelled clam (*Mya arenaria*), and blue crab (*Callinectes sapidus*).

Herpto-Fauna

Species of frog and toad such as the green frog (*Rana clamitans melanota*), spring peeper (*Acris crucifer*), bull frog (*Rana catesbeiana*), and Fowler's toad (*Bufo fowleri*) are common to the area and can be found inhabiting fresh and low salinity wetlands (U.S. Army Corps of Engineers 1976; New York State Department of Environmental Conservation 2003b). Diamondback terrapins (*Malaclemys terrapin*) are common to the Great Kills Harbor (U.S. Army Corps of Engineers 1976), in addition to the common snapping turtle (*Chelydra s. serpentine*), painted turtle (*Chrysemys picta*), and eastern box turtle (*Terrapene c. carolina*) occurring in the Fort Wadsworth to Oakwood Beach project area. Common snakes such as the eastern garter snake (*Thamnophis sirtalis sirtalis*), northern ringneck snake (*Diadophis punctatus edwardsii*), and the northern brown snake (*Storeria d. dekayi*) are found inhabiting vegetated upland and wetlands in the Fort Wadsworth to Oakwood Beach project area (New York State Department of Environmental Conservation 2003b; U.S. Army Corps of Engineers 1976). Finally, northern redback (*Plethodon c. cinereus*), northern red (*Pseudotriton r. ruber*), and northern two-lined (*Eurycea bislineata*) salamanders have been observed in the vicinity of the project area (New York State Department of Environmental Conservation 2003b).

Mammals

Site-specific mammalian species have not been confirmed in the project area. Species that are most likely to occur are those that are tolerant of urban development, including eastern gray squirrel (*Sciurus carolinsnsis*), eastern cottontail (*Sylvilagus floridanus*), eastern chipmunk (*Tamias striatus*), raccoon (*Procyon lotor*), opossum (*Didelphis virginiana*), muskrat (*Ondatra*

zibethica), white-footed mouse (*Peromyscus leucopus*), and the Norway rat (*Rattus norvegicus*) (U.S. Army Corps of Engineers 1995; U.S. Fish and Wildlife Service 1997).

Threatened and Endangered Species

The south shore of Staten Island including the adjacent waters of Raritan Bay and Lower Bay is utilized by bald eagles (*Haliaaetus leucocephalus*), a State- and Federally-listed (threatened) species, as a migratory route (New York State Department of Environmental Conservation 2003a). Although bald eagles have been observed in the project area, these individuals are considered to be occasional transients. No habitat in the project area is currently designated or proposed "critical habitat" in accordance with provisions of the ESA. The Service notes that the project area contains suitable habitat for the Federally-listed piping plover (*Charadrius melodus*) and that new piping plover breeding sites have been recorded over the last decade on Long Island in areas where they were not previously observed. Therefore, we recommend that the Corps conduct a maritime beach survey in coordination with the Service during the months of March/April/May to determine the presence of Federally-listed species, in particular, piping plover and seabeach amaranth (*Amaranthus pumilus*). Further ESA coordination is needed to update the presence/absence information currently, which dates back to 1997, contained in the preliminary Draft EIS. ESA consultation is pending until this further coordination and data request is completed.

Federally-listed threatened and endangered marine species under the jurisdiction of NOAA/F may also be found near the project area. These species include the threatened loggerhead turtle (*Caretta caretta*), as well as the endangered Kemp's ridley turtle (*Lepidochelys kempi*), leatherback turtle (*Dermochelys coriacea*), and green turtle (*Chelonia mydas*). In addition, species which are protected under the Marine Mammal Protection Act of 1972 (as amended 1994) include harbor seal (*Phoca vitulina*) and the grey seal (*Halichoerus grypus*). For additional information, contact Mr. Stanley Gorski, Habitat Conservation Division, Field Office Supervisor, National Oceanic and Atmospheric Administration/Fisheries, James J. Howard Sciences Laboratory, 74 Magruder Road, Highlands, NJ 07732 (telephone: 732-872-3037). State-listed species are also present in the project area; the northern harrier (*Circus cyaneus*), a State-listed threatened species, and the peregrine falcon (*Falco peregrinus*), a State-listed endangered species. The northern harrier possibly breeds, and is a common winter resident, in tidal wetlands on Staten Island (U.S. Fish and Wildlife Service 1992). In addition, the peregrine falcon is a confirmed breeder on Staten Island (New York State Department of Environmental Conservation 2003c; New York State Department of Environmental Conservation 2004).

If the Corps has not already done so, we recommend that they contact the New York State Department of Environmental Conservation (NYSDEC) for additional information. The NYSDEC contact is Mr. Peter Nye, Endangered Species Unit, New York State Department of Environmental Conservation, 625 Broadway, Albany, NY 12233-4753 (telephone: 518-402-8859) and Mr. James Gilmore, New York State Department of Environmental Conservation - Region 2, 1 Hunter's Point Plaza, 47-40 21st Street, Long Island City, NY

11101-5407 (telephone: 718-482-6464).

FUTURE WITHOUT PROJECT CONDITIONS

According to the Corps, under this scenario, also known as the "No Action Alternative," all natural forces and manmade conditions currently in effect would continue.

Periodic storm-related flooding would continue to affect low-lying interior areas of the Fort Wadsworth to Oakwood Beach project area. No interior flood control improvements would be implemented through Federal actions to reduce flooding problems. It is possible that locally funded flood control improvements would be implemented in certain areas within the project area. However these would likely be piecemeal and would not provide as comprehensive a solution as would be needed for the southern shore of Staten Island. Certain areas of beach (Oakwood Beach and Great Kills Park) would continue to experience accelerated beach erosion.

Future storms would continue to cause damage to property in the Crescent Beach area. Beach and bluff erosion would continue and the level of protection afforded by the existing beach and seawall would continue to decline, increasing the risk of damage to adjacent residences from wave action. Based on its poor condition, the seawall is expected to fail completely within six to ten years. As a result, flood damage would continue to occur to homes and properties in the Crescent Beach area (U.S. Army Corps of Engineers 2002).

PROJECT ALTERNATIVES

The study area was initially divided into three reaches in order to aid in problem identification and analysis. The three project reaches were Fort Wadsworth to Oakwood Beach, Great Kills Harbor to Crescent Beach, and Annadale to Tottenville. The Corps (2004a) determined that there was no Federal interest for storm damage reduction for the Annadale to Tottenville reach. Thus further analysis of the potential storm damage reduction alternatives (i.e., beach fill, flood proofing, and land acquisition) for this reach would not be necessary. Consequently, only alternatives addressing the remaining two reaches will be reviewed in this document.

Reach 1: Fort Wadsworth to Oakwood Beach

Several alternatives have been withdrawn from further consideration. These alternatives include: a beach fill plan, a flood proofing plan, an acquisition plan, and various permutations of road raising, buried sea wall dune reinforcement, levees and flood walls (Alternative No's 1, 2, 2a, and 3). The chosen line of protection for Fort Wadsworth to Oakwood Beach is summarized below. Refer to Figures 5 through 11 provided in this report, as well as the Corps' (2005) Preliminary Draft EIS for further details on the project alternatives.

Line of Protection (Alternative No. 4)

- Buried sea wall and sheet pile sea wall at the existing boardwalk and the raising of existing promenade;
- Raised promenade from Miller Field to Oakwood Beach; and
- Dune reinforcement, levees, and flood wall at Oakwood Beach.

Reach 2: Great Kills Harbor to Crescent Beach

Several alternatives for protection and interior drainage have been discontinued from further consideration for this reach of the project area. These include: a beach fill with levee plan, a flood-proofing plan, an acquisition plan, a vertical sheet pile sea wall with levees plan, and the use of ponds with pressure lines (Alternative No's 2, 3, and 4). The chosen line of protection for Great Kills Harbor to Crescent Beach is summarized below. Refer to Figures 12 through 14 provided in this report, as well as the Corps' (2005) Preliminary Draft EIS for further details on the project alternatives.

Line of Protection (Alternative # 1)

- Sloped Stone Seawall
- Levees

PROJECT IMPACTS

The Corps' recommended plan, specifically Alternative No. 4 for Fort Wadsworth to Oakwood Beach and Alternative No. 1 for Crescent Beach, would have direct adverse impacts on fish and wildlife resources. An area approximately 6.5 miles long with varying widths of intertidal estuarine and palustrine wetlands, and maritime beach habitats is expected to be directly impacted from dune reinforcement; construction of levees, floodwalls, buried seawalls, and tide

gates; pond excavation; and the use of heavy machinery. In particular, project construction and long-term maintenance would result in both short-term and long-term impacts. Short-term impacts include burial of benthic organisms on the maritime beach habitat due to construction activities and increased turbidity. Long-term impacts include precluding formation of maritime beach and wetland habitat, and habitat modification/loss, both affecting fish and wildlife resources.

As per the Scope of Work (SOW), this section only provides a description of the preferred proposed alternative; no other alternatives were evaluated as part of this analysis.

Direct and Indirect Impacts

Habitat Modification

Maritime Beach

Changes in the beach morphology and sedimentologic characteristics (slope, height, grain size, sorting coefficient, etc.) may affect colonization of marine invertebrates, a major forage resource for shorebirds in the intertidal and dune zone. A shift to finer or coarser sediments can affect the abundance of macrofauna prey resources (Peterson and Manning 2001) in the proposed project area, which can have consequences for higher trophic levels (Peterson and Manning 2001). Morphological and sedimentologic changes to the maritime beach and dunes can also impact wildlife breeding habitat, either adversely or beneficially. For example, the Corps' Long Island Intracoastal Waterway Channel Maintenance Dredging Project resulted inadvertently in the

deposition of highly fine sand and mud dredge spoils on East Inlet, Moriches Bay, Brookhaven, NY. This material was not suitable substrate for colonial waterbirds (U.S. Fish and Wildlife Service – Long Island Field Office project file). A corrective plan of action was initiated by the Corps to mitigate for this condition; however, the short- and long-term effects of placing unsuitable material, and later, re-depositing suitable material, have not been evaluated as of this time. Potentially beneficial impacts of sand placement have been observed at other Corps sites existing on Long Island; however, these are not well studied and remain anecdotal as to their long-term contribution to resource conservation. The proposed action would, therefore, result in the conversion of maritime beach habitat into vegetated dune habitat, and a potential loss of intertidal habitat, during the life of the project.

The proposed project will also result in changes to the existing dune structure, burial of dune vegetation, and acceleration of plant succession, as early successional, sparsely vegetated sand is replaced by vegetation. The proposed project will create a monotypic stand of American beach grass through artificial planting at densities which may or may not be beneficial to avifauna. If plant succession is encouraged, shorebirds, which require early successional beach strand habitat to forage and breed, will most likely be discouraged from occupying these habitats. In addition, grooming of the beaches to remove detritus and litter can remove vital foraging resources (e.g. wrack) for shorebirds and adversely impact the trophic transfer of energy in the coastal setting (Dugan *et al.* 2003).

Tidal and Freshwater Wetlands

Many of the remaining wetlands plant communities have been altered as a result of historic alterations to tidal creeks which now limit or prevent natural tidal influxes of salt water. Nearly 63 percent of Staten Island's tidal wetlands have been filled or altered (Tiner 2000); thus, the amount and quality of wetland habitat remaining on the south shore of Staten Island is low. The wetlands within the project area are dominated by common reed, often observed as a monoculture. Although the existing wetlands could be characterized as degraded or low quality, they still perform needed ecological functions, and will always provide opportunities where wetland restoration or enhancement could result in significant benefits to native fish and wildlife. The project alternatives propose excavation of approximately 85 acres of vegetated wetland and replacement of shallow-water wetland habitat with shallow open-water areas. The Service is concerned with the loss of vegetated wetlands as a result of the conversion of these wetlands, albeit degraded, to open water habitat.

Vegetated wetlands provide important ecological functions. They improve water quality by removing pollutants from surface waters through the processes of sediment trapping, nutrient removal, and chemical detoxification. The value of natural wetlands, however, extends beyond their flood storage and water quality functions to include food chain support, erosion control, groundwater recharge/discharge, and habitat functions. Wetlands provide valuable sources of wildlife food and habitat, and wetlands often become a focal point for varied wildlife populations within a particular region. Wetland vegetation also provides nesting material and sites for numerous birds and mammals. Wetlands are important habitats for a disproportionately high number of endangered and threatened plant, mammal, bird, reptile, amphibian, and fish species. Some aquatic organisms may use wetlands seasonally as a spawning ground and nursery for their

young, spending most of their adult lives in deeper waters. Amphibians, reptiles, and invertebrates usually undergo an aquatic phase that requires water for breeding, egg development, and larval growth. Some reptiles and amphibians are able to adapt to fluctuating water levels (Mitsch and Gosselink 1986), whereas others may experience changes in breeding patterns and forage species composition due to water level fluctuations (Azous 1991). Wetlands are also used daily by birds and terrestrial animals during diurnal and nocturnal food foraging. Many birds that utilize both terrestrial and wetland habitats are frequently found in the highest numbers in the diverse, productive habitats of wetlands (NWTC 1979).

The Service recognizes that the creation of open water aquatic habitats may be beneficial to many species of migratory birds and over-wintering waterfowl. However, the loss of vegetated wetland may affect other species already using the habitat (i.e. invertebrates and avifauna), and may decrease the quality of water flowing from the wetland. As described in this report, the area surrounding the remaining wetland habitat on Staten Island is highly developed with pavement and infrastructure. Therefore, the wetland functions of water quality control and flood storage/flood attenuation become highly important benefits in an area of high and rapid storm-water discharges. Open water aquatic habitats typically do not provide all of these functions.

Burial of Benthic Resources

Benthic macro-invertebrate mortality is likely along the 6.5-mile project area, due to the construction of seawalls, levees, dunes, and the raising of the promenade. As a result, re-colonization of benthic macro-invertebrates in the project area would potentially be slowed or

prevented because of the lack of available source populations and suitable habitat. Moreover, the increase in suspended sediments may cause displacement of food sources for the motile benthic organisms and may smother the openings of benthic organisms' (i.e. polychaete worms, crabs, clams) burrows. Other impacts from the proposed construction activities include the potential destruction of benthic resources by smothering the benthic habitats with massive amounts of sand (U.S. Army Corps of Engineers 1998). These impacts to benthic resources have the potential to adversely affect shorebird species using the area, by removing a native food source.

Recent studies provide somewhat conflicting evidence as to the potential for both short- and long-term impacts of beach nourishment on wildlife along the western coast of the Atlantic Coast. These studies focus principally on beach and benthic/pelagic invertebrate and finfish communities of the western Atlantic Coast (e.g., Minerals Management Service 2001; Peterson and Manning 2001; Lindquist and Manning 2001; U.S. Army Corps of Engineers 2004b.; Burlas *et al.* 2001; and Byrnes *et al.* 2004). To illustrate the findings of these research studies, the Service briefly reviews the impacts of maritime beach nourishment on the infaunal community, which is composed of meiofauna (animals whose shortest dimensions are less than 0.5 millimeters [mm] or 0.02 inches [in.] but greater than or equal to 0.1 mm [0.004 in.]), macrofauna (those animals 0.5 mm or larger in size), and mobile organisms.

Infaunal populations naturally decline dramatically between November and January. Reilly and Bellis (1978) and Parr *et al.* (1978) noted that when beach nourishment ceases, the recovery of the community is rapid and complete recovery may occur within one or two seasons. Recovery will depend on the season of the year of the nourishment operations and on the recruitment of

larval fauna, once the operation is completed. Gorzelany and Nelson (1987) found no significant long-term negative effects of beach nourishment on nearshore benthic fauna during monitoring of a beach replenishment project on a central Florida east coast sand beach community. Yet Hurme and Pullen (1988) found that meiofauna recover very slowly from a major disturbance, perhaps due to their slow rates of reproduction, their limited ability to migrate either our of harms way or into new suitable habitat, and their highly specialized adaptations to specific environmental conditions. However, meiofaunal recovery can be rapid following minor disturbances (Naqvi and Pullen 1982).

The recovery of benthic macrofauna after beach nourishment varies from one site to another. Studies completed in the 1970s indicate that when nourishment ceases, the recovery of benthic macrofauna is rapid, and complete recovery might occur within one or two seasons (Reilly and Bellis 1978; Parr *et al.* 1978). The ability of macrofauna to recover is due to: (a) their short life cycles, (b) their fast reproductive potential, and (c) the recruitment of plankton larvae and motile macrofauna from nearby unaffected areas (Naqvi and Pullen 1982).

More recently, the Corps presented data describing recovery of intertidal infauna depending upon time of year of beach nourishment. When beach nourishment is completed between early August and early October, the infaunal community may recover within 2 months, prior to the natural winter population decline. Recovery time following nourishment in mid- to late-October is expected to occur within the range of 2 to 6 months. If nourishment occurs between the months of late October and January, the compounding effects of nourishment and seasonal population decline will result in a minimum of 6 months recovery time for the community (U.S.

Army Corps of Engineers 2001). Also, the Corps' Draft EIS (2005) addresses mobile organisms, such as crabs and fishes. The Corps' Draft EIS (2005) suggests that mobile organisms appear to be the least affected by construction activities, as they are able to move to avoid disturbances (Hurme and Pullen 1988). Such motile species are able to return to the area when conditions are suitable again.

In view of these data findings, the Service believes that if beach sand placement occurs between the months of late August and January along the south shore of Staten Island, the infaunal community, including meiofauna, macrofauna, and mobile organisms, will be able to recover prior to the arrival of shorebird species (terns, sanderlings, and ruddy turnstones), which depend on the infaunal community as food source.

Preclusion of Habitat Formation

Any activity that artificially stabilizes naturally dynamic beach strand habitats has the potential to be detrimental to fish and wildlife resources. Many species using the beaches of the south shore of Staten Island prefer or require early successional habitat for breeding, foraging, and/or resting. These include terns, sanderlings, ruddy turnstones, and semi-palmated sandpipers. The most highly productive habitat for these species is found in areas of overwash or recent inlet formation. The proposed project perpetuates a system of shoreline stabilization structures that will limit the natural process of shoreline retreat and, consequently, prevent the natural formation of optimal habitats. Due to erosion, establishment of predators and competitors, and lower prey densities, stabilized beach strands are generally less productive habitats for these species than

more dynamic, ever-changing beaches, particularly inlets and overwash areas (U.S. Fish and Wildlife Service 2002). However, the great amount of infrastructure (roads, residential, and commercial structures) adjacent to the maritime beach and wetlands of the south shore of Staten Island, make it unlikely that the Staten Island communities would accept the creation and long-term management and maintenance of these species' preferred habitat. Therefore the Service believes that indirect effects attributable to long-term stabilization of the maritime shoreline are unlikely to occur.

In contrast, tidal wetlands were once a vast resource on Staten Island, comprising approximately 5600 acres in the late 1800s. Today only approximately 1800 acres of these original wetlands remain tidal. Approximately 300 acres of former tidal wetlands have become non-tidal freshwater marshes and swamps due to flow restrictions (Midland Beach and South Beach areas) (Tiner 2000). The majority of the south shore of Staten Island is developed, whether as residential areas or as boardwalks along the beachfront. This project's intent will be to further prevent the natural tidal influx of salt water and/or any natural tidal flooding cycles along the south shore of Staten Island. Preventing natural processes for the long-term will have a major impact on the hydrology, sedimentology, vegetative community structure, and consequently on fish and wildlife species use of the area.

Construction Activities

The timing of sand placement and pond construction and maintenance activities will be a major factor resulting in potential short- and long-term impacts for non-endangered shorebird and waterbird species. The potential direct effects include disruption of breeding, foraging, and roosting activities. Beach construction and pond creation activities are usually very intensive and environmentally disruptive operations, which involve the mobilization and use of heavy equipment and other construction vehicles in wildlife habitat. The operation of machinery to grade the modified beach and to excavate the ponds immediately adjacent to habitat that is used by wildlife as a roosting, over-wintering, courtship, nesting, and brood-rearing area has the potential to disturb avifauna to the point where they may not successfully nest and/or fledge young. Moreover, this disturbance may preclude avifauna from using the habitat entirely, forcing them to seek appropriate habitat elsewhere (U.S. Fish and Wildlife Service 1995). Human activities may adversely affect the productivity of shorebirds (Ruhlen *et al.* 2002) and influence the foraging activity of some shorebird species (Burger and Gochfeld 1991). Even low levels of human activity have been shown to result in disturbance and displacement of shorebirds at migrational staging and roosting areas (Pfister *et al.* 1992).

In addition, the use of heavy machinery within the project area for initial construction and maintenance of the proposed project would directly impact wildlife use of the area by increasing noise levels. The Corps (Alvarez, pers. comm. 2005) has indicated that it intends to construct the project according to the design specifications using earth moving equipment. Noise associated with project-related activities has the potential to disturb fish and wildlife foraging and breeding behavior, both at the project site and within the adjacent habitat. The Corps predicts that construction will take approximately one year to complete.

Turbidity

Turbidity, while comparatively unimportant to benthic organisms in the ocean intertidal community, may be a relatively more important environmental factor in determining fish community structure. Suspended solids in water can affect fish populations by delaying the hatching time of fish eggs (Schubel and Wang 1973); by killing fish by coating and/or smothering the surfaces of fish eggs, and the gills of juvenile, or adult fish; and by creating anoxic conditions (O'Conner *et al.* 1976; Naqvi and Pullen 1982). Sherk *et al.* (1974) found that demersal fish are more tolerant of suspended solids than filter-feeding fish, resulting in a competitive advantage to demersal fish and a disadvantage to filter feeders. Temporary decreased water quality and increased turbidity in the marine nearshore subtidal zone could result from the actual beach creation activity (Minerals Management Service 2001). Sand particles suspended in the water column during the beach fill placement process are dense and fall quickly back to the benthic zone whereas the fine sediments stay in suspension longer than sand, only sinking slowly (Woodhead 1992). Less mobile invertebrate species would therefore be exposed to increased turbidity associated with the suspended sediment; nevertheless they are generally adapted to a highly turbid nearshore environment.

Localized turbidity plumes can have lethal and sublethal effects on benthic invertebrates and fish, including hematological compensation for reduced gas exchange across gill surfaces, and abrasion of epithelial tissue. A fish's gut can become packed with large quantities of solids ingested along with forage; it may have little nutritive value. Disruption of gill tissues (abrasion,

clogging, and/or increased activity of mucosa), and increased activity with a reduction of stored metabolic reserves (Profiles and Research Consulting Groups, Inc. 1980) are other potential adverse impacts from high levels of suspended solids. As previously stated, the project area serves as a nursery and feeding area (from April to November) for scup, bluefish, Atlantic silverside, menhaden, winter flounder, striped bass, and blackfish. Winter flounder are known to occur in the project area throughout the year, spawning during the winter months (January to March). While adult fishes are unlikely to be affected by project construction, planktonic life stages of species that may undergo a dormant phase in the near shore area would be unable to escape burial. The Service does not expect significant impacts to finfish due to their ability leave the area being affected by disturbance (Van Dolah *et al.* 1992).

Other effects of increases in turbidity include a decrease in light penetration, hampering fish which use sight as their primary means to detect prey; possible re-suspension of contaminants and nutrients; burial of non-motile eggs, larvae, and adults; and absorption of essential nutrients from the water column (Stern and Stickle 1978). Although, these impacts are detrimental to the fish and wildlife resources inhabiting the project area, they are unlikely to result in significant adverse impacts since the majority of sand will be placed and re-distributed in the upper portions (dune areas) of the beach. In addition, the Corps reported that the increased turbidity resulting from beachfill activities on the New Jersey shore of the Atlantic Ocean was negligible due to the natural dynamic nature of the shoreline, wave action, and currents (U.S. Army Corps of Engineers 2001).

Cumulative Impacts

As described in the Service's Mitigation Policy (40 CFR 1508.20), the Service must consider project impacts, including: (1) the total long-term biological impact of the project, including any secondary or indirect impacts regardless of location; and (2) any cumulative effects, when viewed in the context of existing or anticipated projects. The Council on Environmental Quality defined cumulative impacts (40 CFR 1508.7) as "the impacts on the environment which results from the incremental impacts of the action when added to other past, present and reasonably foreseeable future actions...."

The Service is not aware of any other proposed Federal or State projects within or adjacent to the south shore of Staten Island erosion control and storm damage reduction project area. Nevertheless, the Service has been made aware of a private development adjacent to the project area consisting of the development of approximately 2.19 acres of freshwater wetland habitat that should be included in the Corps' cumulative impacts analysis. As previously described, the area adjacent to the project area is heavily developed with commercial and residential infrastructure. This development has caused, and will continue to cause, numerous impacts to the natural resources of the south shore of Staten Island, some of which include the loss of wetland habitat, habitat fragmentation, degradation of habitats, and preclusion of habitat formation. The swell in residential and commercial development in the surrounding area has lead to a significant increase in storm-water run-off and shoreline hardening, both of which degrade wetland and maritime habitats. As discussed in the report's section on wetlands, the cumulative effects from historical losses of wetlands are significant. More information on the status and trends in wetlands of Staten Island can be found in Tiner (2000).

The Service recommends that the Corps provide total amounts by acreage of habitat likely to be affected by this project in the Draft EIS. In addition, the Corps should evaluate the cumulative impacts of its coastal erosion and shoreline protection program on migratory birds and wetlands, particularly those species and habitats of priority concern as established in various conservation plans that have been developed by local, State, and Federal agencies.

The Service believes that these cumulative impacts could be ameliorated with the inclusion of the mitigation recommendations (compensatory mitigation, habitat restoration, treatment of storm-water run-off, and habitat enhancement) provided in the following section of this report.

MITIGATION

As established in the preceding sections of this report, the proposed project is likely to result in adverse impacts to Federal trust wildlife species. This report has focused on the migratory birds and their habitats, primarily maritime beach and dune communities; and marine intertidal habitat. We also provide information on effects to tidal and freshwater wetlands which support species that are of conservation concern. We believe that the use of the proposed project area and adjacent habitats by these species and the potential impacts resulting from the proposed project are clear justifications for the Corps to include conservation measures in these overall project plans and to further evaluate fish and wildlife enhancement opportunities in the study area. Further, habitats in the proposed project area have also received special protection and status as critical conservation areas through the New York State Department of State designation as

Significant Fish and Wildlife Habitats and inclusion in the South Shore Estuary Reserve, warranting careful consideration of potential impacts, mitigation measures, and fish and wildlife enhancement opportunities.

The views and recommendations of the Service on this project are guided by its Mitigation Policy (U.S. Fish and Wildlife Service 1981). This policy seeks to mitigate losses of fish, wildlife, and their habitats, and uses thereof, from land and water developments. The Service's mitigation policy does not apply to the ESA and listed species that will be affected by the project. The term "mitigation" is defined as: (a) avoiding the impact altogether by not taking a certain action or parts of an action; (b) minimizing impacts by limiting the degree or magnitude of the action and its implementation; (c) rectifying the impact by repairing, rehabilitating, or restoring the affected environment; (d) reducing or eliminating impacts over time; and, (e) compensating for impacts by replacing or providing substitute resources or habitats.

The FWCA Report provides information on the proposed project's potential impacts on fish and wildlife resources, to assist the Corps in giving equal consideration of fish and wildlife in the planning of water resource development projects. In addition, the Corps now has an Environmental Program Authorities for environmental restoration within the Continuing Authorities Program, under Section 204 of the Water Resources Development Act (WRDA) of 1992 (P.L. 102-580) (WRDA) (Beneficial Use of Dredged Material); Section 1135 of WRDA of 1992 (PL), (Restoration of Environmental Quality); and Section 206 of WRDA of 1996 (P.L. 104-303) (Aquatic Ecosystem Restoration).

The proposed project may have direct adverse effects on waterbird and shorebird species of regional concern in the short-term and over the life of the project as identified in the report. The following provides strategies for avoiding, minimizing, or compensating impacts to fish and wildlife resources and their habitats in the proposed project area.

Maritime Beach

a) Access to the project beaches should be provided to the Service, the Corps, or their mutually agreed upon designated representatives, to survey and monitor waterbird and shorebird use areas. Access should be given during daylight hours on any day(s) of any given year at the required frequency to accomplish the purposes stated above.

b) The Service recommends that construction occurs during the autumn months to ensure that there is sufficient time for re-establishment of the essential infaunal prey base and breeding and loafing habitat for the spring time arrival of shorebirds.

c) The Corps should conduct annual maritime beach surveys in coordination with the Service during the months of March/April/May to determine the presence of State- and Federally-listed species, in particular, piping plover (*Charadrius melodus*), least tern (*Sterna antillarum*), common tern (*Sterna hirundo*), black skimmer (*Rynchops niger*), and seabeach amaranth (*Amaranthus pumilis*). These species may re-colonize an area where newly created beaches appear, and now potentially provide previously unavailable early successional habitat. If any of

these species are observed loafing, roosting, foraging, courting, nesting, or growing in the project area, the Corps will need to coordinate with the Service to ascertain whether further technical assistance or ESA section 7 consultation is warranted. At this time, we can assist the Corps and landowners in incorporating species recovery guidelines into the project.

d) The Corps should ensure that the beach sand is compatible with the sand that is now on the beach with respect to grain size, clay content, and organic matter.

e) If the dunes are to be planted with American beach grass, they should be planted 18 in. on center from the southern toe of the dune to the dune crest and to the northern toe of the dune. The Corps should also consult with the Service on a planting scheme with the potential for open areas in the dune. Such breaks in the vegetation are attractive for some shorebirds. The Corps should also consider incorporating other plant species into the planting scheme for the purposes of increasing plant diversity and heterogeneity in the proposed project area. Beach pea and seabeach knotweed are examples of native plants which might be considered.

Tidal and Freshwater Wetlands

The Service recognizes that part of the Corps' proposed project is the acquisition and preservation of approximately 260 acres of tidal and freshwater wetland habitat. Although the Service is encouraged with this portion of the project plan, there still remain some concerns regarding the quality of those wetland habitats for fish and wildlife resources and, over the long-

term, whether sufficient invasive plant monitoring and management has been factored into the project for a period of time commensurate with the life of the project. The following recommendations provide additional strategies for avoiding, minimizing, or compensating impacts to fish and wildlife resources and their habitats in the proposed project area.

a) The Service recommends the monitoring and maintenance of the preserved wetland habitats for the life of the project to ensure that the wetland habitats continue to provide the targeted functions and values. Once areas are re-stored to a predominance of native vegetation (see "c" below), the Corps should set performance criteria to be met and monitor to ensure that invasive species have not re-colonized the restored wetland areas. If performance criteria are not met, provisions need to be in place to ensure continued invasive species treatment.

b) The Service recommends an overall compensatory mitigation plan that provides a ratio of 1:1 to compensate for the conversion of vegetated wetlands to open water (pond) areas. Even though the existing wetlands areas may be considered degraded, the removal of approximately 85 acres of functioning habitat will result in adverse impacts to the species which use the habitat. We will support a proposal to perform 85 acres of compensatory mitigation in the form of acquisition of natural wetlands or restoration or enhancement of degraded wetlands, to offset the adverse impacts of the habitat conversion.

c) The Service recommends restoration of vegetation in the areas that will be excavated. The Service would like to see the invasive-dominated common reed ponds re-planted with native emergent and submerged/floating vegetative species,

such as freshwater eelgrass (*Vallisneria americana*), redhead grass (*Potamogenton perfoliatus*), rushes (*Juncus* spp.), skunk cabbage (*Symplocarpus foetidus*), cordgrass (*Spartina* spp.), bulrush (*Scirpus* spp.), sedges (*Carex* spp.), and spike rush (*Eleocharis* spp.). In addition, in less frequently flooded and/or upland areas, shrub species such as buttonbush (*Cephalanthus occidentalis*) should be planted. In total, all these species will provide food sources for waterfowl, migratory birds, and invertebrates.

d) The Service recommends that the Corps' analyze the potential for stocking native fish species (Families: Cyprinidae, Atherinidae, Gasterosteidae, Cyprinodontidae, and Centrarchidae) in the excavated pond areas in order to increase biodiversity and forage sources for waterfowl and mammalian species. Fish may also assist the mosquito control as in Open Water Marsh Management (OWMM). The Service can provide additional information on desirable fish species and OWMM.

e) The Service recommends the creation of public outreach material about maritime beach and the wetland habitats. We recommend development of signage reflecting species use, habitat importance, and potential public involvement in conservation. The Service would be willing to assist the Corps in this endeavor.

f) The Service recommends that the Corps explore methods to address the quality of water (storm-water) input into the wetlands that are adjacent to roads, in the project area.

SUMMARY OF FINDINGS AND SERVICE POSITION

The proposed project will impact marine and terrestrial communities, as well as wetland areas, resulting in the elimination and disturbance of invertebrate, vertebrate, and vegetative inhabitants of the maritime beach, dune communities, and freshwater wetlands, which, in some cases, support species or habitats which have been identified in Service's (1997) Significant Habitat Complexes document as highly imperiled or a high priority concern in the region. However, implementation of the mitigation measures provided in this report could assist the Corps in offsetting the proposed project's potential adverse impacts. We recommend that the Corps use resource information to guide appropriate design and construction approaches. Overall, we believe that project implementation, coupled with adoption of our recommendations, has the potential to result in positive effects to the aquatic ecosystem.

FISH AND WILDLIFE ENHANCEMENT OPPORTUNITIES

The Service recommends that the Corps develop construction techniques and approaches which will assist in creating optimal habitats for the avifauna species discussed in this report. This should not be considered single species management, as the health of these species depends in large measure on ecosystems which are functioning as closely to a natural condition as possible. As one example, the Corps can collect information on the physical and environmental characteristics of existing shorebird and waterbird breeding habitat in the proposed project area, and look to replicate those conditions elsewhere in the project area in order to make the constructed beaches, dunes, and wetlands more attractive to those species.

The Service recommends that the Corps participate throughout this project in the protection, enhancement, and restoration of adjacent wetland habitats which support breeding and non-breeding birds, as well as fish and invertebrates. The Service is interested in pursuing these and other fish and wildlife enhancement opportunities in the proposed study area, and is willing to extend the FWCA consultation under a separate SOW to address these ideas in more detail.

LITERATURE CITED

Andrle, R.F. and J.R. Carroll. 1988. The Atlas of Breeding Birds in New York State. Cornell University Press, Ithaca, NY.

Azous, A. 1991. An Analysis of Urbanization Effects on Wetland Biological Communities. Master's Thesis, University of Washington. Published by the Puget Sound Wetlands and Stormwater Management Research Program.

Berg, D.L. and J.S. Levinton. 1985. The Biology of the Hudson-Raritan Estuary, with Emphasis on Fishes. NOAA Technical Memorandum NOS OMA-16. 170 pp.

Burger, J., and M. Gochfeld. 1991. Human Activity Influence and Diurnal and Nocturnal Foraging of Sanderlings (*Calidris alba*). *The Condor* 93: 259-265.

Burlas, M. G.L. Ray, and D. Clarke. 2001. The New York Districts Biological Monitoring Program for the Atlantic Coast of New Jersey, Asbury Park to Manasquan Section Beach Erosion Control Project. Final Report. U.S. Army Engineer District, New York and U.S. Army Engineer Research and Development Center, Waterways Experiment Station.

Byrnes, M.R., R.M. Hammer, T.D. Thibaut, and D.B. Snyder. 2004. Effects of Sand Mining on Physical Processes and Biological Communities Offshore New Jersey, U.S.A. *Journal of Coastal Research* 20: 25-43.

Cerrato, R.M., H.J. Bokuniewicz, and M.H. Wiggins. 1989. A Spatial and Seasonal Study of the Benthic Fauna of the Lower Bay of New York Harbor. Marine Science Research Center, State University of New York, Stony Brook, NY. Special Report 84, Reference No. 89-1. 108 pp.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of Wetlands and Deepwater Habitats of the United States. U.S. Department of the Interior, Fish and Wildlife Service, Biological Services, Washington, DC.

CZR, Inc. 2003. Waterbird and Shorebird Use at Ocean Island Beach in Brunswick County, North Carolina – December 2001-November 2002. Prepared for U.S. Army Corps of Engineers, Wilmington District, Wilmington, NC. Contract Number DACW 54-97-D-0028.

Dugan, J.E., D.M. Hubbard, M.D. McCrary, and M.O. Pierson. 2003. The Response of Macrofauna Communities to Macrophyte Wrack Subsidies on Exposed Sandy Beaches of Southern California. *Estuarine Coastal and Shelf Science* 58S: 133-148.

Figley, W. and T. McCloy. 1988. New Jersey's Recreational and Commercial Fishing Grounds of Raritan Bay, Sandy Hook Bay and Delaware Bay and the Shellfish Resources of Raritan Bay and Sandy Hook Bay. Tech. Ser. 88-1, N.J. Department of Environmental Protection, Division of Fish, Game and Wildlife, Marine Fisheries Administration, CN 400, Trenton, NJ. 39 pp.

Gorzelany, J.F. and W. Nelson. 1987. The Effects of Beach Replenishment on the Benthos of a Sub-Tropical Florida Beach. Department of Oceanography and Ocean Engineering, Florida Institute of Technology, Melbourne, FL.

Hurme, A.K., and E.J. Pullen. 1988. Biological Effects of Marine Sand Mining and Fill Placement for Beach Replenishment. *Marine Mining* (7): 123-136.

Lindquist, N., and L. Manning. 2001. Impacts of Beach Nourishment and Beach Scraping on Critical Habitat and Productivity of Surf Fishes. Final Report to the North Carolina Fisheries Resource Grant Program. 41 pp. plus appendices.

Minerals Management Service. 2001. Final Report Development and Design if Biological and Physical Monitoring Protocols to Evaluate the Long-Term Impacts of Offshore Dredging Operations on the Marine Environment. Prepared for the U.S. Department of the Interior, Minerals Management Service, International Activities and Marine Minerals Division Under Contract No. 14-35-0001-31051. 166 pp. plus Appendix.

Naqvi, S.M., and E.J. Pullen. 1982. Effects of Beach Nourishment and Borrowing on Marine Organisms. Fort Belvior: U.S. Army Corps of Engineers, Coastal Engineering Research Center. MR 82-14.

Mitsch, W.T., and J.G. Gosselink. 1986. Wetlands. Van Nostrand Reinhold Company, New York, NY.

New York State Department of Environmental Conservation. 2003a. List of Endangered, Threatened and Special Concern Fish and Wildlife Species of New York State.

New York State Department of Environmental Conservation. 2003b. New York State Amphibian and Reptile Atlas Project 1990-1998.

New York State Department of Environmental Conservation. 2003c. Peregrine Falcon Fact

Sheet.

New York State Department of Environmental Conservation. 2004. New York State Breeding Bird Atlas 2000-2004.

NWTC. 1979. Scientists' Report: The National Symposium on Wetlands Lake Buena Vista, Florida, November 6-9, 1978, ed. J. Clark and J. Clark. National Wetlands Technical Council.

O'Conner, J.M., D.A. Neumann, and J.A. Sherk, Jr. 1976. Lethal Effects of Suspended Sediments on Estuarine Fish. TP 76-20.

Parr, T., E. Diener, and S. Lacy. 1978. Effects of Beach Replenishment on Nearshore Sand Fauna at Imperial Beach, California. Fort Belvior: U.S. Army Corps of Engineers, Coastal Engineering Research Center. MR-74.

Peterson, C.H., and L. Manning. 2001. How Beach Nourishment Affect the Habitat Value of Intertidal Beach Prey for Surf Fish and Shorebirds and Why Uncertainty Still Exists. *Proceedings of the Coastal Ecosystems and Federal Activities Technical Training Symposium*, August 20-22, 2001. 2 pp.

Pfister, C., B.A. Harrington, and M. Lavine. 1992. The Impact of Human Disturbance on Shorebirds at a Migration Staging Area. *Biological Conservation* (60): 115-126.

Profiles and Research Consulting Groups, Inc. 1980. Seasonal Restrictions on Dredging Projects by NMFS in the Northeast. Volume 1. Prepared for the National Marine Fisheries Service under Contract SB 1408(a) -79-C-169.

Reid, R.N., D.J. Rodosh, A.B. Frame, and S.A. Fromm. 1991. Benthic Macrofauna of New York Bight 1979-1989. NOAA Technical Report, NMFS 103. 50 pp.

Reilly, F., and V.J. Bellis. 1978. A Study of the Ecological Impact of Beach Nourishment with Dredged Materials on the Intertidal Zone. Inst. For Coastal and Marine Resources, East Carolina University Technical Report No. 4. East Carolina University, Greenville, NC.

Ruhlen, T.D., S. Abbott, L.E. Stenzel, and G.W. Page. 2002. Evidence that Human Disturbance Reduces Snowy Plover Chick Survival. *Journal of Field Ornithology* 74(3): 300-304.

Schubel, J.R., and D.P. Wang. 1973. The Effects of Suspended Sediment in Northern Chesapeake Bay. Power Technology 6: 9-16.

Sherk, J.A., J.M. O'Conner, and D.A. Neumann. 1974. Effects of Suspended and Deposited Sediments on Estuarine Organisms, Phase II. Reference No. 74-02, National Research Institute, Solomons, MD.

Stern. E.M., and W.B. Stickle. 1978. Effects of Turbidity and Suspended Material in Aquatic Environments. Vicksburg: U.S. Army Corps of Engineers, Waterways Experiment Station. Technical Report D-78-21.

Tiner, R.W. 2000. Wetlands of Staten Island, New York. Valuable Vanishing Urban Wildlands. U.S. Fish and Wildlife Service, Ecological Services, Northeast Region, Hadley, MA. 19 pp.

U.S. Army Corps of Engineers. 1976. General Design Memorandum No. 1 – Fort Wadsworth to

Great Kills Park, Fort Wadsworth to Arthur Kill Project, Staten Island, New York.

U.S. Army Corps of Engineers. 1995. South Shore of Staten Island, New York. Beach Erosion Control and Storm Damage Protection Reconnaissance Study. U.S. Army Corps of Engineers, New York District, New York, NY. 78+ pp.

U.S. Army Corps of Engineers. 1998. Atlantic Coast of Long Island New York, Jones Inlet to East Rockaway Inlet, Long Beach Island, New York, Final Feasibility Report with Final Environmental Impact Statement. U.S. Army Corps of Engineers, New York District, New York, NY. 89 pp.

U.S. Army Corps of Engineers. 2001. The New York District's Biological Monitoring Program for the Atlantic Coast of New Jersey, Asbury Park to Manasquan Section Beach Erosion Control Project Final Report. Engineer Research and Development Center, Waterways Experiment Station, Vicksburg, MS.

U.S. Army Corps of Engineers. 2002. South Shore of Staten Island Feasibility Study, Draft Preliminary Alternatives Report. U.S. Army Corps of Engineers, New York District, New York, NY. 81+ pp.

U.S. Army Corps of Engineers. 2004a. (Supplement to) South Shore of Staten Island Feasibility Study, Line of Protection and Interior Drainage Alternatives Report. U.S. Army Corps of Engineers, New York District, New York, NY. 46 pp.

U.S. Army Corps of Engineers. 2004b. Year 2 Recovery from impacts of Beach Nourishment and Surf Zone Fish and Benthic Resources on Bald Head Island, Caswell Beach, Oak Island, and Holden Beach, North Carolina – Final Study Findings. Prepared for U.S. Army Corps of Engineers, Wilmington District, Wilmington, NC. Contract No. DACW54-00-D-0001.

U.S. Army Corps of Engineers. 2005. Preliminary Draft Environmental Impact Statement for the South Shore of Staten Island Beach Erosion Control and Storm Damage Reduction Project. U.S. Army Corps of Engineers, New York District, New York, NY.

U.S. Fish and Wildlife Service. 1981. U.S. Fish and Wildlife Service Mitigation Policy. U.S.

Department of the Interior, Washington, DC. Federal Register v.46 n.15. pp. 7644-7663.

U.S. Fish and Wildlife Service. 1992. Planning Aid Report. Raritan Bay-Sandy Hook Bay Reconnaissance Study: Fish and Wildlife Resources. 135 pp.

U.S. Fish and Wildlife Service. 1995. Fish and Wildlife Coordination Act Section 2(b) Report, Atlantic Coast of Long Island, Jones Inlet to East Rockaway Inlet, Long Beach Island, New York, Storm Damage Reduction Project. U.S. Fish and Wildlife Service, Long Island Field Office, Islip, NY. 32 pp.

U.S. Fish and Wildlife Service. 1997. Significant Habitat Complexes of the New York Bight Watershed. U.S. Fish and Wildlife Service, Southern New England - New York Bight Coastal Ecosystems Program, Charlestown, RI.

U.S. Fish and Wildlife Service. 2002. Biological Opinion on the Effects of Beach Nourishment and Restoration Activities Townsend Inlet to Hereford Inlet, Cape May County, New Jersey on the Piping Plover and Seabeach Amaranth. U.S. Fish and Wildlife Service, New Jersey Field Office, Pleasantville, NJ.

Van Dolah, R.F., P.H. Wendt, R.M. Martore, M.V. Levisen, and W.A. Roumillat. 1992. A Physical and Biological Monitoring Study of the Hilton Head Beach Nourishment Project. Unpublished Report Prepared by South Carolina Wildlife & Marine Resources Department for Town of Hilton Head Island, SC. *In* Greene, K. 2002. Beach Nourishment: A Review of the Biological and Physical Impacts. Atlantic States Marine Fisheries Commission Habitat Management Series #7, Washington, DC.

Woodhead, P.M.J. 1992. *Assessments of the Fish Community and Fishery Resources of the Lower New York Bay Area in relation to a Program of Sand Mining Proposed by New York State*. Stony Brook: Marine Sciences Research Center, SUNY at Stony Brook, NY.

Attachment B

U.S. Army Corps Engineers Comments on Draft Planning Aide Letter

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

September 9, 2015

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

Subject: South Shore of Staten Island Coastal Storm Risk Management Project

Dear Mr. Stilwell:

The U.S. Army Corps of Engineers New York District (District) received the U.S. Fish and Wildlife Service's (Service) Draft Planning Aid Letter (PAL) for the South Shore of Staten Island (SSSI) Coastal Storm Risk Management Project, Phase 1 - Fort Wadsworth to Oakwood Beach, dated 27 March 2015.

The District has reviewed the PAL and in coordination with Mr. Steven Sinkevich of your Long Island Field Office has incorporated five of the six Service Recommended Conservation Measures from the PAL into the SSSI Project, including 1) burial of the exposed seawall, 2) planting of wetland vegetation/increase in diversity in excavated wetland and upland areas, 3) monitoring and maintenance of all restored wetlands, 4) restoration of some wetlands not originally proposed for excavation (in the form of a buffer area around the areas originally proposed for excavation and 5) providing the results of sampling for contaminants that will be conducted during the Planning, Engineering and Design (PED) phase of the project. The only Recommended Conservation Measure that the District was not able to incorporate is the construction of bio-filtration basins/swales in upland areas to provide primary treatment of storm water run-off. This measure would have required acquisition of additional land and therefore greatly increased the project cost. In addition, this measure to pre-treat run off for water quality purposes would have been too far outside of the authorized scope of the project.

The PAL also noted the Service's position that mitigation for the acres of wetland filled from construction of the Line of Protection (LOP) will be achieved through the project feature to excavate upland areas supporting interior drainage, which includes the removal of invasive non-native vegetation, the seeding and planting of native wetland vegetation and the creation of emergent wetlands.

The draft Feasibility Study and draft Environmental Impact Statement for the South Shore of Staten Island Coastal Storm Risk Management Project are currently in the public review period.

In response to public request, the public review period (originally 45 days) was extended an additional 30 days, and will now close on 9 September 2015.

Enclosed is the District's Endangered Species Act (ESA) determination and assessment for Red Knot (*Calidris canutus rufa*) and Northern Long-Eared Bat (*Myotis septentrionalis*) to fulfill Section 7 consultation under the ESA of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq).

The District determined that because the proposed construction of the LOP and interior drainage project features are outside of the potential habitat suitable for red knot foraging, those project features will not affect red knot. Construction of the tidal wetland at Oakwood Beach project feature "May Affect but is not Likely to Adversely Affect" the red knot. Additionally, the District finds that construction of the recommended alternative for the SSSI project "May Affect but is not Likely to Adversely Affect" the northern long-eared bat.

The District looks forward to continuing to work with you and your staff on this effort. If you should have any questions, please contact Ms. Catherine J. Alcoba of my staff at 917-790-8216.

Sincerely,

Peter Weppler
Chief, Environmental Analysis Branch

cc: USFWS, LI Field Office

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
GREATER ATLANTIC REGIONAL FISHERIES OFFICE
55 Great Republic Drive
Gloucester, MA 01930-2276

OCT 13 2015

Mr. Peter Weppler
Chief, Environmental Analysis Branch
New York District, U.S. Army Corps of Engineers
Jacob K. Javits Federal Building
26 Federal Plaza
New York, New York 10278-0090

RE: Draft Environmental Impact Statement for the South Shore Staten Island, New York Beach Erosion Control and Storm Damage Reduction Project

Dear Mr. Weppler:

We have reviewed the draft Environmental Impact Statement for the South Shore Staten Island, New York Beach Erosion Control and Storm Damage Reduction Project. The primary goal of the project is to manage the risk of damages from coastal storm flooding. The project area is located in the Borough of Staten Island, Richmond County, New York, and generally extends along the shoreline from Fort Wadsworth to Oakwood Beach. The selected plan includes a line of protection (LOP) that would consist of a buried seawall/armored levee along a majority of the Fort Wadsworth – Oakwood Beach reach serving as the first line of defense against severe coastal surge flooding and wave forces. The remainder of the LOP would consist of a T-Type vertical floodwall and levee. In the Oakwood Beach area, a mosaic of habitats including tidal wetlands, maritime forest/scrub shrub habitat, low marsh, high marsh and living shorelines would be enhanced. The LOP would also include a closure structure at Hylan Boulevard, drainage control structures for existing stormwater outfalls, tide gate structures, vehicle and pedestrian access structures, and the demolition of the existing boardwalk. The plan also provides for interior flood control, consisting of tide gates, sluice gates, stormwater outfall structures, road raisings, and 10 excavated ponds.

The Magnuson-Stevens Fishery Conservation and Management Act (MSA) requires federal agencies, such as the Corps to consult with us on any action or proposed action authorized, funded, or undertaken by such agency that may adversely affect EFH identified under the MSA. This process is guided by the requirements of our EFH regulation at 50 CFR 600.905, which mandates the preparation of EFH assessments and generally outlines each agency's obligations in the consultation process. In turn, we must provide recommendations to protect and conserve EFH. These recommendations may include measures to avoid, minimize, mitigate, or otherwise offset adverse effects on EFH resulting from actions or proposed actions authorized, funded, or undertaken by that agency.

We have been coordinating with you on this project for the several years. As a result of your October 31, 2014, letter outlining project updates and modifications, we recommended that the previous EFH assessment be updated to address the changes to the project. We have reviewed the updated EFH assessment submitted in January 2015, as well as the supplemental information provided in February 2015. Based upon this information and our meeting in March 2015 to discuss the project, it was determined that the only portions of the project may affect aquatic resources or EFH are the wetland enhancement work and the installation of the tide gates and slide gates. The work proposed in these areas will have a minimal impact to EFH, and the proposed best management practices to minimize turbidity using turbidity curtains and other methods will further reduce the adverse effects. The proposed wetland enhancement by restoring and improving tidal exchange will outweigh the impacts created by the tide gates and slide gates, provided that the gates are operated in a manner that does not preclude tidal exchange and fish access. It will also restore and enhance essential fish habitat (EFH) for a number of federally managed species including summer flounder (*Paralichthys dentatus*), bluefish (*Pomatomus saltatrix*) and their prey species. As a result, EFH conservation recommendations are not needed to minimize adverse effects to EFH.

Because the exact design of the wetlands and the extent of work needed to accomplish the project goals of enhancing the tidal exchange to the acres projected is not fully developed at this time, we will continue to work with you as project plans for the habitat enhancement actions are finalized to minimize any temporary impacts that may occur during project construction. Please also note that a distinct and further EFH consultation must be reinitiated pursuant to 50 CFR 600.920(l) if new information becomes available or the project is revised in such a manner that affects the basis of our EFH determination.

We support your efforts to develop a comprehensive storm damage reduction plan for the south shore of Staten Island and we look forward to continued coordination on this project.

Sincerely,

Karen Greene
Mid-Atlantic Field Office Supervisor

cc: Dan Marrone, PRD

Hi Jay,

Please include this email below on our EIS pertinent correspondence to document no further ESA coordination with NOAA is required.

Thanks,
Kate

-----Original Message-----
From: Gallo, Jenine NAN02
Sent: Thursday, October 22, 2015 3:33 PM
To: Alcoba, Catherine J NAN02 <Catherine.J.Alcoba@usace.army.mil>
Subject: RE: [EXTERNAL] Re: SSSI - Sect 7 consult? (UNCLASSIFIED)

Classification: UNCLASSIFIED
Caveats: NONE

We'll add this em into our responses for SSSI.

-----Original Message-----
From: Daniel Marrone - NOAA Federal [mailto:daniel.marrone@noaa.gov]
Sent: Thursday, October 22, 2015 3:27 PM
To: Gallo, Jenine NAN02
Cc: Alcoba, Catherine J NAN02
Subject: Re: [EXTERNAL] Re: SSSI - Sect 7 consult? (UNCLASSIFIED)

Yes, that works. Thanks.

On Thu, Oct 22, 2015 at 3:17 PM, Gallo, Jenine NAN02 <Jenine.Gallo@usace.army.mil> wrote:

> Classification: UNCLASSIFIED
> Caveats: NONE
>
> Dan- we will need to incl. your em response into our final report for it to be approved by our HQ as proof of our closing the ESA Section 7 loop - is that ok with you/NOAA?
>
> JG
>
> -----Original Message-----
> From: Daniel Marrone - NOAA Federal [mailto:daniel.marrone@noaa.gov]
> Sent: Thursday, October 22, 2015 3:07 PM
> To: Gallo, Jenine NAN02
> Cc: Alcoba, Catherine J NAN02
>
> Subject: Re: [EXTERNAL] Re: SSSI - Sect 7 consult? (UNCLASSIFIED)
>
> Hi Jenine,

I don't think a response to our letter is necessary. I will save this email exchange with the record and that will be all the documentation we need. Do you need anything else from us?
Dan

On Thu, Oct 22, 2015 at 2:56 PM, Gallo, Jenine NAN02 <Jenine.Gallo@usace.army.mil> wrote:

Classification: UNCLASSIFIED
Caveats: NONE

Hi Dan, thank you for your quick response. It really helps since our schedule has us submitting this report to HQ by December!

How do you prefer we respond to your letter (see attached)? Thx- JG

-----Original Message-----
From: Daniel Marrone - NOAA Federal [mailto:daniel.marrone@noaa.gov]
Sent: Thursday, October 22, 2015 2:52 PM
To: Gallo, Jenine NAN02
Cc: Alcoba, Catherine J NAN02
Subject: [EXTERNAL] Re: SSSI - Sect 7 consult? (UNCLASSIFIED)

Hi Jenine,
It was not me who reviewed and commented on this so I was a little confused but I believe I figured it out. I went back and gave the EIS and our response a quick look. It looks to me that our response does not realize that there is no in-water work proposed for this project. Since there is no in-water work proposed, ESA-listed species under NMFS jurisdiction will not be exposed to any effects of the proposed project. Therefore, no ESA section 7 consultation is necessary.
Dan

On Thu, Oct 22, 2015 at 2:24 PM, Gallo, Jenine NAN02 <Jenine.Gallo@usace.army.mil> wrote:

Classification: UNCLASSIFIED
Caveats: NONE

Hi Dan- attached is a figure out of the South Shore Staten Island (SSSI) Feasibility report depicting the NED plan. All the work is upland, to be constructed with land based equipment.

We're not entirely clear about why NOAA-NMFS is concerned about ESA (turtles, sturgeon) - can you please advise? Thx- JG

Classification: UNCLASSIFIED
Caveats: NONE

Classification: UNCLASSIFIED
Caveats: NONE

Classification: UNCLASSIFIED
Caveats: NONE

Classification: UNCLASSIFIED
Caveats: NONE

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

October 30, 2014

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

Subject: **South Shore of Staten Island Coastal Storm Risk Management Project, Staten Island, New York**

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 risk management projects and studies in the Northeast. As part of the planning and implementation process for the South Shore of Staten Island Coastal Storm Risk Management Project, Staten Island, New York, the New York District will be completing the Feasibility Study and environmental compliance.

Your office last reviewed 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 2005. This letter is a request for your office to provide an update to the original EFH assessment. Please find attached the Essential Fish Habitat Assessment previously submitted as well as 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 Ms. Catherine Alcoba of my staff at 917-790-8216.

Sincerely,

Peter Weppler
Chief, Environmental Analysis Branch

Cc: Melissa Alvarez, NMFS Sandy Hook

Attachments

Alcoba, Catherine J NAN02

From: Alcoba, Catherine J NAN02
Sent: Tuesday, January 06, 2015 2:16 PM
To: 'Melissa Alvarez - NOAA Federal'
Subject: RE: [EXTERNAL] Re: SSSI EFH (UNCLASSIFIED)
Attachments: Final SSSI EFH 1-2015.pdf

Classification: UNCLASSIFIED
Caveats: NONE

Melissa,

Sorry for the delay getting back to you. The project details are still being finalized. We are still waiting to receive sponsor comments on the draft FS/EIS, however we still hope to release the updated document to NAD and the public later in January.

The EFH assessment, updated to reflect each of the project changes below, is attached.

Let me know if you have any questions to want to arrange a time to talk.

Thanks and happy new year!
Kate

Catherine J. Alcoba
Biologist
U.S. Army Corps of Engineers
New York District
26 Federal Plaza - Room 2145
New York, NY 10278-0090
Voice: 917-790-8216
Fax: 212-264-0961

-----Original Message-----
From: Melissa Alvarez - NOAA Federal [mailto:melissa.alvarez@noaa.gov]
Sent: Wednesday, November 05, 2014 8:53 AM
To: Alcoba, Catherine J NAN02
Subject: [EXTERNAL] Re: SSSI EFH (UNCLASSIFIED)

Kate,

Please update the EFH assessment to include changes. The original document is too old and we have nothing in the system or files here on it. Thanks.

Melissa D. Alvarez, PWS
Marine Habitat Resource Specialist
Habitat Conservation Division
National Marine Fisheries Service
James J. Howard Marine Sciences Laboratory
74 Magruder Rd.
Highlands, NJ 07732
(732) 872-3116 phone
(732) 872-3077 fax
melissa.alvarez@noaa.gov
http://www.greateratlantic.fisheries.noaa.gov/

On Fri, Oct 31, 2014 at 8:51 AM, Alcoba, Catherine J NAN02 <Catherine.J.Alcoba@usace.army.mil> wrote:

Classification: UNCLASSIFIED
Caveats: NONE

Hello Chris and Melissa,

NYD will soon be completing the Feasibility Study and Environmental Impact Statement for the South Shore of Staten Island (SSSI) Coastal Storm Risk Management Project.

Your office last reviewed an EFH report (attached) for SSSI in 2005. NYD requests that you provide an update to the original EFH assessment.

I will be sending you a current project description showing where the Line of Protection (LOP) is located, figures showing the individual interior drainage areas as well as the project plan sheets that are going through NYD review now. You will get a separate email from the AMRDEC Safe Access website with a onetime use password to access and download the files.

The project has LOP and interior drainage features like what your office reviewed in 2005, but has modifications such as:

1. Divided the original SSSI project into 2 phases
- Fort Wadsworth to Oakwood Beach (Phase I, focus of this coordination with NMFS)
- Great Kills Harbor to Crescent Beach and Annadale to Tottenville (Phase 2, will coordinate with you in the future) - NYD is re-evaluating this hydrologically separable area that previously did not have Federal and/or non-Federal interest

2. Moved the LOP landward at Oakwood Beach
- allowed the LOP to have a lower crest elevations
- gave opportunity for constructing natural/nature-based features as part of the overall solution to protect the Oakwood Beach area, the recommended alternative includes tidal wetland (seaward of the LOP) as a sustainable and resilient approach to attenuate coastal storm surge
- required additional interior drainage at Oakwood Beach (pond B)

3. Change from LOP with many different structure types/heights to a more uniform structure type/height
- was combination of buried seawall, sheet pile wall, rock revetment, earthen levee ranging from 17 to 28.5 ft NGVD
- now predominantly buried seawall with design crest elevation of 20.5 ft NGVD

4. Revised design water level elevations based on FEMA analysis

5. No in water construction equipment. Possible delivery of rock material via barge (could also be truck delivery).

Please let me know if there is any additional information that I can send you.

Thanks,
Kate

Catherine J. Alcoba

ESSENTIAL FISH HABITAT ASSESSMENT

COASTAL STORM RISK MANAGEMENT PROJECT

SOUTH SHORE OF STATEN ISLAND, NEW YORK

January 2015

TABLE OF CONTENTS

SECTION		PAGE
1.0	INTRODUCTION	1
2.0	PROJECT DESCRIPTION	3
	2.1 PROJECT AREA	3
	2.2 PROJECT DESCRIPTION	3
3.0	EXISTING ENVIRONMENT	14
4.0	SPECIES OVERVIEWS	17
	4.1 EFH-DESIGNATED SPECIES	17
	4.2 NON-EFH-DESIGNATED FISH AND SHELLFISH SPECIES	30
	4.3 PREY SPECIES	33
5.0	IMPACTS	36
	5.1 HABITAT IMPACTS	36
	5.2 DIRECT IMPACTS	37
	5.3 INDIRECT IMPACTS	41
6.0	CONCLUSION	44
7.0	REFERENCES	45

APPENDICES

APPENDIX	DESCRIPTION
Appendix A.	Detailed Plan Drawings of Proposed Project, Including Proposed Line of Protection and Interior Drainage Facilities, and Typical Cross-Section Figures

LIST OF FIGURES

FIGURE **PAGE**

Figure 1 - Location of Study Area for the South Shore of Staten Island.....2

Figure 2 - Overview of Line of Protection 4

Figure 3 – Levee Typical Section (Reach A-1) 5

Figure 4 -Levee Typical Section (Reach A-2).....6

Figure 5 – Floodwall Typical Section (Reach A-3) 7

Figure 6 –Buried Seawall Typical Section (Reach A-4) 8

Figure 7 – Typical Section of Stoplog Structure 7

Figure 8 - Typical Section Gate Chamber 9

Figure 9 - Typical Section Tide Gate.....10

Figure 10 -Typical Plan View of Pond 13

Figure 11 - Geographic Features Pertinent to Essential Fish Habitat Along the Atlantic Coast……..…18

LIST OF TABLES

TABLE **PAGE**

Table 1. EFH Designated Fish, Skate, and Shark Species and Life History Stages in the Project Area.....19

Table 2. Prey Species for EFH-Designated Fish Species. 33

Table 3. Benthic Invertebrate Species Collected at Princess Bay, New York in 2002.....35

Table 4. Potential Impacts on EFH-Designated Species in the Project Area. 38

Table 5. Potential Impacts on Non-EFH Designated Species with Commercial and/or Recreational Value in the Project Area. 42

ABBREVIATIONS AND ACRONYMS

°C	degrees Celsius
councils	regional fishery management councils
CSO	combined sewer overflow
District	New York District
DO	Dissolved oxygen
EFH	Essential Fish Habitat
ft	feet
HRE	Hudson-Raritan Estuary
MFCMA	Magnuson-Stevens Fishery Conservation and Management Act
mg/l	milligrams per liter
MLW	mean low water
mm	millimeter
NEFMC	New England Fisheries Management Council
NGVD	National Geodetic Vertical Datum
NOAA	National Oceanic and Atmospheric Administration
NOAA Fisheries	National Oceanic and Atmospheric Administration – Fisheries
NYC	New York City
NYSDEC	New York State Department of Environmental Conservation
ppm	parts per million
ppt	parts per thousand
USACE	U.S. Army Corps of Engineers
USDOC	U.S. Department of Commerce
USFWS	U.S. Fish and Wildlife Service
WWTP	Waste Water Treatment Plant
YOY	Young-of-the-year

1.0 INTRODUCTION

In accordance with the Magnuson-Stevens Fishery Conservation and Management Act (MFCMA), this assessment identifies the potential impacts of the United States Army Corps of Engineers (USACE), New York District's (District's), proposed Coastal Storm Risk Management Project (Project) on designated Essential Fish Habitat (EFH) along the southern Staten Island shoreline, New York (Figure 1). The MFCMA, as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267), set forth several new mandates for the U.S. Department of Commerce (USDOC), the National Oceanic and Atmospheric Administration – Fisheries (NOAA Fisheries), regional fishery management councils (councils), and other Federal agencies to identify and protect important marine and anadromous fish habitat. Although the concept of EFH is similar to "critical habitat" under the Endangered Species Act of 1973, measures recommended to protect EFH are advisory, rather than prescriptive.

The councils, with assistance from NOAA Fisheries, 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 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 food 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 NOAA Fisheries regarding the potential effects of their actions on EFH. According to USDOC (2014), the contents of an EFH assessment should include:

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

This EFH assessment includes:

- A description of proposed Coastal Storm Risk Management activities in the southern Staten Island shoreline project area (Project Area);
- A description of the existing environment in the Project Area;
- A listing of EFH-designated species for the Project Area;
- Information relating to the habitat suitability and relative abundance of EFH-designated species and life history stages in the Project Area;
- A summary of the diets of EFH species (i.e., prey species) in the Project Area;
- A summary of available survey data for benthic prey species in the vicinity of the Project Area;

- An analysis of the potential impacts of Project activities on EFH-designated species and species of special interest; and,
- An analysis of the direct, indirect, cumulative, and synergistic impacts as a result of Project activities.

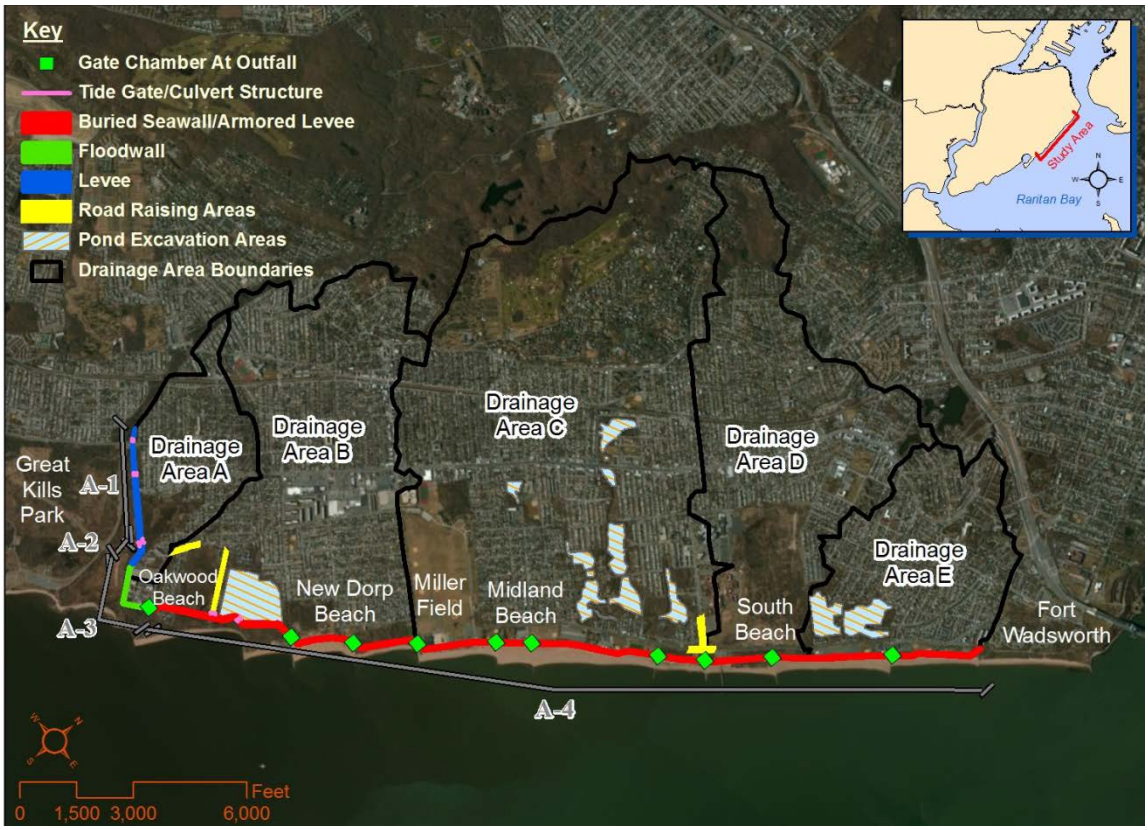


Figure 1 - Location of Study Area for the South Shore of Staten Island

Coastal Storm Risk Management Feasibility Study

2.0 PROJECT DESCRIPTION

2.1 PROJECT AREA

The proposed Project consists of the construction of measures to provide coastal storm risk management for the southern Staten Island shoreline. The proposed Project area is located on the eastern side of the south shoreline of Staten Island, NY and encompasses a reach approximately 5.5 miles long from Fort Wadsworth to Oakwood Beach. The principal neighborhoods along the study reach from east to west are South Beach, Midland Beach, New Dorp Beach, and Oakwood Beach. The study limit is bound inland by natural high ground approximately one mile from the shoreline. The study area lies within the political boundary of the 11th Congressional District of New York. (USACE 2014).

2.2 PROJECT DESCRIPTION

This section provides a brief description of the various structural coastal storm risk management measures proposed by the District for the southern Staten Island shoreline. Measures planned for the southern Staten Island shoreline generally include construction of levee, flood walls and seawalls. Figures depicting the proposed Project in detail are provided in Appendix A.

2.2.1 Line of Protection

The NED Plan includes the Line of Protection Alternative that consists of a buried seawall/armored levee along a majority of the reach (approximately 80%) serving as the first line of defense against severe coastal surge flooding and wave forces. The remainder of the Plan consists of a T-Type Vertical Floodwall, and Levee. The Plan also includes a stoplog closure structure at Hylan Boulevard, drainage control structures for existing storm water outfalls, tide gate structures, vehicle and pedestrian access structures. In general the Plan structure was split into four engineering reaches based on different design sections as listed below and depicted in Figure 2:

- Reach A-1: Levee
- Reach A-2: Levee
- Reach A-3: Floodwall
- Reach A-4: Buried Seawall

Figure 2 - Overview of Line of Protection

Alignment

Starting in Oakwood Beach in Reach A-1, the earthen levee with a 10-foot wide crest ties into high ground on the northwest side of Hylan Boulevard. A stop-log structure, consisting of H-shaped posts that accommodate the stacking of metal panels, is proposed at Hylan Boulevard to prevent floodwaters from flanking the levees during rare high water events. The earthen levee continues southeast through Oakwood Beach parallel to Oakwood Creek and Buffalo Street until the levee crosses over Oakwood Creek. A tide gate structure is proposed at this location. The total length of this Reach A-1 is 2,800 ft.

Reach A-2 begins on the eastern side of the creek and includes a levee that extends approximately 600 feet up to the Oakwood Beach Waste Water Treatment Plant (WWTP).

In Reach A-3 the Line of Protection transitions to a Vertical T-type Floodwall surrounding two sides of the WWTP at Oakwood Beach. The total length of the floodwall is 1,800 feet.

Reach A-4 extends 22,700 feet from the southeast corner of the WWTP to Fort Wadsworth. In previous alternatives Reach 4 consisted of a mixture of exposed armor stone revetments, buried seawalls, and vertical steel sheet pile flood walls. The structure was revised to a continuous buried seawall. The alignment of the buried seawall through Oakwood Beach deviates from previously developed alternatives, extending across a portion of the Fox Beach neighborhood that is being environmental restored as part of the State of New York's Bluebelt Plan. The alignment continues across the marshes of Oakwood Beach and past Kissam Ave. The alignment in this marshy area is landward of New York City's sanitary sewer trunk line to the WWTP. A service road is proposed along the seaward edge of the buried seawall to facilitate access to the trunk line. A bend in the alignment occurs at the eastern end of Oakwood Beach to accommodate a second proposed tide gate structure.

From Midland Beach to Fort Wadsworth the alignment generally follows the footprint of the existing promenade and FDR Boardwalk. There are a few exceptions where the alignment was shifted landward to maintain a protective buffer between the shoreline and buried seawall/armored levee. This is most noticeably at the eastern end of the project area where the beach narrows. The buried seawall/armored levee ties-in to high ground at Fort Wadsworth. The buried seawall/armored levee in this reach extends 22,700 feet from the Oakwood Beach to Fort Wadsworth.

Levee

An 3,415-foot long earthen levee is proposed in Reaches A-1 and A-2 to terminate the structures in the LOP plan into high ground, thereby creating a closed system that protects the project area from floodwaters. The proposed levee in Reach A-1 and A-2 has a crest elevation of 18 foot NGVD29. The proposed Levee consists of compacted impervious fill that extends a minimum of 6 feet below the existing ground surface to prevent seepage. Common fill would be placed at a 2.5H:1V slope to stabilize the core and provide a solid basis for vegetation. The Levee along Reach A-1 has a crest width of 10 feet. The crest width of the A-2 Levee section (approximately 615 feet) was increased to 15 feet to allow maintenance vehicle access to the tide gates. Figure 3 presents a typical section of the Levee in Reach A-1. Figure 4 presents a typical section for the levee in reach A-2.

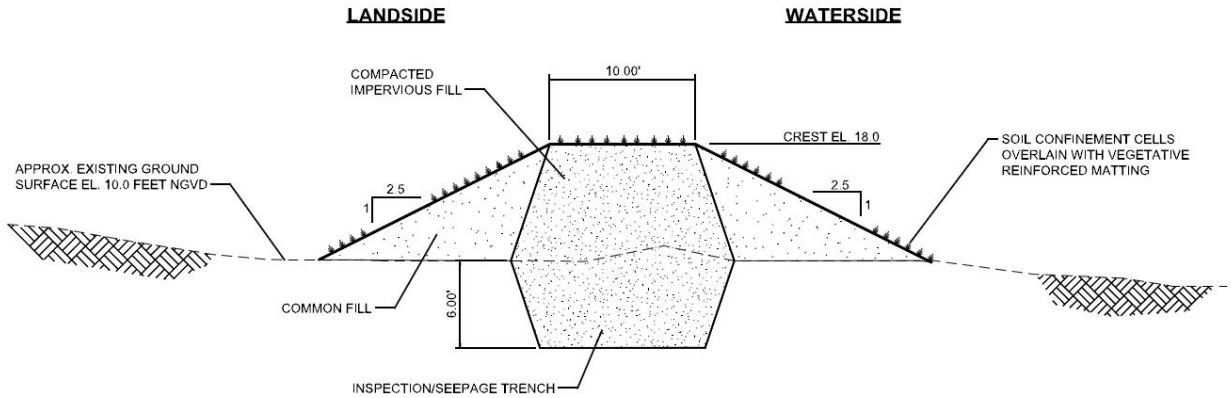


Figure 3 – Levee Typical Section (Reach A-1)

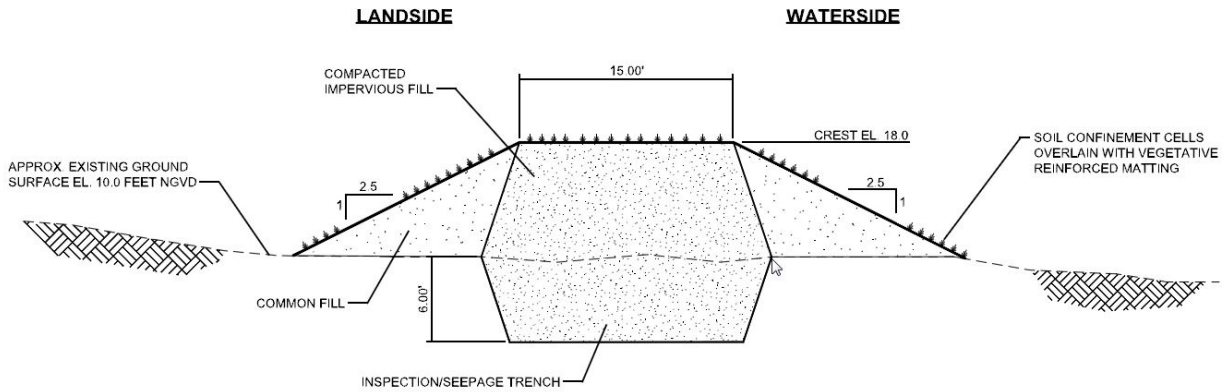


Figure 4 -Levee Typical Section (Reach A-2)

Floodwall

A reinforced concrete floodwall was proposed for Reach A-3 where a confined footprint is necessary to minimized impacts to the Oakwood Beach WWTP. The floodwall design consists of an H-pile supported T-wall with top of wall elevation of 20.5 feet NGVD29.

The structure footing was designed to accommodate localized wave induced and overtopping jet scour by defining a 4-foot thick base set 2-feet below grade. In addition, a rock blanket extends 15-foot seaward side of the wall to address wave scour and a rock splash apron extends 10 to 15 feet landward from the concrete footing to provide adequate overtopping jet scour protection. A vertical steel sheet pile wall has been added beneath the wall to prevent seepage below the footing. Figure 5 presents a typical section of the Floodwall (Reach A-3).

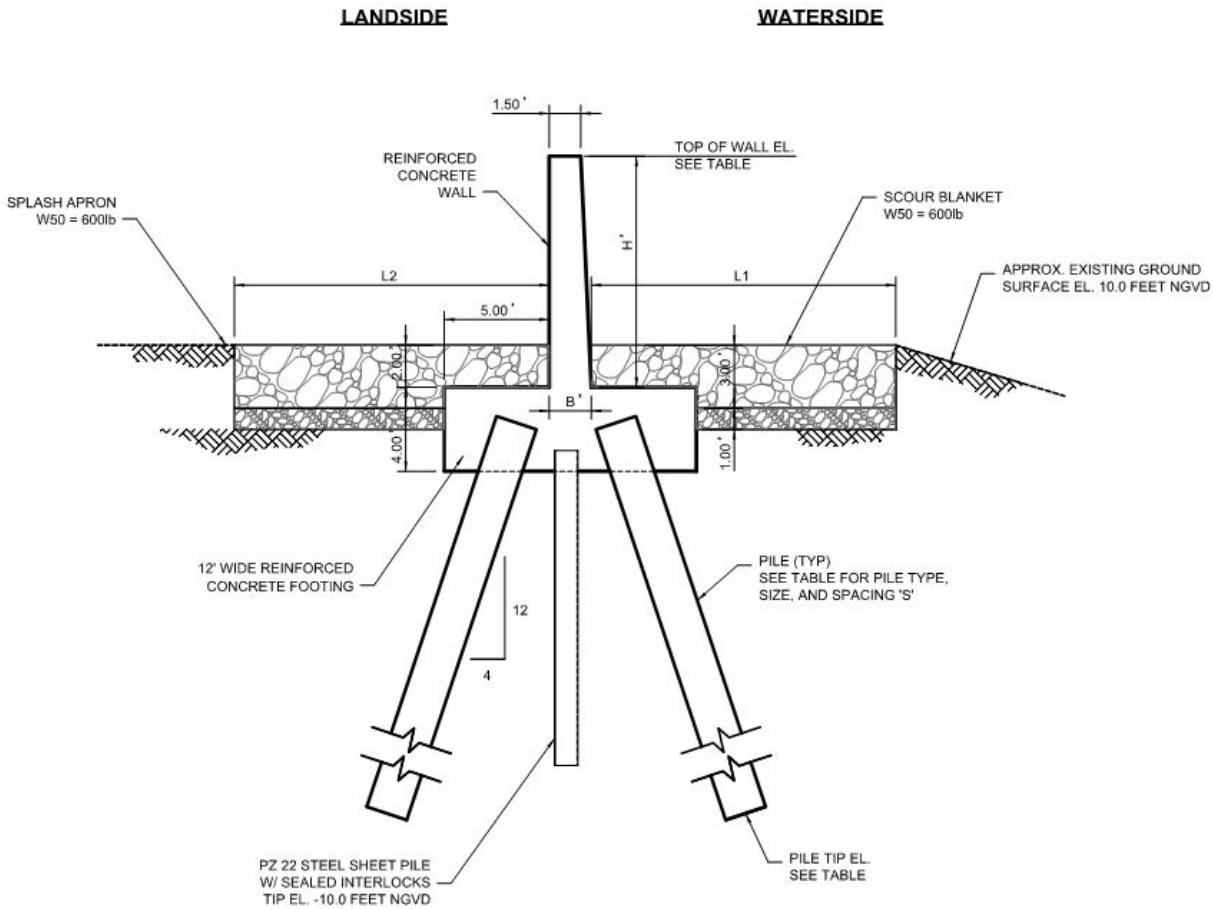


Figure 5 – Floodwall Typical Section (Reach A-3)
Buried Seawall

A buried seawall is selected for Reach A-4 which spans the majority of the project reach from Fort Wadsworth to Oakwood Beach. The designed crest elevation of the Buried Seawall is 20.5 feet NGVD 1929.

The buried seawall comprises a trapezoidal shaped core structure with a 10-foot wide crest and 1.5:1 (horizontal: vertical) side slopes. The core is constructed with two-stone thickness armor stone and bedding stone layers. A 10-foot wide scour apron is incorporated into the seaside structure toe. The entire above-grade portion of the structure is covered with material excavated to accommodate the structure foundation. This material, primarily sand with some clay, silts, and topsoil, will support grass and other native beach vegetation. The material cover is used to visually integrate the buried seawall with surrounding topography and to protect the public from climbing and/or falling on the uneven rock surface. Geotextile fabric is placed underneath the bedding layer to reduce settlement and around the core structure to minimize loss of fill through the voids. The material cover will be placed on 2:1 side slopes with a vegetative reinforced matting to provide additional protection and stabilization of the seaward face during less intense storm events. A vertical steel sheet pile wall will be installed in the interior of the structure to prevent seepage.

The buried seawall incorporates a promenade, replacing the continuous at-grade paved and pile supported promenade from Fort Wadsworth to Miller Field and FDR Timber Boardwalk. Roller compacted concrete is constructed atop the crest to create a 17-foot wide paved promenade. Figure 6 presents a typical section of the Buried Seawall (Reach A-4).

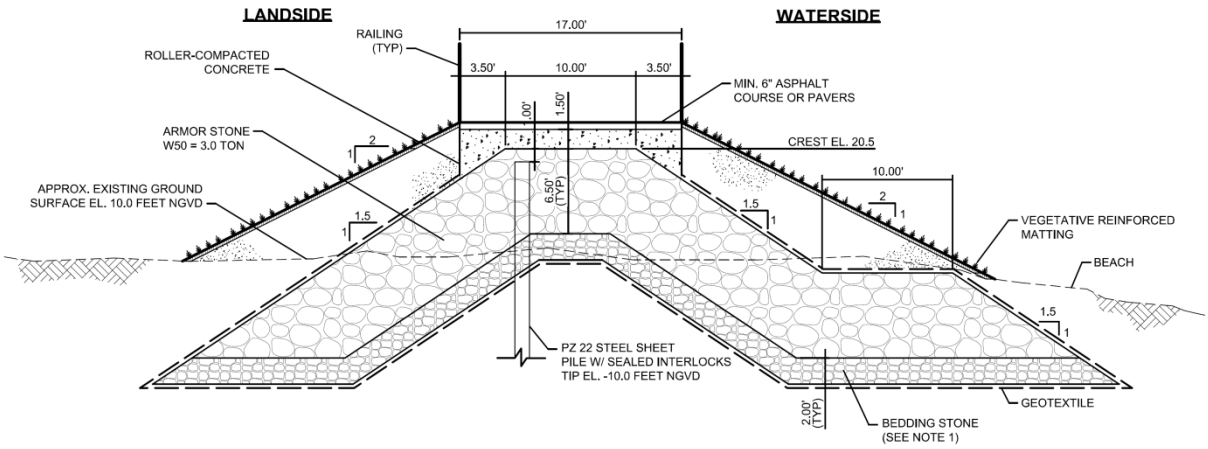


Figure 6 –Buried Seawall Typical Section (Reach A-4)

Stoplog Structure

At Hyland Boulevard a stoplog closure gate closure structure will be used to close off the roadway as needed to prevent flooding during rare storm events. The structure is approximately 106 feet long and 4 to 4.5 feet high and will be supported by a concrete foundation which consists of a series of footings located within the roadway adjacent to each lane of traffic along with footings located in the center median and each side of the Hylan Boulevard. During a flood event removable posts will be installed within the roadway and the stoplogs installed within the frame/guide. There are nine spans in the design. The multiple spans allow for testing the stoplog structure to be staged, precluding a full closure of Hylan Boulevard. Figure 7 presents a typical section view.

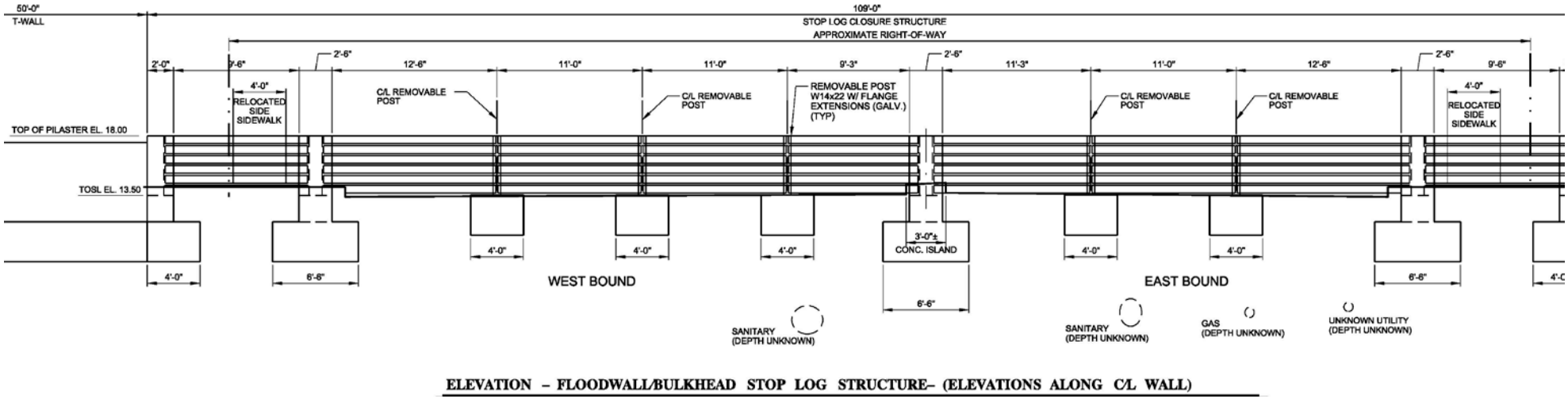


Figure 7 – Typical Section of Stoplog Structure

Tidal Marsh

The shorelines along the southeastern shore of Staten Island have generally been mildly erosional, which indicate that the rate of erosion over most large areas of the shoreline is low, averaging less than 1 foot per year of shoreline loss. However, the segment near the Oakwood Beach area is at a much lower elevation (within 5 feet or less of sea level), and shoreline recession has been as high as 20 feet per year. Physical properties of the area seaward of the LOP in Oakwood Beach include poorly drained, organic and erosive soils.

As part of the integrated approach for the Oakwood Beach area, the District considered increasing human and ecosystem community resilience as part of the overall solution to manage risk. To inhibit erosion, attenuate wave energy that can cause scour to the Project area, and to reduce sedimentation through the creek and tide gate into the freshwater wetland, the NED Plan has been designed to preserve the functional effectiveness of tidal exchange. This would facilitate wetland drainage and enable the tidal wetlands seaward of the LOP to help filter sediments so they are not brought into the freshwater wetlands (see Figure 4-3). In addition, the NED plan will utilize sand excavated during construction of the foundation for the LOP.

To accomplish this enhancement, the existing channel would be relocated from along the inside toe of the existing natural berm to a central location within the site. The mouth of the existing channel would be widened from 22 feet (at elevation 2.0 feet NGVD 1929) to 30 feet wide. Widening the channel mouth and relocating the channel itself would allow for proper flooding and draining of the proposed marsh. The channel would be extended into the upper portion of the site to allow drainage from runoff from the scrub-shrub and maritime forest. The channel would also branch off and would connect with the proposed tide gate under the proposed access road that would run parallel to the LOP (USACE 2014a).

The proposed measures along the coastline include constructing approximately 46 acres of tidal wetlands on the seaward side of the proposed revetment. Approximately 10.1 acres of maritime forest/scrub-shrub habitat would also be planted along the front of the revetment, while 12.9 acres of low marsh and 6 acres of high marsh acres of living shoreline are proposed in the shallow waters adjacent to the existing beachfront. Further, 17 acres of dune grass is proposed to be planted. These measures include multiple habitats that would provide environmental and public benefits to the Oakwood Beach area (USACE 2014).

Stormwater Outfalls/Gate Chambers

Existing stormwater outfalls, consisting of single and double concrete box culverts, pass beneath the Buried Seawall at nine locations. At these locations, the sheet pile seepage wall terminates either side of the existing culverts and the buried seawall rock structure will be constructed around the culverts and proposed gate chambers. A typical section view of the designed gate chamber is presented in Figure 8.

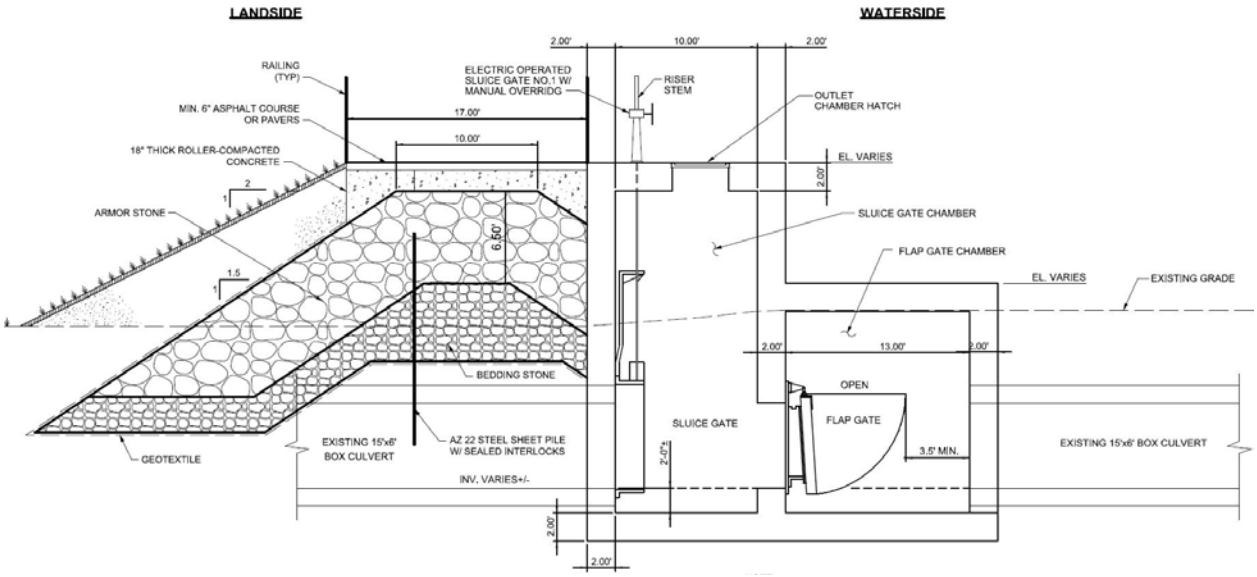


Figure 8 - Typical Section Gate Chamber

Tide Gates

Tide gate structures with reinforced concrete wing walls are proposed at two locations along the Line of Protection in the vicinity of Oakwood Beach. Aside from increases in wall height and thickness, the basic design of the proposed tide gate structures is consistent with the design of the existing tide gate structure located to the east of the Water Treatment Plant at Oakwood Beach. The tide gate structures are not designed for vehicular loading. Figure 9 presents a typical section of the tide gates.

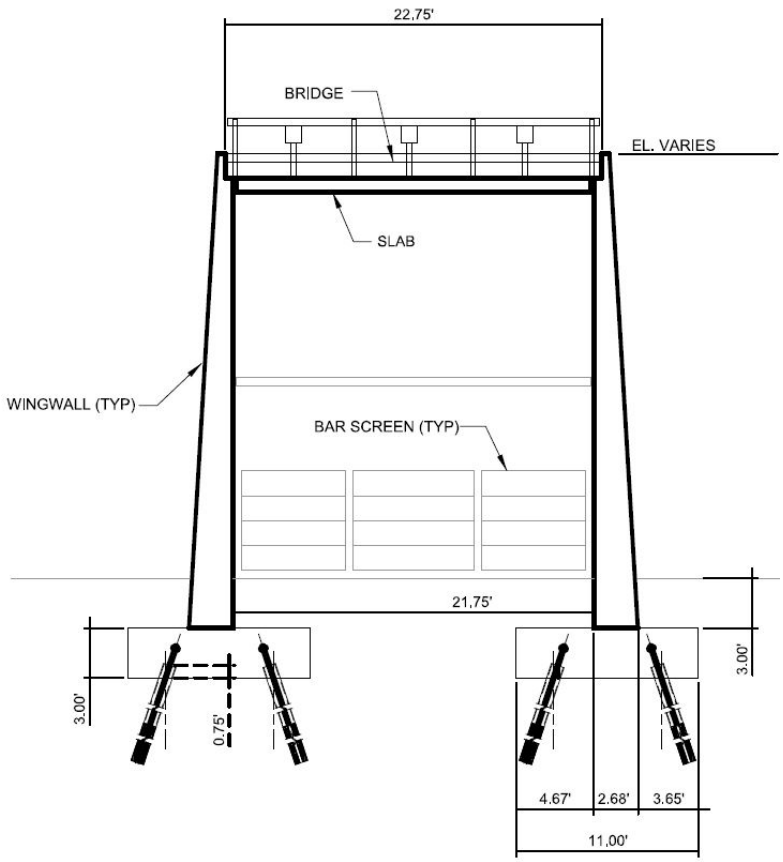


Figure 9 - Typical Section Tide Gate

Pedestrian and Vehicular Access

Three types of access points are provided along the Line of Protection: Maintenance vehicle access (MVA), combined truck and pedestrian access (DTP), and pedestrian access (PA).

Maintenance vehicle access is provided at one location in Reach A-2 and at four locations along Reach A-4 between New Dorp Beach and Oakwood Beach to provide vehicular access to the tide gate and stormwater outfall gate chambers. Earthen ramps are proposed to provide vehicular access to the tide gate and stormwater outfall gate chambers. These ramp sections are designed to handle HS-20 loading to allow maintenance vehicles to access the sluice gates in the drainage structures from above.

An additional nine earthen ramps are proposed between Oakwood Beach and South Beach. These ramps are designed for both pedestrian and HS-20 vehicular access and meet the 1:12 maximum slope required by ADA guidelines. The ramps have been located to provide beach access from existing roads and access paths.

Pedestrian access points, spaced approximately every 500 feet, are located along the Buried Seawall between Midland Beach and South Beach. Each access point consists of 10-foot wide reinforced concrete stairs on both the landward and seaward sides of the buried seawall that

provide access to the promenade and the beach. There are a total of 27 access points for pedestrians along the promenade including the 9 combined vehicle/pedestrian access ramps.

The buried seawall crest elevation exceeds the existing deck elevation for the Ocean Breeze fishing pier. The pier segments nearest to the promenade will need to be reconstructed to ramp up to the promenade at a 1:12 maximum slope required by ADA guidelines.

2.2.2 Interior Drainage Measures

The Interior Drainage measures as part of the NED Plan include tide gates, sluice gates, stormwater outfall structures, road raisings, and excavated ponds. The tide gates, sluice gates and outfall chambers are listed above as part of the Line of Protection design but are also included in this summary. The Interior Drainage Measures utilized in each of Drainage Areas include:

Area A: Minimum Facility

Natural Storage: 17.19 acres
Tide Gate
- Length: 22.75 ft. along levee alignment
- Height: 18 ft. NGVD 1929 crest elevation
- Width: 16 ft. wide
- Features: 3 @ 5 ft. by 5 ft. sluice gates, wingwalls, pre-engineered bridge on top of the tide gate

Outlets: 2 sluice gate structures (2 ft. by 2ft.) & 2 intermediate pipe outlets with flap gates

Area B: Minimum Facility

Natural Storage: 81.23 acres
Excavated Pond: 1 Pond
- Volume: 204,000 c.y.
- Invert: 2 ft. NGVD 1929

Tide Gate
- Length: 22.75 ft. along levee alignment
- Height: 20.5 ft. NGVD 1929 crest elevation
- Width: 16 ft. wide
- Features: 3 @ 5 ft. by 5 ft. sluice gates, wingwalls, pre-engineered bridge on top of the tide gate

Road Raising Kissam Ave. to 7.1 ft. NGVD 1929, Mill Rd. to 7.1 ft. NGVD 1929
- Length: 1,730 lf. @ Kissam Avenue & 630 lf. @ Mill Road
- Width: 30 ft. @ Kissam Avenue & 60 ft. @ Mill Road
- Avg. Height: 3 ft. @ Kissam Avenue & 1 ft. @ Mill Road

Outlets: Ebbits Street, New Dorp Lane, Tysens Lane Gate Chambers

Area C: Alternative 4

Natural Storage: 120.44 acres
Excavated Ponds

Volume:	377,200 c.y.
Area:	42.2 acres
Invert:	2 ft. NGVD 1929
Road Raising	Seaview Ave. & Father Capodanno Blvd. to 10 ft. NGVD 1929
Length:	820 lf. @ Seaview Ave & 300 lf @ Father Capodanno Blvd.
Width:	90 ft. @ Seaview Ave & 60 ft. @ Father Capodanno Blvd.
Avg. Height:	1 ft. for both
Outlets:	Greely Avenue, Midland Avenue, Naughton Avenue, Seaview Avenue Gate Chambers

Area D: Minimum Facility

Natural Storage:	30.76 acres
Outlets:	Quintard Street Gate Chamber

Area E: Alternative 2

Natural Storage:	46.7 acres
Excavated Ponds:	2 Ponds
Volume:	222,720 c.y.
Area:	34.0 acres
Invert:	2 ft. NGVD 1929
Outlets:	Sand Lane Gate Chamber, Quincy Ave. Chamber

Ponds

Drainage Areas B, C, and E include ponds excavated to 2 ft. NGVD 1929 (Drainage areas A and D involve acquisition and or preservation of open space and do not require ponding). The proposed pond locations and associated excavation areas are shown on the attached sheets.

For the potential pond excavation in Drainage Areas B, C and E, the depth of ponding will be no lower than 2 feet, NGVS29 since the ground water table in the project area is near this elevation. The potential location f the ponds for each proposed plan, in Drainage Area B, C and E, will be show in the Feasibility Study Interior Drainage Appendix. The final pond dimensions should not exceed the excavated amount and will be within the minimum facility footprint for natural storage. Please done that excavated amount needed for each pond can change based upon additional data being acquired during the PED/Plans and Specifications Phase (i.e., boring data within the pond footprint). A typical plan view of a Pond layout from the Interior Drainage Plates is presented in Figure 10. The Figure and Plates also include overlays of all of the other Interior Drainage Measures included in the NED Plan such as flowage easements, road raisings, tide gates, etc. as well as the alignment of the Line of Protection.

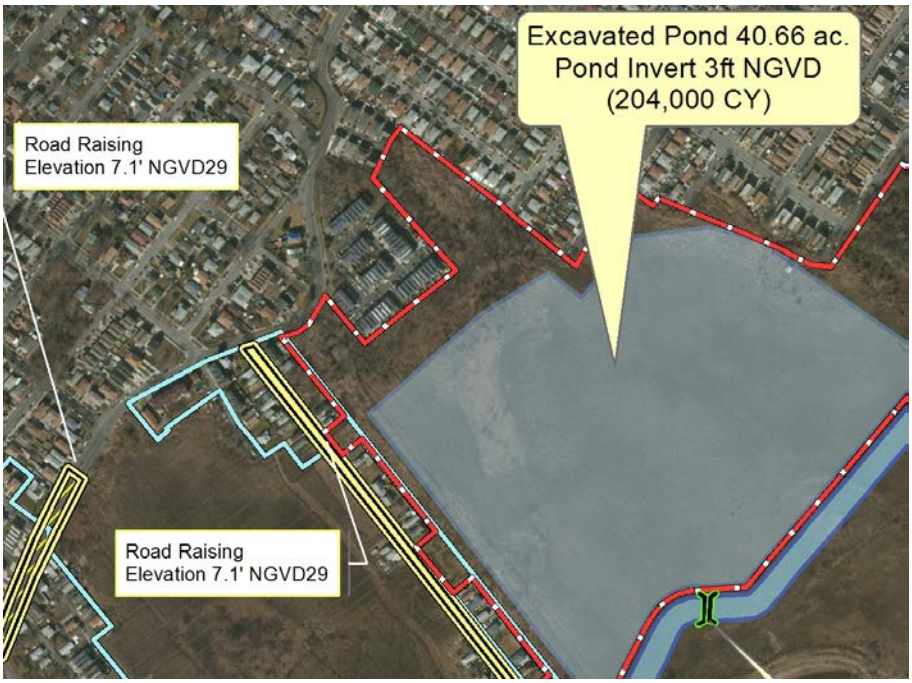


Figure 10 -Typical Plan View of Pond

Road Raisings

In Drainage Area B, Mill Road and Kissam Avenue will be raised to control the spillover of interior stormwater collections to and from Drainage Area A. In Drainage Area C Seaview Ave. will be raised to control the spillover of interior stormwater to/from Drainage Area D and Father Capodanno Blvd will be raised to meet the new crest elevation at Seaview Ave.

The road raising along Mill Road and Kissam Ave. will be implemented as part of the Minimum Facility for Area B and the road raising along Seaview Avenue & Father Capodanno Blvd will be implemented as part of an Alternative for Area C.

3.0 EXISTING ENVIRONMENT

The proposed Project Area consists of approximately 5.5 miles of coastline in the Borough of Staten Island, New York City, New York, extending along the Lower New York Bay and Raritan Bay, two relatively shallow bodies of water that are part of the Hudson-Raritan Estuary (HRE), and includes the Gateway National Recreational Area (USACE 1995). The approximate west and east limits (i.e. along the south shoreline) of the study area are Oakwood Beach and the easternmost point of land within Fort Wadsworth at the Narrows. Densely developed residential and commercial areas, wetlands, forests, ponds, creeks, meadows, and a narrow beach along the southern Staten Island shore characterize the environmental setting of the Project Area. Beachfront development includes residential structures ranging from small cottages to expensive homes, commercial properties, and developed parks with large parking areas, a shore-parallel boardwalk and promenade walkway. The most dominant existing coastal storm risk management structures east of Oakwood Beach are groins for outfall structures. In addition, the USACE constructed a project in 1999 to protect the Oakwood Beach area from Bay flooding. The project consists of two earthen levee segments, one tide gate structure, underground storm water storage, and road raising. The first levee segment, located south of the treatment plant and east of Oakwood Creek running parallel to the creek, has a top elevation of 10 feet NGVD. The second levee segment, located north of the treatment plant and running approximately northward and westward, is a raised road system with a top elevation varying between 7.9 ft. NGVD to 8.4 ft. NGVD. This project also consists of: (1) a new tide gate; (2) the raising of an access road at the northwestern area of the treatment plant property; and (3) underground storm runoff storage—all within the project area. The project is based on a 10 year economic life and protects against a 15-year storm (6.7% chance of occurring in any given year) (USACE 2014).

Historically, lands along the South Shore of Staten Island have been susceptible to tidal inundation during extratropical storms, nor'easters, and hurricanes with severe damage to life and property caused by wave action, erosion, storm surges and rising interior stormwater runoff trapped landward of the Bay. Areas between Fort Wadsworth to Oakwood Beach are susceptible to high velocity overtopping Bay flood waters when the storm surge from the Bay rise above Father Capodanno Boulevard or other local topographic features as was the case during Hurricane Sandy. Even if storm surge levels do not rise high enough to overtop the existing coastal barrier, if flood levels rise above the local storm sewer outfalls, it effectively blocks interior runoff from escaping out into the Bay, leading to high pooling water surface elevations landward of the existing coastal barrier and ultimately risks to life-safety and damages to property (USACE 2014).

Water Quality

Under existing conditions, pollutants that enter the local waterways in turn flow to the Lower Bay. These pollutants can include organic matter, which can increase the biochemical oxygen demand (BOD) within the water column and reduce the dissolved oxygen (DO) concentrations. This can then stress natural communities. Organic matter can also cause an increase in coliform bacteria, and nutrients. Although nutrients such as nitrogen and phosphorus are essential to the growth of phytoplankton and act as a base for supporting higher tropic levels, in excess

concentrations these nutrients can result in a condition known as eutrophication. This can result in phytoplankton blooms, including nuisance algal forms, which further depresses DO levels in water bodies. With large stormwater runoff volumes that are not attenuated in any way, as under current conditions, more of these pollutants coming from rooftops, lawns, roadway surfaces and other urban areas are transported directly to local streams and ultimately to the Lower Bay. There are also the erosive forces of unmanaged runoff which leads to sedimentation in local waterbodies (NYCDEP 2013).

Oakwood Beach (Drainage Areas A and B). Many water bodies in the Oakwood Beach area are small, and as a result, many are not classified by NYSDEC. For unclassified streams and ponds there are no legally mandated water quality goals. In the inland part of the watershed, there are no classified water bodies. In the lower Watershed, all three branches of Oakwood Beach Creek are classified as I/C or C (NYSDEC water quality standard ratings are defined in the text box). In general, activities in these designated waters cannot degrade water quality, introduce new contaminants or reduce flow or oxygen concentrations to a level that impairs the designated functions. The Lower Bay is classified as SB.

NYSDEC Water Quality Standard Ratings

Class B waters - primary and secondary contact recreation and fishing. These waters shall be suitable for fish propagation and survival.
Class C waters - best usage is fishing. These waters shall be suitable for fish propagation and survival.
Class SA waters - shellfishing for market purposes, primary and secondary contact recreation and fishing. These waters shall be suitable for fish propagation and survival.
Class SB waters - primary and secondary contact recreation and fishing. These waters shall be suitable for fish propagation and survival.
Class SC waters - best usage is fishing. These waters shall be suitable for fish propagation and survival.
Class I waters - best usages are secondary contact recreation and fishing. These waters shall be suitable for fish propagation and survival.

New Creek (Drainage Area C). In the inland part of the watershed, the ponds at the Richmond County Country Club and Reeds Basket are either unclassified or listed as Class B water bodies by the NYSDEC. Under existing conditions, there are no known water quality issues in the surface water bodies of the inland watershed. The streams in the lower watershed are small and, as a result, many are not classified for water quality standards or goals. The Main Channel and the East and West Branches of New Creek are classified as I/C or C. The Lower Bay is classified as SB. Activities proposed within these designated water bodies cannot degrade water quality, introduce new contaminants or diminish flows or oxygen concentrations such that it impairs or compromises the function or intended use of the water body.

South Beach (Drainage Areas D and E). Surface waters in the inland part of the watershed include Brady's Pond, Cameron's Lake, and Whitney Woods. NYSDEC classifies Brady's Pond and Cameron's Lake as Class B waterbodies. The Lower Bay is classified as SB. The surface water that collects in Whitney Woods is not classified by the State. Under existing conditions, water quality issues at Brady's Pond include algal blooms that can lead to low dissolved oxygen counts in addition to the impacts on aesthetics and recreational uses. As discussed above, water supply to Brady's Pond is most likely dependent on groundwater discharges since water levels

do not fluctuate seasonally or with periods of low rainfall and the quality of the water is swimmable.

Substrate

The overall Project area lies within the Atlantic Coastal Plain Province. This region is characterized by low topographic relief and extends along the eastern margin of the United States. The topography of the Project area is nearly level with elevations ranging from sea level to almost 100 feet above sea level (USACE 2014).

There are four types of bedrock existing within or adjacent to the Project area. The predominant and oldest bedrock unit is serpentinite and consists of the serpentine minerals antigorite, chrysotile, and lizardite. The remaining three types of bedrock include the Stockton Formation consisting of sandstones and arkoses; the Lockatong Formation consisting of siltstones and shales; and the Passaic Formation consisting of shale, siltstone, sandstone, and conglomerate (Benimoff and Ohan 2003). The surficial deposits within the Project area consist primarily of glacial outwash deposits from the most recent (Wisconsin) glaciations (Benimoff and Ohan 2003).

The main soil type within the Project area consists of Beaches. The Beaches unit is composed of very deep to deep bedrock and poorly drained areas adjacent to the Atlantic Ocean. Beaches are not considered a true soil because they typically do not support vegetation, and are constantly reworked by wave and wind action (U.S. Department of Agriculture, Natural Resources Conservation Service [USDA/NRCS] 2014).

These sands contain abundant magnetite and comparatively little garnet (Northern Ecological Associates, Inc. [NEA] 2002). The general characteristics of these sands are very different from other sands in the region. These sands are less rounded and poorly sorted, and contain abundant feldspar and rock fragments suggesting that the materials were derived mostly from the rivers draining the Newark Basin region (i.e., the Passaic, Hackensack, and Raritan rivers) (NEA 2002).

4.0 SPECIES OVERVIEWS

This section describes the habitat requirements of the EFH-designated species and non-EFH-designated fish that potentially occur within the Project Area. Specifically, Section 4.1 provides individual species assessments of EFH-designated species and Section 4.2 provides assessments of prey species.

4.1 EFH-DESIGNATED SPECIES

EFH-designated species and life history stages in the Project Area were identified based on a list in the NOAA Guide to EFH Designations in the Northeastern United States (USDOC 2014) for the 10-minute by 10-minute area of latitude and longitude bounded on the north, west, south, and east as follows: 40° 40.0′ N latitude, 74° 00.0′ W longitude, 40° 30.0′ N latitude, and 74° 10.0′ W longitude. EFH designations for coastal finfish and shellfish species in this area were based on information compiled by the New England Fisheries Management Council (NEFMC) (NEFMC 2014). Designations for sharks and highly migratory finfish (e.g., mackerel) were made by NOAA Fisheries (USDOC 2014).

A total of 13 finfish species, three skate species, and three shark species are currently designated as EFH species in this area. Each EFH-designated species and the corresponding designated life stages are presented in Table 1.

Available information on life history and habitat requirements for each EFH-designated species is summarized in this section, along with relevant survey information. Primary reference sources are cited once, at the beginning of each summary. For most species, the primary source was one of a series of EFH source documents prepared by the NOAA Fisheries in 1999. Several other primary sources are also identified. Designated life history stages (eggs, larvae, juveniles, and adults for finfish and early and late juveniles and adults for sharks) for the 10-minute by 10-minute "square" of latitude and longitude that includes the Project Area are identified at the beginning of each species assessment and in Table 1. Additionally, Figure 11 depicts the area of occurrence along the eastern Atlantic shore for all EFH-designated species affected by the proposed project.

Conclusions regarding the likelihood of occurrence of each species and life history stage in the Project Area are presented at the end of each species assessment. In reaching these conclusions, emphasis was given to the depth and water quality preferences of eggs, larvae, juveniles and adults, and their association with sandy substrates. Another important factor is whether the bottom sediments (sand) in the Project Area provide suitable habitat for invertebrates that are preyed upon by bottom feeding EFH species.

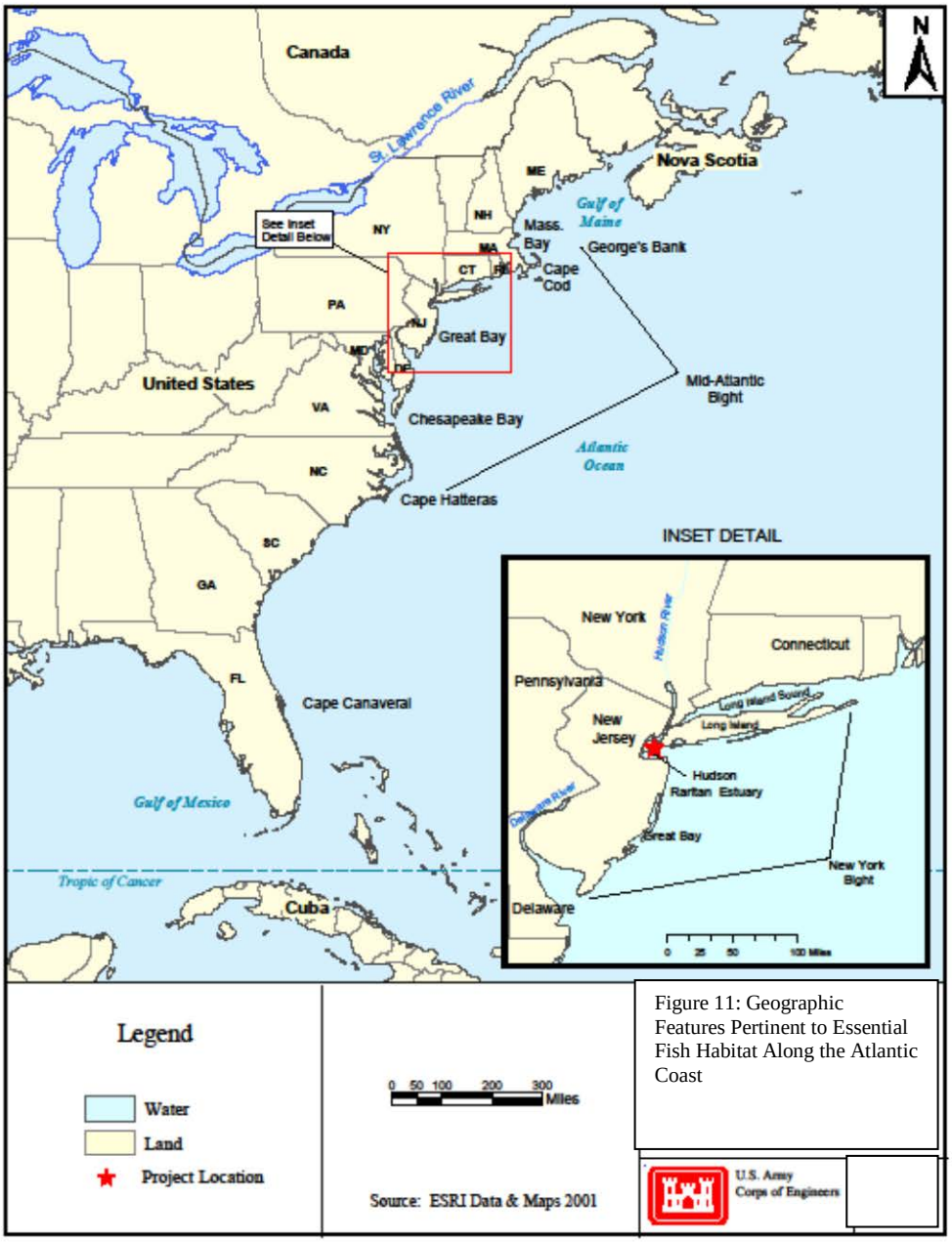


Figure 11: Geographic Features Pertinent to Essential Fish Habitat Along the Atlantic Coast

Table 1. EFH Designated Fish, Skate, and Shark Species and Life History Stages in the Project Area.

	Life Stage			
Fish Species	**E**	**L**	**J**	**A**
Atlantic butterfish (*Peprilus triacanthus*)		X	X	X
Atlantic mackerel (*Scomber scombrus*)			X	X
Atlantic sea herring (*Clupea harengus*)		X	X	X
Black sea bass (*Centropristis striata*)			X	X
Bluefish (*Pomatomus saltatrix*)			X	X
Cobia (*Rachycentron canadum*)	X	X	X	X
King mackerel (*Scomberomorus cavalla*)	X	X	X	X
Red hake (*Urophycis chuss*)	X	X	X	
Scup (*Stenotomus chrysops*)	X	X	X	X
Spanish mackerel (*Scomberomorus maculatus*)	X	X	X	X
Summer flounder (*Paralichthys dentatus*)		X	X	X
Windowpane (*Scophthalmus aquosus*)	X	X	X	X
Winter flounder (*Pseudopleuronectes americanus*)	X	X	X	X
Skate Species				
Clearnose skate (*Raja eglanteria*)			X	X
Little skate (*Leucoraja erinacea*)			X	X
Winter skate (*Leucoraja ocellata*)			X	X
Shark Species	**EJ**	**LJ**		**A**
Dusky shark (*Charcharinus obscurus*)	X	X		
Sandbar shark (*Charcharinus plumbeus*)	X			X
Sand tiger shark (*Odontaspis taurus*)	X			

Source: USDOC 2014.

Key to Life Stage:

E = egg
L = larval
J = juvenile
A = adult
EJ = early juvenile
LJ = late juvenile

Atlantic Butterfish (*Peprilus triacanthus*): Larvae, Juveniles, and Adults

Primary Source: Cross et al. (1999)

Butterfish are fast-growing, short-lived, pelagic fish that form loose schools, often near the surface. Larval butterfish are pelagic and occur from the outer continental shelf to the lower, high salinity parts of estuaries in the mid-Atlantic Bight. Juveniles and adults are common in inshore areas, including the surf zone, and occur in sheltered bays and estuaries in the mid-Atlantic Bight during the summer and fall. Juveniles and adults are eurythermal and euryhaline, and are frequently found over sand, mud, and mixed substrates. Smaller juveniles often aggregate under floating objects.

Larval butterfish occurs within a water temperature range of 4.0 to 28°C, salinity range of 5 to 32 ppt, and depth range of -10 to -1750 ft mean low water (MLW). Juvenile and adult butterfish in the HRE are typically found at depths ranging from -10 to -75 ft MLW, temperatures of 8 to 26°C, salinities of 19 to 32 ppt, and DO concentrations of 3 to 10 mg/l.

Project Area: Larval butterfish are pelagic and therefore their occurrence in the Project Area would be rare. Juvenile and adult butterfish are common inhabitants of the water column in shallow water over sandy substrates in the New York Bight and HRE in the summer and fall and would likely occupy the nearshore portions of the Project Area during those seasons.

Atlantic Mackerel (*Scomber scombrus*): Juveniles and Adults

Primary Source: Studholme et al. (1999)

Atlantic mackerel overwinter in deep water on the continental shelf from Sable Island Bank (Canada) to Chesapeake Bay, and in spring move inshore and northeast. This pattern in reversed in the fall. Juveniles are generally found in some inshore bays and estuaries as well as offshore at salinities greater than 25 ppt. Adults are commonly found in open sea, although occasionally they are found in open bays with lower salinity limits of approximately 25 ppt. The geographical and seasonal distribution of juveniles and adults is generally similar, although juveniles tend to be distributed further inshore than adults in the spring and fall.

Juvenile Atlantic mackerel are reported to be common in the HRE during the months of April to June and October to November, whereas adults are common during April, May, October, and November (Stone et al. 1994). Atlantic mackerel are not commonly collected in bottom trawl surveys in the HRE. Wilk et al. (1998) conducted a trawl survey in the HRE from 1992 to 1997 to measure natural as well as anthropogenic changes in fish distribution, abundance, ecology, and life history. Throughout their survey, Wilk et al. collected only 12 juvenile Atlantic mackerel from 1992 to 1997, with the collection that captured the juvenile Atlantic mackerel occurring on one occasion on the eastern shore of Staten Island in July 1997. All juveniles were collected at depths of -16 to -33 ft MLW, salinities of 26.1 to 28.9 ppt, DO concentrations of 7.3 to 8.0 mg/l, and temperatures of 17.6 to 21.7°C. Adults generally prefer temperatures of 4 to 6°C, salinities greater than 25 ppt, and depths of 0 to -1,250 ft MLW.

Project Area: Due to the pelagic preference of this species, both juveniles and adults are uncommon in the Project Area. Transient juveniles and adults may occupy the Project Area during the summer, but would be rare.

Atlantic Sea Herring (*Clupea harengus*): Larvae, Juveniles and Adults

Primary Source: Reid et al. (1999)

Adult Atlantic sea herring migrate south into southern New England and mid-Atlantic shelf waters in the winter after spawning in the Gulf of Maine, on Georges Bank, and Nantucket Shoals. Juvenile and adult herring are abundant in coastal and mid-shelf waters from southern New England to Cape Hatteras in the winter and spring. In the spring, adults return north, but juveniles do not undertake coastal migrations. Larval herring are limited almost exclusively to Georges Bank and the Gulf of Maine waters. Larvae typically metamorphose the following spring into young-of-the-year (YOY) juveniles.

In general, larval herring have a temperature preference of less than 16°C with salinity near 32 ppt and depths of -160 to -295 ft MLW. Juvenile and adult herrings have a temperature preference of less than 10°C, salinities of 26 to 32 ppt, and depths of -50 to -445 ft MLW. In the HRE, Atlantic herring prefer water depths greater than -25 ft MLW. Atlantic herring in the New York Bight generally prefer water depths greater than -60 ft MLW.

Project Area: Atlantic herring are pelagic species. Larval Atlantic herring are limited to northern waters and are rare in the Project Area. Due to the depth preference of this species, larval, juvenile, and adult Atlantic herring occurrence in the Project Area are likely rare during the summer and fall seasons.

Black Sea Bass (*Centropristis striata*): Juveniles and Adults

Primary Source: Steimle et al. (1999a)

Black sea bass are usually strongly associated with structured, sheltering habitats such as reefs and wrecks. Spawning occurs on the continental shelf, beginning in the spring off Cape Hatteras and progressing into the fall in the New York Bight and off southern New England. When larvae reach 10 to 16 millimeters (mm) total length, they tend to settle and become demersal on structured inshore habitat such as sponge beds. In the mid-Atlantic Bight, recently settled juveniles move into coastal estuarine nursery areas between July and September. The estuarine nursery habitat of YOY black sea bass is relatively shallow, hard bottom with some kind of natural or man-made structure, including amphipod tubes, eelgrass, sponges, and shellfish beds, in water with salinities above 8 ppt. Black sea bass do not tolerate cold inshore winter conditions. Following an overwintering period presumably spent on the continental shelf, older juveniles return to inshore estuaries in late spring and early summer. They are uncommon in open, unvegetated, sandy intertidal flats or beaches. Like juveniles, adult sea bass are very structure oriented, especially during their summer coastal residency. Unlike juveniles, adults

only enter larger estuaries and are most abundant along the outer Atlantic coast. Larger fish tend to be found in deeper water than smaller fish.

A few juveniles and adults were collected in the 1992–1997 HRE bottom trawl survey in the summer and fall, but in general, juvenile and adult black sea bass are uncommon in the HRE (Stone et al. 1994). Juveniles were more abundant in annual catches than adults and were most abundant in the summer and fall. In the HRE, black sea bass prefer depths greater than -30 ft MLW. Adults on the Atlantic coast occupy waters greater than -65 ft MLW in the fall and -260 to -460 ft MLW in the winter and spring.

Project Area: Due to the depth preference of black sea bass, juveniles and adults would not occupy the Project Area in significant numbers. However, the attraction of structures, such as piers and pilings, in the nearby Project Area may lure a few juveniles or adults in the summer and fall.

Bluefish (*Pomatomus saltatrix*): Juveniles and Adults

Source: Fahay et al. (1999)

Juvenile bluefish are found in estuaries, bays, and coastal ocean waters in the mid-Atlantic Bight and South Atlantic Bight in many habitats. Juveniles move inshore in early- to mid-June, arriving when temperatures reach approximately 20°C, and are typically found near shorelines, including the surf zone, during the day and in open waters at night. Like adults, they are active swimmers and feed on small forage fishes, which are commonly found in nearshore habitats. They remain inshore in water temperatures up to 30°C and return to the continental shelf in the fall when water temperatures fall below approximately 15°C. Juvenile bluefish are associated mostly with sand, but are also found over silt and clay bottom substrates. They usually occur at salinities of 23 to 33 ppt, but can tolerate salinities as low as 3 ppt. Adults are generally oceanic but are found near shore as well as offshore. Adults usually prefer warm water (at least 14 to 16°C) and full salinity.

One-year-old juveniles and adults are common in the HRE in the summer and fall in fairly shallow (-20 ft MLW) and deeper water (-40 to -45 ft MLW) in the shipping channels. YOY juveniles are very common in nearshore sub-tidal and intertidal waters of the HRE in the late spring and summer (USACE 2000). Bluefish of all ages occupy coastal waters in the mid-Atlantic Bight in the fall. Juveniles and adults are present in the fall and prefer depths greater than -35 ft MLW. Eggs and larvae are present in the New York Bight during the summer and are more commonly found at depths greater than -100 ft MLW.

Project Area: YOY juvenile bluefish prefer coastal embayments and estuaries in the summer and can be expected to occupy the Project Area during that time. Adults are typically pelagic and would be rare in the Project Area.

Cobia (*Rachycentron canadum*): All Stages

Primary Sources: Richards (1967), Bester (1984)

Cobia are distributed worldwide in tropical, subtropical, and warm-temperate waters. It is known as a southern, pelagic species that overwinters near the Florida Keys and migrates in late spring and summer to the mid-Atlantic states to spawn. Adults are rarely found as far north as Massachusetts. Spawning also occurs in the Gulf of Mexico from April through September. Spawning has been observed to occur in estuaries and shallow bays with the young heading offshore soon after hatching. Cobia are often found over the continental shelf as well as around offshore reefs. Habitat preference of this species are structures that interrupt the open water, such as pilings, buoys, platforms, anchored boats, and flotsam. It is also found in inshore waters inhabiting bays, inlets, and mangroves. Cobia prefer temperatures greater than 20°C and salinities greater than 25 ppt. In general, cobia are rare in the HRE (Stone et al. 1994).

Project Area: Cobia are pelagic, warm water species. The Project Area is the northern temperature limit for this species. Due to the habitat preference of this species, an occasional larval or juvenile cobia may occur in the water column of the Project Area during the summer, but other life history stages of this species are likely rare at the Project Area.

King and Spanish Mackerel (*Scomberomorus cavalla* and *S. maculatus*): All Stages

Primary Sources: Godcharles and Murphy (1986), Collette and Nauen (1983)

King and Spanish mackerels are highly migratory epipelagic, neritic fish that migrate north from Florida to as far north as the Gulf of Maine in the summer and fall. Both mackerel species prefer sandy shoals of capes and offshore bars, and high profile rock bottoms and barrier island ocean side waters. King mackerel spawn in coastal waters of the Gulf of Mexico and off the South Atlantic coast over the middle and outer continental shelf. Spanish mackerel spawn as far north as offshore Sandy Hook and Long Island in late August to late September over the inner and middle continental shelf.

The eggs and larvae of both species are pelagic. Juvenile Spanish mackerel use estuaries as nursery grounds and have been collected from low salinity estuaries and high salinity beaches, but most stay nearshore in open beach waters. In general, both mackerel species prefer temperatures greater than 18°C and salinities between than 32-36 ppt.

Project Area: Due to the migratory and epipelagic nature of the Spanish and king mackerels, all stages of both species are likely rare in the Project Area. However, a few juvenile and adult Spanish and king mackerels may utilize the Project Area to feed during their annual northward migration during the spring and summer and when they return south in the fall.

Red Hake (*Urophycis chuss*): Eggs, Larvae, and Juveniles

Primary Source: Steimle et al. (1999b)

Red hake spawn offshore in the mid-Atlantic Bight in the summer, primarily in southern New England. The distribution of eggs is unknown because they cannot be distinguished from other hakes, therefore the characteristics of the habitat in which red hake eggs are commonly found is poorly known. Larvae dominate the summer ichthyoplankton in the mid-Atlantic Bight and are most abundant on the mid- and outer-continental shelf. Larvae are transported into coastal waters and settle to the bottom in the fall. Juveniles seek shelter and commonly associate with scallops, surf clam shells, and seabed depressions. In addition, juveniles undertake seasonal migrations in response to changes in water temperatures. In the mid-Atlantic Bight, red hake are commonly found in coastal waters in the spring and fall and move offshore or into deeper inshore water to avoid warm, summer temperatures.

Hake eggs are commonly found buoyant in the upper water column of the inner shelf, and commonly found in the New York Bight from May to November. EFH for hake eggs is defined as areas with surface temperatures less than 10°C and salinity less than 25 ppt. Larval red hake are found primarily further offshore. Larvae are reported to be common in the HRE during June, and juveniles are commonly found from May to November (Stone et al. 1994). Larval red hake in the mid-Atlantic Bight are mostly collected in temperatures of 8 to 23°C, depths of -33 to -660 ft MLW, and salinities greater than 0.5 ppt. Juveniles in the HRE avoid depths less than -30 ft MLW and exhibit a preference for salinities above 27 ppt, temperatures above 5°C, and DO concentrations of 10 to 11 mg/l. Juvenile red hake can be found in the New York Bight throughout the year and prefer depths of -15 to -250 ft MLW during the spring and -70 to -250 ft MLW during the fall. Red hake in the HRE prefer depths greater than -35 ft MLW and congregate in the shipping channels.

Project Area: Red hake spawns in offshore waters, and therefore the presence of eggs in the Project Area is unlikely. In addition, due to the depth preference of this species, larvae are not likely to occupy shallow coastal waters. Juvenile red hake are attracted to deeper, cooler water in the shipping channels of the HRE, and therefore would be rare in the shallower, warmer waters found in the Project Area.

Scup (*Stenotomus chrysops*): All Stages

Source: Steimle et al. (1999c)

Scup spawn along the inner continental shelf from Delaware Bay to southern New England between May and August, mainly in bays and sounds in and near southern New England. Scup spawn in the HRE during July. Eggs are commonly found in larger bodies of coastal waters such as bays and sounds in and near southern New England during spring and summer. Larval scup are pelagic and occur in coastal waters during warmer months. YOY juveniles are commonly found from the intertidal zone to depths of about -100 ft MLW in portions of bays and estuaries where salinities are above 15 ppt. Juvenile scup use a variety of coastal intertidal and subtidal

sedimentary habitats during their seasonal inshore residency, including sand, mud, mussel beds, and eelgrass beds. Adults migrate inshore during early May and June between Long Island and Delaware Bay. Adults are found inside bays and sounds, but like juveniles, do not penetrate low salinity areas. Adults are often observed or caught over soft, sandy bottoms and in or near structured habitats, such as rocky ledges, wrecks, artificial reefs, and mussel beds. Adults move offshore once water temperatures fall below 7.5 to 10°C in the fall.

Scup eggs and larvae are pelagic and occur in coastal waters during warmer months (May to September) with temperature preference of 13 to 23°C, salinities greater than 15 ppt, and depths less than -164 ft MLW. Juveniles and adults are present in the HRE. Juveniles are much more abundant than adults, especially in the spring and summer. No juvenile or adult scup are present in the HRE in the winter. In general, juveniles are abundant and adults are common from June to October (Stone et al. 1994). Spawning takes place in July. Juveniles and adults in the HRE prefer depths greater than -30 ft MLW, temperatures above 15°C, DO concentrations of from 5 to 9 mg/l, and occur over a wide salinity range (20 to 30 ppt).

Project Area: Scup prefer pelagic areas therefore no eggs and larvae are expected in the Project Area. Juvenile and adult scup in the HRE prefer deeper waters and would be uncommon in the Project Area.

Summer Flounder (*Paralichthys dentatus*): Larvae, Juveniles, and Adults

Primary Source: Packer et al. (1999)

Summer flounder exhibit strong seasonal inshore-offshore movements. Planktonic larvae and post-larvae derived from offshore fall and winter spawning migrate inshore, entering coastal and estuarine nursery areas to complete transformation. Transforming larvae typically settle to the bottom and prefer sandy benthic substrate. Juveniles are distributed inshore and occupy estuaries during spring, summer, and fall. Some juveniles remain inshore for an entire year before migrating offshore, whereas others move offshore in the fall and return the following spring. Juvenile summer flounder utilize several different estuarine habitats such as marsh creeks, seagrass beds, mud flats, and open bay areas. As long as other conditions are favorable, substrate preferences and prey availability are the most important factors affecting distribution. Some studies indicate that juveniles prefer mixed or sandy substrate; others show that mud and vegetated habitats are used.

Adult summer flounder inhabit shallow, inshore, and estuarine waters during warmer months and migrate offshore in the fall. Adults are reported to prefer sandy habitats, but can be found in a variety of habitats with both mud and sand substrates. Adult summer flounder are present in moderate numbers in the HRE during all seasons except winter, and are most abundant in the summer. Juveniles are much less abundant than adults, but are caught throughout the year. In general, adults collected during the NOAA Fisheries bottom trawl surveys in the New York Bight showed no particular depth preference at any time of year.

Larval summer flounder prefer temperatures of 8 to 18°C, salinities of 23 to 33 ppt, depths of -33 to -230 ft MLW, and DO concentrations of greater than 5.3 mg/l. However, larval summer flounder in the HRE have been collected in great abundance in low to intermediate salinities (3 to 15 ppt). Juveniles prefer temperatures greater than 11°C, salinities of 10 to 30 ppt, and depths of -2 to -17 ft MLW in estuaries. Adults prefer temperatures of 2 to 27°C, depending on the time of the year, and high salinity (greater than 20 ppt). The distribution of adult summer flounder was correlated more closely to substrate than to salinity.

Project Area: Larval, juvenile, and adult summer flounder are expected to occupy the Project Area, given their association with sandy substrates and the fact that they feed on a variety of bottom-dwelling invertebrates and fish species that occupy the nearshore, intertidal zone. Larvae would probably be present from the fall to late winter of the following year, whereas juveniles are probably present in the spring and fall. Adults would be present at all times of year except winter, and would be most abundant in the fall.

Windowpane (*Scophthalmus aquosus*): All Stages

Primary Source: Chang et al. (1999)

Windowpane is a shallow water mid- and inner-shelf species found primarily between Georges Bank and Cape Hatteras on fine sandy sediment. Spawning occurs on inner shelf waters, including many coastal bays and sounds, and on Georges Bank. Juveniles and adults are similarly distributed. They are found in most bays and estuaries south of Cape Cod throughout the year at a wide range of depths (less than -5 to -130 ft MLW), bottom temperatures (3 to 18°C in the spring and 8 to 23°C in the fall), and salinities (18 to 32 ppt). Juveniles that settle in shallow inshore waters move to deeper offshore waters as they grow. Adults occur primarily on sand substrates off southern New England and the mid-Atlantic Bight.

Juveniles and adults are common in the HRE and New York Bight throughout the year, but are more common in the deeper shipping channels in the HRE in winter and summer. YOY and older juveniles are common within 100 ft of shore. In general, eggs are common in the HRE from April to July and September to October, larvae are common from April to November, and juveniles and adults are common throughout the year (Stone et al. 1994). Eggs are present in the New York Bight from March to December, and larvae are present from May to December.

Project Area: Juvenile and adult windowpane are commonly found on shallow, sandy substrates and are expected to occupy the Project Area throughout the year. Because this species spawns in inner shelf and nearshore waters, eggs and larvae are expected be found in the Project Area at all times of the year except during the winter. Smaller, YOY juveniles, as well as older juveniles and adults, are expected to be common in the Project Area throughout the year.

Winter Flounder (*Pseudopleuronectes americanus*): All Stages

Primary Source: Pereira et al. (1999)

Winter flounder spawning occurs from late winter through early spring, peaking south of Cape Cod in February and March. Eggs are found inshore in depths ranging from -1 to -13.5 ft MLW and have been collected in plankton nets offshore, e.g., on Georges Bank at depths of -300 ft MLW or less during March to May. Eggs are adhesive and demersal and are deposited on a variety of substrates, but sand is the most common; they also have been found attached to vegetation and on mud and gravel. Larvae are negatively buoyant and non-dispersive; they sink when they stop swimming. Thus, recently settled YOY juveniles are found close to spawning grounds and in high concentrations in depositional areas with low current speeds. YOY juveniles migrate very little in the first summer, move to deeper water in the fall, and remain in deeper cooler water for much of the following year. Habitat utilization by YOY is not consistent across habitat types and is highly variable among systems and from year to year. Several field and lab studies suggest a "preference" for muddy/fine sediment substrates where they are most likely to have been deposited by currents. Adult winter flounder prefer temperatures of 12 to 15°C, DO concentrations greater than 2.9 mg/l, and salinities above 22 ppt, although they have been shown to survive at salinities as low as 15 ppt. Mature adults are found in very shallow waters (less than -16 ft MLW) during the spawning season.

Juveniles and adults are present in the HRE year round, but juveniles are less common in the winter (except in the deeper channels) and adults are scarce in the summer. In general, eggs and larvae are abundant in the HRE from October to May, juveniles are abundant from June to November, and adults are abundant from January to April (Stone et al. 1994). In the HRE, one-year-old juveniles and adults prefer depths greater than -35 ft MLW. Larvae have been collected in the New York Bight in March and April. Juveniles and adults are present on the Atlantic coast year round and prefer depths of -15 to -165 ft MLW in the spring and -80 to -250 ft MLW in the fall.

Project Area: Due to their range of habitat utilization, larvae, juveniles, and adults can be expected to be common in the Project Area throughout the year. The sandy habitat of the Project Area may provide suitable spawning habitat for this species. In addition, winter flounder would also spawn on the neighboring shoal areas.

Clearnose Skate (*Raja eglanteria*): Juveniles and Adults

Primary Source: Packer et al. (2003a)

The clearnose skate occurs along the eastern United States coast from the Nova Scotian Shelf to northeastern Florida, as well as in the northern Gulf of Mexico from northwestern Florida to Texas. This species can be found on soft bottom substrates along the continental shelf, but also can be found in areas with rocky or gravelly bottoms. Both juveniles and adults are known to occupy the waters of HRE during spring, summer, and fall, with a depth preference of –16 to –26

ft MLW, temperature preference of 16 to 22°C, salinity preference of 21 to 37 ppt, and DO preference of 6 to 8 parts per million (ppm).

Project Area: Due to the habitat utilization of this species, both juvenile and adult clearnose skates would occupy the nearshore waters of the Project Area. However, the occurrence of this species throughout the Project Area would be uncommon.

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

Primary Source: Packer et al. (2003b)

Little skates are found from Nova Scotia to North Carolina. They usually occupy areas with sandy or gravelly bottom substrates from shoal waters at depths up to -1,260 ft MLW, but are normally found in depths of -120 to -160 ft MLW in the region of the New York Bight. Both juveniles and adults can be found year-round in the HRE. However, adults are not as common in the HRE, particularly during the summer season when they migrate into deeper waters. Juveniles have a depth preference of –16 to –65 ft MLW, temperature preference of 4 to 18°C, salinity preference of 25 to 32 ppt, and DO preference of 6 to 12 ppm. Depth preference of adults ranges between –23 to –33 ft MLW, temperature preference of 3 to 12°C, salinity preference of 25 to 29 ppt, and DO preference of 8 to 12 ppm.

Project Area: Due to the habitat utilization of this species, juvenile little skates would occupy the nearshore waters of the Project Area and the occurrence of adults throughout the Project Area would be uncommon.

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

Primary Source: Packer et al. (2003c)

The winter skate, formerly *Raja ocellata*, can be found from the southern coast of Newfoundland and the southern Gulf of St. Lawrence to Cape Hatteras. Its center of abundance is on Georges Bank and in the northern section of the Mid-Atlantic Bight. In both areas it is often second in abundance to (and often confused with) the little skate, a sympatric species. Juveniles can be found year round in the HRE, with a summer migration into deeper waters. Juveniles have a depth preference ranging between –16 to –26 ft MLW, a temperature preference of 4 to 13°C, salinity preference of 23 to 32 ppt, and DO preference of 8 to 12 ppm. Adults have a depth preference ranging between –20 to –82 ft MLW, a temperature preference of 6 to 12°C, and salinity preference of 32 to 33 ppt.

Project Area: Similar to the little skate, juvenile winter skates would occupy the nearshore waters of the Project Area and the occurrence of adults throughout the Project Area would be uncommon.

Dusky Shark (*Charcharinus obscurus*): Early and Late Juveniles

Primary Sources: USDOC (1999) and Compagno (1984)

The dusky shark is a large, highly migratory species that is common in warm and temperate continental waters throughout the world. Dusky sharks are strongly migratory in temperate and subtropical waters in western north Atlantic, moving north during the summer and retreating south when the water cools. The dusky shark has an extensive lateral range from close inshore in the surf zone to well out to sea, and a depth preference from the surface to -1,315 ft MLW. Although nursery areas are in coastal waters, dusky sharks do not prefer areas with reduced salinities and tend to avoid estuaries. In the western Atlantic, dusky sharks are highly migratory with a geographical range from Nova Scotia to Cuba (including the northern Gulf of Mexico). Dusky sharks are viviparous. Females move inshore to drop their young and then return to deeper water. Young dusky sharks have been observed to form large feeding schools or aggregations.

Project Area: Although migratory and pelagic, dusky sharks spawn in nearshore water, and therefore juveniles are expected to occur in the Project Area, but not in significant numbers.

Sandbar Shark (*Charcharinus plumbeus*): Early Juveniles and Adults

Primary Sources: USDOC (1999) and Compagno (1984)

The sandbar shark is an abundant, coastal-pelagic shark of temperate and tropical waters that occurs inshore and offshore. It is found on continental and insular shelves and is common at bay mouths, in harbors, inside shallow muddy or sandy bays, and at river mouths, but tends to avoid sandy beaches and the surf zone. Sandbar sharks migrate north and south along the Atlantic coast, reaching as far north as Massachusetts in the summer. Sandbar sharks bear live young in shallow Atlantic coastal waters between Great Bay, New Jersey, and Cape Canaveral, Florida. The young inhabit shallow coastal nursery grounds during the summer and move offshore into deeper, warmer water in winter. Late juveniles and adults occupy coastal waters as far north as southern New England and Long Island. Sandbar shark prefers temperatures greater than 21°C, salinities greater than 22 ppt, and depth of -66 to -215 ft MLW.

Project Area: Sandbar sharks are a migratory and coastal-pelagic species. Due to the habitat utilization of this species, neonates/early juveniles are expected in the Project Area during the summer. Migrating adults are expected to make a transient appearance during the summer, but not in significant numbers.

Sand Tiger Shark (*Odontaspis taurus*): Early Juveniles

Primary Source: Compagno (1984)

The sand tiger shark is a species that occurs in tropical to warm-temperate waters, inshore to offshore locations, and from littoral to deepwater depths. The sand tiger shark occurs in

continental and insular waters from the outer shelves and down the slopes to seamounts, possibly 5,250 ft deep. Occasional individuals of this species have been observed to come into the tide line along beaches or enter mouths of rivers (Bigelow and Schroeder 1953). They may also be found in shallow bays and around coral reefs. The general range of sand tiger shark is from Brazil to Maine in the western Atlantic. Sand tiger sharks have been observed hovering motionless just above the seabed in or near deep sandy bottom gutters or rocky caves, usually in the vicinity of inshore rocky reefs and islands (NOAA Fisheries 2000).

Project Area: Based on their range of habitat utilization, sand tiger sharks are likely rare in the HRE and the Project Area.

4.2 NON-EFH-DESIGNATED FISH AND SHELLFISH SPECIES

This section provides information on life history and habitat requirements for important recreational and commercial, non-EFH-designated species, i.e., striped bass (*Morone saxatilis*), weakfish (*Cynoscion regalis*), American lobster (*Homarus americanus*), blue crab (*Callinectes sapidus*), and horseshoe crab (*Limulus polyphemus*). Similar to the EFH-designated species, primary reference sources are cited once, at the beginning of each summary. For each species, the primary source was one of a series of *Species Profiles: Life Histories and Environmental Requirements of Coastal Fishes and Invertebrates* reports prepared by the USFWS and USACE, Waterways Experiment Station, during the 1980s.

Unlike the EFH-designated species, no life stages of importance have been designated for the non-EFH-designated species, and therefore each species assessment addresses all life stages of that particular species. Conclusions regarding the likelihood of occurrence of each species and life history stage in the Project Area are presented at the end of each species assessment.

Striped Bass (*Morone saxatilis*)

Primary Source: Fay et al. (1983)

Striped bass is a "generalist" species because it can tolerate a variety of environmental conditions and eat a variety of organisms. The mid-Atlantic distribution ranges from Cape Hatteras to the St. Lawrence River, Canada. However, there are distinct populations associated with the Roanoke River, Chesapeake Bay, Delaware River, and the Hudson River. Striped bass are an anadromous species, spawning once a year in fresh or nearly fresh water. Spawning for the mid-Atlantic region takes place primarily in April, May, and June. Striped bass eggs tolerate temperatures of 14 to 23°C. Striped bass larvae tolerate temperatures of 8 to 25°C and generally stay in or near the area where they were spawned. Juvenile striped bass tolerate temperatures of 10 to 27°C, and also tend to remain in the river or estuarine habitat where they were spawned. Adult striped bass tolerate temperatures of 0 to 30°C. Striped bass is an opportunistic carnivore with a diet that may include a mix of fish and various invertebrates. A study of the mid-Atlantic stocks found that, as their size increases, diet switches from mainly invertebrates to a mixture of fish and invertebrates, and then to a diet of primarily fish supplemented with invertebrates.

Project Area: Striped bass eggs and larvae are unlikely to be found in the Project Area because they are spawned in fresh to nearly fresh water and the larvae stay in the area of spawning. Juvenile striped bass also tend to remain in the spawning habitat, but may use nearshore portions of the HRE as foraging areas. Both juvenile and adult striped bass are likely to occupy the Project Area because they rely on the nearshore HRE as a nursery and forage area.

Weakfish (*Cynoscion regalis*)

Primary Source: Mercer (1989)

Weakfish can be found from the southern coast of Florida to Massachusetts Bay. They spawn in the nearshore and estuarine areas of the coast after a spring inshore migration. Weakfish larvae have been found in nearshore waters to 70 kilometers offshore. Juvenile weakfish use estuarine areas as nursery grounds and are more commonly found in the deeper areas of rivers or bays. Adults migrate seasonally between inshore and offshore waters. In the spring, weakfish migrate north to warming inshore waters and reverse this migration in the fall. In northern areas, a greater proportion of adults spend the summer in oceanic waters rather than estuaries. Weakfish have been collected over a temperature range of 9.5 to 30.8°C and a salinity range of 0.1 to 32.3 ppt. However, areas with the most abundant juvenile catches had salinities of 2.0 to 10.8 ppt. Young weakfish feed primarily on mysid shrimp and anchovies; older weakfish feed primarily on available clupeid fish.

Project Area: Weakfish are expected to occupy the Project Area because they migrate in and out of the HRE on a seasonal basis and utilize the HRE as a foraging and nursery area.

Blue Crab (*Callinectes sapidus*)

Primary Source: Hill et al. (1989)

The blue crab is found in coastal waters from Massachusetts to South America. Its primary habitat is in bays and brackish estuaries. Substrate preference varies with life stage. Areas with submerged aquatic vegetation and soft sediments are important for juvenile crabs, which use the vegetation as a refuge from predation. Adult crabs prefer a wide range of substrates ranging from harder substrates, such as sand and rock, to mud bottoms. Mating takes place primarily in relatively low salinity waters in upper portions of estuaries and lower portions of rivers. After mating, females migrate to high salinity waters in lower estuaries, sounds, and nearshore spawning areas. Juveniles migrate to shallower low salinity waters where they grow and mature. Blue crabs prey on commercially important clams and oysters, and serve as food for commercially important species such as striped bass.

Project Area: Based on their range of habitat utilization and availability of food sources, blue crabs are expected to occur in the Project Area.

American Lobster (*Homarus americanus*)

Primary Source: MacKenzie and Moring (1985)

The American lobster occurs in coastal surf to continental slope waters up to 2,300 ft in depth. However, this range is divided between inshore and offshore groups, with some overlap occurring. Lobsters are solitary, territorial crustaceans that live in a variety of different habitats, preferring areas that have a rocky or soft mud bottom to one that is sandy. Lobsters reproduce when a recently molted soft-shelled female mates with a hard-shelled male in the summer or fall. The female generally extrudes and fertilizes the eggs about a year after mating, and then carries the eggs on her abdomen until they hatch the following spring or early summer. Hatched larvae go through a planktonic stage for about a month, and then permanently settle to the bottom. Seasonal distribution may be related to water temperature. Migrations into the shallow waters of the Lower Bay take place in spring and summer, and correspond with spawning episodes. Most lobsters are caught in shallow inshore waters, at depths of -15 to -100 ft MLW.

Project Area: American lobsters prefer sandy areas with rock overhangs. Although sandy substrates are abundant throughout the Project Area, there are a lack of rock overhangs or underwater structures, and therefore American lobsters are likely not present in significant numbers in the Project Area.

Atlantic Horseshoe Crab (*Limulus polyphemus*)

Primary Source: Atlantic States Marine Fishery Commission (1998)

The horseshoe crab is a benthic arthropod that utilizes both estuarine and continental shelf habitats. They are not a true "crab" and are classified in their own class (Merostomata), which is more closely related to arachnids. Horseshoe crabs range from the Yucatan peninsula to northern Maine but are most abundant between Virginia and New Jersey. The NOAA Fisheries, Northeast Fisheries Center bottom trawl surveys show that 92 percent of the horseshoe crabs caught were in waters shallower than -66 ft MLW. Horseshoe crabs are ecological generalists that can survive in a range of environmental conditions. Studies report that adult horseshoe crabs migrate from deep bay waters and the Atlantic continental shelf to spawn on intertidal sandy beaches. Spawning generally occurs from March to July. Eggs are laid in the sediment and hatch approximately 14 to 30 days after fertilization. Larvae may over-winter in the sediment but when they emerge they generally settle in shallow water areas to molt. Juvenile horseshoe crabs usually spend the first 2 years of life on intertidal flats near the breeding beaches. Older individuals move out of intertidal areas to a few miles offshore, but some remain in intertidal areas year round.

Larvae feed on a variety of small polychaetes and nematodes. Juvenile and adult horseshoe crabs feed primarily on mollusks, including various clams and blue mussels. Horseshoe crabs also prey on a wide variety of benthic organisms.

Project Area: Based on their range of habitat utilization and availability of food sources, horseshoe crabs are expected to occur in the Project Area.

4.3 PREY SPECIES

Principal prey items for the EFH-designated species that have been identified as probable occupants of the Project Area are listed in Table 2. Adults and juveniles with different diets are listed separately. Winter and windowpane flounder and clearnose, little, and winter skates are obligate bottom feeders. Dusky, sandbar, and sand tiger sharks also are bottom feeders, foraging mostly on fish species. Red hake, black sea bass, summer flounder, and scup feed on benthic and pelagic organisms and Atlantic butterfish, Atlantic herring, cobia, and the three mackerel species are pelagic feeders.

Table 2. Prey Species for EFH-Designated Fish Species.

Species	Life History Stage	Principal Prey
Bottom and Pelagic Feeders		
Black sea bass	Juveniles	Small benthic crustaceans (e.g., crustaceans and mollusks) and small fish.
	Adults	Benthic and near-bottom invertebrates and small fish.
Red hake	Larvae	Copepods and micro-crustaceans; feeding is usually nocturnal.
	Juveniles	Polychaetes and small benthic and pelagic crustaceans, including decapod shrimp and crabs, mysids, euphausiids, and amphipods.
Cobia	Juveniles and adults	Crustaceans, cephalopods, and small fishes, most notably portunid crabs.
Dusky shark	Early and late juveniles	Wide variety of fish species and crustaceans (e.g., squids).
Sandbar shark	Early juveniles and adults	Small bottom and pelagic fish with some mollusks and crustaceans.
Sand tiger shark	Early juveniles	Wide variety of fish species and epibenthic prey (e.g., crabs).
Scup	Larvae	Zooplankton.
	Juveniles	Polychaetes, amphipods, other small crustacea (copepods, mysids), small mollusks, and fish eggs and larvae.
	Adults	Benthic and near bottom invertebrates and small fish.
Summer flounder	Larvae	Calanoid and harpactacoid copepods and polychaete tentacles.
	Juveniles	YOY (<100 mm) feed on polychaetes and small crustaceans, and older juveniles have the same diet plus small fish.
	Adults	Crustaceans (e.g., crabs), bivalves, marine worms, sand dollars, and a variety of fish species.
Winter flounder	Larvae	Nauplii, invertebrate eggs, protozoans, and polychaetes.
	Juveniles and adults	Mostly polychaetes and amphipods (e.g., *Ampelisca abdita*); also *Crangon*, sand dollars, and bivalves.
Windowpane	Larvae	Copepods and other zooplankton.

Table 2. Prey Species for EFH-Designated Fish Species.

Species	Life History Stage	Principal Prey
	Juveniles and adults	Small crustaceans (e.g., mysids and decapod shrimp) and fish larvae.
Clearnose skate	Juveniles and Adults	Polychaetes, amphipods, mysid shrimp, crabs, bivalves, squid, and small fishes.
Little skate	Juveniles and Adults	Mostly decapods (e.g., crustaceans and amphipods) and followed by polychaetes, isopods, bivalves, hydroids, and fishes.
Winter skate	Juveniles and Adults	Mostly polychaetes and amphipods and followed by decapods, isopods, bivalves, and fishes.
Pelagic Feeders		
Atlantic butterfish	Larvae, juveniles and adults	Planktonic prey, squid, and crustaceans, polychaetes, and small fish.
Atlantic sea herring	Larvae, juveniles, and adults	Zooplanktons (e.g., copepods, crustacean eggs, decapod larvae, and shrimp).
Atlantic mackerel	Juveniles and adults	Crustaceans, pelagic mollusks, polychaetes, squid, and fish.
Bluefish	Juveniles	Polychaetes and crustaceans, but mostly fish.
	Adults	Wide variety of fish species.
King mackerel	Larvae	Larval fish, especially carangids, clupeids, and engraulids.
	Juveniles and adults	Crustaceans and variety of fish species.
Spanish mackerel	Larvae	Larval fish, especially carangids, clupeids, and engraulids; also some crustaceans.
	Juveniles and adults	Crustaceans and variety of fish species.

Sources: EFH Source Documents (see references).

No surveys of benthic prey species have been conducted in the immediate nearshore waters of the Project Area. However, El Paso Energy Bridge Holding Company, LLC (El Paso) (2003) conducted a benthic invertebrate survey in the nearshore waters at nearby Princess Bay in November 2002. Benthic samples were collected using a Smith-MacIntyre benthic grab sampler (0.1 square meter) or equivalent grab sampling device. Results of the benthic macroinvertebrate survey showed a total of five taxa collected in the nearshore waters of Princess Bay (Table 3). Oligochaeta was the most abundant benthic taxon and consisted of 68 percent of the total catch. Polychaeta was the second most abundant benthic taxon collected and consisted of 21.6 percent of the total catch. Gastropoda (4.8 percent), malacostraca (3.6 percent), and bivalvia (2.0 percent) comprised the remainder of the benthic macroinvertebrate taxons collected (Table 3) (El Paso 2003).

This survey indicates that benthic oligochaetes, polychaetes, and bivalves are common in the sandy, shoal areas in the vicinity of the Project Area. Given that Princess Bay is located just south of the Crescent Beach portion of the Project Area, the same taxons of benthic macroinvertebrates would also be present in the nearshore waters of the Project Area. These organisms represent food resources for bottom-feeding EFH-designated species and are thus a component of EFH for these species.

Table 3. Benthic Invertebrate Species Collected at Princess Bay, New York in 2002.

Taxon	Total Captured	Percent Composition
Oligochaeta	170	68.0
Polychaeta	54	21.6
Gastropoda	12	4.8
Malacostraca	9	3.6
Bivalvia	5	2.0
Total	**250**	**100**

Source: El Paso 2003, compiled by Northern Ecological Associates, Inc.

5.0 IMPACTS

This section identifies the direct, indirect, and cumulative impacts of the proposed Project activities on the relevant life history stages of EFH-designated species, their habitats, and their prey species.

5.1 HABITAT IMPACTS

The proposed Project involves the construction of coastal storm risk management measures for the southern Staten Island shoreline areas. The proposed measures for the line of protection include road raising, levee, floodwall, buried seawall (including a segment of raised boardwalk and sand fill/dune grass placement on adjacent slopes) and tidal marsh, to preserve the functional effectiveness of tidal exchange. The road raising, levee, floodwall and seawall would be constructed in areas of the southern Staten Island shoreline that are landward of the mean high tide line, and therefore would not cause any direct habitat impacts on the nearshore Staten Island area. The tidal marsh, to preserve the functional effectiveness of tidal exchange, will include construction seaward of the mean high tide line. However the impacts from this construction, such as increased turbidity, will be minimal and temporary. In additional, the long term impacts of this project feature, such as creation of forage habitat for juvenile fish, will be beneficial to the environment. This increase in habitat will support the target ecosystem characteristic (TEC) goals for the Hudson Raritan Estuary, such as coastal wetlands, shorelines and shallows and habitat for fish, crab and lobsters.

The construction of minimum facilities to provide interior drainage for the Project Area would be located in areas of Staten Island shoreline that are landward of the mean high tide line and with the exception of tide/slide gates at existing sewer outfalls and the tide gates in Oakwood Creek (removal of 1 existing tide gate near WWTP and construction of 2 new tide gates), would not cause any direct habitat impacts in the Project Area. Habitat impacts from tide and slide gates would be limited to the footprint of the gates. Overall impacts to the nearshore Project Area would be minimal as the new construction would be limited to the addition of 2 tide gates and slide gates at existing storm sewer outfalls.

Water Quality

The building materials for levees, floodwalls and seawalls consist of stones, sheet pilings, and sand. Proper erosion control measures, such as hay bales and silt fences, would be erected if necessary to prevent project related erosion and runoff from entering the bay during upland construction. Should erosion and runoff from upland construction occur, a temporary, short-term increase in sedimentation and turbidity can be expected, but the sediments will settle quickly out of the water column causing minimal impacts on water quality. Sand will be from material excavated for the foundation of the line of protection and therefore sand composition is similar to the existing habitat and contains little organic matter and no unacceptable levels of toxic materials, thereby avoiding significant impact on water quality at the Project Area. Additionally, the stones and sheet pilings used for the proposed Project would be clean and contain little

organic matter and no hazardous materials, and therefore would not cause a significant impact on water quality in the Project Area.

Construction of interior drainage facilities, including pond excavation, would have no foreseeable impact on water quality to the nearshore waters surrounding the Project Area, given the distance of the proposed locations from the shore and the planned use of best management practices to control soil erosion and sedimentation during periods of soil disturbance.

5.2 DIRECT IMPACTS

The placement of Oakwood Creek slide gates and tide gates at sewer outfalls, as well as the tidal marsh to preserve the functional effectiveness of tidal exchange, within the Project Area may cause direct mortality (burial) of demersal eggs and any small larval and juvenile EFH and non-EFH-designated species that may be present at the footprint of the construction area during the time of construction. This type of direct impact is expected to be limited primarily to egg and larval stages of windowpane, winter flounder, blue crab, and horseshoe crab, the larval stage of summer flounder, and YOY juvenile windowpane and summer and winter flounders. The overall mortality of any finfish or crustacean species would be limited to the footprint of the construction area and is not expected to be significant because these species are highly mobile and individuals tend to move away from areas where large construction equipment is working (Table 4).

Construction of the Oakwood Creek tide gates and tide/slide gates at existing sewer outfalls, as well as the tidal marsh to preserve the functional effectiveness of tidal exchange, may also cause a temporary increase in sedimentation and turbidity. The increase in sedimentation and turbidity could potentially lead to gill abrasion and cause suffocation (Uncles et al. 1998) to fish and crustacean species, as well as hinder predation efficiency of sight-feeding fish, such as summer flounder at or adjacent to the Project Area. However, placement of the coastal storm risk management measures would be localized and limited to the footprint of each individual outfall and the proposed tidal marsh footprint. Additionally, placement of the coastal storm risk management measures would be in the sandy nearshore zone of the Project Area, where the increase in sedimentation and turbidity are expected to be minor and the sand would quickly settle out of the water column or be dispersed by the currents at the Project Area (Table 4).

For upland coastal storm risk management measures (i.e., levees, floodwalls and seawalls), proper erosion control measures, such as hay bales and silt fences, would be erected where necessary to prevent construction related erosion from entering the nearshore zone during construction. Should erosion and runoff from upland construction occur, a temporary, short-term increase in sedimentation and turbidity can be expected, but the sediments are expected to settle quickly out of the water column and cause minimal impacts.

Table 4. Potential Impacts on EFH-Designated Species in the Project Area.

Species	Stage	Potential Impacts
Atlantic butterfish	Larvae	Pelagic. No significant impact.
	Juveniles	Pelagic, zooplankton-feeding species. No significant impact.
	Adults	Pelagic, zooplankton-feeding species. No significant impact.
Atlantic mackerel	Juveniles	Transient, pelagic species. No significant impact.
	Adults	Transient, pelagic species. No significant impact.
Atlantic sea herring	Larvae	Pelagic. No significant impact.
	Juveniles	Pelagic, zooplankton-feeding species. No significant impact.
	Adults	Pelagic, zooplankton-feeding species. No significant impact.
Black sea bass	Juveniles	Depth and structure preference will limit this species from occurring in great numbers at the Project Area. No significant impact.
	Adults	Depth and structure preference will limit this species from occurring in great numbers at the Project Area. No significant impact.
Bluefish	Juveniles	Temporary displacement of fish and their prey (forage fish). No significant impact due to the ability to relocate for food.
	Adults	Pelagic, temporary displacement of fish and their prey (forage fish). No significant impact.
Clearnose skate	Juveniles	Short-term, temporary loss of a small fraction of benthic infaunal prey organisms. No significant impact because fish also feed on pelagic prey organisms or are able to relocate for food.
	Adults	Short-term, temporary loss of a small fraction of benthic infaunal prey organisms. No significant impact because fish also feed on pelagic prey organisms or are able to relocate for food.
Cobia	Eggs	No significant impact.
	Larvae	No significant impact.
	Juveniles	Transient pelagic species. No significant impact.
	Adults	Transient pelagic species. No significant impact.
King mackerel	Eggs	No significant impact.
	Larvae	No significant impact.
	Juveniles	Transient pelagic species. No significant impact.
	Adults	Transient pelagic species. No significant impact.
Little skate	Juveniles	Short-term, temporary loss of a small fraction of benthic infaunal prey organisms. No significant impact because fish also feed on pelagic prey organisms or are able to relocate for food.
	Adults	Depth preference limits this species from occurring in great numbers at the Project Area. No significant impact.
Red hake	Eggs	No significant impact.
	Larvae	Pelagic. No significant impact.
	Juveniles	Depth preference will limit this species from occurring in great numbers at the Project Area. No significant impact.
Scup	Eggs	Pelagic. No significant impact.
	Larvae	Pelagic. No significant impact.

Table 4. Potential Impacts on EFH-Designated Species in the Project Area.

Species	Stage	Potential Impacts
	Juveniles	Depth preference will limit this species from occurring in great numbers at the Project Area. No significant impact.
	Adults	Depth preference will limit this species from occurring in great numbers at the Project Area. No significant impact.
Spanish mackerel	Eggs	No significant impact.
	Larvae	No significant impact.
	Juveniles	Transient pelagic species. No significant impact.
	Adults	Transient pelagic species. No significant impact.
Summer flounder	Larvae	Short-term, temporary loss of a small fraction of benthic infaunal prey organisms. No adverse impact because fish also feed on pelagic prey organisms or are able to relocate for food.
	Juveniles	Short-term, temporary loss of a small fraction of benthic infaunal prey organisms. No adverse impact because fish also feed on pelagic prey organisms or are able to relocate for food.
	Adults	Short-term, temporary loss of a small fraction of benthic infaunal prey organisms. No adverse impact because fish also feed on pelagic prey organisms or are able to relocate for food.
Windowpane	Eggs	Placement of outfall extension and tide and slide gates may cause mortality of demersal eggs in the spawning area during the February-November spawning season. Minimal impact expected.
	Larvae	Placement of outfall extension and tide and slide gates may cause mortality of recently-hatched larvae near the bottom, but have no significant impact on larvae in surface waters.
	Juveniles	Placement of outfall extension and tide and slide gates may impact smaller and slower YOY juveniles. No significant impact from loss of benthic infaunal species because primary prey are more mobile epifaunal species.
	Adults	No significant impact from loss of benthic infaunal species because primary prey are more mobile epifaunal species and fish will relocate for food. Construction during spawning season will cause females to move to nearby unaffected areas to spawn, but should have no significant impact on egg production.
Winter flounder	Eggs	Placement of outfall extension and tide/slide gates may cause mortality of demersal eggs in the spawning area during the January-April spawning season. Minimal impact expected.
	Larvae	Placement of outfall extension and tide/slide gates may cause mortality of recently-hatched larvae near the bottom, but have no significant impact on larvae in surface waters.
	Juveniles	Loss of benthic infaunal prey organisms will cause larger juveniles to relocate to nearby, unaffected areas; smaller YOY juveniles are less able to relocate and are vulnerable to mortality from construction activities.

Table 4. Potential Impacts on EFH-Designated Species in the Project Area.

Species	Stage	Potential Impacts
	Adults	Loss of benthic infaunal prey organisms will cause adults to relocate to nearby, unaffected areas to feed. Construction during spawning season will cause females to move to nearby, unaffected areas to spawn, but should have no significant impact on egg production.
Winter skate	Juveniles	Short-term, temporary loss of a small fraction of benthic infaunal prey organisms. No significant impact because fish also feed on pelagic prey organisms or are able to relocate for food.
	Adults	Depth preference limits this species from occurring in great numbers at the Project Area. No significant impact.
Dusky shark	Early Juveniles	Short-term, temporary loss of a small fraction of benthic infaunal prey organisms. No adverse impact because shark will relocate for food.
	Late Juveniles	Short-term, temporary loss of a small fraction of benthic infaunal prey organisms. No adverse impact because shark will relocate for food.
Sandbar shark	Early Juveniles	Short-term, temporary loss of a small fraction of benthic infaunal prey organisms. No adverse impact because sharks are able to relocate for food.
	Adults	Short-term, temporary loss of a small fraction of benthic infaunal prey organisms. No adverse impact because sharks are able to relocate for food.
Sand tiger shark	Early Juveniles	Pelagic, transient species. May experience a short-term, temporary loss of benthic infaunal prey organisms. No adverse impact because sharks are able to relocate for food.

Source: Compiled by Northern Ecological Associates, Inc. 2004.

The preferred spawning habitat of windowpane and winter flounder are sandy substrates from the nearshore waters to the outer continental shelf, similar to the areas at or near the footprints of the tide/slide gates at existing sewer outfalls. Spawning of winter flounder can be expected to occur between January and March, whereas spawning of windowpane can be expected to occur between February and November. Winter flounder eggs are demersal and adhere to the bottom until they hatch, whereas windowpane eggs are buoyant and remain in the water column. Therefore, eggs of winter flounder could potentially be present on the bottom of the nearshore zone of the Project Area throughout most of the year and would be most vulnerable in the spring and summer just after they settle to the bottom and are still very small. The sandy habitats of the nearshore waters of Raritan Bay are ideal nursery grounds for newly hatched larval and juvenile flounders (i.e., windowpane and summer and winter flounders). The small, larval and juvenile flounders, which live in contact with the bottom and are poor swimmers, would be most at risk during construction of the tide gates. Direct impacts would potentially include burial of flounder eggs, larvae, and YOY juveniles, but due to the small size of the required construction area for the tide gate construction, minimal impacts are expected. Older juveniles and adults of both species that are likely to occupy the Project Area are not at risk from construction because of their mobility.

Eggs and larvae of all the other EFH-designated species in the Project Area are pelagic and not at risk from nearshore and dredging construction activities. None of the other EFH-designated fish species or life history stages that are likely to occupy the Project Area are at risk because they are either pelagic species, large demersal species (sharks), or adults of demersal species that are only at risk as juveniles (Table 4).

Due to the habitat utilization of horseshoe and blue crabs, these two non-EFH-designated species would be present throughout the nearshore zone of the Project Area and may be subject to some direct impact from the placement of the tide gates at existing sewer outfalls. Spawning of horseshoe crabs generally occurs from March to July with eggs laid in the sediment. Larval horseshoe crabs may over-winter in the sediment but when they emerge they generally settle in shallow water areas to molt. Mating of blue crabs typically takes place in relatively low salinity waters in upper portions of estuaries and lower portions of rivers, and subsequently females migrate to higher salinity waters in the lower portions of estuaries, sounds, and nearshore areas to spawn. Juvenile blue crabs migrate to shallow, low salinity waters to grow and mature. The placement of the tide gates may cause direct mortality of horseshoe crab eggs and larvae and impact larval blue crabs. However, the footprints of the tide gates are small and localized. Therefore, minimal impacts to horseshoe and blue crabs are anticipated (Table 5).

5.3 INDIRECT IMPACTS

The most significant impact from the placement of the Oakwood Creek tide gates and slide gates at existing sewer outfalls, as well as the tidal marsh to preserve the functional effectiveness of tidal exchange, on EFH and non-EFH-designated species would be the indirect effects caused by the burial of benthic infaunal prey organisms and some epifaunal prey organisms for the bottom-feeding EFH and non-EFH-designated species. Any benthic organism that lives in the sand (infauna) and the smaller, less motile organisms that live on the bottom (epifauna) that are not capable of avoiding the construction activities will be smothered. Most of these organisms will be invertebrates, but a few small forage fish such as sand lance (*Ammodytes americanus*), which burrow into the sand, will also be impacted. However, impacts to benthic organisms would be minimal, localized, and limited to the footprint of the slide and tide gates.

Table 5. Potential Impacts on Non-EFH Designated Species with Commercial and/or Recreational Value in the Project Area.

Species	Stage	Potential Impacts
Striped Bass	Eggs	No significant impact.
	Larvae	No significant impact.
	Juveniles	Loss of benthic prey species. No significant impact.
	Adults	Loss of small benthic prey organisms would have minimal impact because fish also feed on pelagic prey organisms and larger, more mobile benthic epifauna (*e.g.*, crabs). No significant impact.
Weakfish	Eggs	No significant impact.
	Larvae	No significant impact.
	Juveniles	Loss of benthic prey organisms would have minimal impact because fish also feed on more mobile benthic epifauna. No significant impact.
	Adults	Temporary displacement of fish and their prey species. No significant impact.
American lobster	Eggs	No significant impact.
	Larvae	No significant impact.
	Juveniles	Loss of infaunal and benthic prey species. No significant impact.
	Adults	Loss of infaunal prey species. No significant impact.
Blue crab	Eggs	No significant impact.
	Larvae	No significant impacts.
	Juveniles	Loss of infaunal prey species. No significant impact.
	Adults	Loss of infaunal prey species. No significant impact.
Horseshoe crab	Eggs	Eggs attached to female may be lost if female was impacted by construction.
	Larvae	Placement of outfall extension and tide and slide gates may cause burial/mortality for those located within the nearshore sediments of the Project footprint. Minimal impact expected.
	Juveniles	Placement of outfall extension and tide and slide gates will cause a lost of available habitat at the footprint of the Project Area and loss of infaunal prey species. Minimal impact expected.
	Adults	Loss of infaunal prey species. No significant impact.

Because juvenile and adult winter flounder and windowpane feed primarily on benthic infaunal organisms (Table 2), they are most likely to be indirectly affected as a result of impacts to their prey during construction of the Project. However, bottom-feeding finfish that have trouble finding sufficient prey in the Project Area during and following construction would be expected to simply relocate to an adjacent unaffected portion of the nearshore zone to feed. Pelagic piscivorous (fish-feeding) species might leave the immediate area during construction because of the noise, but would resume feeding as soon as the construction ceases and forage fish re-occupy the area.

The temporary loss of benthic prey resources caused by the proposed construction activities will not have any serious adverse effects on EFH for any species that feeds primarily on more motile epifaunal organisms (e.g., crabs, mysids, sand shrimp) or fish, because these organisms are readily available throughout the nearshore zone of the Project Area. For this reason, most of the EFH and non-EFH-designated species present would probably continue to feed in or adjacent to the Project Area even during construction (Table 4 and Table 5).

5.4 Cumulative and Synergistic Impacts

Cumulative impacts in the Project Area could result if the same area is subjected to repeated construction activities before the fish and benthic community has enough time to recover from the initial construction. The entire Coastal Storm Risk Management effort for southern Staten Island is anticipated to be a one-time construction project, with subsequent minor maintenance and/or repair, if necessary. Recruitment and re-colonization of the Project Area will begin immediately following completion of the construction activities. Impacts to the benthic and epibenthic fauna of the Project Area would be minimal, localized, and limited to the footprint of the size of the outfall extension and slide and tide gates, and therefore, the overall cumulative impact to bottom feeding EFH and non-EFH-designated species resulting from the proposed Project is expected to be minimal.

Synergistic effects associated with water quality changes due to resuspension of sand and from erosion would be limited and localized throughout the Project Area. Best management practices would be implemented during construction of upland coastal storm risk management measures (i.e., levees, floodwalls and seawalls consist of stones and sheet pilings). Proper erosion control measures, such as hay bales and silt fences, would be erected where necessary to prevent erosion and runoff from entering the nearshore zone during construction. Additionally, sedimentation from upland erosion or resuspended sand from placement of slide or tide gates is expected to rapidly settle out of the water column with currents in the nearshore zone of the Project Area rapidly dispersing suspended sediments that remain in the water column. Therefore, the cumulative and synergistic impacts associated with this Project are expected to be minimal.

6.0 CONCLUSION

This assessment concludes that the overall potential adverse impacts to EFH and non-EFH-designated species and EFH in the Project Area will not be significant. Most EFH and non-EFH-designated species that are expected to be present in the Project Area feed on more motile epifaunal organisms or on small forage fish and will not be significantly affected. For any bottom-feeding EFH and non-EFH species, the impact of sedimentation and turbidity would be localized and temporary.

Due to their association with benthic sandy habitats, flounders (windowpane and summer and winter flounders) would be the EFH-designated species that will experience the most direct impacts. Similarly, horseshoe and blue crabs would be the non-EFH-designated species that will experience the most direct impacts. If present, eggs, larvae, and juveniles of the EFH-designated flounder species may suffer burial and mortality from the placement of the outfall extension and tide gates at existing sewer outfalls. The increase sedimentation and turbidity from construction activities could also cause an indirect impact to fish species by causing gill abrasion and affect sight feeders. To avoid potential direct impacts to EFH and non-EFH-designated species, the Project will be constructed in accordance with mitigation and prevention measures recommended by the NOAA Fisheries, if required. Additionally, erosion control measures, such as hay bales and silt fences, would be erected to minimize upland erosion and sedimentation into the Lower New York Bay.

The most significant indirect impact of the proposed Project would be caused by the burial of benthic infaunal prey organisms and some epifaunal prey organisms for the bottom-feeding EFH and non-EFH-designated species. However, impacts to benthic organisms would be minimal, localized, and limited to the footprint of the slide and tide gates.

7.0 REFERENCES

Atlantic States Marine Fishery Commission. 1998. Interstate Fishery Management Plan for Horseshoe Crab. Fisheries Management Report No. 32. 52 pp.

Benimoff, A.I., and A.A Ohan. 2003. The Geology of Staten Island. http://www.library.csi.cuny.edu/dept/as/geo/sigeo.htm. Accessed on November 28, 2003.

Bester, C. 2004. Biological Profiles: Description Cobia – *Rachycentron canadum*. Ichthyology at the Florida Museum of Natural History. Http://www.flmnh.ufl.edu/fish/Gallery/Descript/Cobia/Cobia.html (Retrieved January 7, 2004).

Bigelow, H.B. and W. Schroeder. 1953. Fishes of the Gulf of Maine. Fishery Bulletin of the Fish and Wildlife Service, bulletin 74, volume 53. Washington, D.C.

Bokuniewicz, H.J. and C.T. Fray. 1979. The Volume of Sand and Gravel Resources in the Lower Bay of New York Harbor. Marine Science Research Center, State University of New York at Stony Brook, Special Report 32, Reference 79-16. 34 pp.

Chang S., P.L. Berrien, D.L. Johnson, and W.W. Morse. 1999. Essential fish habitat source document: windowpane, *Scophthalmus aquosus*, life history and habitat characteristics. NOAA Technical Memorandum NMFS-NE-137. U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Northeast Fisheries Science Center, Woods Hole, MA. 32 pp.

Collette, B.B. and C.E. Nauen. 1983. FAO species catalogue. Vol. 2. Scombrids of the world. An annotated and illustrated catalogue of tunas, mackerels, bonitos and related species known to date. FAO Fish. Synopsis, (125) Vol. 2:137 p.

Compagno, L.J.V. 1984. FAO species catalogue. Sharks of the world. An annotated and illustrated catalogue of shark species known to date. FAO Fisheries Synopsis No. 125, Vol. 4, Part 1 (Hexanchiformes to Lamniformes) and Part 2 (Carchariniformes). United Nations Fisheries and Agriculture Organization, Rome, Italy. 655 pp.

Cross, J.N., C.A. Zetlin, P.L. Berrien, D.L. Johnson, and C. McBride. 1999. Essential fish habitat source document: butterfish, *Peprilus triacanthus*, life history and habitat characteristics. NOAA Technical Memorandum NMFS-NE-145. U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Northeast Fisheries Science Center, Woods Hole, MA. 42 pp.

El Paso Energy Bridge Holding Company, LLC. 2003. New York/New Jersey Energy Bridge Project. Geophysical Surveys: Geotechnical and Environmental Sampling. Preliminary Report, February 2003. 33 pp.

Fahay, M.P., P.L. Berrien, D.L. Johnson, and W.W. Morse. 1999. Essential fish habitat source document: bluefish, *Pomatomus saltatrix*, life history and habitat characteristics. NOAA Technical Memorandum NMFS-NE-144. U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Northeast Fisheries Science Center, Woods Hole, MA. 65 pp.

Fay, C.W., R.J. Neves, and G.B. Garland. 1983. Species profiles: life histories and environmental requirements of coastal fishes and invertebrates (Mid-Atlantic) – striped bass. U.S. Fish and Wildlife Service, Biological Report 82(11.8). U.S. Army Corps of Engineers, TR EL-82-4, Waterways Experiment Station, Vicksburg, MS. 36 pp.

Godcharles, M.F. and M.D. Murphy. 1986. Species profiles: life histories and environmental requirements of coastal fishes and invertebrates (south Florida) – king mackerel and Spanish mackerel. U.S. Fish and Wildlife Service, Biological Report 82(11.58). U.S. Army Corps of Engineers, TR EL-82-4, Waterways Experiment Station, Vicksburg, MS. 18 pp.

Hill, J., D.L. Fowler, and M.J. Van Den Avyle. 1989. Species profiles: life histories and environmental requirements of coastal fishes and invertebrates (Mid-Atlantic) – blue crab. U.S. Fish and Wildlife Service, Biological Report 82(11.100). U.S. Army Corps of Engineers, TR EL-82-4, Waterways Experiment Station, Vicksburg, MS. 18 pp.

MacKenzie, C. and J.R. Moring. 1985. Species profiles: life histories and environmental requirements of coastal fishes and invertebrates (North Atlantic) – American lobster. U.S. Fish and Wildlife Service, Biological Report 82(11.33). U.S. Army Corps of Engineers, TR EL-82-4, Waterways Experiment Station, Vicksburg, MS. 19 pp.

Mercer, L.P. 1989. Species profiles: life histories and environmental requirements of coastal fishes and invertebrates (Mid-Atlantic) – weakfish. U.S. Fish and Wildlife Service, Biological Report 82(11.109). U.S. Army Corps of Engineers, TR EL-82-4, Waterways Experiment Station, Vicksburg, MS. 17 pp.

National Marine Fisheries Service (NMFS). 2000. The Office of Protected Resources: candidate species. sand tiger shark – *Odontaspis taurus*. http://www.nmfs.noaa.gov/pr/species/concern/profiles/sandtiger_shark.pdf (Retrieved May 26, 2005).

New England Fishery Management Council (NEFMC). 1999. Amendment #11 to the Northeast Multispecies Fishery Management Plan, Amendment #9 to the Atlantic Sea Scallop Fishery Management Plan, Amendment #1 to the Monkfish Fishery Management Plan, Amendment #1 to the Atlantic Salmon Fishery Management Plan, and Components of the Proposed Atlantic Herring Fishery Management Plan, for Essential Fish Habitat, incorporating the Environmental Assessment, Vol. I. New England Fishery Management Council in consultation with the National Marine Fisheries Service, Saugus, MA. 388 pp.

New York City Department of Environmental Protection (NYCDEP). 2013. Final Generic Environmental Impact Statement (GEIS) for the proposed Staten Island Bluebelt Drainage Plans for Mid-Islands Watersheds. November 2013.NYCDCP 2011 NYC Department of City Planning (NYCDCP), New York City Comprehensive Waterfront Plan: Vision 2020. 2011.

New York State Department of Environmental Conservation. 1991. Title 6, New York State Codes, Rules, and Regulations, Chapter X, Part 701: Classifications – Surface Waters and Groundwaters. http://www.dec.state.ny.us/website/regs/701.htm#701.1 (Retrieved 12/22/03).

Packer, D.B., S.J. Griesbach, P.L. Berrien, C.A. Zetlin, D.L. Johnson, and W.W. Morse. 1999. Essential fish habitat source document: summer flounder, *Paralichthys dentatus*, life history and habitat characteristics. NOAA Technical Memorandum NMFS-NE-151. U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Northeast Fisheries Science Center, Woods Hole, MA. 88 pp.

Packer, D.B., C.A. Zetlin, and J.J. Vitaliano. 2003a. Essential fish habitat source document: clearnose skate, *Raja eglanteria*, life history and habitat characteristics. NOAA Technical Memorandum NMFS-NE-174. U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Northeast Fisheries Science Center, Woods Hole, MA. 60 pp.

Packer, D.B., C.A. Zetlin, and J.J. Vitaliano. 2003b. Essential fish habitat source document: little skate, *Leucoraja erinace*, life history and habitat characteristics. NOAA Technical Memorandum NMFS-NE-175. U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Northeast Fisheries Science Center, Woods Hole, MA. 76 pp.

Packer, D.B., C.A. Zetlin, and J.J. Vitaliano. 2003c. Essential fish habitat source document: winter skate, *Leucoraja ocellata*, life history and habitat characteristics. NOAA Technical Memorandum NMFS-NE-179. U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Northeast Fisheries Science Center, Woods Hole, MA. 68 pp.

Pereira, J.J., R. Goldberg, J.J. Ziskowski, P.L. Berrien, W.W. Morse, and D.L. Johnson. 1999. Essential fish habitat source document: winter flounder, *Pseudopleuronectes americanus*, life history and habitat characteristics. NOAA Technical Memorandum NMFS-NE-138. U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Northeast Fisheries Science Center, Woods Hole, MA. 39 pp.

Reid, R.N., L.M. Cargnelli, S.J. Griesbach, D.B. Packer, D.L. Johnson, C.A. Zetlin, W.W. Morse, and P.L. Berrien. 1999. Essential fish habitat source document: Atlantic herring, *Clupea harengus*, life history and habitat characteristics. NOAA Technical Memorandum NMFS-NE-126. U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Northeast Fisheries Science Center, Woods Hole, MA. 48 pp.

Richards, C.E. 1967. Age, growth and fecundity of the cobia, *Rachycentron canadum*, from the Chesapeake Bay and adjacent Mid-Atlantic waters. Trans. Amer. Fish. Soc. 96:343-350.

Steimle, F.W., C.A. Zetlin, P.L. Berrien, and S. Chang. 1999a. Essential fish habitat source document: black sea bass, *Centropristis striata*, life history and habitat characteristics. NOAA Technical Memorandum NMFS-NE-143. U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Northeast Fisheries Science Center, Woods Hole, MA. 42 pp.

Steimle, F.W., W.W. Morse, P.L. Berrien, and D.L. Johnson. 1999b. Essential fish habitat source document: red hake, *Urophycis chuss*, life history and habitat characteristics. NOAA Technical Memorandum NMFS-NE-133. U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Northeast Fisheries Science Center, Woods Hole, MA. 34 pp.

Steimle, F.W., C.A. Zetlin, P.L. Berrien, D.L. Johnson, and S. Chang. 1999c. Essential fish habitat source document: scup, *Stenotomus chrysops*, life history and habitat characteristics. NOAA Technical Memorandum NMFS-NE-149. U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Northeast Fisheries Science Center, Woods Hole, MA. 39 pp.

Stone, S.L., T.A. Lowery, J.D. Field, C.D. Williams, D.M. Nelson, S.H. Jury, M.E. Monaco, and L. Andreasen. 1994. Distribution and abundance of fishes and invertebrates in Mid-Atlantic estuaries. ELMR Rep. No. 12. NOAA/NOS Strategic Environmental Assessments Division, Silver Spring, MD. 280 pp.

Studholme, A.L., D.B. Packer, P.L. Berrien, D.L. Johnson, C.A. Zetlin, and W.W. Morse. 1999. Essential fish habitat source document: Atlantic mackerel, *Scomber scombrus*, life history and habitat characteristics. NOAA Technical Memorandum NMFS-NE-141. U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Northeast Fisheries Science Center, Woods Hole, MA. 35 pp.

Uncles, R.J., I. Joint, and J.A. Stephens. 1998. Transport and retention of suspended particulate matter and bacteria in the Humber-Ouse Estuary, United Kingdom, and their relationship to hypoxia and anoxia. Estuaries. 21:4A:597-612.

United States Army Corps of Engineers (USACE). 1995. South Shore of Staten Island, New York. Beach Erosion Control and Storm Damage Protection Reconnaissance Study. USACE, New York District, New York, NY. 78 pp. + appendices.

_____. 1999. New York and New Jersey Harbor Navigation Study. Biological Monitoring Program. USACE, New York District, New York, NY. 147 pp.

_____. 2000. Nearshore Raritan Bay and Sandy Hook Bay, New Jersey, Pre-Final Essential Fish Habitat Assessment. Raritan Bay and Sandy Hook Bay Combined Flood Control and Shore Protection Project, Union Beach, New Jersey. USACE, New York District, North Atlantic Division, New York, NY. 29 pp. + appendices.

_____. 2014. South Shore of Staten Island Coastal Storm Risk Management Project, New York Draft Feasibility Study. USACE, New York District. 178 pp. + figures.

United States Department of Agriculture, Natural Resources Conservation Service (USDA/NRCS). 2014. Soils Website. Available at: http://soils.usda.gov/. Accessed on October 23, 2014.

United States Department of Commerce (USDOC). 1999. Final Fishery Management Plan for Atlantic Tunas, Swordfish and Sharks. Vol. II, Chapter 6: Highly Migratory Species (HMS) Essential Fish Habitat (EFH) Provisions. U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Office of Sustainable Fisheries, Silver Spring, MD. 302 pp.

_____. 2014. Guide to essential fish habitat designations in the Northeastern United States. U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Northeast Regional Office, Gloucester, MA. http://www.nero.noaa.gov/ro/doc/index2a.htm (Retrieved November 6, 2014).

Wilk, S.J., R.A. Pikanowski, D.G. McMillian, and E.M. MacHaffie. 1998. Seasonal Distribution and Abundance of 26 Species of Fish and Megainvertebrates Collected in the Hudson-Raritan Estuary, January 1992 – December 1997. Northeast Fisheries Science Center Reference Document 98-10. 145 pp.

APPENDIX A

Detailed Plan Drawings of Proposed Project,
Including Proposed Line of Protection,
Interior Drainage Facilities, and
Typical Cross-Section Figures

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

November 17, 2014

Mr. Nick Conrad
New York Natural Heritage Program
New York State Department of Environmental Conservation
625 Broadway, 5th Floor
Albany, NY 12233-4757

Dear Mr. Nick Conrad,

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 risk management projects and studies in the Northeast. As part of the planning and implementation process for the South Shore of Staten Island Coastal Storm Risk Management Project, New York District (NYD) will be completing the Feasibility Study and associated environmental compliance.

The project is located in Staten Island, Richmond County, New York. NYD is currently drafting an Environmental Impact Statement (EIS) for the project and requests that your office review the location for any records in your database of rare species or significant natural communities in the vicinity which may be impacted by the project.

Please find attached for your review: (1) project description, including maps and (2) plan sheets. The Draft EIS will be available for public and agency review in January 2015.

I look forward to working with you and your staff on this effort. If you should have any questions, please contact Ms. Catherine Alcoba of my staff at 917-790-8216.

Sincerely,

Peter Weppler
Chief, Environmental Analysis Branch

Attachments

1. SOUTH SHORE OF STATEN ISLAND PROJECT DESCRIPTION

1.1 Description of the National Economic Development (NED) Plan

1. The NED Plan for the Interim Feasibility Study on the South Shore of Staten Island from Fort Wadsworth to Oakwood Beach incorporates the optimum design stillwater height for the Tentatively Selected Line of Protection Plan and Tentatively Selected Interior Drainage Plans. The NED Plan meets the needs of the Disaster Relief Appropriations Act of 2013 (Public Law 113-2; herein P.L. 113-2).

2. Figure 1 below provides an overview of the NED Plan.

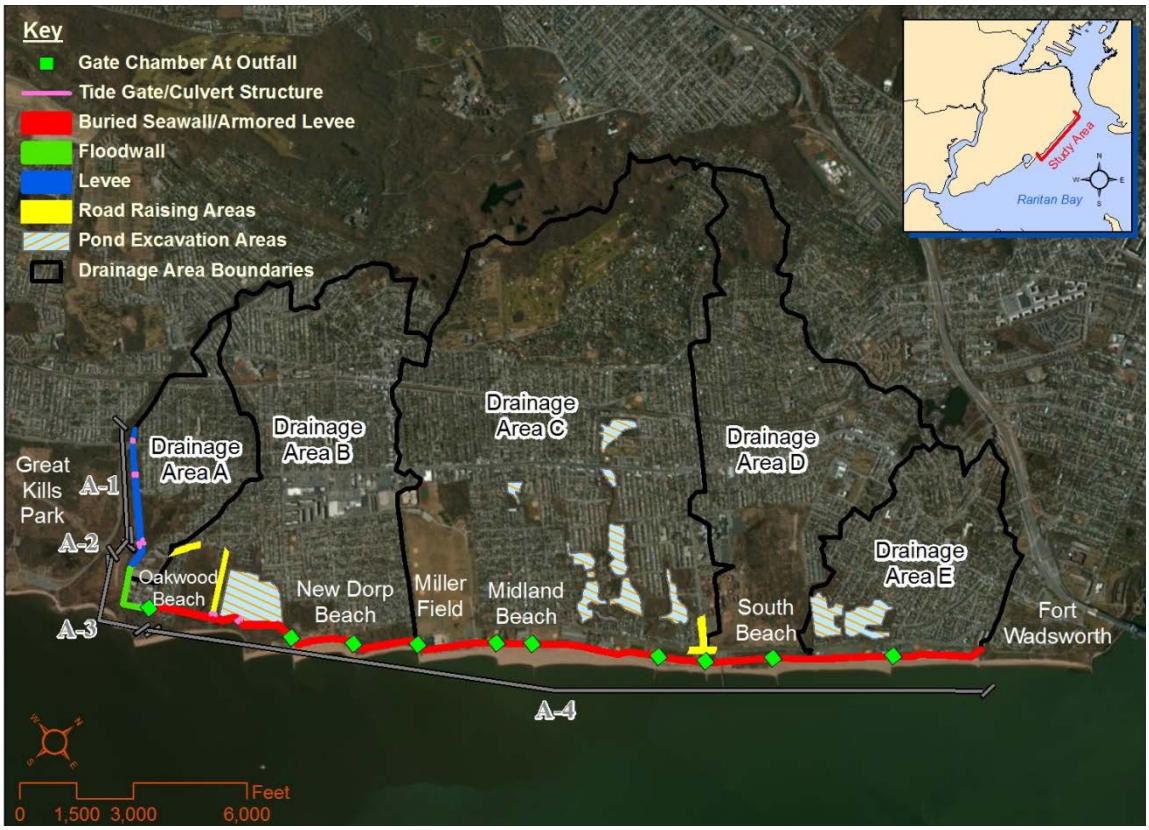


Figure 1 - NED Plan Overview

1.1.1 Line of Protection

3. The NED Plan includes the Line of Protection Alternative that consists of a buried seawall/armored levee along a majority of the reach (approximately 80%) serving as the first line of defense against severe coastal surge flooding and wave forces. The remainder of the Plan consists of a T-Type Vertical Floodwall, and Levee. The Plan also includes a stoplog closure structure at Hylan Boulevard, drainage control structures for existing storm water outfalls, tide gate structures, vehicle and pedestrian access structures. In general the Plan structure was split into four engineering reaches based on different design sections as listed below and depicted in Figure 2:

- Reach A-1: Levee
- Reach A-2: Levee
- Reach A-3: Floodwall
- Reach A-4: Buried Seawall

Figure 2 - Overview of Line of Protection

Alignment

4. Starting in Oakwood Beach in Reach A-1, the earthen levee with a 10-foot wide crest ties into high ground on the northwest side of Hylan Boulevard. A stop-log structure, consisting of H-shaped posts that accommodate the stacking of metal panels, is proposed at Hylan Boulevard to prevent floodwaters from flanking the levees during rare high water events. The earthen levee continues southeast through Oakwood Beach parallel to Oakwood Creek and Buffalo Street until the levee crosses over Oakwood Creek. A tide gate structure is proposed at this location. The total length of this Reach A-1 is 2,800 ft.

5. Reach A-2 begins on the eastern side of the creek and includes a levee that extends approximately 600 feet up to the Oakwood Beach Waste Water Treatment Plant.

6. In Reach A-3 the Line of Protection transitions to a Vertical T-type Floodwall surrounding two sides of the Waste Water Treatment Plant at Oakwood Beach. The total length of the floodwall is 1,800 feet.

Reach A-4 extends 22,700 feet from the southeast corner of the WWTP to Fort Wadsworth. In previous alternatives Reach 4 consisted of a mixture of exposed armor stone revetments, buried seawalls, and vertical steel sheet pile flood walls. The structure was revised to a continuous buried seawall. The alignment of the buried seawall through Oakwood Beach deviates from previously developed alternatives, extending across a portion of the Fox Beach neighborhood that is being environmental restored as part of the State of New York's Bluebelt Plan. The alignment continues across the marshes of Oakwood Beach and past Kissam Ave. The alignment in this marshy area is landward of New York City's sanitary sewer trunk line to the WWTP. A service road is proposed along the seaward edge of the buried seawall to facilitate access to the trunk line. A bend in the alignment occurs at the eastern end of Oakwood Beach to accommodate a second proposed tide gate structure.

7. From Midland Beach to Fort Wadsworth the alignment generally follows the footprint of the existing promenade and FDR Boardwalk. There are a few exceptions where the alignment was shifted landward to maintain a protective buffer between the shoreline and buried seawall/armored levee. This is most noticeably at the eastern end of the project area where the beach narrows. The buried seawall/armored levee ties-in to high ground at Fort Wadsworth. The buried seawall/armored levee in this reach extends 22,700 feet from the Oakwood Beach to Fort Wadsworth.

Levee

8. An 3,415-foot long earthen levee is proposed in Reaches A-1 and A-2 to terminate the structures in the LOP plan into high ground, thereby creating a closed system that protects the project area from floodwaters. The proposed levee in Reach A-1 and A-2 has a crest elevation of 18 foot NGVD29. The proposed Levee consists of compacted impervious fill that extends a minimum of 6 feet below the existing ground surface to prevent seepage. Common fill would be placed at a 2.5H:1V slope to stabilize the core and provide a solid basis for vegetation. The Levee along Reach A-1 has a crest width of 10 feet. The crest width of the A-2 Levee section (approximately 615 feet) was increased to 15 feet to allow maintenance vehicle access to the tide gates. Figure 3 presents a typical section of the Levee in Reach A-1. Figure 4 presents a typical section for the levee in reach A-2.

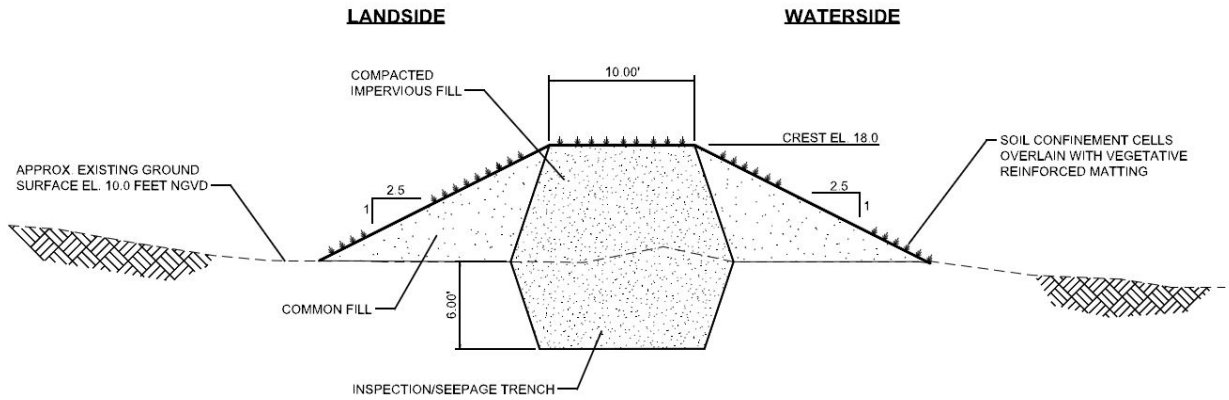


Figure 3 – Levee Typical Section (Reach A-1)

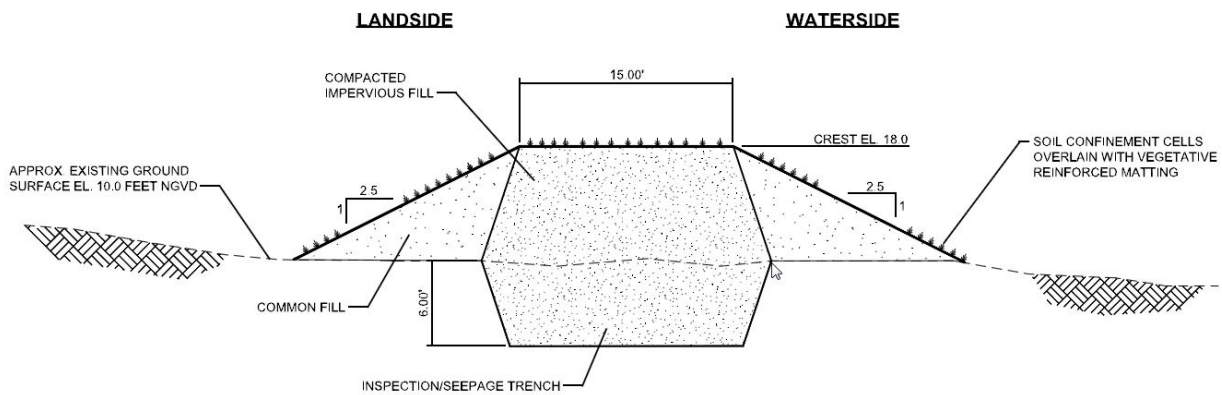


Figure 4 -Levee Typical Section (Reach A-2)

Floodwall

9. A reinforced concrete floodwall was proposed for Reach A-3 where a confined footprint is necessary to minimized impacts to the Oakwood Beach WWTP. The floodwall design consists of an H-pile supported T-wall with top of wall elevation of 20.5 feet NGVD29.

10. The structure footing was designed to accommodate localized wave induced and overtopping jet scour by defining a 4-foot thick base set 2-feet below grade. In addition, a rock blanket extends 15-foot seaward side of the wall to address wave scour and a rock splash apron extends 10 to 15 feet landward from the concrete footing to provide adequate overtopping jet scour protection. A vertical steel sheet pile wall has been added beneath the wall to prevent seepage below the footing. Figure 5 presents a typical section of the Floodwall (Reach A-3).

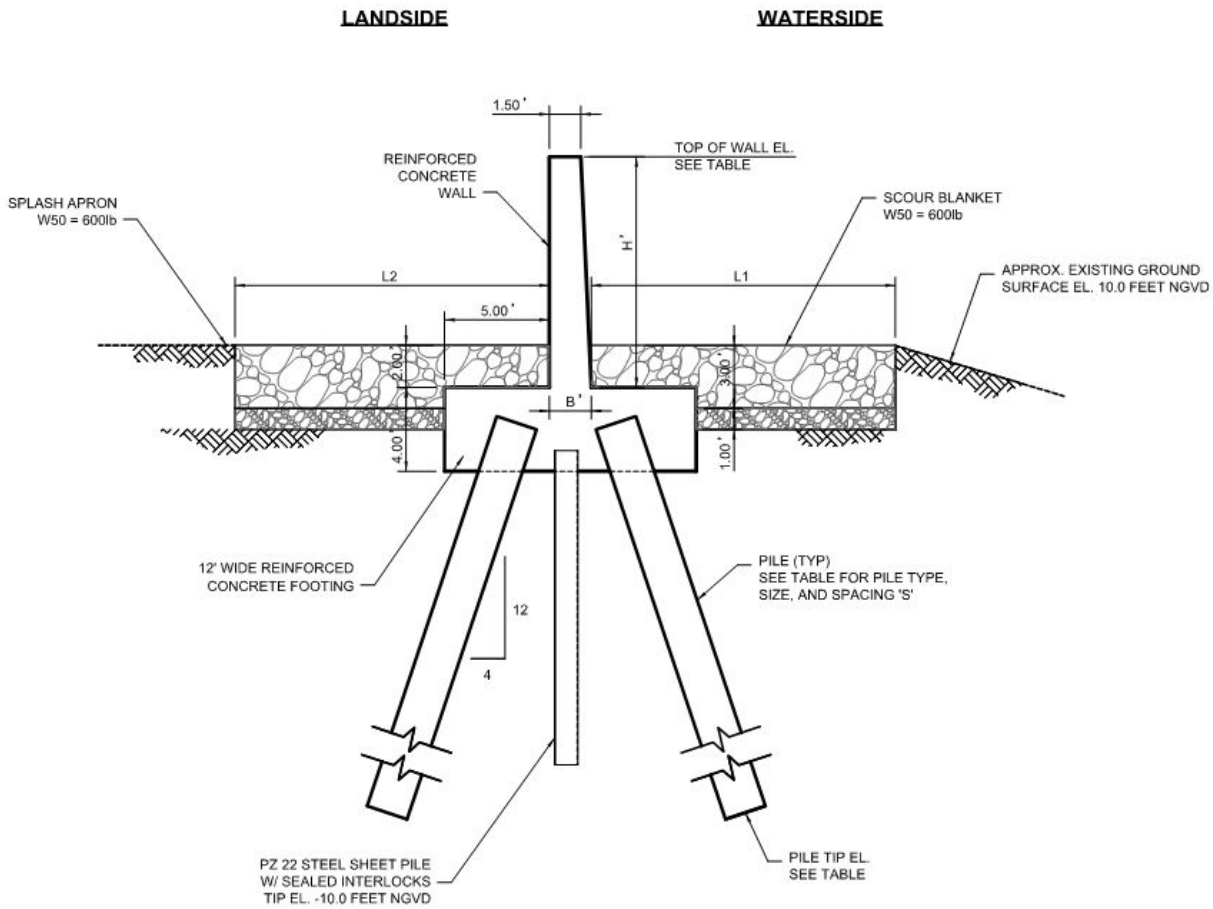


Figure 5 – Floodwall Typical Section (Reach A-3)

Buried Seawall

11. A buried seawall is selected for Reach A-4 which spans the majority of the project reach from Fort Wadsworth to Oakwood Beach. The designed crest elevation of the Buried Seawall is 20.5 feet NGVD 1929.

12. The buried seawall comprises a trapezoidal shaped core structure with a 10-foot wide crest and 1.5:1 (horizontal: vertical) side slopes. The core is constructed with two-stone thickness armor stone and bedding stone layers. A 10-foot wide scour apron is incorporated into the seaside structure toe. The entire above-grade portion of the structure is covered with material excavated to accommodate the structure foundation. This material, primarily sand with some clay, silts, and topsoil, will support grass and other native beach vegetation. The material cover is used to visually integrate the buried seawall with surrounding topography and to protect the public from climbing and/or falling on the uneven rock surface. Geotextile fabric is placed underneath the bedding layer to reduce settlement and around the core structure to minimize loss of fill through the voids. The material cover will be placed on 2:1 side slopes with a vegetative reinforced matting to provide additional protection and stabilization of the seaward face during less intense storm events. A vertical steel sheet pile wall will be installed in the interior of the structure to prevent seepage.

13. The buried seawall incorporates a promenade, replacing the continuous at-grade paved and pile supported promenade from Fort Wadsworth to Miller Field and FDR Timber Boardwalk. Roller compacted concrete is constructed atop the crest to create a 17-foot wide paved promenade. Figure 6 presents a typical section of the Buried Seawall (Reach A-4).

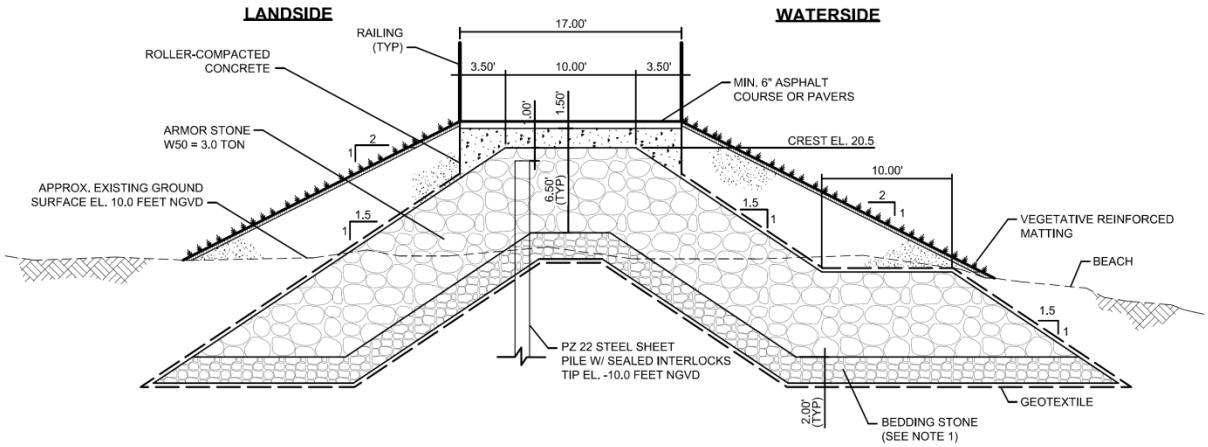


Figure 6 –Buried Seawall Typical Section (Reach A-4)

Stoplog Structure

14. At Hyland Boulevard a stoplog closure gate closure structure will be used to close off the roadway as needed to prevent flooding during rare storm events. The structure is approximately 106 feet long and 4 to 4.5 feet high and will be supported by a concrete foundation which consists of a series of footings located within the roadway adjacent to each lane of traffic along with footings located in the center median and each side of the Hylan Boulevard. During a flood event removable posts will be installed within the roadway and the stoplogs installed within the frame/guide. There are nine spans in the design. The multiple spans allow for testing the stoplog structure to be staged, precluding a full closure of Hylan Boulevard. Figure 7 presents a typical section view.

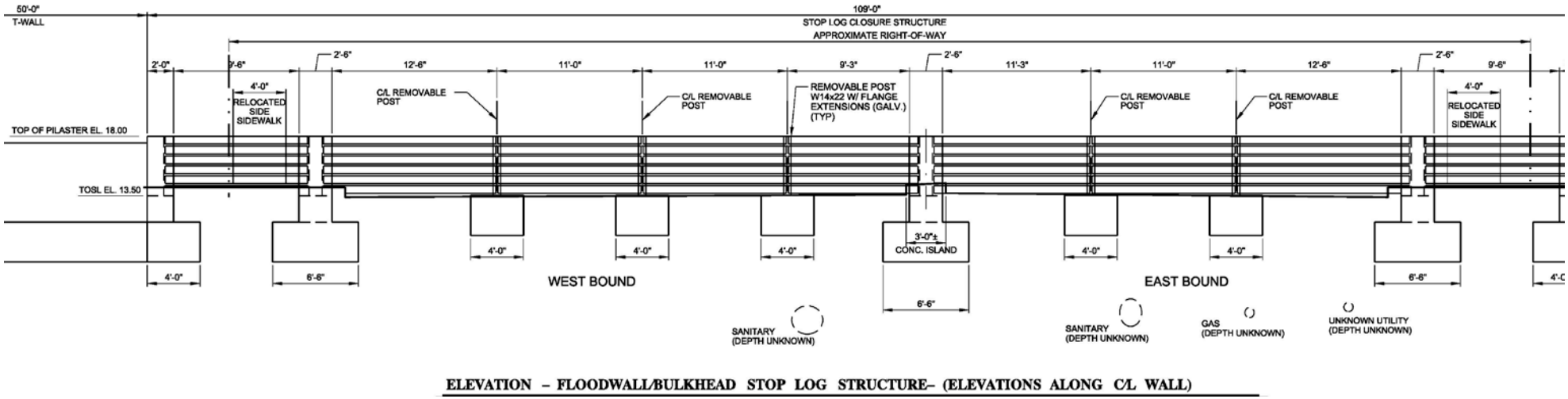


Figure 7 – Typical Section of Stoplog Structure

Tidal Marsh

15. The shorelines along the southeastern shore of Staten Island have generally been mildly erosional, which indicate that the rate of erosion over most large areas of the shoreline is low, averaging less than 1 foot per year of shoreline loss. However, the segment near the Oakwood Beach area is at a much lower elevation (within 5 feet or less of sea level), and shoreline recession has been as high as 20 feet per year. Physical properties of the area seaward of the LOP in Oakwood Beach include poorly drained, organic and erosive soils.

16. As part of the integrated approach for the Oakwood Beach area, the District considered increasing human and ecosystem community resilience as part of the overall solution to manage risk. To inhibit erosion, attenuate wave energy that can cause scour to the Project area, and to reduce sedimentation through the creek and tide gate into the freshwater wetland, the NED Plan has been designed to preserve the functional effectiveness of tidal exchange. This would facilitate wetland drainage and enable the tidal wetlands seaward of the LOP to help filter sediments so they are not brought into the freshwater wetlands (see Figure 4-3). In addition, the NED plan will utilize sand excavated during construction of the foundation for the Line of Protection.

17. To accomplish this enhancement, the existing channel would be relocated from along the inside toe of the existing natural berm to a central location within the site. The mouth of the existing channel would be widened from 22 feet (at elevation 2.0 feet NGVD 1929) to 30 feet wide. Widening the channel mouth and relocating the channel itself would allow for proper flooding and draining of the proposed marsh. The channel would be extended into the upper portion of the site to allow drainage from runoff from the scrub-shrub and maritime forest. The channel would also branch off and would connect with the proposed tide gate under the proposed access road that would run parallel to the LOP (USACE 2014a).

18. As shown on Figure 4-4, the proposed measures along the coastline include constructing approximately 46 acres of tidal wetlands on the seaward side of the proposed revetment. Approximately 10.1 acres of maritime forest/scrub-shrub habitat would also be planted along the front of the revetment, while 12.9 acres of low marsh and 6 acres of high marsh acres of living shoreline are proposed in the shallow waters adjacent to the existing beachfront. Further, 17 acres of dune grass is proposed to be planted. These measures include multiple habitats that would provide environmental and public benefits to the Oakwood Beach area (USACE 2014a).

Stormwater Outfalls/Gate Chambers

19. Existing stormwater outfalls, consisting of single and double concrete box culverts, pass beneath the Buried Seawall at nine locations. At these locations, the sheet pile seepage wall terminates either side of the existing culverts and the buried seawall rock structure will be constructed around the culverts and proposed gate chambers. A typical section view of the designed gate chamber is presented in Figure 8.

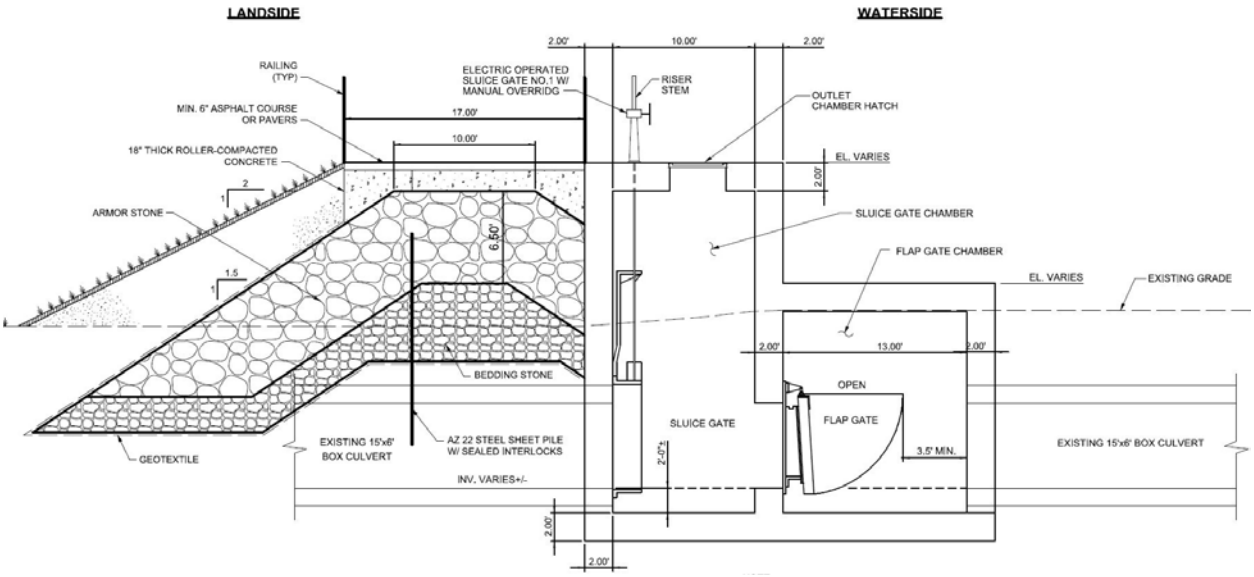


Figure 8 - Typical Section Gate Chamber

Tide Gates

20. Tide gate structures with reinforced concrete wing walls are proposed at two locations along the Line of Protection in the vicinity of Oakwood Beach. Aside from increases in wall height and thickness, the basic design of the proposed tide gate structures is consistent with the design of the existing tide gate structure located to the east of the Water Treatment Plant at Oakwood Beach. The tide gate structures are not designed for vehicular loading. Figure 9 presents a typical section of the tide gates.

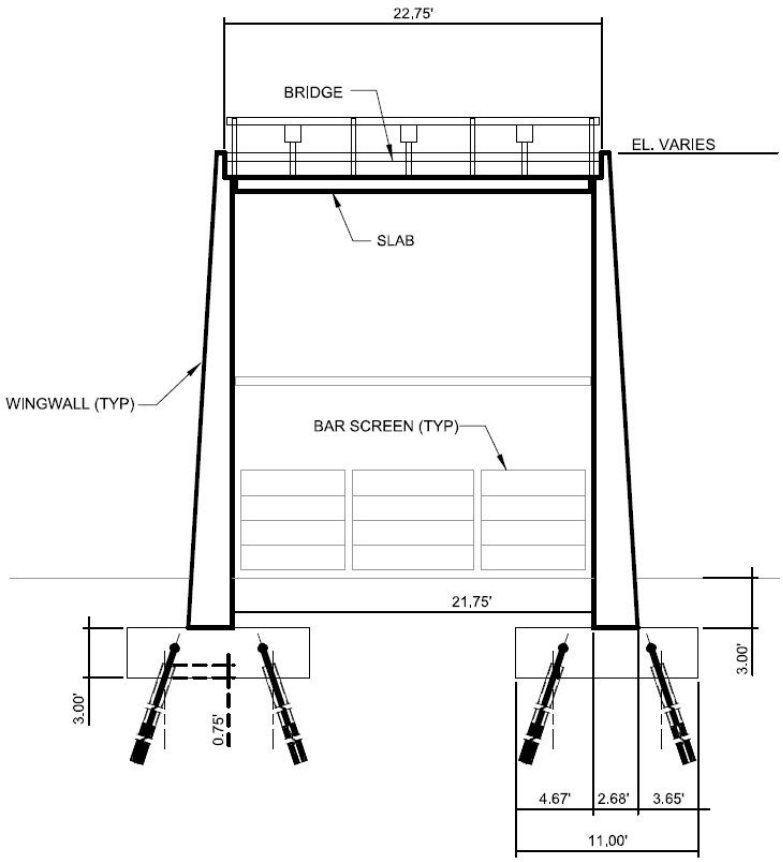


Figure 9 - Typical Section Tide Gate

Pedestrian and Vehicular Access

21. Three types of access points are provided along the Line of Protection: Maintenance vehicle access (MVA), combined truck and pedestrian access (DTP), and pedestrian access (PA).

22. Maintenance vehicle access is provided at one location in Reach A-2 and at four locations along Reach A-4 between New Dorp Beach and Oakwood Beach to provide vehicular access to the tide gate and stormwater outfall gate chambers. Earthen ramps are proposed to provide vehicular access to the tide gate and stormwater outfall gate chambers. These ramp sections are designed to handle HS-20 loading to allow maintenance vehicles to access the sluice gates in the drainage structures from above.

23. An additional nine earthen ramps are proposed between Oakwood Beach and South Beach. These ramps are designed for both pedestrian and HS-20 vehicular access and meet the 1:12 maximum slope required by ADA guidelines. The ramps have been located to provide beach access from existing roads and access paths.

24. Pedestrian access points, spaced approximately every 500 feet, are located along the Buried Seawall between Midland Beach and South Beach. Each access point consists of 10-foot wide reinforced concrete stairs on both the landward and seaward sides of the buried seawall that provide access to the promenade and the beach. There are a total of 27 access points for pedestrians along the promenade including the 9 combined vehicle/pedestrian access ramps.

25. The buried seawall crest elevation exceeds the existing deck elevation for the Ocean Breeze fishing pier. The pier segments nearest to the promenade will need to be reconstructed to ramp up to the promenade at a 1:12 maximum slope required by ADA guidelines.

1.1.2 Interior Drainage Measures

26. The Interior Drainage measures as part of the NED Plan include tide gates, sluice gates, stormwater outfall structures, road raisings, and excavated ponds. The tide gates, sluice gates and outfall chambers are listed above as part of the Line of Protection design but are also included in this summary. The Interior Drainage Measures utilized in each of Drainage Areas include:

Area A: Minimum Facility

Natural Storage:	17.19 acres
Tide Gate	
Length:	22.75 ft. along levee alignment
Height:	18 ft. NGVD 1929 crest elevation
Width:	16 ft. wide
Features:	3 @ 5 ft. by 5 ft. sluice gates, wingwalls, pre-engineered bridge on top of the tide gate
Outlets:	2 sluice gate structures (2 ft. by 2ft.) & 2 intermediate pipe outlets with flap gates

Area B: Minimum Facility

Natural Storage:	81.23 acres
Excavated Pond:	1 Pond
Volume:	204,000 c.y.
Invert:	2 ft. NGVD 1929
Tide Gate	
Length:	22.75 ft. along levee alignment
Height:	20.5 ft. NGVD 1929 crest elevation
Width:	16 ft. wide
Features:	3 @ 5 ft. by 5 ft. sluice gates, wingwalls, pre-engineered bridge on top of the tide gate
Road Raising	Kissam Ave. to 7.1 ft. NGVD 1929, Mill Rd. to 7.1 ft. NGVD 1929
Length:	1,730 lf. @ Kissam Avenue & 630 lf. @ Mill Road
Width:	30 ft. @ Kissam Avenue & 60 ft. @ Mill Road
Avg. Height:	3 ft. @ Kissam Avenue & 1 ft. @ Mill Road
Outlets:	Ebbits Street, New Dorp Lane, Tysens Lane Gate Chambers

Area C: Alternative 4

Natural Storage:	120.44 acres
Excavated Ponds	
Volume:	377,200 c.y.
Area:	42.2 acres

Invert:	2 ft. NGVD 1929
Road Raising	Seaview Ave. & Father Capodanno Blvd. to 10 ft. NGVD 1929
Length:	820 lf. @ Seaview Ave & 300 lf @ Father Capodanno Blvd.
Width:	90 ft. @ Seaview Ave & 60 ft. @ Father Capodanno Blvd.
Avg. Height:	1 ft. for both
Outlets:	Greely Avenue, Midland Avenue, Naughton Avenue, Seaview Avenue Gate Chambers

Area D: Minimum Facility

Natural Storage:	30.76 acres
Outlets:	Quintard Street Gate Chamber

Area E: Alternative 2

Natural Storage:	46.7 acres
Excavated Ponds:	2 Ponds
Volume:	222,720 c.y.
Area:	34.0 acres
Invert:	2 ft. NGVD 1929
Outlets:	Sand Lane Gate Chamber, Quincy Ave. Chamber

Ponds

27. Drainage Areas B, C, and E include ponds excavated to 2 ft. NGVD 1929 (Drainage areas A and D involve acquisition and or preservation of open space and do not require ponding). The proposed pond locations and associated excavation areas are shown on the attached sheets.

28. For the potential pond excavation in Drainage Areas B, C and E, the depth of ponding will be no lower than 2 feet, NGVS29 since the ground water table in the project area is near this elevation. The potential location f the ponds for each proposed plan, in Drainage Area B, C and E, will be show in the Feasibility Study Interior Drainage Appendix. The final pond dimensions should not exceed the excavated amount and will be within the minimum facility footprint for natural storage. Please done that excavated amount needed for each pond can change based upon additional data being acquired during the PED/Plans and Specifications Phase (i.e., boring data within the pond footprint). A typical plan view of a Pond layout from the Interior Drainage Plates is presented in Figure 10. The Figure and Plates also include overlays of all of the other Interior Drainage Measures included in the NED Plan such as flowage easements, road raisings, tide gates, etc. as well as the alignment of the Line of Protection.

Figure 10 -Typical Plan View of Pond

Road Raisings

29. In Drainage Area B, Mill Road and Kissam Avenue will be raised to control the spillover of interior stormwater collections to and from Drainage Area A. In Drainage Area C Seaview Ave. will be raised to control the spillover of interior stormwater to/from Drainage Area D and Father Capodanno Blvd will be raised to meet the new crest elevation at Seaview Ave.

30. The road raising along Mill Road and Kissam Ave. will be implemented as part of the Minimum Facility for Area B and the road raising along Seaview Avenue & Father Capodanno Blvd will be implemented as part of an Alternative for Area C.

Interior Drainage Area A

Date Saved: 10/23/2014 5:44:24 PM

0 250 500 1,000 Feet

Interior Drainage Area B

Date Saved: 10/23/2014 6:11:14 PM

Excavation Areas
Flowage Easement / Interior Drainage Areas
Flood Protection Levee Easement
Temporary Work Area Easement
Mean High Water Line
Gate Structure
Gate Chamber At Outfall
Road Raising
C
D
E
Hylan Blvd
Beach 116th St
Beach 108th St
Beach 98th St
Beach 90th St
Beach 86th St
Beach 75th St
Beach 67th St
Beach 60th St
Beach 54th St
Beach 47th St
Beach 41st St
Beach 35th St
Beach 32nd St
Beach 28th St
Beach 25th St
Beach 20th St
Beach 17th St
Beach 13th St
Beach 9th St
Beach 5th St
Beach 1st St
Beach 3rd St
Beach 7th St
Beach 11th St
Beach 15th St
Beach 19th St
Beach 22nd St
Beach 26th St
Beach 30th St
Beach 34th St
Beach 38th St
Beach 44th St
Beach 51st St
Beach 57th St
Beach 64th St
Beach 70th St
Beach 79th St
Beach 83th St
Beach 94th St
Beach 102th St
Beach 112th St
Beach 124th St
Beach 131st St
Beach 137th St
Beach 142nd St
Beach 147th St
Beach 149th St
Beach 151st St
Beach 153rd St
Beach 155th St
Beach 157th St
Beach 159th St
Beach 161st St
Beach 163rd St
Beach 165th St
Beach 167th St
Beach 169th St
Beach 171st St
Beach 173rd St
Beach 175th St
Beach 177th St
Beach 179th St
Beach 181st St
Beach 183rd St
Beach 185th St
Beach 187th St
Beach 189th St
Beach 191st St
Beach 193rd St
Beach 195th St
Beach 197th St
Beach 199th St
Beach 201st St
Beach 203rd St
Beach 205th St
Beach 207th St
Beach 209th St
Beach 211th St
Beach 213th St
Beach 215th St
Beach 217th St
Beach 219th St
Beach 221st St
Beach 223rd St
Beach 225th St
Beach 227th St
Beach 229th St
Beach 231st St
Beach 233rd St
Beach 235th St
Beach 237th St
Beach 239th St
Beach 241st St
Beach 243rd St
Beach 245th St
Beach 247th St
Beach 249th St
Beach 251st St
Beach 253rd St
Beach 255th St
Beach 257th St
Beach 259th St
Beach 261st St
Beach 263rd St
Beach 265th St
Beach 267th St
Beach 269th St
Beach 271st St
Beach 273rd St
Beach 275th St
Beach 277th St
Beach 279th St
Beach 281st St
Beach 283rd St
Beach 285th St
Beach 287th St
Beach 289th St
Beach 291st St
Beach 293rd St
Beach 295th St
Beach 297th St
Beach 299th St
Beach 301st St
Beach 303rd St
Beach 305th St
Beach 307th St
Beach 309th St
Beach 311th St
Beach 313th St
Beach 315th St
Beach 317th St
Beach 319th St
Beach 321st St
Beach 323rd St
Beach 325th St
Beach 327th St
Beach 329th St
Beach 331st St
Beach 333rd St
Beach 335th St
Beach 337th St
Beach 339th St
Beach 341st St
Beach 343rd St
Beach 345th St
Beach 347th St
Beach 349th St
Beach 351st St
Beach 353rd St
Beach 355th St
Beach 357th St
Beach 359th St
Beach 361st St
Beach 363rd St
Beach 365th St
Beach 367th St
Beach 369th St
Beach 371st St
Beach 373rd St
Beach 375th St
Beach 377th St
Beach 379th St
Beach 381st St
Beach 383rd St
Beach 385th St
Beach 387th St
Beach 389th St
Beach 391st St
Beach 393rd St
Beach 395th St
Beach 397th St
Beach 399th St
Beach 401st St
Beach 403rd St
Beach 405th St
Beach 407th St
Beach 409th St
Beach 411th St
Beach 413th St
Beach 415th St
Beach 417th St
Beach 419th St
Beach 421st St
Beach 423rd St
Beach 425th St
Beach 427th St
Beach 429th St
Beach 431st St
Beach 433rd St
Beach 435th St
Beach 437th St
Beach 439th St
Beach 441st St
Beach 443rd St
Beach 445th St
Beach 447th St
Beach 449th St
Beach 451st St
Beach 453rd St
Beach 455th St
Beach 457th St
Beach 459th St
Beach 461st St
Beach 463rd St
Beach 465th St
Beach 467th St
Beach 469th St
Beach 471st St
Beach 473rd St
Beach 475th St
Beach 477th St
Beach 479th St
Beach 481st St
Beach 483rd St
Beach 485th St
Beach 487th St
Beach 489th St
Beach 491st St
Beach 493rd St
Beach 495th St
Beach 497th St
Beach 499th St
Beach 501st St
Beach 503rd St
Beach 505th St
Beach 507th St
Beach 509th St
Beach 511th St
Beach 513th St
Beach 515th St
Beach 517th St
Beach 519th St
Beach 521st St
Beach 523rd St
Beach 525th St
Beach 527th St
Beach 529th St
Beach 531st St
Beach 533rd St
Beach 535th St
Beach 537th St
Beach 539th St
Beach 541st St
Beach 543rd St
Beach 545th St
Beach 547th St
Beach 549th St
Beach 551st St
Beach 553rd St
Beach 555th St
Beach 557th St
Beach 559th St
Beach 561st St
Beach 563rd St
Beach 565th St
Beach 567th St
Beach 569th St
Beach 571st St
Beach 573rd St
Beach 575th St
Beach 577th St
Beach 579th St
Beach 581st St
Beach 583rd St
Beach 585th St
Beach 587th St
Beach 589th St
Beach 591st St
Beach 593rd St
Beach 595th St
Beach 597th St
Beach 599th St
Beach 601st St
Beach 603rd St
Beach 605th St
Beach 607th St
Beach 609th St
Beach 611th St
Beach 613th St
Beach 615th St
Beach 617th St
Beach 619th St
Beach 621st St
Beach 623rd St
Beach 625th St
Beach 627th St
Beach 629th St
Beach 631st St
Beach 633rd St
Beach 635th St
Beach 637th St
Beach 639th St
Beach 641st St
Beach 643rd St
Beach 645th St
Beach 647th St
Beach 649th St
Beach 651st St
Beach 653rd St
Beach 655th St
Beach 657th St
Beach 659th St
Beach 661st St
Beach 663rd St
Beach 665th St
Beach 667th St
Beach 669th St
Beach 671st St
Beach 673rd St
Beach 675th St
Beach 677th St
Beach 679th St
Beach 681st St
Beach 683rd St
Beach 685th St
Beach 687th St
Beach 689th St
Beach 691st St
Beach 693rd St
Beach 695th St
Beach 697th St
Beach 699th St
Beach 701st St
Beach 703rd St
Beach 705th St
Beach 707th St
Beach 709th St
Beach 711th St
Beach 713th St
Beach 715th St
Beach 717th St
Beach 719th St
Beach 721st St
Beach 723rd St
Beach 725th St
Beach 727th St
Beach 729th St
Beach 731st St
Beach 733rd St
Beach 735th St
Beach 737th St
Beach 739th St
Beach 741st St
Beach 743rd St
Beach 745th St
Beach 747th St
Beach 749th St
Beach 751st St
Beach 753rd St
Beach 755th St
Beach 757th St
Beach 759th St
Beach 761st St
Beach 763rd St
Beach 765th St
Beach 767th St
Beach 769th St
Beach 771st St
Beach 773rd St
Beach 775th St
Beach 777th St
Beach 779th St
Beach 781st St
Beach 783rd St
Beach 785th St
Beach 787th St
Beach 789th St
Beach 791st St
Beach 793rd St
Beach 795th St
Beach 797th St
Beach 799th St
Beach 801st St
Beach 803rd St
Beach 805th St
Beach 807th St
Beach 809th St
Beach 811th St
Beach 813th St
Beach 815th St
Beach 817th St
Beach 819th St
Beach 821st St
Beach 823rd St
Beach 825th St
Beach 827th St
Beach 829th St
Beach 831st St
Beach 833rd St
Beach 835th St
Beach 837th St
Beach 839th St
Beach 841st St
Beach 843rd St
Beach 845th St
Beach 847th St
Beach 849th St
Beach 851st St
Beach 853rd St
Beach 855th St
Beach 857th St
Beach 859th St
Beach 861st St
Beach 863rd St
Beach 865th St
Beach 867th St
Beach 869th St
Beach 871st St
Beach 873rd St
Beach 875th St
Beach 877th St
Beach 879th St
Beach 881st St
Beach 883rd St
Beach 885th St
Beach 887th St
Beach 889th St
Beach 891st St
Beach 893rd St
Beach 895th St
Beach 897th St
Beach 899th St
Beach 901st St
Beach 903rd St
Beach 905th St
Beach 907th St
Beach 909th St
Beach 911th St
Beach 913th St
Beach 915th St
Beach 917th St
Beach 919th St
Beach 921st St
Beach 923rd St
Beach 925th St
Beach 927th St
Beach 929th St
Beach 931st St
Beach 933rd St
Beach 935th St
Beach 937th St
Beach 939th St
Beach 941st St
Beach 943rd St
Beach 945th St
Beach 947th St
Beach 949th St
Beach 951st St
Beach 953rd St
Beach 955th St
Beach 957th St
Beach 959th St
Beach 961st St
Beach 963rd St
Beach 965th St
Beach 967th St
Beach 969th St
Beach 971st St
Beach 973rd St
Beach 975th St
Beach 977th St
Beach 979th St
Beach 981st St
Beach 983rd St
Beach 985th St
Beach 987th St
Beach 989th St
Beach 991st St
Beach 993rd St
Beach 995th St
Beach 997th St
Beach 999th St
Beach 1001st St
Beach 1003rd St
Beach 1005th St
Beach 1007th St
Beach 1009th St
Beach 1011th St
Beach 1013th St
Beach 1015th St
Beach 1017th St
Beach 1019th St
Beach 1021st St
Beach 1023rd St
Beach 1025th St
Beach 1027th St
Beach 1029th St
Beach 1031st St
Beach 1033rd St
Beach 1035th St
Beach 1037th St
Beach 1039th St
Beach 1041st St
Beach 1043rd St
Beach 1045th St
Beach 1047th St
Beach 1049th St
Beach 1051st St
Beach 1053rd St
Beach 1055th St
Beach 1057th St
Beach 1059th St
Beach 1061st St
Beach 1063rd St
Beach 1065th St
Beach 1067th St
Beach 1069th St
Beach 1071st St
Beach 1073rd St
Beach 1075th St
Beach 1077th St
Beach 1079th St
Beach 1081st St
Beach 1083rd St
Beach 1085th St
Beach 1087th St
Beach 1089th St
Beach 1091st St
Beach 1093rd St
Beach 1095th St
Beach 1097th St
Beach 1099th St
Beach 1101st St
Beach 1103rd St
Beach 1105th St
Beach 1107th St
Beach 1109th St
Beach 1111th St
Beach 1113th St
Beach 1115th St
Beach 1117th St
Beach 1119th St
Beach 1121st St
Beach 1123rd St
Beach 1125th St
Beach 1127th St
Beach 1129th St
Beach 1131st St
Beach 1133rd St
Beach 1135th St
Beach 1137th St
Beach 1139th St
Beach 1141st St
Beach 1143rd St
Beach 1145th St
Beach 1147th St
Beach 1149th St
Beach 1151st St
Beach 1153rd St
Beach 1155th St
Beach 1157th St
Beach 1159th St
Beach 1161st St
Beach 1163rd St
Beach 1165th St
Beach 1167th St
Beach 1169th St
Beach 1171st St
Beach 1173rd St
Beach 1175th St
Beach 1177th St
Beach 1179th St
Beach 1181st St
Beach 1183rd St
Beach 1185th St
Beach 1187th St
Beach 1189th St
Beach 1191st St
Beach 1193rd St
Beach 1195th St
Beach 1197th St
Beach 1199th St
Beach 1201st St
Beach 1203rd St
Beach 1205th St
Beach 1207th St
Beach 1209th St
Beach 1211th St
Beach 1213th St
Beach 1215th St
Beach 1217th St
Beach 1219th St
Beach 1221st St
Beach 1223rd St
Beach 1225th St
Beach 1227th St
Beach 1229th St
Beach 1231st St
Beach 1233rd St
Beach 1235th St
Beach 1237th St
Beach 1239th St
Beach 1241st St
Beach 1243rd St
Beach 1245th St
Beach 1247th St
Beach 1249th St
Beach 1251st St
Beach 1253rd St
Beach 1255th St
Beach 1257th St
Beach 1259th St
Beach 1261st St
Beach 1263rd St
Beach 1265th St
Beach 1267th St
Beach 1269th St
Beach 1271st St
Beach 1273rd St
Beach 1275th St
Beach 1277th St
Beach 1279th St
Beach 1281st St
Beach 1283rd St
Beach 1285th St
Beach 1287th St
Beach 1289th St
Beach 1291st St
Beach 1293rd St
Beach 1295th St
Beach 1297th St
Beach 1299th St
Beach 1301st St
Beach 1303rd St
Beach 1305th St
Beach 1307th St
Beach 1309th St
Beach 1311th St
Beach 1313th St
Beach 1315th St
Beach 1317th St
Beach 1319th St
Beach 1321st St
Beach 1323rd St
Beach 1325th St
Beach 1327th St
Beach 1329th St
Beach 1331st St
Beach 1333rd St
Beach 1335th St
Beach 1337th St
Beach 1339th St
Beach 1341st St
Beach 1343rd St
Beach 1345th St
Beach 1347th St
Beach 1349th St
Beach 1351st St
Beach 1353rd St
Beach 1355th St
Beach 1357th St
Beach 1359th St
Beach 1361st St
Beach 1363rd St
Beach 1365th St
Beach 1367th St
Beach 1369th St
Beach 1371st St
Beach 1373rd St
Beach 1375th St
Beach 1377th St
Beach 1379th St
Beach 1381st St
Beach 1383rd St
Beach 1385th St
Beach 1387th St
Beach 1389th St
Beach 1391st St
Beach 1393rd St
Beach 1395th St
Beach 1397th St
Beach 1399th St
Beach 1401st St
Beach 1403rd St
Beach 1405th St
Beach 1407th St
Beach 1409th St
Beach 1411th St
Beach 1413th St
Beach 1415th St
Beach 1417th St
Beach 1419th St
Beach 1421st St
Beach 1423rd St
Beach 1425th St
Beach 1427th St
Beach 1429th St
Beach 1431st St
Beach 1433rd St
Beach 1435th St
Beach 1437th St
Beach 1439th St
Beach 1441st St
Beach 1443rd St
Beach 1445th St
Beach 1447th St
Beach 1449th St
Beach 1451st St
Beach 1453rd St
Beach 1455th St
Beach 1457th St
Beach 1459th St
Beach 1461st St
Beach 1463rd St
Beach 1465th St
Beach 1467th St
Beach 1469th St
Beach 1471st St
Beach 1473rd St
Beach 1475th St
Beach 1477th St
Beach 1479th St
Beach 1481st St
Beach 1483rd St
Beach 1485th St
Beach 1487th St
Beach 1489th St
Beach 1491st St
Beach 1493rd St
Beach 1495th St
Beach 1497th St
Beach 1499th St
Beach 1501st St
Beach 1503rd St
Beach 1505th St
Beach 1507th St
Beach 1509th St
Beach 1511th St
Beach 1513th St
Beach 1515th St
Beach 1517th St
Beach 1519th St
Beach 1521st St
Beach 1523rd St
Beach 1525th St
Beach 1527th St
Beach 1529th St
Beach 1531st St
Beach 1533rd St
Beach 1535th St
Beach 1537th St
Beach 1539th St
Beach 1541st St
Beach 1543rd St
Beach 1545th St
Beach 1547th St
Beach 1549th St
Beach 1551st St
Beach 1553rd St
Beach 1555th St
Beach 1557th St
Beach 1559th St
Beach 1561st St
Beach 1563rd St
Beach 1565th St
Beach 1567th St
Beach 1569th St
Beach 1571st St
Beach 1573rd St
Beach 1575th St
Beach 1577th St
Beach 1579th St
Beach 1581st St
Beach 1583rd St
Beach 1585th St
Beach 1587th St
Beach 1589th St
Beach 1591st St
Beach 1593rd St
Beach 1595th St
Beach 1597th St
Beach 1599th St
Beach 1601st St
Beach 1603rd St
Beach 1605th St
Beach 1607th St
Beach 1609th St
Beach 1611th St
Beach 1613th St
Beach 1615th St
Beach 1617th St
Beach 1619th St
Beach 1621st St
Beach 1623rd St
Beach 1625th St
Beach 1627th St
Beach 1629th St
Beach 1631st St
Beach 1633rd St
Beach 1635th St
Beach 1637th St
Beach 1639th St
Beach 1641st St
Beach 1643rd St
Beach 1645th St
Beach 1647th St
Beach 1649th St
Beach 1651st St
Beach 1653rd St
Beach 1655th St
Beach 1657th St
Beach 1659th St
Beach 1661st St
Beach 1663rd St
Beach 1665th St
Beach 1667th St
Beach 1669th St
Beach 1671st St
Beach 1673rd St
Beach 1675th St
Beach 1677th St
Beach 1679th St
Beach 1681st St
Beach 1683rd St
Beach 1685th St
Beach 1687th St
Beach 1689th St
Beach 1691st St
Beach 1693rd St
Beach 1695th St
Beach 1697th St
Beach 1699th St
Beach 1701st St
Beach 1703rd St
Beach 1705th St
Beach 1707th St
Beach 1709th St
Beach 1711th St
Beach 1713th St
Beach 1715th St
Beach 1717th St
Beach 1719th St
Beach 1721st St
Beach 1723rd St
Beach 1725th St
Beach 1727th St
Beach 1729th St
Beach 1731st St
Beach 1733rd St
Beach 1735th St
Beach 1737th St
Beach 1739th St
Beach 1741st St
Beach 1743rd St
Beach 1745th St
Beach 1747th St
Beach 1749th St
Beach 1751st St
Beach 1753rd St
Beach 1755th St
Beach 1757th St
Beach 1759th St
Beach 1761st St
Beach 1763rd St
Beach 1765th St
Beach 1767th St
Beach 1769th St
Beach 1771st St
Beach 1773rd St
Beach 1775th St
Beach 1777th St
Beach 1779th St
Beach 1781st St
Beach 1783rd St
Beach 1785th St
Beach 1787th St
Beach 1789th St
Beach 1791st St
Beach 1793rd St
Beach 1795th St
Beach 1797th St
Beach 1799th St
Beach 1801st St
Beach 1803rd St
Beach 1805th St
Beach 1807th St
Beach 1809th St
Beach 1811th St
Beach 1813th St
Beach 1815th St
Beach 1817th St
Beach 1819th St
Beach 1821st St
Beach 1823rd St
Beach 1825th St
Beach 1827th St
Beach 1829th St
Beach 1831st St
Beach 1833rd St
Beach 1835th St
Beach 1837th St
Beach 1839th St
Beach 1841st St
Beach 1843rd St
Beach 1845th St
Beach 1847th St
Beach 1849th St
Beach 1851st St
Beach 1853rd St
Beach 1855th St
Beach 1857th St
Beach 1859th St
Beach 1861st St
Beach 1863rd St
Beach 1865th St
Beach 1867th St
Beach 1869th St
Beach 1871st St
Beach 1873rd St
Beach 1875th St
Beach 1877th St
Beach 1879th St
Beach 1881st St
Beach 1883rd St
Beach 1885th St
Beach 1887th St
Beach 1889th St
Beach 1891st St
Beach 1893rd St
Beach 1895th St
Beach 1897th St
Beach 1899th St
Beach 1901st St
Beach 1903rd St
Beach 1905th St
Beach 1907th St
Beach 1909th St
Beach 1911th St
Beach 1913th St
Beach 1915th St
Beach 1917th St
Beach 1919th St
Beach 1921st St
Beach 1923rd St
Beach 1925th St
Beach 1927th St
Beach 1929th St
Beach 1931st St
Beach 1933rd St
Beach 1935th St
Beach 1937th St
Beach 1939th St
Beach 1941st St
Beach 1943rd St
Beach 1945th St
Beach 1947th St
Beach 1949th St
Beach 1951st St
Beach 1953rd St
Beach 1955th St
Beach 1957th St
Beach 1959th St
Beach 1961st St
Beach 1963rd St
Beach 1965th St
Beach 1967th St
Beach 1969th St
Beach 1971st St
Beach 1973rd St
Beach 1975th St
Beach 1977th St
Beach 1979th St
Beach 1981st St
Beach 1983rd St
Beach 1985th St
Beach 1987th St
Beach 1989th St
Beach 1991st St
Beach 1993rd St
Beach 1995th St
Beach 1997th St
Beach 1999th St
Beach 2001st St
Beach 2003rd St
Beach 2005th St
Beach 2007th St
Beach 2009th St
Beach 2011th St
Beach 2013th St
Beach 2015th St
Beach 2017th St
Beach 2019th St
Beach 2021st St
Beach 2023rd St
Beach 2025th St
Beach 2027th St
Beach 2029th St
Beach 2031st St
Beach 2033rd St
Beach 2035th St
Beach 2037th St
Beach 2039th St
Beach 2041st St
Beach 2043rd St
Beach 2045th St
Beach 2047th St
Beach 2049th St
Beach 2051st St
Beach 2053rd St
Beach 2055th St
Beach 2057th St
Beach 2059th St
Beach 2061st St
Beach 2063rd St
Beach 2065th St
Beach 2067th St
Beach 2069th St
Beach 2071st St
Beach 2073rd St
Beach 2075th St
Beach 2077th St
Beach 2079th St
Beach 2081st St
Beach 2083rd St
Beach 2085th St
Beach 2087th St
Beach 2089th St
Beach 2091st St
Beach 2093rd St
Beach 2095th St
Beach 2097th St
Beach 2099th St
Beach 2101st St
Beach 2103rd St
Beach 2105th St
Beach 2107th St
Beach 2109th St
Beach 2111th St
Beach 2113th St
Beach 2115th St
Beach 2117th St
Beach 2119th St
Beach 2121st St
Beach 2123rd St
Beach 2125th St
Beach 2127th St
Beach 2129th St
Beach 2131st St
Beach 2133rd St
Beach 2135th St
Beach 2137th St
Beach 2139th St
Beach 2141st St
Beach 2143rd St
Beach 2145th St
Beach 2147th St
Beach 2149th St
Beach 2151st St
Beach 2153rd St
Beach 2155th St
Beach 2157th St
Beach 2159th St
Beach 2161st St
Beach 2163rd St
Beach 2165th St
Beach 2167th St
Beach 2169th St
Beach 2171st St
Beach 2173rd St
Beach 2175th St
Beach 2177th St
Beach 2179th St
Beach 2181st St
Beach 2183rd St
Beach 2185th St
Beach 2187th St
Beach 2189th St
Beach 2191st St
Beach 2193rd St
Beach 2195th St
Beach 2197th St
Beach 2199th St
Beach 2201st St
Beach 2203rd St
Beach 2205th St
Beach 2207th St
Beach 2209th St
Beach 2211th St
Beach 2213th St
Beach 2215th St
Beach 2217th St
Beach 2219th St
Beach 2221st St
Beach 2223rd St
Beach 2225th St
Beach 2227th St
Beach 2229th St
Beach 2231st St
Beach 2233rd St
Beach 2235th St
Beach 2237th St
Beach 2239th St
Beach 2241st St
Beach 2243rd St
Beach 2245th St
Beach 2247th St
Beach 2249th St
Beach 2251st St
Beach 2253rd St
Beach 2255th St
Beach 2257th St
Beach 2259th St
Beach 2261st St
Beach 2263rd St
Beach 2265th St
Beach 2267th St
Beach 2269th St
Beach 2271st St
Beach 2273rd St
Beach 2275th St
Beach 2277th St
Beach 2279th St
Beach 2281st St
Beach 2283rd St
Beach 2285th St
Beach 2287th St
Beach 2289th St
Beach 2291st St
Beach 2293rd St
Beach 2295th St
Beach 2297th St
Beach 2299th St
Beach 2301st St
Beach 2303rd St
Beach 2305th St
Beach 2307th St
Beach 2309th St
Beach 2311th St
Beach 2313th St
Beach 2315th St
Beach 2317th St
Beach 2319th St
Beach 2321st St
Beach 2323rd St
Beach 2325th St
Beach 2327th St
Beach 2329th St
Beach 2331st St
Beach 2333rd St
Beach 2335th St
Beach 2337th St
Beach 2339th St
Beach 2341st St
Beach 2343rd St
Beach 2345th St
Beach 2347th St
Beach 2349th St
Beach 2351st St
Beach 2353rd St
Beach 2355th St
Beach 2357th St
Beach 2359th St
Beach 2361st St
Beach 2363rd St
Beach 2365th St
Beach 2367th St
Beach 2369th St
Beach 2371st St
Beach 2373rd St
Beach 2375th St
Beach 2377th St
Beach 2379th St
Beach 2381st St
Beach 2383rd St
Beach 2385th St
Beach 2387th St
Beach 2389th St
Beach 2391st St
Beach 2393rd St
Beach 2395th St
Beach 2397th St
Beach 2399th St
Beach 2401st St
Beach 2403rd St
Beach 2405th St
Beach 2407th St
Beach 2409th St
Beach 2411th St
Beach 2413th St
Beach 2415th St
Beach 2417th St
Beach 2419th St
Beach 2421st St
Beach 2423rd St
Beach 2425th St
Beach 2427th St
Beach 2429th St
Beach 2431st St
Beach 2433rd St
Beach 2435th St
Beach 2437th St
Beach 2439th St
Beach 2441st St
Beach 2443rd St
Beach 2445th St
Beach 2447th St
Beach 2449th St
Beach 2451st St
Beach 2453rd St
Beach 2455th St
Beach 2457th St
Beach 2459th St
Beach 2461st St
Beach 2463rd St
Beach 2465th St
Beach 2467th St
Beach 2469th St
Beach 2471st St
Beach 2473rd St
Beach 2475th St
Beach 2477th St
Beach 2479th St
Beach 2481st St
Beach 2483rd St
Beach 2485th St
Beach 2487th St
Beach 2489th St
Beach 2491st St
Beach 2493rd St
Beach 2495th St
Beach 2497th St
Beach 2499th St
Beach 2501st St
Beach 2503rd St
Beach 2505th St
Beach 2507th St
Beach 2509th St
Beach 2511th St
Beach 2513th St
Beach 2515th St
Beach 2517th St
Beach 2519th St
Beach 2521st St
Beach 2523rd St
Beach 2525th St
Beach 2527th St
Beach 2529th St
Beach 2531st St
Beach 2533rd St
Beach 2535th St
Beach 2537th St
Beach 2539th St
Beach 2541st St
Beach 2543rd St
Beach 2545th St
Beach 2547th St
Beach 2549th St
Beach 2551st St
Beach 2553rd St
Beach 2555th St
Beach 2557th St
Beach 2559th St
Beach 2561st St
Beach 2563rd St
Beach 2565th St
Beach 2567th St
Beach 2569th St
Beach 2571st St
Beach 2573rd St
Beach 2575th St
Beach 2577th St
Beach 2579th St
Beach 2581st St
Beach 2583rd St
Beach 2585th St
Beach 2587th St
Beach 2589th St
Beach 2591st St
Beach 2593rd St
Beach 2595th St
Beach 2597th St
Beach 2599th St
Beach 2601st St
Beach 2603rd St
Beach 2605th St
Beach 2607th St
Beach 2609th St
Beach 2611th St
Beach 2613th St
Beach 2615th St
Beach 2617th St
Beach 2619th St
Beach 2621st St
Beach 2623rd St
Beach 2625th St
Beach 2627th St
Beach 2629th St
Beach 2631st St
Beach 2633rd St
Beach 2635th St
Beach 2637th St
Beach 2639th St
Beach 2641st St
Beach 2643rd St
Beach 2645th St
Beach 2647th St
Beach 2649th St
Beach 2651st St
Beach 2653rd St
Beach 2655th St
Beach 2657th St
Beach 2659th St
Beach 2661st St
Beach 2663rd St
Beach 2665th St
Beach 2667th St
Beach 2669th St
Beach 2671st St
Beach 2673rd St
Beach 2675th St
Beach 2677th St
Beach 2679th St
Beach 2681st St
Beach 2683rd St
Beach 2685th St
Beach 2687th St
Beach 2689th St
Beach 2691st St
Beach 2693rd St
Beach 2695th St
Beach 2697th St
Beach 2699th St
Beach 2701st St
Beach 2703rd St
Beach 2705th St
Beach 2707th St
Beach 2709th St
Beach 2711th St
Beach 2713th St
Beach 2715th St
Beach 2717th St
Beach 2719th St
Beach 2721st St
Beach 2723rd St
Beach 2725th St
Beach 2727th St
Beach 2729th St
Beach 2731st St
Beach 2733rd St
Beach 2735th St
Beach 2737th St
Beach 2739th St
Beach 2741st St
Beach 2743rd St
Beach 2745th St
Beach 2747th St
Beach 2749th St
Beach 2751st St
Beach 2753rd St
Beach 2755th St
Beach 2757th St
Beach 2759th St
Beach 2761st St
Beach 2763rd St
Beach 2765th St
Beach 2767th St
Beach 2769th St
Beach 2771st St
Beach 2773rd St
Beach 2775th St
Beach 2777th St
Beach 2779th St
Beach 2781st St
Beach 2783rd St
Beach 2785th St
Beach 2787th St
Beach 2789th St
Beach 2791st St
Beach 2793rd St
Beach 2795th St
Beach 2797th St
Beach 2799th St
Beach 2801st St
Beach 2803rd St
Beach 2805th St
Beach 2807th St
Beach 2809th St
Beach 2811th St
Beach 2813th St
Beach 2815th St
Beach 2817th St
Beach 2819th St
Beach 2821st St
Beach 2823rd St
Beach 2825th St
Beach 2827th St
Beach 2829th St
Beach 2831st St
Beach 2833rd St
Beach 2835th St
Beach 2837th St
Beach 2839th St
Beach 2841st St
Beach 2843rd St
Beach 2845th St
Beach 2847th St
Beach 2849th St
Beach 2851st St
Beach 2853rd St
Beach 2855th St
Beach 2857th St
Beach 2859th St
Beach 2861st St
Beach 2863rd St
Beach 2865th St
Beach 2867th St
Beach 2869th St
Beach 2871st St
Beach 2873rd St
Beach 2875th St
Beach 2877th St
Beach 2879th St
Beach 2881st St
Beach 2883rd St
Beach 2885th St
Beach 2887th St
Beach 2889th St
Beach 2891st St
Beach 2893rd St
Beach 2895th St
Beach 2897th St
Beach 2899th St
Beach 2901st St
Beach 2903rd St
Beach 2905th St
Beach 2907th St
Beach 2909th St
Beach 2911th St
Beach 2913th St
Beach 2915th St
Beach 2917th St
Beach 2919th St
Beach 2921st St
Beach 2923rd St
Beach 2925th St
Beach 2927th St
Beach 2929th St
Beach 2931st St
Beach 2933rd St
Beach 2935th St
Beach 2937th St
Beach 2939th St
Beach 2941st St
Beach 2943rd St
Beach 2945th St
Beach 2947th St
Beach 2949th St
Beach 2951st St
Beach 2953rd St
Beach 2955th St
Beach 2957th St
Beach 2959th St
Beach 2961st St
Beach 2963rd St
Beach 2965th St
Beach 2967th St
Beach 2969th St
Beach 2971st St
Beach 2973rd St
Beach 2975th St
Beach 2977th St
Beach 2979th St
Beach 2981st St
Beach 2983rd St
Beach 2985th St
Beach 2987th St
Beach 2989th St
Beach 2991st St
Beach 2993rd St
Beach 2995th St
Beach 2997th St
Beach 2999th St
Beach 3001st St
Beach 3003rd St
Beach 3005th St
Beach 3007th St
Beach 3009th St
Beach 3011th St
Beach 3013th St
Beach 3015th St
Beach 3017th St
Beach 3019th St
Beach 3021st St
Beach 3023rd St
Beach 3025th St
Beach 3027th St
Beach 3029th St
Beach 3031st St
Beach 3033rd St
Beach 3035th St
Beach 3037th St
Beach 3039th St
Beach 3041st St
Beach 3043rd St
Beach 3045th St
Beach 3047th St
Beach 3049th St
Beach 3051st St
Beach 3053rd St
Beach 3055th St
Beach 3057th St
Beach 3059th St
Beach 3061st St
Beach 3063rd St
Beach 3065th St
Beach 3067th St
Beach 3069th St
Beach 3071st St
Beach 3073rd St
Beach 3075th St
Beach 3077th St
Beach 3079th St
Beach 3081st St
Beach 3083rd St
Beach 3085th St
Beach 3087th St
Beach 3089th St
Beach 3091st St
Beach 3093rd St
Beach 3095th St
Beach 3097th St
Beach 3099th St
Beach 3101st St
Beach 3103rd St
Beach 3105th St
Beach 3107th St
Beach 3109th St
Beach 3111th St
Beach 3113th St
Beach 3115th St
Beach 3117th St
Beach 3119th St
Beach 3121st St
Beach 3123rd St
Beach 3125th St
Beach 3127th St
Beach 3129th St
Beach 3131st St
Beach 3133rd St
Beach 3135th St
Beach 3137th St
Beach 3139th St
Beach 3141st St
Beach 3143rd St
Beach 3145th St
Beach 3147th St
Beach 3149th St
Beach 3151st St
Beach 3153rd St
Beach 3155th St
Beach 3157th St
Beach 3159th St
Beach 3161st St
Beach 3163rd St
Beach 3165th St
Beach 3167th St
Beach 3169th St
Beach 3171st St
Beach 3173rd St
Beach 3175th St
Beach 3177th St
Beach 3179th St
Beach 3181st St
Beach 3183rd St
Beach 3185th St
Beach 3187th St
Beach 3189th St
Beach 3191st St
Beach 3193rd St
Beach 3195th St
Beach 3197th St
Beach 3199th St
Beach 3201st St
Beach 3203rd St
Beach 3205th St
Beach 3207th St
Beach 3209th St
Beach 3211th St
Beach 3213th St
Beach 3215th St
Beach 3217th St
Beach 3219th St
Beach 3221st St
Beach 3223rd St
Beach 3225th St
Beach 3227th St
Beach 3229th St
Beach 3231st St
Beach 3233rd St
Beach 3235th St
Beach 3237th St
Beach 3239th St
Beach 3241st St
Beach 3243rd St
Beach 3245th St
Beach 3247th St
Beach 3249th St
Beach 3251st St
Beach 3253rd St
Beach 3255th St
Beach 3257th St
Beach 3259th St
Beach 3261st St
Beach 3263rd St
Beach 3265th St
Beach 3267th St
Beach 3269th St
Beach 3271st St
Beach 3273rd St
Beach 3275th St
Beach 3277th St
Beach 3279th St
Beach 3281st St
Beach 3283rd St
Beach 3285th St
Beach 3287th St
Beach 3289th St
Beach 3291st St
Beach 3293rd St
Beach 3295th St
Beach 3297th St
Beach 3299th St
Beach 3301st St
Beach 3303rd St
Beach 3305th St
Beach 3307th St
Beach 3309th St
Beach 3311th St
Beach 3313th St
Beach 3315th St
Beach 3317th St
Beach 3319th St
Beach 3321st St
Beach 3323rd St
Beach 3325th St
Beach 3327th St
Beach 3329th St
Beach 3331st St
Beach 3333rd St
Beach 3335th St
Beach 3337th St
Beach 3339th St
Beach 3341st St
Beach 3343rd St
Beach 3345th St
Beach 3347th St
Beach 3349th St
Beach 3351st St
Beach 3353rd St
Beach 3355th St
Beach 3357th St
Beach 3359th St
Beach 3361st St
Beach 3363rd St
Beach 3365th St
Beach 3367th St
Beach 3369th St
Beach 3371st St
Beach 3373rd St
Beach 3375th St
Beach 3377th St
Beach 3379th St
Beach 3381st St
Beach 3383rd St
Beach 3385th St
Beach 3387th St
Beach 3389th St
Beach 3391st St
Beach 3393rd St
Beach 3395th St
Beach 3397th St
Beach 3399th St
Beach 3401st St
Beach 3403rd St
Beach 3405th St
Beach 3407th St
Beach 3409th St
Beach 3411th St
Beach 3413th St
Beach 3415th St
Beach 3417th St
Beach 3419th St
Beach 3421st St
Beach 3423rd St
Beach 3425th St
Beach 3427th St
Beach 3429th St
Beach 3431st St
Beach 3433rd St
Beach 3435th St
Beach 3437th St
Beach 3439th St
Beach 3441st St
Beach 3443rd St
Beach 3445th St
Beach 3447th St
Beach 3449th St
Beach 3451st St
Beach 3453rd St
Beach 3455th St
Beach 3457th St
Beach 3459th St
Beach 3461st St
Beach 3463rd St
Beach 3465th St
Beach 3467th St
Beach 3469th St
Beach 3471st St
Beach 3473rd St
Beach 3475th St
Beach 3477th St
Beach 3479th St
Beach 3481st St
Beach 3483rd St
Beach 3485th St
Beach 3487th St
Beach 3489th St
Beach 3491st St
Beach 3493rd St
Beach 3495th St
Beach 3497th St
Beach 3499th St
Beach 3501st St
Beach 3503rd St
Beach 3505th St
Beach 3507th St
Beach 3509th St
Beach 3511th St
Beach 3513th St
Beach 3515th St
Beach 3517th St
Beach 3519th St
Beach 3521st St
Beach 3523rd St
Beach 3525th St
Beach 3527th St
Beach 3529th St
Beach 3531st St
Beach 3533rd St
Beach 3535th St
Beach 3537th St
Beach 3539th St
Beach 3541st St
Beach 3543rd St
Beach 3545th St
Beach 3547th St
Beach 3549th St
Beach 3551st St
Beach 3553rd St
Beach 3555th St
Beach 3557th St
Beach 3559th St
Beach 3561st St
Beach 3563rd St
Beach 3565th St
Beach 3567th St
Beach 3569th St
Beach 3571st St
Beach 3573rd St
Beach 3575th St
Beach 3577th St
Beach 3579th St
Beach 3581st St
Beach 3583rd St
Beach 3585th St
Beach 3587th St
Beach 3589th St
Beach 3591st St
Beach 3593rd St
Beach 3595th St
Beach 3597th St
Beach 3599th St
Beach 3601st St
Beach 3603rd St
Beach 3605th St
Beach

Interior Drainage Areas D and E

Date Saved: 10/23/2014 5:49:39 PM

Interior Drainage Area E

Date Saved: 10/23/2014 6:08:36 PM

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

Joe Martens
Commissioner

December 02, 2014

Peter Weppler
U.S. Army Corps of Engineers, New York District
Jackb K. Javits Federal Building
New York, NY 10278

Re: South Shore of Staten Island Coastal Storm Risk Management Project
Town/City: New York. County: Richmond.

Dear Peter Weppler :

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

Enclosed is a report of rare or state-listed animals and plants, and significant natural communities, which our databases indicate occur, or may occur, on your site or in the immediate vicinity of your site.

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

Our databases are continually growing as records are added and updated. If this proposed project is still under development one year from now, we recommend that you contact us again so that we may update this response with the most current information.

Sincerely,

Nicholas Conrad
Information Resources Coordinator
New York Natural Heritage Program

1217

The following rare plants and rare animals have been documented at your project site, or in its vicinity.

We recommend that potential onsite and offsite impacts of the proposed project on these species be addressed as part of any environmental assessment or review conducted as part of the planning, permitting and approval process, such as reviews conducted under SEQR. Field surveys of the project site may be necessary to determine the status of a species at the site, particularly for sites that are currently undeveloped and may still contain suitable habitat. Final requirements of the project to avoid, minimize, or mitigate potential impacts are determined by the lead permitting agency or the government body approving the project.

The following animals, while not listed by New York State as Endangered or Threatened, are of conservation concern to the state, and are considered rare by the New York Natural Heritage Program.

COMMON NAME	*SCIENTIFIC NAME*	*NY STATE LISTING*	*HERITAGE CONSERVATION STATUS*
Birds			
Barn Owl	*Tyto alba*	Protected Bird	Critically Imperiled in NYS

Breeding

Miller Field, 2002-06-15: The nest was found in a tower at Miller Field, a large manicured field. The field is bordered by abandoned buildings, a stand of pines and extensive residential area, a beach, and a small patch of deciduous trees and houses. (Near **STA 153** on plan maps.) 11357

Dragonflies and Damselflies			
Needham's Skimmer	*Libellula needhami*	Unlisted	Vulnerable in NYS

Interior Drainage Area C, Seavers Creek at Olympia Boulevard, 1997-07-11: The dragonflies were observed on both sides of the road along a creek bordered by thick stands of Phragmites. 11184

The following plants are listed as Endangered or Threatened by New York State, and/or are considered rare by the New York Natural Heritage Program, and so are a vulnerable natural resource of conservation concern.

COMMON NAME	*SCIENTIFIC NAME*	*NY STATE LISTING*	*HERITAGE CONSERVATION STATUS*
Vascular Plants			
Green Milkweed	*Asclepias viridiflora*	Threatened	Imperiled in NYS

Ocean Breeze Park, South Beach, near Quintard Street near its end, 1998-07-22: Open grassland habitat on artifically deposited sand, now resembling a maritime grassland. Grassland about 175+ acres surrounded by heavy development. Grassland varies in quality, but the highest quality is located along the northeast side. **Near Interior Drainage Area D.** 7904

Globose Flatsedge	*Cyperus echinatus*	Endangered	Critically Imperiled in NYS

Ocean Breeze Park, South Beach, near Quintard Street near its end, 1998-07-22: Large open grassland outlined by major roads. Soil is very sandy. **Near Interior Drainage Area D.** 7425

This report only includes records from the NY Natural Heritage databases. For most sites, comprehensive field surveys have not been conducted, and we cannot provide a definitive statement as to the presence or absence of

all rare or state-listed species. Depending on the nature of the project and the conditions at the project site, further information from on-site surveys or other sources may be required to fully assess impacts on biological resources.

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

Information about many of the rare animals and plants in New York, including habitat, biology, identification, conservation, and management, are available online in Natural Heritage's Conservation Guides at www.guides.nynhp.org, from NatureServe Explorer at www.natureserve.org/explorer, and from USDA's Plants Database at http://plants.usda.gov/index.html (for plants).

The following rare plants have historical records at your project site, or in its vicinity.

The following rare plants were documented in the vicinity of the project site at one time, but have not been documented there since 1919 or earlier, and/or there is uncertainty regarding their continued presence. There is no recent information on these plants and animals in the vicinity of the project site and their current status there is unknown. In most cases the precise location of the plant or animal in this vicinity at the time it was last documented is also unknown.

We provide this information for your general reference. If suitable habitat for these plants or animals is present in the vicinity of the project site, it is possible that they may still occur there. We recommend that any field surveys to the site include a search for these species, particularly at sites that are currently undeveloped and may still contain suitable habitat.

COMMON NAME	*SCIENTIFIC NAME*	*NYS LISTING*	*HERITAGE CONSERVATION STATUS*	
Vascular Plants				
Straw Sedge	*Carex straminea*	Endangered	Critically Imperiled in NYS	
1915-06-13: South Beach.				1889
Straw Sedge	*Carex straminea*	Endangered	Critically Imperiled in NYS	
1896-06-15: Grant City.				5017
Primrose-leaf Violet	*Viola primulifolia*	Threatened	Imperiled in NYS	
1907-05-30: Grant City. Open moist soil.				6294
Downy Carrion-flower	*Smilax pulverulenta*	Endangered	Critically Imperiled in NYS	
1919-05-17: Grant City.				8699
Spring Ladies'-tresses	*Spiranthes vernalis*	Endangered	Critically Imperiled in NYS	
1892-08-07: South Beach				7984

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

Information about many of the rare animals and plants in New York, including habitat, biology, identification, conservation, and management, are available online in Natural Heritage's Conservation Guides at www.guides.nynhp.org.

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

November 17, 2014

Mr. Jeff Zappieri
NYS Department of State
Consistency Review Unit, Office of Planning and Development
One Commerce Place, 99 Washington Avenue Suite 1010
Albany, NY 12231-0001

Dear Mr. Zappieri,

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 risk management projects and studies in the Northeast. As part of the planning and implementation process for the South Shore of Staten Island Coastal Storm Risk Management Project, Staten Island, New York, New York District (NYD) will be completing the Feasibility Study and environmental compliance.

Please find attached for your review: (1) project description, (2) plan sheets and (3) Appendix D (New York City and New York State Coastal Zone Management Program Consistency Determination) of the Draft Environmental Impact Statement (EIS). The Draft EIS is undergoing internal review and will be available for public and agency review in January 2015.

NYD requests a Consistency Statement for the South Shore of Staten Island Coastal Storm Risk Management Project, Staten Island, New York.

I look forward to working with you and your staff on this effort. If you should have any questions, please contact Ms. Catherine Alcoba of my staff at 917-790-8216.

Sincerely,

Peter Weppler
Chief, Environmental Analysis Branch

Cc: Michael Marrella, NYC Department of City Planning
Attachments

NEW YORK CITY AND NEW YORK STATE COASTAL ZONE MANAGEMENT PROGRAM CONSISTENCY DETERMINATION

Project: South Shore of Staten Island Coastal Storm Risk Management Project (Project). For a complete Project history and description refer to Chapters 1 and 2 of the Environmental Impact Statement (EIS).

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

Applicable Policies: Based on a review of the Coastal Management Program policies for New York, 20 state policies and 9 New York City policies were found to be potentially applicable to the proposed Project. These policies are listed below.

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

State Policy 1 – Restore, revitalize and redevelop deteriorated and underutilized waterfront areas for commercial, industrial, cultural, recreational and other compatible uses.

Also applicable: **NYC Policy 1 --** Support and facilitate commercial and residential redevelopment in areas well-suited to such development; and

NYC Policy 2 – Support water-dependent and industrial uses in New York City coastal areas that are well-suited to their continued operation.

Determination – Construction of the NED Plan would contribute to the revitalization of the waterfront area associated with the Project area. The Project would provide coastal risk management of the south shore of Staten Island (from Fort Wadsworth to Oakwood Beach), protecting life, property and existing infrastructure from storm damage and erosive forces from coastal storm events. The physical integrity of the south shore of Staten Island's coastline must be maintained to protect these uses. Therefore, the District has determined that the proposed NED Plan would be consistent with this policy.

State Policy 2 – Facilitate the siting of water dependent uses and facilities on or adjacent to coastal waters.

Determination – The area/land on which the Project's line of protection (LOP) is being built is publicly owned, and supports a variety of public recreational activities. The south shore of Staten Island's coastline must be maintained to protect these uses. The without Project condition would eventually impact public recreational activities. The District has determined that the NED Plan would be consistent with, and would advance, this policy.

State Policy 4 – Strengthen the economic base by encouraging the development and enhancement of those traditional uses and activities that have provided such areas with their unique maritime identity.

Determination – The NED Plan would insure that historic recreational use of the south shore of Staten Island beaches would be enhanced and preserved. The NED Plan would stabilize the shoreline and manage the risk from coastal storm damage to the surrounding area, thus enabling continued recreational enjoyment. Therefore, the District has determined that the NED Plan would be consistent with this policy.

State Policy 5 – Encourage the location of development in areas where public services and facilities essential to such development are adequate.

Determination – The NED Plan would manage the risk of coastal storm damage to existing infrastructure along the south shore of Staten Island from hurricane and storm surge flooding. Risk management would provide stability and enhancement to existing and future development Projects. The without Project condition would eventually impact development as contractors would be hesitant to develop in an unstable, unprotected environment. Therefore, the District has determined that the NED Plan would be consistent with this policy.

State Policy 7 – Significant coastal fish and wildlife habitats would be protected, preserved, and where practical, restored so as to maintain their viability as habitats.

Also applicable: **NYC Policy 4** – Protect and restore the quality and function of ecological systems within the New York City coastal area.

NYC Policy 5 – **Protect and improve water quality in the New York City coastal area.**

Determination – The District calculated that the NED Plan would reduce freshwater wetland acreage by approximately 10.9 acres and would create/restore approximately 18.9 acres of tidal wetlands. Overall, the NED Plan would improve wetland quality and enhance wetlands by increasing diversity with expanded open water (low-flow channels and ponds) and permanent pool (emergent wetlands) habitats. The NED Plan is also expected to result in improved water quality in the watershed. Proposed ponds function as wetlands that provide physical, chemical, and biological treatment of pollutants contained within runoff; flow rates into wetlands are attenuated, allowing sediment and organic debris to settle. During this process, nutrients undergo both chemical and biological transformation. Nitrogen can be naturally altered into forms that are more favorable to uptake by wetland plants and phosphorus is readily precipitated out of water in many of its chemical forms, depending on the pH of the water and is also utilized by plants. Proposed ponds can also reduce fecal coliform concentrations by detaining water, allowing for die-off of microorganisms. Beneficial impacts to aquatic ecosystem would occur through improved habitats. To achieve the goal of habitat enhancements, natural features have been designed into the Project for the purposes of providing ecological

diversity in addition to (and in support of) the functions of stormwater management and flood control. The objective of these diverse design elements is to enhance the overall habitat complexity and ecological values in the Project area. Accordingly, the District has determined that the NED Plan would be consistent with this policy.

State Policy 8 – Protect fish and wildlife resources in the coastal area from the introduction of hazardous wastes and other pollutants which bio-accumulate in the food chain or which cause significant sublethal or lethal effect on those resources.

Also applicable: **NYC Policy 7** – Minimize environmental degradation from solid waste and hazardous substances.

Determination – The NED Plan would involve the disturbance of soil and groundwater in areas where prior uses, regulatory database searches, and testing have indicated a potential for the presence of hazardous materials in the soil and/or groundwater. Under the NED Plan, these locations would be tested in accordance with NYCDEP protocols prior to construction. If contaminated materials are found, they would be removed and disposed of in accordance with all City, State, and Federal regulations. In addition, the NED Plan would handle contaminated groundwater in accordance with all regulations. If hazardous materials are encountered, the NED Plan could provide beneficial impacts associated with the cleanup of such hazardous materials. Accordingly, the District has determined that NED Plan would be consistent with this policy.

State Policy 12 – Activities or development in the coastal area would be undertaken so as to minimize damage to natural resources and property from flooding and erosion by protecting natural protective features including beaches, dunes, barrier islands and bluffs.

Also applicable: **NYC Policy 6** – Minimize loss of life, structures and natural resources caused by flooding and erosion.

Determination – The primary goal of the Project is to manage the risk of damages from hurricane and storm surge flooding along the south shore of Staten Island. The NED Plan involves the construction of a LOP consisting of a buried seawall/armored levee along a majority of the reach (approximately 80%) serving as the first line of defense against severe coastal surge flooding and wave forces. The remainder of the LOP would consist of a T-Type vertical floodwall, and earthen levee. The crest elevation of the LOP would be 18 feet NGVD 1929 to 20.5 feet NGVD 1929. The LOP would also include a stoplog closure structure at Hylan Boulevard, drainage control structures for existing storm water outfalls, tide gate structures, vehicle and pedestrian access structures, and demolition of the existing boardwalk. The NED Plan also involves excavation of interior areas to augment/create 10 ponds that would alleviate flooding that may subsequently occur from interior runoff. Therefore, the District has determined that the NED Plan would be consistent with this policy.

State Policy 13 – The construction or reconstruction of erosion protection structures shall be undertaken only if they have a reasonable probability of controlling erosion for at least

30 years as demonstrated in design and construction standards and/or assured maintenance or replacement programs.

Determination – The construction and maintenance of the LOP would provide coastal storm risk management for a minimum of 50 years after initial construction (note: 50 years was the minimum life of the Project analyzed by the District). Therefore, the District has determined that the NED Plan would be consistent with this policy.

State Policy 14 – Activities and development including the construction or reconstruction of erosion protection structures, shall be undertaken so that there would be no measurable increase in erosion or flooding at the site of such activities or development, or at other locations.

Determination – The primary goal of the Project is to manage the risk of damages from hurricane and storm surge flooding along the south shore of Staten Island. The LOP and interior ponds would alleviate flooding and reduce interior runoff by reducing water surface elevations. Therefore, the District has determined that the NED Plan would be consistent with this policy.

State Policy 16 – Public funds shall only be used for erosion protective structures where necessary to protect human life, and new development which requires a location within or adjacent to an erosion hazard area to be able to function, or existing development; and only where the public benefits outweigh the long term monetary and other costs including the potential for increasing erosion and adverse effects on natural protective features.

Determination – The without Project alternative would result in increased flood risks and associated negative consequences to life, property and the environment. Coastal storm risk management provides significant public benefits. The District has weighed the public costs of the Project against the benefits and has determined that the public benefits outweigh the public costs because beach protection would provide a significant reduction in damages to housing, infrastructure, and the environment. Additionally, the Project would improve water quality in the Project area, which would also be positive for recreation. Therefore, the District has determined that the NED Plan would be consistent with this policy.

State Policy 17 – Non-structural measures to minimize damage to natural resources and property from flooding and erosion shall be used whenever possible.

Determination – The NED Plan utilizes both structural and non-structural measures to minimize damage to natural resources and property from flooding and erosion. Non-structural measures alone would not provide the required coastal storm risk management. The policy explanation states that consistency with this policy requires the use of such non-structural measures when they are appropriate and available. Given the need to provide coastal storm risk management to the Project area, structural measures are required. Therefore, the District has determined that the NED Plan would be consistent with and would advance this policy.

State Policy 18 – To safeguard the vital economic, social and environmental interests of the state and of its citizens, proposed major action in the coastal area must give full consideration to those interests, and to the safeguards which the state has established to protect valuable coastal resource areas.

Determination – The area on which the LOP would be constructed is publicly owned and supports a variety of public recreational activities. The south shore of Staten Island's coastline must be maintained to protect these uses. The without Project condition would eventually impact public recreational activities. The Project would provide coastal storm risk management to an important public recreational area and adjacent commercial and residential properties with minimal short-term impacts to economic, social, and environmental resources. Therefore, the District has determined that the NED Plan would be consistent with this policy.

State Policy 19 – Protect, maintain, and increase the level and types of access to public water-related recreation resources and facilities.

Also applicable: **NYC Policy 8** – Provide public access to and along New York City's coastal waters.

Determination – The NED Plan would result in positive impacts on recreation as a result of improved water quality and better coastal storm risk management in the Project area. The without Project alternative would result in increased flood risks, increased erosion, and decreased water quality, thereby decreasing recreational potential in the area. Consequently, the District has determined that the NED Plan would be consistent with this policy.

State Policy 20 – Access to publicly-owned foreshore and to lands immediately adjacent to the foreshore or the water's edge that are publicly-owned shall be provided and it shall be provided in a manner compatible with adjoining uses.

Determination – The NED Plan would not adversely affect public access along the south shore of Staten Island. Fourteen (14) earthen ramps are proposed between Oakwood Beach and South Beach. These ramps would be designed for both pedestrian and vehicular access and meet the 1:12 maximum slope required by ADA guidelines. The ramps would be strategically located to provide beach access from existing roads and access paths. Pedestrian access points, spaced approximately every 500 feet, would be located along the Buried Seawall between Midland Beach and South Beach. There would be a total of 27 access points for pedestrians along the promenade. Because the Project would be compatible with adjoining uses and provides adequate public access, the District has determined that the NED Plan would be consistent with this policy.

State Policy 21 – Water-dependent and water-enhanced recreation would be encouraged and facilitated, and would be given priority over non-water related uses along the coast.

Determination – The NED Plan would result in positive impacts on recreation as a result of improved water quality and better coastal storm risk management in the Project area. The without Project alternative would result in increased flood risks, increased erosion, and decreased water quality, thereby decreasing recreational potential in the area. Consequently, the District has determined that the NED Plan would be consistent with the policy to encourage and enhance water-dependent and water-enhanced recreation.

State Policy 22 – Development when located adjacent to the shore would provide for water-related recreation whenever such use is compatible with reasonably anticipated demand for such activities, and is compatible with the primary purpose of the development.

Determination – The NED Plan would result in positive impacts on recreation as a result of improved water quality and better coastal storm risk management in the Project area. The without Project alternative would result in increased flood risks, increased erosion, and decreased water quality, thereby decreasing recreational potential in the area. Consequently, the District has determined that the NED Plan would be consistent with this policy.

State Policy 23 – Protect, enhance and restore structures, districts, areas of sites that are of significance in history, architecture, archeology or culture of the State, its communities, or the Nation.

Also applicable: **NYC Policy 10** – Protect, preserve and enhance resources significant to the historical, archaeological, and cultural legacy of the New York City coastal area.

Determination – The NED Plan would provide coastal storm risk management to the south shore of Staten Island. No New York City designated landmarks are present in the area. The alignment passes adjacent to, and at times crosses into, the Miller Army Air Field Historic District which is a National Register of Historic Places listed property. The NED Plan would impact Miller Field; however the District is working with the National Park Service and the New York State Historic Preservation office on a Programmatic Agreement to mitigate any impacts.

The NED Plan would protect the structures within the historic district from further flood damage. The NED Plan would also reduce risk identified in Policy 23; therefore, the District has determined that the NED Plan would be consistent with this policy.

State Policy 24 – Prevent impairment of scenic resources of statewide significance.

Also applicable: **NYC Policy 9** – Protect scenic resources that contribute to the visual quality of the New York City coastal area.

Determination – The NED Plan would help manage the risk of flood damages in the area, would enhance water quality, and would create more and improved wetland habitats. No

known scenic resources of statewide significance exist in the immediate Project area, therefore, the District has determined that the proposed NED Plan would be consistent with this policy.

State Policy 25 – Protect, restore or enhance natural and man-made resources which are not identified as being of statewide significance, but which contribute to the overall scenic quality of the coastal area.

Determination – The NED Plan would help manage the risk of flood damages in the area, would enhance water quality, and would create more and improved wetland habitats. The District is working closely with NYC Parks to avoid or minimize potential impacts to recreational impacts. The revitalized and protected beach would enhance the scenic quality of the coastal area, therefore, the District has determined that the NED Plan would be consistent with this policy.

State Policy 44 – Preserve and protect tidal and freshwater wetlands and preserve the benefits derived from these areas.

Determination – Proposed tidal gates associated with the LOP would remain open during normal tidal elevations to allow passage of saline tidewater into marsh areas and drainage of rainfall runoff. Consequently, no salinity effects are expected. The NED Plan is expected to result in improved water quality in the watershed compared to the No-Action (without-project) Alternative. Without the NED Plan, runoff would not be collected and directed to the proposed ponds. In contrast, proposed ponds function as wetlands that provide physical, chemical, and biological treatment of pollutants contained within runoff; flow rates into wetlands are attenuated, allowing sediment and organic debris to settle. During this process, nutrients undergo both chemical and biological transformation in a wetland. Nitrogen can be naturally altered into forms that are more favorable to uptake by wetland plants and phosphorus is readily precipitated out of water in many of its chemical forms, depending on the pH of the water and is also utilized by plants. Proposed ponds can also reduce fecal coliform concentrations by detaining water, allowing for die-off of microorganisms. The interior drainage features of the NED Plan would also improve wetland quality and enhance wetlands by increasing diversity with expanded open water (low-flow channels and ponds) and permanent pool (emergent wetlands) habitats. The District calculated that the NED Plan would reduce freshwater wetland acreage by approximately 10.9 acres and would create/restore approximately 18.9 acres of tidal wetlands. Consequently, the District has determined that the NED Plan would be consistent with this policy.

REFERENCES

New York State Department of State (NYSDOS). Coastal Management Program, State Coastal Policies (Including Program changes from 1982-2006). 2006.

NYC Department of City Planning (NYCDCP), New York City Comprehensive Waterfront Plan: Vision 2020. 2011.

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

5 November 2104

Environmental Assessment Section
Environmental Analysis Branch

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

Dear Ms. Pierpont:

The U.S. Army Corps of Engineers, New York District, (Corps), is authorized to undertake construction of the South Shore of Staten Island Coastal Storm Damage Reduction Project, Richmond County, New York under P.L. 113-2, the Disaster Relief Appropriations Act of 2013, following Hurricane Sandy in October 2012. The Corps is presently completing the feasibility study of the Phase I portion of the project which runs along the Atlantic Ocean shoreline from just outside the Fort Wadsworth boundary to Oakwood Beach (Enclosure 1). The recommended Line of Protection Plan (LOP) consists of a buried seawall/armored levee along a majority of the reach (approximately 80%) serving as the first line of defense against severe coastal surge flooding and wave forces. The remainder of the LOP consists of a T-Type Vertical Floodwall and Levee. The LOP also includes a stoplog closure structure at Hylan Boulevard, drainage control structures for existing storm water outfalls, tide gate structures, vehicle and pedestrian access structures, and demolition of the existing boardwalk. The Interior Drainage Plan includes pond excavation, construction of tide gates and gate chambers along the LOP, road raisings, and other minor interior drainage facilities. The Area of Potential Effect (APE) for this undertaking includes all areas impacted by activities required to construct the above listed features as well as construction access and staging areas and, if required, environmental mitigation measures. The locations of some of these features have yet to be determined. Maps and proposed plans are contained in the enclosed Preliminary Case Report and Programmatic Agreement (PA) referenced below.

A Phase I survey was completed for the Corps in 2005 and your office reviewed the resulting report and had no comments (OPRHP No 05-4225). The Corp proposes several changes, outlined below, to the recommendations that were issued in the Phase I report. A Preliminary Case Report was prepared which summarizes all cultural resources work conducted to date and outlines future studies (Enclosure 2). The Corps has prepared a Draft PA which stipulates further studies the Corps will undertake. The draft PA for your review and comment is included as Enclosure 7 in the Preliminary Case Report.

The bungalow community at Cedar Grove was determined eligible for the National Register of Historic Places (NRHP) by your office in 2011. The New York City Department of Parks and Recreation (Parks), our non-federal sponsor on this project, was addressing mitigation measures associated with their removal. Parks was to remove these structures before initiation of construction by the Corps. Since that time the structures were severely impacted by Hurricane Sandy in October 2012 and just two remain extant although severely damaged. The Corps will undertake no further study of the bungalow community. The Corps in 2005 excavated 68 shovel tests on the beach at Cedar Grove and found only modern materials. No additional shovel testing will be conducted at Cedar Grove.

At New Dorp Beach the remains of several concrete structures were encountered. These remains are likely from the St. John's Guild Hospital (also known as the Seaside Hospital) built in 1881, closed in the 1960s, but extant until 1988. The 2005 report recommended Phase II field and documentary investigations to define specific structural features and make direct linkages with the documented structures from the shoreline inland to Cedar Grove Avenue. As discussed in the Preliminary Case Report, the lack of structural integrity and lack of documented stratigraphy suggests that further field work will not yield any significant information. It is the Corps' opinion that no further work be undertaken in connection with these structural remains along the beach front. However, the alignment has recently been redesigned and moved landward where buried intact archaeological remains of the hospital may be encountered. This shift may also impact remains associated with the original site of the Britton Cottage which is now located in Historic Richmondtown. Archaeological studies will be conducted of the new proposed alignment.

The project alignment crosses the NRHP-listed Miller Army Air Field Historic District and will sever the connection between the historic seaplane airfield and the sea. The Corps has been working with the National Park Service (NPS), owners of Miller Field which is part of the Gateway National Recreation Area (GNRA), to develop mitigation measures for impacts to the property. Measures may in part be based on the final PA for the GNRA General Management Plan (GMP) signed this year by NPS and your office.

The 1943 World War II Fire Control Tower on the beach at Miller Field was not included as a contributing element to the property in the National Register Nomination Form prepared in 1976. The 2005 Corps report indicates that due to the structure's lack of integrity it was neither an individually eligible resource nor a contributing element to the historic district but recommended further study. The recent GMP /Environmental Impact Statement for the GNRA by the NPS does not mention the fire control tower. The Corps will work with the NPS to determine eligibility of this structure. The proposed alignment will likely destroy the tower.

The project alignment ties into high ground just outside the southern boundary of the NRHP-listed Fort Wadsworth Historic District and will have no direct impact on the historic district. The proposed project will be visible from Fort Wadsworth however the historically significant views from the fort, from the time the initial defenses were constructed through the Endicott Era, face towards the Narrows and the entrance to New York Harbor. Endicott-Era Batteries Ayres and Richmond are the only two historic structures in the historic district that are oriented

somewhat towards the project alignment although both face southeast towards the main approach channel and not the beach. It is the Corps' opinion that the project will not impact the viewshed from these historic structures or from the Fort Wadsworth Historic District. While there may have been observations from the fort along the ocean the focus of the defensive systems were towards the approach channels to New York Harbor. The proposed seawall will be built to elevation 20 feet above sea level (ASL), approximately 12 to 14 feet above grade, which is significantly lower than the elevation of 100 feet ASL at Fort Wadsworth and would still allow an observer an unobstructed view to the sea.

Several locations are proposed to be acquired for interior drainage facilities. Excavation may be required to increase water storage capacity at these sites. The Corps' work will largely be within areas identified by New York City Department of Environmental Protection (NYCDEP) as part of their Staten Island Blue Belt Initiative. A Phase I study was conducted on the Blue Belt for NYCDEP by Historical Perspectives (OPRHP No. 10PR02085). The Corps will follow on with studies recommended by that work where relevant to our project actions. Features not contained within the Blue Belt program will be further investigated by the Corps. This work will be coordinated with your office as outlined in the draft PA.

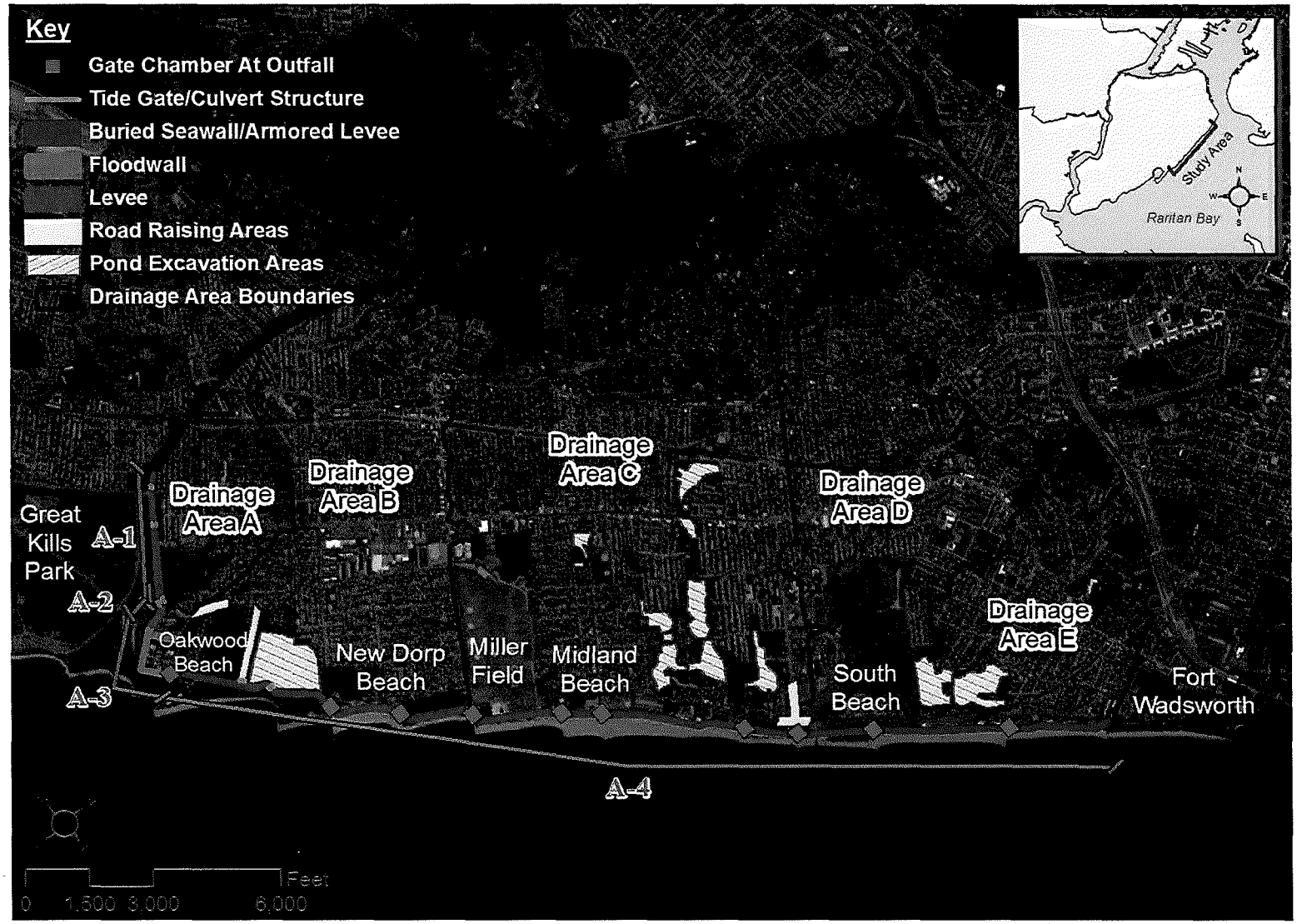
All other work recommended in the 2005 report will be undertaken. The Corps will excavate borings along the project alignment where construction by open trenching is proposed to provide an understanding of shoreline development as sea level rose and to determine areas sensitive for deeply buried landforms and Native American resources. No borings will be conducted where construction will entail just pile driving. The locations and number of borings will be determined by a geoarchaeologist or a geomorphologist with archaeological experience. Please note that work at Crescent Beach (Study Area C in the 2005 report) has been postponed as Phase II of this project and no further work will be conducted in that segment at this time.

The direction of studies to be undertaken, including in those locations where the proposed alignment has shifted or where locations of features such as staging areas have yet to be defined, are stipulated in the Draft PA. The Corps is coordinating the document with NPS, Delaware Tribe of Indians, Delaware Nation, New York City Landmarks Preservation Commission and other interested parties (Enclosure 3). The draft PA will also be available for public review in the project's Draft Environmental Impact Statement. Please review the enclosed materials and provide Section 106 comments, pursuant to 36 CFR 800.5. If you or your staff require additional information or have any questions, please contact Lynn Rakos, Project Archaeologist, at (917) 790-8629.

Sincerely,

Peter M. Weppler
Chief, Environmental Analysis Branch

Enclosures



Enclosure 1 - Overview of NED Plan

Enclosure 3

Ed Wiseman
Executive Director
Staten Island Historical Society
Historic Richmond Town
441 Clarke Avenue
Staten Island, NY 10306

Elizabeth Egbert
President & CEO
Staten Island Museum
75 Stuyvesant Place
Staten Island, New York 10301

Dr. Thomas Matteo
Staten Island Historian
460 Brielle Avenue
Staten Island, N.Y. 10314

Barnett Shepherd
Executive Director
Preservation League of Staten Island
54 Port Richmond Avenue
Staten Island, NY 10302

Mr. Paul Morando, Director
Harbor Defense Museum of Fort Hamilton
230 Sheridan Loop ,
Fort Hamilton Military Community
Brooklyn, NY 11252-5701

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 5, 2014

Environmental Assessment Section
Environmental Analysis Branch

Mr. Reid Nelson, Director
Office of Federal Agency Programs
Advisory Council on Historic Preservation
The Old Post Office Building
1100 Pennsylvania Avenue, N.W., Suite 809
Washington, D.C. 20004

Dear Mr. Nelson:

The U.S. Army Corps of Engineers, New York District, (Corps), is authorized to undertake construction of the South Shore of Staten Island Coastal Storm Damage Reduction Project, Richmond County, New York under P.L. 113-2, the Disaster Relief Appropriations Act of 2013, following Hurricane Sandy in October 2012. The Corps is presently completing the feasibility study of the Phase I portion of the project which runs along the Atlantic Ocean shoreline from just outside the Fort Wadsworth boundary to Oakwood Beach (Enclosure 1). The recommended Line of Protection Plan (LOP) consists of a buried seawall/armored levee along a majority of the reach (approximately 80%) serving as the first line of defense against severe coastal surge flooding and wave forces. The remainder of the LOP consists of a T-Type Vertical Floodwall and Levee. The LOP also includes a stoplog closure structure at Hylan Boulevard, drainage control structures for existing storm water outfalls, tide gate structures, vehicle and pedestrian access structures, and demolition of the existing boardwalk. The Interior Drainage Plan includes pond excavation, construction of tide gates and gate chambers along the LOP, road raisings, and other minor interior drainage facilities. The Area of Potential Effect (APE) for this undertaking includes all areas impacted by activities required to construct the above listed features as well as construction access and staging areas and, if required, environmental mitigation measures. The locations of some of these features have yet to be determined. Maps and proposed plans are contained in the enclosed Preliminary Case Report and Programmatic Agreement (PA) referenced below.

A Phase I survey was completed for the Corps in 2005. No Native American archaeological sites were identified but deep testing was recommended. The National Register of Historic Places (NRHP) -listed Miller Army Airfield Historic District in the National Park Service (NPS) Gateway National Recreation Area is immediately adjacent to the proposed project. The District is working with NPS regarding impacts to this property. The project alignment ties into high ground just outside the southern boundary of the NRHP-listed Fort Wadsworth Historic District and will have no direct impact on the historic district. It is the Corps' opinion that the project

will not impact the viewshed from the Fort Wadsworth Historic District as the focus of the historic defensive systems were towards the approach channels to New York Harbor and not towards the ocean.

A Preliminary Case Report was prepared which summarizes all cultural resources work conducted to date and outlines future studies (Enclosure 2). The Corps has prepared a Draft PA which stipulates further work the Corps will undertake. The draft PA for your review and comment is included as Enclosure 7 in the Preliminary Case Report. The Corps is coordinating the document with NPS, Delaware Tribe of Indians, Delaware Nation, New York City Landmarks Preservation Commission and other interested parties (Enclosure 3). The draft PA will also be available for public review in the project's Draft Environmental Impact Statement. Please review the enclosed materials. We invite you to consult with us on the South Shore of Staten Island Coastal Storm Damage Reduction Project and participate in the PA as per 36 CFR Part 800.6. If you or your staff require additional information or have any questions, please contact Lynn Rakos, Project Archaeologist, at (917) 790-8629

Sincerely,

Peter M. Weppler
Chief, Environmental Analysis Branch

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

5 November 2104

Environmental Assessment Section
Environmental Analysis Branch

Gateway National Recreation Area
ATTN: Marilou Ehrler
Historical Architect
210 New York Avenue
Staten Island, New York 10305

Dear Ms. Ehrler:

The U.S. Army Corps of Engineers, New York District, (Corps), is authorized to undertake construction of the South Shore of Staten Island Coastal Storm Damage Reduction Project, Richmond County, New York under P.L. 113-2, the Disaster Relief Appropriations Act of 2013, following Hurricane Sandy in October 2012. The Corps is presently completing the feasibility study of the Phase I portion of the project which runs along the Atlantic Ocean shoreline from just outside the Fort Wadsworth boundary to Oakwood Beach (Enclosure 1). The recommended Line of Protection Plan (LOP) consists of a buried seawall/armored levee along a majority of the reach (approximately 80%) serving as the first line of defense against severe coastal surge flooding and wave forces. The remainder of the LOP consists of a T-Type Vertical Floodwall, and Levee. The LOP also includes a stoplog closure structure at Hylan Boulevard, drainage control structures for existing storm water outfalls, tide gate structures, vehicle and pedestrian access structures, and demolition of the existing boardwalk. The Interior Drainage Plan includes pond excavation, construction of tide gates and gate chambers along the LOP, road raisings, and other minor interior drainage facilities. The Area of Potential Effect (APE) for this undertaking includes all areas impacted by activities required to construct the above listed features as well as construction access and staging areas and, if required, environmental mitigation measures. The locations of some of these features have yet to be determined. Maps and proposed plans are contained in the enclosed Preliminary Case Report (Enclosure 2). A buried seawall is proposed to cross the beach at Miller Field. The proposed alignment is adjacent to, and crosses into, the National Register of Historic Places (NRHP) listed Miller Army Airfield Historic District. The project as now proposed will remove the 1943 fire tower on the beach at Miller Field. We would like to work with your office to minimize and/or mitigate potential impacts to cultural resources on National Park Service (NPS) property.

Much of the project's APE has been subject to cultural resource surveys by the Corps or by others. A reconnaissance report was prepared for this study in 1995 and a Phase I survey was completed for the Corps in 2005. A CD containing the final Phase I report is enclosed (Enclosure 3). This work included archaeological testing and an historic architectural survey. The resulting report recommended further work in selected locations along the proposed project alignment. The 1995 and 2005 studies were coordinated with the New York State Historic Preservation Office (SHPO). These studies noted the Miller Army Airfield Historic District but did not discuss potential project impacts. The 1995 report recommended that the NRHP eligibility of the fire tower be evaluated. The 2005 Corps report had conflicting recommendations as it indicated that due to the structure's lack of integrity it was neither an

individually eligible resource nor a contributing element to the historic district however recommended further study. The fire tower was not included in the NPS 1976 NRHP Nomination Form and was not addressed in the 2014 Gateway National Recreation Area Final General Management Plan and Environmental Impact Statement (EIS). The Corps will evaluate the NRHP-eligibility of this structure. There has been no study of the former ramp which connected the seaplane hangar to the sea. If your office has any information on the ramp we would appreciate receiving that data.

The project alignment ties into high ground just outside the southern boundary of the NRHP-listed Fort Wadsworth Historic District and will have no direct impact on the historic district. The proposed project will be visible from Fort Wadsworth however the historically significant views from the fort, from the time the initial defenses were constructed through the Endicott Era, face towards the Narrows and the entrance to New York Harbor. Endicott-Era Batteries Ayres and Richmond are the only two historic structures in the historic district that are oriented somewhat towards the project alignment although both face southeast towards the main approach channel and not the beach. It is the Corps' opinion that the project will not impact the viewshed from these historic structures or from the Fort Wadsworth Historic District. While there may have been observations from the fort along the ocean the focus of the defensive systems were towards the approach channels to New York Harbor. The proposed seawall will be built to elevation 20 feet above sea level (ASL), approximately 12 to 14 feet above grade, which is significantly lower than the elevation of 100 feet ASL at Fort Wadsworth and would still allow an observer an unobstructed view to the sea.

The Corps has drafted a PA which is contained as Enclosure 7 in the enclosed Preliminary Case Report for your review and comment. The document will be coordinated with the SHPO, Advisory Council on Historic Preservation, Delaware Nation, Delaware Tribe of Indians, New York City Landmarks Preservation Commission and other potential interested parties (Enclosure 4). The draft PA will also be available for public review in the project's Draft EIS prepared under the National Environmental Policy Act which will serve as part of the Corp' Section 106 public coordination. The final PA will incorporate comments received on the draft document, as appropriate.

We invite you to participate as a Consulting Party to the PA and provide input to its development. To that end we would like to meet with you to discuss working together to meet our Section 106 responsibilities in a way that will facilitate your goals for Gateway and in particular your plans for the Miller Army Airfield Historic District. A meeting was held on 19 March 2014 in Federal Hall to provide the NPS with an overview of the project. A second meeting was held at our office on 7 August 2014 to discuss the LOP and representatives of NPS were in attendance. These meetings did not address cultural resource issues but served to introduce the project to NPS.

Please review the enclosed material. We will coordinate a meeting with NPS and the Corps as soon as practicable. Should you require additional information or have any questions, please contact Ms. Lynn Rakos, Project Archaeologist, at (917) 790-8629 or by email at Lynn.Rakos@usace.army.mil.

Sincerely,

Peter M. Weppler
Chief, Environmental Analysis Branch

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

November 5, 2014

Environmental Assessment Section
Environmental Analysis Branch

Mr. Jason Ross
Delaware Nation
Section 106 Manager
P.O. Box 825
Anadarko, OK 73005

Dear Mr. Ross:

The U.S. Army Corps of Engineers, New York District, (Corps), is authorized to undertake construction of the South Shore of Staten Island Hurricane and Storm Risk Management Project, Richmond County, New York under P.L. 113-2, the Disaster Relief Appropriations Act of 2013, following Hurricane Sandy in October 2012. The Corps is presently completing the feasibility study of the Phase I portion of the project which runs from just south of Fort Wadsworth to Oakwood Beach (Enclosure 1). The recommended Line of Protection Plan (LOP) consists of a buried seawall/armored levee along a majority of the reach (approximately 80%) serving as the first line of defense against severe coastal surge flooding and wave forces. The remainder of the LOP consists of a T-Type Vertical Floodwall and Levee. The LOP also includes a stoplog closure structure at Hylan Boulevard, drainage control structures for existing storm water outfalls, tide gate structures, vehicle and pedestrian access structures, and demolition of the existing boardwalk. The Interior Drainage Plan includes pond excavation, construction of tide gates and gate chambers along the LOP, road raisings, and other minor interior drainage facilities. The Area of Potential Effect (APE) for this undertaking includes all areas impacted by activities required to construct the above listed features as well as construction access and staging areas and, if required, environmental mitigation measures. The locations of some of these features have yet to be determined. Maps and proposed plans are contained in the enclosed Preliminary Case Report and Programmatic Agreement (PA) referenced below.

As a federal agency the USACE has certain responsibilities for the identification, protection and preservation of cultural resources that may be located within the area of potential project effect (APE) associated with the proposed South Shore of Staten Island project. Present statutes and regulations governing the identification, protection and preservation of these resources include the National Historic Preservation Act of 1966 (NHPA), as amended through 2006; the National Environmental Policy Act of 1969; Executive Order 11593; and the regulations implementing Section 106 of the NHPA (36 CFR Part 800, Protection of Historic Properties, August 2004). Significant cultural resources include any material remains of human activity eligible for inclusion on the National Register of Historic Places (NRHP).

Much of the project's APE has been subject cultural resource surveys by the Corps or by others including a Phase I survey completed for the Corps in 2005. A CD containing the final Phase I report is enclosed (Enclosure 2). This work included archaeological testing and an historic architectural survey. The resulting report recommended further work in selected locations along the proposed project alignment. No Native American sites were identified however the Corps will excavate borings along the project alignment where construction by open trenching is proposed to provide an understanding of shoreline development as sea level rose and to determine areas sensitive for deeply buried landforms and Native American resources. No borings will be conducted where construction will entail just pile driving. The locations and number of borings will be determined by a geoarchaeologist or a geomorphologist with archaeological experience. Archaeological testing of high ground adjacent to proposed ponding areas and pump stations is also recommended.

A Preliminary Case Report was prepared which summarizes all cultural resources work conducted to date and outlines future work (Enclosure 3). The Corps has prepared a Draft PA which stipulates further studies the Corps will undertake. The draft PA for your review and comment is included as Enclosure 7 in the Preliminary Case Report. This document is being coordinated with the State Historic Preservation Office, National Park Service, New York City Landmarks Preservation Commission and other interested parties. We invite you to consult with us on this project and the PA. If you have questions please contact the project archaeologist, Ms. Lynn Rakos at (917)790-8629 or by email at Lynn.Rakos@usace.army.mil.

Sincerely,

Peter M. Weppler
Chief, Environmental Branch

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

November 5, 2014

Environmental Assessment Section
Environmental Analysis Branch

Ms. Blair Fink
Delaware Tribe Historic Preservation Representatives
Department of Anthropology
Gladfelter Hall
Temple University
1115 W. Polett Walk
Philadelphia. PA 19122

Dear Ms. Fink:

The U.S. Army Corps of Engineers, New York District, (Corps), is authorized to undertake construction of the South Shore of Staten Island Hurricane and Storm Risk Management Project, Richmond County, New York under P.L. 113-2, the Disaster Relief Appropriations Act of 2013, following Hurricane Sandy in October 2012. The Corps is presently completing the feasibility study of the Phase I portion of the project which runs from just south of Fort Wadsworth to Oakwood Beach (Enclosure 1). The recommended Line of Protection Plan (LOP) consists of a buried seawall/armored levee along a majority of the reach (approximately 80%) serving as the first line of defense against severe coastal surge flooding and wave forces. The remainder of the LOP consists of a T-Type Vertical Floodwall and Levee. The LOP also includes a stoplog closure structure at Hylan Boulevard, drainage control structures for existing storm water outfalls, tide gate structures, vehicle and pedestrian access structures, and demolition of the existing boardwalk. The Interior Drainage Plan includes pond excavation, construction of tide gates and gate chambers along the LOP, road raisings, and other minor interior drainage facilities. The Area of Potential Effect (APE) for this undertaking includes all areas impacted by activities required to construct the above listed features as well as construction access and staging areas and, if required, environmental mitigation measures. The locations of some of these features have yet to be determined. Maps and proposed plans are contained in the enclosed Preliminary Case Report and Programmatic Agreement (PA) referenced below.

As a federal agency the USACE has certain responsibilities for the identification, protection and preservation of cultural resources that may be located within the area of potential project effect (APE) associated with the proposed South Shore of Staten Island project. Present statutes and regulations governing the identification, protection and preservation of these resources include the National Historic Preservation Act of 1966 (NHPA), as amended through 2006; the National Environmental Policy Act of 1969; Executive Order 11593; and the regulations implementing

Section 106 of the NHPA (36 CFR Part 800, Protection of Historic Properties, August 2004). Significant cultural resources include any material remains of human activity eligible for inclusion on the National Register of Historic Places (NRHP).

Much of the project's APE has been subject cultural resource surveys by the Corps or by others including a Phase I survey completed for the Corps in 2005. A CD containing the final Phase I report is enclosed (Enclosure 2). This work included archaeological testing and an historic architectural survey. The resulting report recommended further work in selected locations along the proposed project alignment. No Native American sites were identified however the Corps will excavate borings along the project alignment where construction by open trenching is proposed to provide an understanding of shoreline development as sea level rose and to determine areas sensitive for deeply buried landforms and Native American resources. No borings will be conducted where construction will entail just pile driving. The locations and number of borings will be determined by a geoarchaeologist or a geomorphologist with archaeological experience. Archaeological testing of high ground adjacent to proposed ponding areas and pump stations is also recommended.

A Preliminary Case Report was prepared which summarizes all cultural resources work conducted to date and outlines future work (Enclosure 3). The Corps has prepared a Draft PA which stipulates further studies the Corps will undertake. The draft PA for your review and comment is included as Enclosure 7 in the Preliminary Case Report. This document is being coordinated with the State Historic Preservation Office, National Park Service, New York City Landmarks Preservation Commission and other interested parties. We invite you to consult with us on this project and the PA. If you have questions please contact the project archaeologist, Ms. Lynn Rakos at (917)790-8629 or by email at Lynn.Rakos@usace.army.mil.

Sincerely,

Peter M. Weppler
Chief, Environmental Branch

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

5 November 2104

Environmental Assessment Section
Environmental Analysis Branch

Ms. Amanda Sutphin
New York City Landmarks Preservation Commission
Municipal Building
One Center Street, 9th Floor
New York, N.Y. 10007

Dear Ms. Sutphin:

The U.S. Army Corps of Engineers, New York District, (Corps), is authorized to undertake construction of the South Shore of Staten Island Coastal Storm Damage Reduction Project, Richmond County, New York under P.L. 113-2, the Disaster Relief Appropriations Act of 2013, following Hurricane Sandy in October 2012. The Corps is presently completing the feasibility study of the Phase I portion of the project which runs along the Atlantic Ocean shoreline from just outside the Fort Wadsworth boundary to Oakwood Beach (Enclosure 1). The recommended Line of Protection Plan (LOP) consists of a buried seawall/armored levee along a majority of the reach (approximately 80%) serving as the first line of defense against severe coastal surge flooding and wave forces. The remainder of the LOP consists of a T-Type Vertical Floodwall and Levee. The LOP also includes a stoplog closure structure at Hylan Boulevard, drainage control structures for existing storm water outfalls, tide gate structures, vehicle and pedestrian access structures, and demolition of the existing boardwalk. The Interior Drainage Plan includes pond excavation, construction of tide gates and gate chambers along the LOP, road raisings, and other minor interior drainage facilities. The Area of Potential Effect (APE) for this undertaking includes all areas impacted by activities required to construct the above listed features as well as construction access and staging areas and, if required, environmental mitigation measures. The locations of some of these features have yet to be determined. Maps and proposed plans are contained in the enclosed Preliminary Case Report and Programmatic Agreement (PA) referenced below.

A Phase I survey was completed for the Corps in 2005. The New York State Historic Preservation Office (SHPO) reviewed the resulting report and had no comments (OPRHP No 05-4225). The Phase I report was not coordinated with your office at that time. A CD containing the final report is enclosed (Enclosure 2). The Corp proposes several changes, outlined below, to the recommendations that were issued in the Phase I report. A Preliminary Case Report was prepared which summarizes all cultural resources work conducted to date and outlines future studies (Enclosure 3). The Corps has prepared a Draft PA which stipulates further studies the

Corps will undertake. The draft PA for your review and comment is included as Enclosure 7 in the Preliminary Case Report.

The bungalow community at Cedar Grove was determined eligible for the National Register of Historic Places (NRHP) by SHPO in 2011. Because it was to remove these structures before initiation of construction by the Corps, the New York City Department of Parks and Recreation (Parks), our non-federal sponsor on this project, was in the process of addressing mitigation measures associated with their removal when Hurricane Sandy damaged the shoreline. Currently, only two remain extant although severely damaged. The Corps will undertake no further study of the bungalow community. In 2005, the Corps excavated 68 shovel tests on the beach at Cedar Grove and found only modern materials. No additional shovel testing will be conducted at Cedar Grove.

At New Dorp Beach the remains of several concrete structures were encountered. These remains are likely from the St. John's Guild Hospital (also known as the Seaside Hospital) built in 1881, closed in the 1960s, but extant until 1988. The 2005 report recommended Phase II field and documentary investigations to define specific structural features and make direct linkages with the documented structures from the shoreline inland to Cedar Grove Avenue. As discussed in the Preliminary Case Report the lack of structural integrity and lack of documented stratigraphy suggests that further field work will not yield any significant information. It is the Corps' opinion that no further work be undertaken in connection with these structural remains along the beach front. However, the alignment has recently been redesigned and moved landward where buried intact archaeological remains of the hospital may be encountered. This shift may also impact remains associated with the original site of the Britton Cottage which is now located in Historic Richmondtown. Archaeological studies will be conducted along the new proposed alignment.

The project alignment crosses the NRHP-listed Miller Army Air Field Historic District and will sever the connection between the historic seaplane airfield and the sea. The Corps has been working with the National Park Service (NPS), owners of Miller Field, which is part of the Gateway National Recreation Area (GNRA), to develop mitigation measures for impacts to the property. Measures may in part be based on the final PA for the GNRA General Management Plan (GMP) signed this year by NPS and SHPO.

The 1943 World War II Fire Control Tower on the beach at Miller Field was not included as a contributing element to the property in the National Register Nomination Form prepared in 1976. The 2005 Corps report indicates that due to the structure's lack of integrity it was neither an individually eligible resource nor a contributing element to the historic district but recommended further study. The recent GMP /Environmental Impact Statement for the GNRA by the NPS does not mention the fire control tower. The Corps will work with the NPS to determine eligibility of this structure. The proposed alignment will likely destroy the tower.

The project alignment ties into high ground just outside the southern boundary of the NRHP-listed Fort Wadsworth Historic District and will have no direct impact on the historic district. The proposed project will be visible from Fort Wadsworth however the historically significant views from the fort, from the time the initial defenses were constructed through the Endicott Era,

face towards the Narrows and the entrance to New York Harbor. Endicott-Era Batteries Ayres and Richmond are the only two historic structures in the historic district that are oriented somewhat towards the project alignment although both face southeast towards the main approach channel and not the beach. It is the Corps' opinion that the project will not impact the viewshed from these historic structures or from the Fort Wadsworth Historic District. While there may have been observations from the fort along the ocean the focus of the defensive systems were towards the approach channels to New York Harbor. The proposed seawall will be built to elevation 20 feet above sea level (ASL), approximately 12 to 14 feet above grade, which is significantly lower than the elevation of 100 feet ASL at Fort Wadsworth and would still allow an observer an unobstructed view to the sea.

Several locations are proposed to be acquired for interior drainage facilities. Excavation may be required to increase water storage capacity at these sites. The Corps' work will largely be within areas identified by New York City Department of Environmental Protection (NYCDEP) as part of their Staten Island Blue Belt Initiative. A Phase I study was conducted on the Blue Belt for NYCDEP by Historical Perspectives (OPRHP No. 10PR02085). The Corps will follow on with studies recommended by that work where relevant to our project actions. Features not contained within the Blue Belt program will be further investigated by the Corps.

All other work recommended in the 2005 report will be undertaken. The Corps will excavate borings along the project alignment where construction by open trenching is proposed to provide an understanding of shoreline development as sea level rose and to determine areas sensitive for deeply buried landforms and Native American resources. No borings will be conducted where construction will entail just pile driving. The locations and number of borings will be determined by a geoarchaeologist or a geomorphologist with archaeological experience. Please note that the shoreline south of Oakwood Beach, which includes Crescent Beach (Study Area C in the 2005 report), will be studied at a later time as Phase II of the Project.

Please let us know if there are deficiencies in the Phase I study or additional historic properties that should be included in the APE so that we might consider them in the PA. The direction of studies to be undertaken, including in those locations where the proposed alignment has shifted or where locations of features such as staging areas have yet to be defined, are stipulated in the Draft PA. The Corps is coordinating the document with NPS, Delaware Tribe of Indians, Delaware Nation and other interested parties (Enclosure 4). If you know of other organizations who we should reach out to please let us know. The draft PA will also be available for public review in the project's Draft Environmental Impact Statement. Please review the enclosed materials and provide comments. We invite you to consult with us on this project and the PA. If you or your staff require additional information or have any questions, please contact Lynn Rakos, Project Archaeologist, at (917) 790-8629.

Sincerely,

Peter M. Weppler
Chief, Environmental Analysis Branch

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

November 5, 2014

Environmental Assessment Section
Environmental Analysis Branch

Dear Interested Party:

The U.S. Army Corps of Engineers, New York District, (Corps), is authorized to undertake construction of the South Shore of Staten Island Coastal Storm Damage Reduction Project, Richmond County, New York under P.L. 113-2, the Disaster Relief Appropriations Act of 2013, following Hurricane Sandy in October 2012. The Corps is presently completing the feasibility study of the Phase I portion of the project which runs from just south of Fort Wadsworth to Oakwood Beach (Enclosure 1). The recommended Line of Protection Plan (LOP) consists of a buried seawall/armored levee along a majority of the reach (approximately 80%) serving as the first line of defense against severe coastal surge flooding and wave forces. The remainder of the LOP consists of a T- Type Vertical Floodwall, and Levee. The LOP also includes a stoplog closure structure at Hylan Boulevard, drainage control structures for existing storm water outfalls, tide gate structures, vehicle and pedestrian access structures, and demolition of the existing boardwalk. The Interior Drainage Plan includes pond excavation, construction of tide gates and gate chambers along the LOP, road raisings, and other minor interior drainage facilities. The Area of Potential Effect (APE) for this undertaking includes all areas impacted by activities required to construct the above listed features as well as construction access and staging areas and, if required, environmental mitigation measures. The locations of some of these measures have yet to be determined.

As a federal agency the Corps has certain responsibilities for the identification, protection and preservation of cultural resources that may be located within the area of potential project effect (APE) associated with the proposed South Shore of Staten Island project. Present statutes and regulations governing the identification, protection and preservation of these resources include the National Historic Preservation Act of 1966 (NHPA), as amended; the National Environmental Policy Act of 1969; Executive Order 11593; and the regulations implementing Section 106 of the NHPA (36 CFR Part 800, Protection of Historic Properties, August 2004). Significant cultural resources include any material remains of human activity eligible for inclusion on the National Register of Historic Places (NRHP).

Much of the project's APE has been subject a cultural resource survey by the Corps or by others. A reconnaissance report was prepared for this study in 1995 which was a summary of cultural resources work conducted to date in the project vicinity, a brief overview of historic map research and recommendations for further work. This work summarized and updated a previous study undertaken for the project in 1978. A Phase I survey was completed for the Corps in 2005. This work included archaeological testing and an historic architectural survey. The resulting report recommended further work in selected locations along the proposed project alignment. The 1995 and 2005 studies were coordinated with the New York State Historic Preservation Office (SHPO).

Recommendations included the excavation of deep borings in selected locations to test for the presence of buried early landforms under the historic period marsh or organic soils. Archaeological testing of high ground adjacent to proposed ponding areas and pump stations is also recommended.

The Corps is working with the National Park Service (NPS) Gateway National Recreation Area regarding impacts to the Miller Army Airfield Historic District. This NRHP-listed resource is immediately adjacent to the proposed project. The historic district consists of the Hangar No. 38, a seaplane hangar constructed by the army in 1920 and its concrete apron. Additions to the building were added in the 1930s by the Works Progress Administration. The Elm Tree Light is also included in the district. Adjacent to, but not included in, the Historic District is a 1943 concrete fire control tower. This structure was not included in the NRHP Nomination Form as a contributing element to the Miller Air Field Historic District. The Corps will evaluate the NRHP-eligibility of this structure.

A Draft Programmatic Agreement (PA) is being prepared in consultation with the SHPO, NPS, Delaware Tribe of Indians, Delaware Nation and New York City Landmarks Preservation Commission. This document will stipulate the actions the Corps will take as the project proceeds with regard to cultural resources. The PA will be used to ensure that the Corps satisfies its responsibilities under Section 106 and other applicable laws and regulations. This document will also be available for review in the Environmental Impact Statement for the project or on request.

We invite you to participate in this project as an interested party. If you would like to receive information on this study please contact the project archaeologist:

Ms. Lynn Rakos
Project Archaeologist
US Army Corps of Engineers
CENAN-PL-EA
26 Federal Plaza
New York, NY 10278

Should you require additional information or have any questions, please contact Ms. Rakos at (917) 790-8629 or by email at Lynn.Rakos@usace.army.mil.

Sincerely,

Peter M. Weppler
Chief, Environmental Branch

Enclosures

CC:
Ed Wiseman, Executive Director, Staten Island Historical Society
Elizabeth Egbert, President and CEO, Staten Island Museum
Dr. Thomas Matteo, Staten Island Historian
Barnett Shepherd, Executive Director, Preservation League of Staten Island
Mr. Paul Morando, Director, Harbor Defense Museum of Fort Hamilton

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

April 21, 2014

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

Subject: South Shore of Staten Island Coastal 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 South Shore of Staten Island Coastal Storm Damage Reduction Project, Phase 1 - Ft Wadsworth to Oakwood Beach, the New York District will be completing the Feasibility Study and Environmental Impact Statement.

This letter is to request your office to provide an update to the above referenced project's Draft Fish and Wildlife Coordination Act Report (FWCAR) dated January 2006 and re-initiate informal consultation. The project includes a line of protection and five areas for interior drainage. The plan is being finalized as information such as real estate acquisition and non-federal sponsor requests evolve. The line of protection varies in elevation and structure type (buried sea wall, sheet pile wall, rock revetment, earthen levee etc) based on location along the shoreline. The real estate to be acquired will impact the final plan for the areas currently designated as interior drainage. It is possible that we will move the line of protection landward and create tidal wetland in the Oakwood Beach area (per the feasibility study conducted by NYSDEC and related to The Nature Conservancy recommendations).

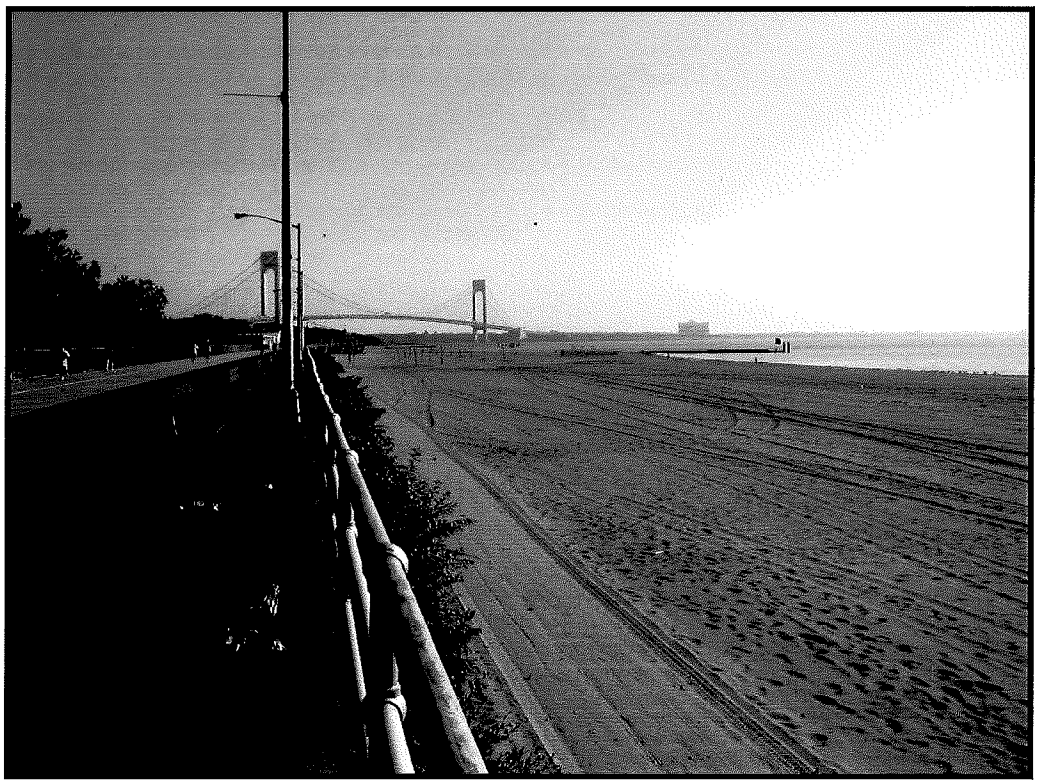
The District looks forward to working with you and your staff on this effort. If you should have any questions, please contact Ms. Catherine J. Alcoba of my staff at 917-790-8216.

Sincerely,

Nancy Brighton
for Acting Chief, Environmental Analysis Branch

cc: USFWS, LI Field Office

DRAFT
Fish and Wildlife Coordination Act 2(b) Report
Beach Erosion Control and Storm Damage Reduction Project
South Shore of Staten Island, Richmond County, New York



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

Prepared by:
Department of the Interior
U.S. Fish and Wildlife Service
Ecological Services
Long Island Field Office
Islip, New York

Preparer: Jill A. Olin

Long Island Field Office Supervisor: Rosemarie Gnam

January 2006

EXECUTIVE SUMMARY

This is the U.S. Fish and Wildlife Service's (Service) Draft Fish and Wildlife Coordination Act Report for the U.S. Army Corps of Engineers' (Corps) proposed project entitled, "South Shore of Staten Island, New York Beach Erosion Control and Storm Damage Reduction Project." Pursuant to the Fish and Wildlife Coordination Act (FWCA) of 1958, as amended (87 Stat. 401, as amended; 16 U.S.C. 661 *et seq.*), the Corps is consulting with the Service to ensure equal consideration for fish and wildlife resources during the planning of the proposed storm damage reduction project.

The Service identifies major ecological communities and significant habitats in the Corps' study area, the species using those habitats, and the potential impacts to those species and habitats resulting from implementation of the proposed project (also referred to as preferred alternative). The study area includes Fort Wadsworth to Oakwood Beach and Great Kills Harbor to Crescent Beach. The preferred alternative includes the placement of buried sea walls, sloped sea walls, double sheet pile seawalls, dune reinforcement, levees, flood walls, and pond creation.

The proposed project area supports many locally, regionally, and nationally important avifauna, fish, and invertebrate species, including several species considered in various local, State, and Federal conservation plans. Therefore, the Service recommends a number of measures the Corps should incorporate in their project design, local cost-sharing agreement, plans and specifications, as well as the operations and maintenance agreements to avoid, minimize, or compensate for potential impacts to Service trust resources including migratory birds and wetland habitats. The

Service recommends that the Corps undertakes a number of measures to avoid, minimize, or compensate for the potential impact on fish and wildlife resources from the construction of this project. Accordingly, the Service believes that, with the incorporation of the recommended mitigation measures, the proposed action will not significantly impact fish and wildlife resources in the project area.

INTRODUCTION 1

PROJECT PURPOSE, HISTORY, AND AUTHORITY 1

Purpose 1

History 2

Authority 4

FISH AND WILDLIFE RESOURCE CONCERNS AND PLANNING OBJECTIVES 5

DESCRIPTION OF EVALUATION METHODS 6

SITE DESCRIPTION 8

Fort Wadsworth to Oakwood Beach 9

Crescent Beach 10

ENVIRONMENTAL SETTING 10

Upland Vegetation 11

Tidal and Freshwater Wetlands 12

Maritime Beach 13

Fish and Wildlife Resources 14

Avian Fauna 14

Finfish and Shellfish 15

Herpto-Fauna 16

Mammals 17

Threatened and Endangered Species 17

FUTURE WITHOUT PROJECT CONDITIONS 19

PROJECT ALTERNATIVES 20

Reach 1: Fort Wadsworth to Oakwood Beach 21

Line of Protection (Alternative # 4) 21

Reach 2: Great Kills Harbor to Crescent Beach 21

Line of Protection (Alternative # 1) 22

PROJECT IMPACTS 22

Direct and Indirect Impacts 23

Habitat Modification 23

Burial of Benthic Resources 26

Preclusion of Habitat Formation 29

Construction Activities 31

Turbidity 32

Cumulative Impacts 34

MITIGATION 35

SUMMARY OF FINDINGS AND SERVICE POSITION 41

FISH AND WILDLIFE ENHANCEMENT OPPORTUNITIES 42

LITERATURE CITED 42

FIGURES

Figure 1: Location of Project Area on the South Shore of Staten Island.

Figure 2: Fort Wadsworth to Midland Beach Project Area.

Figure 3: New Dorp Beach to Crescent Beach Project Area.

Figure 4: South Shore of Staten Island National Wetland Inventory Map.

Figure 5: Typical Buried Seawall and Typical Raised Promenade.

Figure 6: Typical Floodwall/Seawall.

Figure 7: Typical Floodwall/Seawall.

Figure 8: Typical Double Sheet Pile Wall.

Figure 9: Proposed Line of Protection and Interior Drainage Facilities at Oakwood Beach.

Figure 10: Proposed Line of Protection and Interior Drainage Facilities at Midland Beach.

Figure 11: Proposed Line of Protection and Interior Drainage Facilities at South Beach.

Figure 12: Typical Cross-Section of Seawall at Crescent Beach and Extension of Goodall Outfall.

Figure 13: Typical Levee.

Figure 14: Proposed Line of Protection and Interior Drainage Facilities at Crescent Beach.

INTRODUCTION

This is the U.S. Fish and Wildlife Service's (Service) Draft Fish and Wildlife Coordination Act (FWCA) Section 2 (b) Report describing the potential impacts on fish and wildlife resources resulting from the U.S. Army Corps of Engineers' (Corps) "South Shore of Staten Island Beach Erosion Control and Storm Damage Reduction Project, Staten Island, Richmond County, New York." This document constitutes the report of the Secretary of the Interior as required by Section 2(b) of the FWCA (48 Stat. 401, as amended; 16 U.S.C. 661 *et seq.*).

This report describes the project's potential impacts upon fish and wildlife resources and recommends measures to conserve and protect fish and wildlife resources. This analysis incorporates existing information about significant fish and wildlife resources for the project area and discusses related resource concerns; evaluates direct, indirect, and cumulative impacts on significant fish and wildlife resources; provides mitigation recommendations to avoid, minimize, or compensate for impacts resulting from the proposed alternatives; and identifies fish and wildlife enhancement opportunities.

PROJECT PURPOSE, HISTORY, AND AUTHORITY

Purpose

The primary objective of this project is to address the issues of severe beach erosion and storm

events associated with the southern shoreline of Staten Island, as identified by Federal, State, and local interests. The proposed work is intended to alleviate damages caused by erosion and storm events, through the development of sound engineering solutions. These solutions include land acquisition and the following structural components: levees and floodwalls, dune reinforcement through seawalls and sheet-pile, and road raising. Without the implementation of these new storm protection measures, the Corps determined that flooding resulting from storm events is expected to continue to cause damage to homes, businesses, and property along the southern shoreline of Staten Island.

History

Despite the previous beach erosion control and storm damage protection projects implemented along the south shore of Staten Island, properties along the southeastern Staten Island shoreline and inland areas continue to be susceptible to damages as a result of periodic, severe tropical storms, hurricanes, and nor-easters. In the years between 1932 and 1993, at least ninety hurricanes, tropical storms, or nor-easters have significantly impacted the New York City area, often causing storm surges more than four feet in elevation (U.S. Army Corps of Engineers 2002). These storms that wielded the most damage along the south shore of Staten Island include:

- Hurricane of November 25, 1950;
- Tropical storm of November 6-7, 1953;

- Hurricane Donna, September 12, 1960;
- Nor-easter of March 6-8, 1962;
- Storm of January 23, 1966;
- Storm of November 11, 1977;
- Nor-easter of December 11-12, 1992; and
- Storm of March 1993.

Consequently, Federal, State, and local governments have been involved in developing actions to minimize or inhibit these erosion problems, as described in the table below.

Location	Year	Agency	Protection
South Beach	1936-1937	Federal	Shore
South Beach	1937	Federal	Shore
Great Kills Park	1935-1948	Federal	Shore
Oakwood Beach	1952	City	Shore
Midland Beach	1955	State and City	Shore
Midland Beach	1955-present	Private	Shore
Prince's Bay	1960	Private	Shore
Oakwood Beach	1999	Federal	Tidal flooding
Cedar grove Beach	1992	City	Shore
Cedar grove Beach	~1992	City	Shore
Oakwood Beach	~1992	City	Shore
Oakwood Beach	~1992	City	Shore
Oakwood Beach	~1992	Federal	Shore
Crescent Beach	~1992	City	Tidal flooding

Storm data supplied by the Corps (2002) references storms only until 1993. In order to properly address the need for the proposed beach erosion control and storm damage reduction project, the Service recommends that the Corps provide an updated list of storms between 1993 and 2005 that have caused damage to the south shore of Staten Island in their Environmental Impact

Statement (EIS).

Authority

The Federal government authorized the study of the problem and potential solutions along the thirteen-mile long south shoreline of Staten Island via a United States House of Representatives Committee on Public Works and Transportation resolution dated May 13, 1993. This resolution states:

> *"The Secretary of the Army, acting through the Chief of Engineers, is requested to review the report of the Chief of Engineers on the Staten Island coast from Fort Wadsworth to Arthur Kill, New York, published as House Document 181, eighty-ninth congress, First Session, and other pertinent reports, to determine whether modifications of the recommendations contained therein are advisable at the present time, in the interest of beach erosion control, storm damage reduction and related purposes on the South Shore of Staten Island, New York, particularly in and adjacent to the communities of New Dorp Beach, Oakwood Beach, and Annadale Beach, New York."*

FISH AND WILDLIFE RESOURCE CONCERNS AND PLANNING OBJECTIVES

The purpose of consultation under the FWCA is to ensure equal consideration of fish and wildlife resources in the planning of water resource development projects. The Service's emphasis in this regard is to identify means and measures to mitigate for the adverse impacts of the proposed project, as well as to make positive contributions to the fish and wildlife resources in the project area.

This report is intended to be released along with the Corps' Draft EIS to the public, as it will serve as the basis for the Service's public meeting statement and the comments on the Corps' Feasibility Report.

From the Service's perspective, a desired output of the feasibility study is to ensure the safety and protection of the human population, while simultaneously protecting the health of marine, estuarine, and terrestrial ecological communities. Specifically, the Service recommends that conservation of fish and wildlife resources be accomplished by: (1) ensuring that the feasibility study evaluates alternatives which achieve and maintain high biological diversity; (2) ensuring that natural areas are protected and monitored throughout the life of the project; (3) ensuring that construction designs promote high value habitats for Service trust species; (4) establishing conservation easements over the life of the project; and (5) incorporating education and outreach activities into the project to inform the public about the uniqueness and fragility of the coastal ecosystem.

Ultimately, the Service's Mitigation Policy (January 23, 1981, Federal Register v. 46 n. 15 pp. 7644-7663) establishes a number of criteria which, if met, would allow the Service to support a water resource development project. These criteria are:

1) The projects are ecologically sound.
2) The least environmentally damaging alternative is selected.
3) Every reasonable effort has been made to avoid or minimize damage or loss of fish and wildlife resources and uses.
4) All mitigation recommendations have been adopted with guaranteed implementation to satisfactorily compensate for unavoidable damage or loss consistent with the appropriate mitigation goal.
5) For wetlands and shallow water habitats, the proposed activity is clearly water dependent and there is a demonstrated public need.

DESCRIPTION OF EVALUATION METHODS

The Corps' planning schedule and funding limitations precluded the Service from having sufficient time and staff resources to propose, design, and/or conduct extensive field surveys and investigations to establish or verify the presence of important trust wildlife resources, such as migratory birds, in the study and FWCA analysis areas. As a result, descriptions of natural resources are based on previous studies for similar projects; relevant grey and peer-reviewed literature; local, State, and Federal fish and wildlife reports and plans; and personal communications with knowledgeable biologists, planners, coastal geologists, and engineers. As

expressed in earlier correspondence, it is critical for the Service to be given the opportunity to participate early in the planning process, particularly via participation on the Project Delivery Team, in order to be able to provide input into the needed scope of fish and wildlife surveys and investigations that are required under the FWCA. Such surveys are critical, for example, to meet the objectives of Executive Order 13186, Responsibilities of Federal Agencies to Protect Migratory Birds, the intent and requirements of the FWCA and Migratory Bird Treaty Act (16 U.S.C. 703 *et seq.*). In addition, up-to-date surveys would reduce the risks of uncertainty in projecting the future without project conditions, which the Corps believes is critical to making predictions about impacts attributable to project alternatives. Finally, early coordination will prevent delays in project planning, and would provide an opportunity to ensure that appropriate studies can and will be conducted so that they are available for synthesis, analysis, and incorporation into planning documents in a timely manner.

In this report, the Service provides a discussion of Federal trust resources, including migratory birds, wetlands, endangered species, finfish, and shellfish, which use the three major ecological systems (marine, estuarine, and terrestrial) found in the most ecologically significant land and water complexes of the proposed project area. Ecosystem classifications follow Cowardin *et al.* (1979). However, our analysis focuses on maritime beach and wetland habitats because the Corps will likely have to complete an Essential Fish Habitat Assessment for a number of marine shellfish and finfish species during consultation with National Oceanic and Atmospheric Administration / Fisheries (NOAA/F). In addition, consultation under the Endangered Species Act (ESA) will be required for marine Federally-listed species in the proposed project area. A

description of coastal habitats of the south shore of Staten Island area is provided, and the ecosystem classification follows Cowardin *et al.* (1979). Digital data for wetland habitats was obtained from the Service's National Wetlands Mapper found on the Service's National Wetlands Inventory (NWI) website, www.nwi.fws.gov.

In developing mitigation recommendations, the Service relied on staff's expertise, literature searches, and local, State, and Federal conservation plans (e.g. bird conservation plans, and local, State, and Federal land and water conservation plans) and special designations (e.g. State- and Federally-identified Significant Fish and Wildlife Habitat Complexes) to develop appropriate recommendations for mitigation and fish and wildlife enhancement opportunities.

Finally, fish and wildlife enhancement opportunities which would benefit trust resources and the habitats in the study area are recommended.

SITE DESCRIPTION

The project area consists of an approximately 6.5-mile long area along the southern shoreline of Staten Island, entirely within the Borough of Staten Island, City of New York, Richmond County, NY. The project area is adjacent to the Lower New York Bay and the Raritan Bay, and extends southwesterly from Fort Wadsworth near the Verrazano Narrows Bridge to Crescent Beach, located just southwest of Great Kills Harbor. On the landward side, the project area generally is bounded by Fort Wadsworth on the northeast, Hylan Boulevard on the north, and Richmond Avenue in the community of Great Kills/Annadale on the southwest. Hylan Boulevard is aligned

parallel to the shoreline, and is located approximately 0.9-miles inland. The project area encompasses several neighborhood communities including South Beach, Midland Beach, New Dorp Beach, Oakwood Beach, Great Kills, and Crescent Beach (Figure 1).

An approximately 1.7-mile section of essentially undeveloped land along the 6.5-mile long project area consists of Great Kills Park, which is a component of the Gateway National Recreation Area (NRA). Although this segment of shoreline is eroded like the rest of the project area, it has been excluded from the area of planned shoreline protection and storm damage reduction measures at the request of the National Park Service (NPS) (U.S. Army Corps of Engineers 2002). Therefore, in order to more effectively focus planning and analysis efforts, the project are was divided into two project areas: 1) Fort Wadsworth to Oakwood Beach and 2) Crescent Beach.

The project area lies within the Atlantic Coastal Plain Province. This region is characterized by low topographic relief. The topography of the Staten Island project area is nearly level with elevations ranging from sea level to almost 100 feet above sea level (U.S. Army Corps of Engineers 1995).

Fort Wadsworth to Oakwood Beach

Terrain in the Fort Wadsworth to Oakwood Beach portion of the project area generally consists of a relatively wide, low beach intersected by a number of drainage system structures contained

in groins (Figures 2 and 3). The shoreline is uneven or jagged as a result of localized sand erosion and accretion on either side of the groins. The shoreline in this area consists entirely of city-owned beaches and lands of the Gateway NRA, owned by the Federal government and administered by the NPS. A long boardwalk and hard-surface promenade walkway extends approximately 2.75 miles along the beach from South Beach to Midland Beach, ending at Miller Field. In addition to these public parks and recreation areas, landward of the beaches are low-lying, densely developed, primary residential properties, as well as a number of commercial properties located along Hylan Boulevard. Furthermore, the project area contains several large, undeveloped tidal and freshwater wetlands. A sewage treatment plant is located approximately 0.25 miles from the shore in Oakwood Beach, along Oakwood Creek.

Crescent Beach

Terrain in the Crescent Beach portion of the project area (south of the Great Kills Harbor) consists of a narrow beach adjacent to an approximately ten-foot high bluff (Figure 3). Behind the bluff, there are several residential properties, in addition to undeveloped forest, scrub-shrub, and freshwater wetland areas. A seawall exists between the beach and the developed residential properties. A clam flat and sand bar is located along Crescent Beach near the mouth of Great Kills Harbor. A boat marina is located in the Great Kills Harbor at the northwest end of the Crescent Beach area.

ENVIRONMENTAL SETTING

Upland Vegetation

Vegetated uplands are located in the Fort Wadsworth to Oakwood Beach reach of the project area, and can be characterized as isolated islands of habitat, scattered residential and commercial developments, and areas developed for recreational use. The majority of upland vegetation in these areas consists of non-native species that are commonly found in highly disturbed areas. Herbaceous species inhabiting these areas include goldenrod (*Solidago* spp.), common reed (*Phragmites australis*), common ragweed (*Ambrosia artemisiifolia*), common mugwort (*Artemisia vulgaris*), and poison ivy (*Toxicodendron radicans*). The upland scrub-shrub areas are dominated by honeysuckle (*Lonicera* spp.), multifora rose (*Rosa multiflora*), Japanese knotweed (*Polygonum cuspidatum*), common pokeweed (*Phytolacca americana*), winged sumac (*Rhus copallina*), and black locust (*Robinia pseudoacacia*). Finally, upland forests areas are dominated by oaks (*Quercus* spp.), sassafras (*Sassafras albidum*), and black cherry (*Prunus serotina*). In the disturbed areas that have reverted back to forest habitat, black locust and tree of heaven (*Ailanthus altissima*) dominate (U.S. Fish and Wildlife Service 1997; U.S. Army Corps of Engineers 2005).

The majority of upland vegetation in the Crescent Beach area is herbaceous and generally occurs on disturbed land. These areas are dominated by goldenrod, various grasses, legumes, and forbes, as well as common reed. The upland scrub-shrub areas are dominated by bayberry (*Myrica pennsylvanica*), beach plum (*Prunus maritime*), sumac (*Rhus* spp.), hackberry (*Celtis*

occidentalis), and black cherry. Finally, the upland forests are dominated by black cherry, oak, and hickory (*Carya* spp.), in addition to red maple (*Acer rubrum*), sweetgum (*Liquidambar styraciflua*), and pitch pine (*Pinus rigida*) (U.S. Fish and Wildlife Service 1997; U.S. Army Corps of Engineers 2005).

Tidal and Freshwater Wetlands

A number of freshwater wetland complexes were identified and delineated (U.S. Army Corps of Engineers 2005) within the interior drainage portion of the project area. These include: five estuarine, intertidal, narrow-leaved persistent emergent, irregularly-flooded wetlands (E2EM5P) in drainage area A; four palustrine narrow-leaved emergent, seasonally-flooded/saturated (PEM5E) wetland, one palustrine unconsolidated bottom, semi-permanently-flooded (PUBF) wetland, and five E2EM5P wetlands in drainage area C; one palustrine emergent, persistent seasonally-flooded (PEM1C) wetland in drainage area D; and one palustrine narrow-leaved emergent, semi-permanently-flooded wetland (PEM5F) in drainage area E (Cowardin *et al.* 1979).

Wetlands along the line of protection from Fort Wadsworth to Oakwood Beach include six E2EM5P wetlands located in drainage A; one PEM5F wetland located in drainage E along the road raising alternative on Father Cappodano Boulevard; and one PEM5E wetland located southeast of drainage area C along the road raising alternative on Father Cappodano Boulevard. The herbaceous layer in emergent portions of the estuarine and palustrine wetlands is dominated by dense strands of common reed, with lesser amounts of goldenrod, purple loosestrife (*Lythrum*

salicaria), and soft rush (*Juncus effusus*). Black willow (*Salix nigra*) and silver maple (*Acer saccharinum*) are the dominant tree species in the forested components of the wetlands.

NWI (Figure 4) maps indicated that estuarine, intertidal persistent emergent, regularly-flooded (E2EM1N), estuarine, intertidal, unconsolidated shore, irregularly-flooded (E2US2P), and palustrine, narrow-leaved persistent emergent, semi-permanently-flooded (PEM1F) wetland types occur along the shoreline of the Crescent Beach project area. Typical vegetation in the E2EM1N marsh includes a predominance of saltmarsh cordgrass (*Spartina alterniflora*), salt meadow grass (*Spartina patens*), and common reed. The E2US2P habitats are the upper portions of the beach with little or no vegetation. The PEM1F wetland vegetation is dominated by common reed, and hedge bindweed (*Calystegia sepium*), and slippery elm (*Ulmus rubra*). The habitat at Great Kills Harbor and Park, part of the Gateway NRA, includes large areas of disturbed marsh, dominated by common reed, with grassland and shrub thicket habitat at Crookes Point dominated by bayberry (*Myrica pennsylvanica*), beach plum (*Prunus maritima*), sumac (*Rhus* spp.), hackberry (*Celtis occidentalis*), and black cherry. The outer shoreline follows a narrow, sandy, groined beach (U.S. Army Corps of Engineers 2005; U.S. Fish and Wildlife Service 1997).

Maritime Beach

The majority of the maritime beach within the two project reaches is heavily used for recreation. As a result of this, the beach is subject to vegetation removal techniques (including beach raking) and is generally devoid of all vegetation. Some vegetation occurs along the dunes from Fort

Wadsworth to Oakwood Beach. The dune vegetation includes American beachgrass (*Ammophila breviligulata*), seaside goldenrod (*Solidago sempervirens*), sandbur (*Cenchrus* spp.), and beachheather (*Hudsonia* spp.). In addition, sparse patches of vegetation in the beach/upland transition zones of Crescent Beach area consist mostly of American beachgrass.

Beginning in 1966, there have been at least seventeen major sediment-benthic macrofauna sampling efforts in the Raritan Bay area (Reid *et al.* 1991). A study conducted by Cerrato *et al.* (1989) found amphipods (*Ampelisca abdita*, *Corophium tuberculatum*, and *Elasmopus levis*), blue mussel (*Mytilus edulis*), polychaete worms (*Asabellides oculata* and *Heteromastus filiformis*), slipper shell (*Crepidula fornicata*), razor clam (*Ensis directus*), barnacle (*Balanus* spp.), sea lettuce (*Ulva lactuca*), and shore shrimp (*Palaemontes* spp.).

Fish and Wildlife Resources

Avian Fauna

The *Atlas of Breeding Birds in New York State* (Andrle and Carroll 1988; New York State Department of Environmental Conservation 2004) lists sixty-seven waterfowl and shorebird species, and eighty-four upland bird species as either observed or expected to occur along the south shore of Staten Island.

The configurations of the shorelines of Raritan Bay, both the south shore in Monmouth County, New Jersey, and the Staten Island, New York, result in a concentration of migratory shorebirds

and neo-tropical migrant land birds. Shorebird surveys done in the early 1980s have documented the importance of the greater Raritan Bay for spring and fall shorebird migration with seasonal totals of over 20,000 birds, based on weekly surveys. The peak months are June and August, and the primary concentration areas are Great Kills on Staten Island, the flats inside Sandy Hook, and the south shore between Chingora Creek and Conaskonk Point. Three species, sanderling (*Calidris alba*), ruddy turnstone (*Arenaria interpres*), and semi-palmated sandpiper (*Calidris pusilla*), make up about 85 percent of the total of migratory shorebirds using this area. The nearshore open waters provide habitat for species such as Canada goose (*Branta canadensis*), American black duck (*Anas rubripes*), mallard (*Anas platyrhynchos*), green-winged teal (*Anas crecca*), blue-winged teal (*Anas discors*), and gadwall (*Anas strepera*). Several species of wading birds may also occur in the area, including glossy ibis (*Plegadis falcinellus*), great blue heron (*Ardea herodias*), snowy egret (*Egretta thula*), and black-crowned night heron (*Nycticorax nycticorax*) (Andrle and Carroll 1988; New York State Department of Environmental Conservation 2004; U.S. Fish and Wildlife Service 1997).

Finfish and Shellfish

Lower Bay and Raritan Bay support a diverse assemblage of fish and shellfish. Historically an important area for commercial and recreational fisheries, the site has now has seen a decline in the fishery abundance, as a result of heavy fishing, diminished water quality, decreased food supply, and reduction in suitable spawning and nursery areas (Berg and Levinton 1985). Common species observed using the area include bluefish (*Pomatomus saltatrix*), weakfish (*Cynoscion regalis*), winter flounder (*Pseudopleuronectes americanus*), summer flounder

(*Paralichthys dentatus*), stiped bass (*Morone saxatilis*), and scup (*Stenotomus chrysops*) (Figley and McCloy 1988; U.S. Army Corps of Engineers 1995). Additionally, anadromous species such as American shad (*Alosa sapidissima*), alewife (*Alosa pseudoharengus*), Atlantic herring (*Clupea harengus*), Atlantic menhaden (*Brevoortia tyrannus*), and blueback herring (*Alosa aestivalis*), as well as the common forage species Atlantic silverside (*Menidia menidia*), bay anchovy (*Anchoa mitchilli*), and mummichug (*Fundulus heteroclitus*) are found in nearshore waters.

Raritan Bay supports several shellfish species that are commercially- and recreationally-fished. These species include the American lobster (*Homerus americanus*), American oyster (*Crassostrea virginica*), bay scallop (*Argopecten irradiens*), hard-shelled clam (*Mercenaria mercenaria*), horseshoe crab (*Limulus polyphemus*), soft-shelled clam (*Mya arenaria*), and blue crab (*Callinectes sapidus*).

Herpto-Fauna

Species of frog and toad such as the green frog (*Rana clamitans melanota*), spring peeper (*Acris crucifer*), bull frog (*Rana catesbeiana*), and Fowler's toad (*Bufo fowleri*) are common to the area and can be found inhabiting fresh and low salinity wetlands (U.S. Army Corps of Engineers 1976; New York State Department of Environmental Conservation 2003b). Diamondback terrapins (*Malaclemys terrapin*) are common to the Great Kills Harbor (U.S. Army Corps of Engineers 1976), in addition to the common snapping turtle (*Chelydra s. serpentine*), painted turtle (*Chrysemys picta*), and eastern box turtle (*Terrapene c. carolina*) occurring in the Fort

Wadsworth to Oakwood Beach project area. Common snakes such as the eastern garter snake (*Thamnophis sirtalis sirtalis*), northern ringneck snake (*Diadophis punctatus edwardsii*), and the northern brown snake (*Storeria d. dekayi*) are found inhabiting vegetated upland and wetlands in the Fort Wadsworth to Oakwood Beach project area (New York State Department of Environmental Conservation 2003b; U.S. Army Corps of Engineers 1976). Finally, northern redback (*Plethodon c. cinereus*), northern red (*Pseudotriton r. ruber*), and northern two-lined (*Eurycea bislineata*) salamanders have been observed in the vicinity of the project area (New York State Department of Environmental Conservation 2003b).

Mammals

Site-specific mammalian species have not been confirmed in the project area. Species that are most likely to occur are those that are tolerant of urban development, including eastern gray squirrel (*Sciurus carolinsnsis*), eastern cottontail (*Sylvilagus floridanus*), eastern chipmunk (*Tamias striatus*), raccoon (*Procyon lotor*), opossum (*Didelphis virginiana*), muskrat (*Ondatra zibethica*), white-footed mouse (*Peromyscus leucopus*), and the Norway rat (*Rattus norvegicus*) (U.S. Army Corps of Engineers 1995; U.S. Fish and Wildlife Service 1997).

Threatened and Endangered Species

The south shore of Staten Island including the adjacent waters of Raritan Bay and Lower Bay is utilized by bald eagles (*Haliaaetus leucocephalus*), a State- and Federally-listed (threatened) species, as a migratory route (New York State Department of Environmental Conservation

2003a). Although bald eagles have been observed in the project area, these individuals are considered to be occasional transients. No habitat in the project area is currently designated or proposed "critical habitat" in accordance with provisions of the ESA. The Service notes that the project area contains suitable habitat for the Federally-listed piping plover (*Charadrius melodus*) and that new piping plover breeding sites have been recorded over the last decade on Long Island in areas where they were not previously observed. Therefore, we recommend that the Corps conduct a maritime beach survey in coordination with the Service during the months of March/April/May to determine the presence of Federally-listed species, in particular, piping plover and seabeach amaranth (*Amaranthus pumilus*). Further ESA coordination is needed to update the presence/absence information currently, which dates back to 1997, contained in the preliminary Draft EIS. ESA consultation is pending until this further coordination and data request is completed.

Federally-listed threatened and endangered marine species under the jurisdiction of NOAA/F may also be found near the project area. These species include the threatened loggerhead turtle (*Caretta caretta*), as well as the endangered Kemp's ridley turtle (*Lepidochelys kempi*), leatherback turtle (*Dermochelys coriacea*), and green turtle (*Chelonia mydas*). In addition, species which are protected under the Marine Mammal Protection Act of 1972 (as amended 1994) include harbor seal (*Phoca vitulina*) and the grey seal (*Halichoerus grypus*). For additional information, contact Mr. Stanley Gorski, Habitat Conservation Division, Field Office Supervisor, National Oceanic and Atmospheric Administration/Fisheries, James J. Howard Sciences Laboratory, 74 Magruder Road, Highlands, NJ 07732 (telephone: 732-872-3037).

State-listed species are also present in the project area; the northern harrier (*Circus cyaneus*), a State-listed threatened species, and the peregrine falcon (*Falco peregrinus*), a State-listed endangered species. The northern harrier possibly breeds, and is a common winter resident, in tidal wetlands on Staten Island (U.S. Fish and Wildlife Service 1992). In addition, the peregrine falcon is a confirmed breeder on Staten Island (New York State Department of Environmental Conservation 2003c; New York State Department of Environmental Conservation 2004).

If the Corps has not already done so, we recommend that they contact the New York State Department of Environmental Conservation (NYSDEC) for additional information. The NYSDEC contact is Mr. Peter Nye, Endangered Species Unit, New York State Department of Environmental Conservation, 625 Broadway, Albany, NY 12233-4753 (telephone: 518-402-8859) and Mr. James Gilmore, New York State Department of Environmental Conservation - Region 2, 1 Hunter's Point Plaza, 47-40 21st Street, Long Island City, NY 11101-5407 (telephone: 718-482-6464).

FUTURE WITHOUT PROJECT CONDITIONS

According to the Corps, under this scenario, also known as the "No Action Alternative," all natural forces and manmade conditions currently in effect would continue.

Periodic storm-related flooding would continue to affect low-lying interior areas of the Fort Wadsworth to Oakwood Beach project area. No interior flood control improvements would be

implemented through Federal actions to reduce flooding problems. It is possible that locally funded flood control improvements would be implemented in certain areas within the project area. However these would likely be piecemeal and would not provide as comprehensive a solution as would be needed for the southern shore of Staten Island. Certain areas of beach (Oakwood Beach and Great Kills Park) would continue to experience accelerated beach erosion.

Future storms would continue to cause damage to property in the Crescent Beach area. Beach and bluff erosion would continue and the level of protection afforded by the existing beach and seawall would continue to decline, increasing the risk of damage to adjacent residences from wave action. Based on its poor condition, the seawall is expected to fail completely within six to ten years. As a result, flood damage would continue to occur to homes and properties in the Crescent Beach area (U.S. Army Corps of Engineers 2002).

PROJECT ALTERNATIVES

The study area was initially divided into three reaches in order to aid in problem identification and analysis. The three project reaches were Fort Wadsworth to Oakwood Beach, Great Kills Harbor to Crescent Beach, and Annadale to Tottenville. The Corps (2004a) determined that there was no Federal interest for storm damage reduction for the Annadale to Tottenville reach. Thus further analysis of the potential storm damage reduction alternatives (i.e., beach fill, flood proofing, and land acquisition) for this reach would not be necessary. Consequently, only alternatives addressing the remaining two reaches will be reviewed in this document.

Reach 1: Fort Wadsworth to Oakwood Beach

Several alternatives have been withdrawn from further consideration. These alternatives include: a beach fill plan, a flood proofing plan, an acquisition plan, and various permutations of road raising, buried sea wall dune reinforcement, levees and flood walls (Alternative No's 1, 2, 2a, and 3). The chosen line of protection for Fort Wadsworth to Oakwood Beach is summarized below. Refer to Figures 5 through 11 provided in this report, as well as the Corps' (2005) Preliminary Draft EIS for further details on the project alternatives.

Line of Protection (Alternative No. 4)

- Buried sea wall and sheet pile sea wall at the existing boardwalk and the raising of existing promenade;
- Raised promenade from Miller Field to Oakwood Beach; and
- Dune reinforcement, levees, and flood wall at Oakwood Beach.

Reach 2: Great Kills Harbor to Crescent Beach

Several alternatives for protection and interior drainage have been discontinued from further consideration for this reach of the project area. These include: a beach fill with levee plan, a flood-proofing plan, an acquisition plan, a vertical sheet pile sea wall with levees plan, and the use of ponds with pressure lines (Alternative No's 2, 3, and 4). The chosen line of protection for

Great Kills Harbor to Crescent Beach is summarized below. Refer to Figures 12 through 14 provided in this report, as well as the Corps' (2005) Preliminary Draft EIS for further details on the project alternatives.

Line of Protection (Alternative # 1)

- Sloped Stone Seawall
- Levees

PROJECT IMPACTS

The Corps' recommended plan, specifically Alternative No. 4 for Fort Wadsworth to Oakwood Beach and Alternative No. 1 for Crescent Beach, would have direct adverse impacts on fish and wildlife resources. An area approximately 6.5 miles long with varying widths of intertidal estuarine and palustrine wetlands, and maritime beach habitats is expected to be directly impacted from dune reinforcement; construction of levees, floodwalls, buried seawalls, and tide gates; pond excavation; and the use of heavy machinery. In particular, project construction and long-term maintenance would result in both short-term and long-term impacts. Short-term impacts include burial of benthic organisms on the maritime beach habitat due to construction activities and increased turbidity. Long-term impacts include precluding formation of maritime beach and wetland habitat, and habitat modification/loss, both affecting fish and wildlife resources.

As per the Scope of Work (SOW), this section only provides a description of the preferred proposed alternative; no other alternatives were evaluated as part of this analysis.

Direct and Indirect Impacts

Habitat Modification

Maritime Beach

Changes in the beach morphology and sedimentologic characteristics (slope, height, grain size, sorting coefficient, etc.) may affect colonization of marine invertebrates, a major forage resource for shorebirds in the intertidal and dune zone. A shift to finer or coarser sediments can affect the abundance of macrofauna prey resources (Peterson and Manning 2001) in the proposed project area, which can have consequences for higher trophic levels (Peterson and Manning 2001). Morphological and sedimentologic changes to the maritime beach and dunes can also impact wildlife breeding habitat, either adversely or beneficially. For example, the Corps' Long Island Intracoastal Waterway Channel Maintenance Dredging Project resulted inadvertently in the deposition of highly fine sand and mud dredge spoils on East Inlet, Moriches Bay, Brookhaven, NY. This material was not suitable substrate for colonial waterbirds (U.S. Fish and Wildlife Service – Long Island Field Office project file). A corrective plan of action was initiated by the Corps to mitigate for this condition; however, the short- and long-term effects of placing unsuitable material, and later, re-depositing suitable material, have not been evaluated as of this

time. Potentially beneficial impacts of sand placement have been observed at other Corps sites existing on Long Island; however, these are not well studied and remain anecdotal as to their long-term contribution to resource conservation. The proposed action would, therefore, result in the conversion of maritime beach habitat into vegetated dune habitat, and a potential loss of intertidal habitat, during the life of the project.

The proposed project will also result in changes to the existing dune structure, burial of dune vegetation, and acceleration of plant succession, as early successional, sparsely vegetated sand is replaced by vegetation. The proposed project will create a monotypic stand of American beach grass through artificial planting at densities which may or may not be beneficial to avifauna. If plant succession is encouraged, shorebirds, which require early successional beach strand habitat to forage and breed, will most likely be discouraged from occupying these habitats. In addition, grooming of the beaches to remove detritus and litter can remove vital foraging resources (e.g. wrack) for shorebirds and adversely impact the trophic transfer of energy in the coastal setting (Dugan *et al.* 2003).

Tidal and Freshwater Wetlands

Many of the remaining wetlands plant communities have been altered as a result of historic alterations to tidal creeks which now limit or prevent natural tidal influxes of salt water. Nearly 63 percent of Staten Island's tidal wetlands have been filled or altered (Tiner 2000); thus, the amount and quality of wetland habitat remaining on the south shore of Staten Island is low. The

amount and quality of wetland habitat remaining on the south shore of Staten Island is low. The wetlands within the project area are dominated by common reed, often observed as a monoculture. Although the existing wetlands could be characterized as degraded or low quality, they still perform needed ecological functions, and will always provide opportunities where wetland restoration or enhancement could result in significant benefits to native fish and wildlife. The project alternatives propose excavation of approximately 85 acres of vegetated wetland and replacement of shallow-water wetland habitat with shallow open-water areas. The Service is concerned with the loss of vegetated wetlands as a result of the conversion of these wetlands, albeit degraded, to open water habitat.

Vegetated wetlands provide important ecological functions. They improve water quality by removing pollutants from surface waters through the processes of sediment trapping, nutrient removal, and chemical detoxification. The value of natural wetlands, however, extends beyond their flood storage and water quality functions to include food chain support, erosion control, groundwater recharge/discharge, and habitat functions. Wetlands provide valuable sources of wildlife food and habitat, and wetlands often become a focal point for varied wildlife populations within a particular region. Wetland vegetation also provides nesting material and sites for numerous birds and mammals. Wetlands are important habitats for a disproportionately high number of endangered and threatened plant, mammal, bird, reptile, amphibian, and fish species. Some aquatic organisms may use wetlands seasonally as a spawning ground and nursery for their young, spending most of their adult lives in deeper waters. Amphibians, reptiles, and invertebrates usually undergo an aquatic phase that requires water for breeding, egg development,

and larval growth. Some reptiles and amphibians are able to adapt to fluctuating water levels (Mitsch and Gosselink 1986), whereas others may experience changes in breeding patterns and forage species composition due to water level fluctuations (Azous 1991). Wetlands are also used daily by birds and terrestrial animals during diurnal and nocturnal food foraging. Many birds that utilize both terrestrial and wetland habitats are frequently found in the highest numbers in the diverse, productive habitats of wetlands (NWTC 1979).

The Service recognizes that the creation of open water aquatic habitats may be beneficial to many species of migratory birds and over-wintering waterfowl. However, the loss of vegetated wetland may affect other species already using the habitat (i.e. invertebrates and avifauna), and may decrease the quality of water flowing from the wetland. As described in this report, the area surrounding the remaining wetland habitat on Staten Island is highly developed with pavement and infrastructure. Therefore, the wetland functions of water quality control and flood storage/flood attenuation become highly important benefits in an area of high and rapid storm-water discharges. Open water aquatic habitats typically do not provide all of these functions.

Burial of Benthic Resources

Benthic macro-invertebrate mortality is likely along the 6.5-mile project area, due to the construction of seawalls, levees, dunes, and the raising of the promenade. As a result, re-colonization of benthic macro-invertebrates in the project area would potentially be slowed or prevented because of the lack of available source populations and suitable habitat. Moreover, the

increase in suspended sediments may cause displacement of food sources for the motile benthic organisms and may smother the openings of benthic organisms' (i.e. polychaete worms, crabs, clams) burrows. Other impacts from the proposed construction activities include the potential destruction of benthic resources by smothering the benthic habitats with massive amounts of sand (U.S. Army Corps of Engineers 1998). These impacts to benthic resources have the potential to adversely affect shorebird species using the area, by removing a native food source.

Recent studies provide somewhat conflicting evidence as to the potential for both short- and long-term impacts of beach nourishment on wildlife along the western coast of the Atlantic Coast. These studies focus principally on beach and benthic/pelagic invertebrate and finfish communities of the western Atlantic Coast (e.g., Minerals Management Service 2001; Peterson and Manning 2001; Lindquist and Manning 2001; U.S. Army Corps of Engineers 2004b.; Burlas *et al.* 2001; and Byrnes *et al.* 2004). To illustrate the findings of these research studies, the Service briefly reviews the impacts of maritime beach nourishment on the infaunal community, which is composed of meiofauna (animals whose shortest dimensions are less than 0.5 millimeters [mm] or 0.02 inches [in.] but greater than or equal to 0.1 mm [0.004 in.]), macrofauna (those animals 0.5 mm or larger in size), and mobile organisms.

Infaunal populations naturally decline dramatically between November and January. Reilly and Bellis (1978) and Parr *et al.* (1978) noted that when beach nourishment ceases, the recovery of the community is rapid and complete recovery may occur within one or two seasons. Recovery will depend on the season of the year of the nourishment operations and on the recruitment of

larval fauna, once the operation is completed. Gorzelany and Nelson (1987) found no significant long-term negative effects of beach nourishment on nearshore benthic fauna during monitoring of a beach replenishment project on a central Florida east coast sand beach community. Yet Hurme and Pullen (1988) found that meiofauna recover very slowly from a major disturbance, perhaps due to their slow rates of reproduction, their limited ability to migrate either our of harms way or into new suitable habitat, and their highly specialized adaptations to specific environmental conditions. However, meiofaunal recovery can be rapid following minor disturbances (Naqvi and Pullen 1982).

The recovery of benthic macrofauna after beach nourishment varies from one site to another. Studies completed in the 1970s indicate that when nourishment ceases, the recovery of benthic macrofauna is rapid, and complete recovery might occur within one or two seasons (Reilly and Bellis 1978; Parr *et al.* 1978). The ability of macrofauna to recover is due to: (a) their short life cycles, (b) their fast reproductive potential, and (c) the recruitment of plankton larvae and motile macrofauna from nearby unaffected areas (Naqvi and Pullen 1982).

More recently, the Corps presented data describing recovery of intertidal infauna depending upon time of year of beach nourishment. When beach nourishment is completed between early August and early October, the infaunal community may recover within 2 months, prior to the natural winter population decline. Recovery time following nourishment in mid- to late-October is expected to occur within the range of 2 to 6 months. If nourishment occurs between the months of late October and January, the compounding effects of nourishment and seasonal population

decline will result in a minimum of 6 months recovery time for the community (U.S. Army Corps of Engineers 2001). Also, the Corps' Draft EIS (2005) addresses mobile organisms, such as crabs and fishes. The Corps' Draft EIS (2005) suggests that mobile organisms appear to be the least affected by construction activities, as they are able to move to avoid disturbances (Hurme and Pullen 1988). Such motile species are able to return to the area when conditions are suitable again.

In view of these data findings, the Service believes that if beach sand placement occurs between the months of late August and January along the south shore of Staten Island, the infaunal community, including meiofauna, macrofauna, and mobile organisms, will be able to recover prior to the arrival of shorebird species (terns, sanderlings, and ruddy turnstones), which depend on the infaunal community as food source.

Preclusion of Habitat Formation

Any activity that artificially stabilizes naturally dynamic beach strand habitats has the potential to be detrimental to fish and wildlife resources. Many species using the beaches of the south shore of Staten Island prefer or require early successional habitat for breeding, foraging, and/or resting. These include terns, sanderlings, ruddy turnstones, and semi-palmated sandpipers. The most highly productive habitat for these species is found in areas of overwash or recent inlet formation. The proposed project perpetuates a system of shoreline stabilization structures that will limit the natural process of shoreline retreat and, consequently, prevent the natural formation

of optimal habitats. Due to erosion, establishment of predators and competitors, and lower prey densities, stabilized beach strands are generally less productive habitats for these species than more dynamic, ever-changing beaches, particularly inlets and overwash areas (U.S. Fish and Wildlife Service 2002). However, the great amount of infrastructure (roads, residential, and commercial structures) adjacent to the maritime beach and wetlands of the south shore of Staten Island, make it unlikely that the Staten Island communities would accept the creation and long-term management and maintenance of these species' preferred habitat. Therefore the Service believes that indirect effects attributable to long-term stabilization of the maritime shoreline are unlikely to occur.

In contrast, tidal wetlands were once a vast resource on Staten Island, comprising approximately 5600 acres in the late 1800s. Today only approximately 1800 acres of these original wetlands remain tidal. Approximately 300 acres of former tidal wetlands have become non-tidal freshwater marshes and swamps due to flow restrictions (Midland Beach and South Beach areas) (Tiner 2000). The majority of the south shore of Staten Island is developed, whether as residential areas or as boardwalks along the beachfront. This project's intent will be to further prevent the natural tidal influx of salt water and/or any natural tidal flooding cycles along the south shore of Staten Island. Preventing natural processes for the long-term will have a major impact on the hydrology, sedimentology, vegetative community structure, and consequently on fish and wildlife species use of the area.

Construction Activities

The timing of sand placement and pond construction and maintenance activities will be a major factor resulting in potential short- and long-term impacts for non-endangered shorebird and waterbird species. The potential direct effects include disruption of breeding, foraging, and roosting activities. Beach construction and pond creation activities are usually very intensive and environmentally disruptive operations, which involve the mobilization and use of heavy equipment and other construction vehicles in wildlife habitat. The operation of machinery to grade the modified beach and to excavate the ponds immediately adjacent to habitat that is used by wildlife as a roosting, over-wintering, courtship, nesting, and brood-rearing area has the potential to disturb avifauna to the point where they may not successfully nest and/or fledge young. Moreover, this disturbance may preclude avifauna from using the habitat entirely, forcing them to seek appropriate habitat elsewhere (U.S. Fish and Wildlife Service 1995). Human activities may adversely affect the productivity of shorebirds (Ruhlen *et al.* 2002) and influence the foraging activity of some shorebird species (Burger and Gochfeld 1991). Even low levels of human activity have been shown to result in disturbance and displacement of shorebirds at migrational staging and roosting areas (Pfister *et al.* 1992).

In addition, the use of heavy machinery within the project area for initial construction and maintenance of the proposed project would directly impact wildlife use of the area by increasing noise levels. The Corps (Alvarez, pers. comm. 2005) has indicated that it intends to construct the

project according to the design specifications using earth moving equipment. Noise associated with project-related activities has the potential to disturb fish and wildlife foraging and breeding behavior, both at the project site and within the adjacent habitat. The Corps predicts that construction will take approximately one year to complete.

Turbidity

Turbidity, while comparatively unimportant to benthic organisms in the ocean intertidal community, may be a relatively more important environmental factor in determining fish community structure. Suspended solids in water can affect fish populations by delaying the hatching time of fish eggs (Schubel and Wang 1973); by killing fish by coating and/or smothering the surfaces of fish eggs, and the gills of juvenile, or adult fish; and by creating anoxic conditions (O'Conner *et al.* 1976; Naqvi and Pullen 1982). Sherk *et al.* (1974) found that demersal fish are more tolerant of suspended solids than filter-feeding fish, resulting in a competitive advantage to demersal fish and a disadvantage to filter feeders. Temporary decreased water quality and increased turbidity in the marine nearshore subtidal zone could result from the actual beach creation activity (Minerals Management Service 2001). Sand particles suspended in the water column during the beach fill placement process are dense and fall quickly back to the benthic zone whereas the fine sediments stay in suspension longer than sand, only sinking slowly (Woodhead 1992). Less mobile invertebrate species would therefore be exposed to increased turbidity associated with the suspended sediment; nevertheless they are generally adapted to a highly turbid nearshore environment.

Localized turbidity plumes can have lethal and sublethal effects on benthic invertebrates and fish, including hematological compensation for reduced gas exchange across gill surfaces, and abrasion of epithelial tissue. A fish's gut can become packed with large quantities of solids ingested along with forage; it may have little nutritive value. Disruption of gill tissues (abrasion, clogging, and/or increased activity of mucosa), and increased activity with a reduction of stored metabolic reserves (Profiles and Research Consulting Groups, Inc. 1980) are other potential adverse impacts from high levels of suspended solids. As previously stated, the project area serves as a nursery and feeding area (from April to November) for scup, bluefish, Atlantic silverside, menhaden, winter flounder, striped bass, and blackfish. Winter flounder are known to occur in the project area throughout the year, spawning during the winter months (January to March). While adult fishes are unlikely to be affected by project construction, planktonic life stages of species that may undergo a dormant phase in the near shore area would be unable to escape burial. The Service does not expect significant impacts to finfish due to their ability leave the area being affected by disturbance (Van Dolah *et al.* 1992).

Other effects of increases in turbidity include a decrease in light penetration, hampering fish which use sight as their primary means to detect prey; possible re-suspension of contaminants and nutrients; burial of non-motile eggs, larvae, and adults; and absorption of essential nutrients from the water column (Stern and Stickle 1978). Although, these impacts are detrimental to the fish and wildlife resources inhabiting the project area, they are unlikely to result in significant adverse impacts since the majority of sand will be placed and re-distributed in the upper portions

(dune areas) of the beach. In addition, the Corps reported that the increased turbidity resulting from beachfill activities on the New Jersey shore of the Atlantic Ocean was negligible due to the natural dynamic nature of the shoreline, wave action, and currents (U.S. Army Corps of Engineers 2001).

Cumulative Impacts

As described in the Service's Mitigation Policy (40 CFR 1508.20), the Service must consider project impacts, including: (1) the total long-term biological impact of the project, including any secondary or indirect impacts regardless of location; and (2) any cumulative effects, when viewed in the context of existing or anticipated projects. The Council on Environmental Quality defined cumulative impacts (40 CFR 1508.7) as "the impacts on the environment which results from the incremental impacts of the action when added to other past, present and reasonably foreseeable future actions...."

The Service is not aware of any other proposed Federal or State projects within or adjacent to the south shore of Staten Island erosion control and storm damage reduction project area. Nevertheless, the Service has been made aware of a private development adjacent to the project area consisting of the development of approximately 2.19 acres of freshwater wetland habitat that should be included in the Corps' cumulative impacts analysis. As previously described, the area adjacent to the project area is heavily developed with commercial and residential infrastructure. This development has caused, and will continue to cause, numerous impacts to the natural

resources of the south shore of Staten Island, some of which include the loss of wetland habitat, habitat fragmentation, degradation of habitats, and preclusion of habitat formation. The swell in residential and commercial development in the surrounding area has lead to a significant increase in storm-water run-off and shoreline hardening, both of which degrade wetland and maritime habitats. As discussed in the report's section on wetlands, the cumulative effects from historical losses of wetlands are significant. More information on the status and trends in wetlands of Staten Island can be found in Tiner (2000).

The Service recommends that the Corps provide total amounts by acreage of habitat likely to be affected by this project in the Draft EIS. In addition, the Corps should evaluate the cumulative impacts of its coastal erosion and shoreline protection program on migratory birds and wetlands, particularly those species and habitats of priority concern as established in various conservation plans that have been developed by local, State, and Federal agencies.

The Service believes that these cumulative impacts could be ameliorated with the inclusion of the mitigation recommendations (compensatory mitigation, habitat restoration, treatment of storm-water run-off, and habitat enhancement) provided in the following section of this report.

MITIGATION

As established in the preceding sections of this report, the proposed project is likely to result in adverse impacts to Federal trust wildlife species. This report has focused on the migratory birds

and their habitats, primarily maritime beach and dune communities; and marine intertidal habitat. We also provide information on effects to tidal and freshwater wetlands which support species that are of conservation concern. We believe that the use of the proposed project area and adjacent habitats by these species and the potential impacts resulting from the proposed project are clear justifications for the Corps to include conservation measures in these overall project plans and to further evaluate fish and wildlife enhancement opportunities in the study area. Further, habitats in the proposed project area have also received special protection and status as critical conservation areas through the New York State Department of State designation as Significant Fish and Wildlife Habitats and inclusion in the South Shore Estuary Reserve, warranting careful consideration of potential impacts, mitigation measures, and fish and wildlife enhancement opportunities.

The views and recommendations of the Service on this project are guided by its Mitigation Policy (U.S. Fish and Wildlife Service 1981). This policy seeks to mitigate losses of fish, wildlife, and their habitats, and uses thereof, from land and water developments. The Service's mitigation policy does not apply to the ESA and listed species that will be affected by the project. The term "mitigation" is defined as: (a) avoiding the impact altogether by not taking a certain action or parts of an action; (b) minimizing impacts by limiting the degree or magnitude of the action and its implementation; (c) rectifying the impact by repairing, rehabilitating, or restoring the affected environment; (d) reducing or eliminating impacts over time; and, (e) compensating for impacts by replacing or providing substitute resources or habitats.

The FWCA Report provides information on the proposed project's potential impacts on fish and wildlife resources, to assist the Corps in giving equal consideration of fish and wildlife in the planning of water resource development projects. In addition, the Corps now has an Environmental Program Authorities for environmental restoration within the Continuing Authorities Program, under Section 204 of the Water Resources Development Act (WRDA) of 1992 (P.L. 102-580) (WRDA) (Beneficial Use of Dredged Material); Section 1135 of WRDA of 1992 (PL), (Restoration of Environmental Quality); and Section 206 of WRDA of 1996 (P.L. 104-303) (Aquatic Ecosystem Restoration).

The proposed project may have direct adverse effects on waterbird and shorebird species of regional concern in the short-term and over the life of the project as identified in the report. The following provides strategies for avoiding, minimizing, or compensating impacts to fish and wildlife resources and their habitats in the proposed project area.

Maritime Beach

a) Access to the project beaches should be provided to the Service, the Corps, or their mutually agreed upon designated representatives, to survey and monitor waterbird and shorebird use areas. Access should be given during daylight hours on any day(s) of any given year at the required frequency to accomplishthe purposes stated above.

b) The Service recommends that construction occurs during the autumn months to

ensure that there is sufficient time for re-establishment of the essential infaunal prey base and breeding and loafing habitat for the spring time arrival of shorebirds.

c) The Corps should conduct annual maritime beach surveys in coordination with the Service during the months of March/April/May to determine the presence of State- and Federally-listed species, in particular, piping plover (*Charadrius melodus*), least tern (*Sterna antillarum*), common tern (*Sterna hirundo*), black skimmer (*Rynchops niger*), and seabeach amaranth (*Amaranthus pumilis*). These species may re-colonize an area where newly created beaches appear, and now potentially provide previously unavailable early successional habitat. If any of these species are observed loafing, roosting, foraging, courting, nesting, or growing in the project area, the Corps will need to coordinate with the Service to ascertain whether further technical assistance or ESA section 7 consultation is warranted. At this time, we can assist the Corps and landowners in incorporating species recovery guidelines into the project.

d) The Corps should ensure that the beach sand is compatible with the sand that is now on the beach with respect to grain size, clay content, and organic matter.

e) If the dunes are to be planted with American beach grass, they should be planted 18 in. on center from the southern toe of the dune to the dune crest and to the northern toe of the dune. The Corps should also consult with the Service on a planting scheme with the potential for open areas in the dune. Such breaks in the vegetation are attractive for some shorebirds. The Corps should also consider

incorporating other plant species into the planting scheme for the purposes of increasing plant diversity and heterogeneity in the proposed project area. Beach pea and seabeach knotweed are examples of native plants which might be considered.

Tidal and Freshwater Wetlands

The Service recognizes that part of the Corps' proposed project is the acquisition and preservation of approximately 260 acres of tidal and freshwater wetland habitat. Although the Service is encouraged with this portion of the project plan, there still remain some concerns regarding the quality of those wetland habitats for fish and wildlife resources and, over the long-term, whether sufficient invasive plant monitoring and management has been factored into the project for a period of time commensurate with the life of the project. The following recommendations provide additional strategies for avoiding, minimizing, or compensating impacts to fish and wildlife resources and their habitats in the proposed project area.

a) The Service recommends the monitoring and maintenance of the preserved wetland habitats for the life of the project to ensure that the wetland habitats continue to provide the targeted functions and values. Once areas are re-stored to a predominance of native vegetation (see "c" below), the Corps should set performance criteria to be met and monitor to ensure that invasive species have not re-colonized the restored wetland areas. If performance criteria are not met,

provisions need to be in place to ensure continued invasive species treatment.

b) The Service recommends an overall compensatory mitigation plan that provides a ratio of 1:1 to compensate for the conversion of vegetated wetlands to open water (pond) areas. Even though the existing wetlands areas may be considered degraded, the removal of approximately 85 acres of functioning habitat will result in adverse impacts to the species which use the habitat. We will support a proposal to perform 85 acres of compensatory mitigation in the form of acquisition of natural wetlands or restoration or enhancement of degraded wetlands, to offset the adverse impacts of the habitat conversion.

c) The Service recommends restoration of vegetation in the areas that will be excavated. The Service would like to see the invasive-dominated common reed ponds re-planted with native emergent and submerged/floating vegetative species, such as freshwater eelgrass (*Vallisneria americana*), redhead grass (*Potamogenton perfoliatus*), rushes (*Juncus* spp.), skunk cabbage (*Symplocarpus foetidus*), cordgrass (*Spartina* spp.), bulrush (*Scirpus* spp.), sedges (*Carex* spp.), and spike rush (*Eleocharis* spp.). In addition, in less frequently flooded and/or upland areas, shrub species such as buttonbush (*Cephalanthus occidentalis*) should be planted. In total, all these species will provide food sources for waterfowl, migratory birds, and invertebrates.

d) The Service recommends that the Corps' analyze the potential for stocking native fish species (Families: Cyprinidae, Atherinidae, Gasterosteidae, Cyprinodontidae, and Centrarchidae) in the excavated pond areas in order to increase biodiversity

and forage sources for waterfowl and mammalian species. Fish may also assist the mosquito control as in Open Water Marsh Management (OWMM). The Service can provide additional information on desirable fish species and OWMM.

e) The Service recommends the creation of public outreach material about maritime beach and the wetland habitats. We recommend development of signage reflecting species use, habitat importance, and potential public involvement in conservation. The Service would be willing to assist the Corps in this endeavor.

f) The Service recommends that the Corps explore methods to address the quality of water (storm-water) input into the wetlands that are adjacent to roads, in the project area.

SUMMARY OF FINDINGS AND SERVICE POSITION

The proposed project will impact marine and terrestrial communities, as well as wetland areas, resulting in the elimination and disturbance of invertebrate, vertebrate, and vegetative inhabitants of the maritime beach, dune communities, and freshwater wetlands, which, in some cases, support species or habitats which have been identified in Service's (1997) Significant Habitat Complexes document as highly imperiled or a high priority concern in the region. However, implementation of the mitigation measures provided in this report could assist the Corps in offsetting the proposed project's potential adverse impacts. We recommend that the Corps use resource information to guide appropriate design and construction approaches. Overall, we believe that project implementation, coupled with adoption of our recommendations, has the

potential to result in positive effects to the aquatic ecosystem.

FISH AND WILDLIFE ENHANCEMENT OPPORTUNITIES

The Service recommends that the Corps develop construction techniques and approaches which will assist in creating optimal habitats for the avifauna species discussed in this report. This should not be considered single species management, as the health of these species depends in large measure on ecosystems which are functioning as closely to a natural condition as possible. As one example, the Corps can collect information on the physical and environmental characteristics of existing shorebird and waterbird breeding habitat in the proposed project area, and look to replicate those conditions elsewhere in the project area in order to make the constructed beaches, dunes, and wetlands more attractive to those species.

The Service recommends that the Corps participate throughout this project in the protection, enhancement, and restoration of adjacent wetland habitats which support breeding and non-breeding birds, as well as fish and invertebrates. The Service is interested in pursuing these and other fish and wildlife enhancement opportunities in the proposed study area, and is willing to extend the FWCA consultation under a separate SOW to address these ideas in more detail.

LITERATURE CITED

Andrle, R.F. and J.R. Carroll. 1988. The Atlas of Breeding Birds in New York State. Cornell

University Press, Ithaca, NY.

Azous, A. 1991. An Analysis of Urbanization Effects on Wetland Biological Communities. Master's Thesis, University of Washington. Published by the Puget Sound Wetlands and Stormwater Management Research Program.

Berg, D.L. and J.S. Levinton. 1985. The Biology of the Hudson-Raritan Estuary, with Emphasis on Fishes. NOAA Technical Memorandum NOS OMA-16. 170 pp.

Burger, J., and M. Gochfeld. 1991. Human Activity Influence and Diurnal and Nocturnal Foraging of Sanderlings (*Calidris alba*). *The Condor* 93: 259-265.

Burlas, M. G.L. Ray, and D. Clarke. 2001. The New York Districts Biological Monitoring Program for the Atlantic Coast of New Jersey, Asbury Park to Manasquan Section Beach Erosion Control Project. Final Report. U.S. Army Engineer District, New York and U.S. Army Engineer Research and Development Center, Waterways Experiment Station.

Byrnes, M.R., R.M. Hammer, T.D. Thibaut, and D.B. Snyder. 2004. Effects of Sand Mining on Physical Processes and Biological Communities Offshore New Jersey, U.S.A. *Journal of Coastal Research* 20: 25-43.

Cerrato, R.M., H.J. Bokuniewicz, and M.H. Wiggins. 1989. A Spatial and Seasonal Study of the Benthic Fauna of the Lower Bay of New York Harbor. Marine Science Research Center, State University of New York, Stony Brook, NY. Special Report 84, Reference No. 89-1. 108 pp.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of Wetlands and Deepwater Habitats of the United States. U.S. Department of the Interior, Fish and Wildlife Service, Biological Services, Washington, DC.

CZR, Inc. 2003. Waterbird and Shorebird Use at Ocean Island Beach in Brunswick County, North Carolina – December 2001-November 2002. Prepared for U.S. Army Corps of Engineers, Wilmington District, Wilmington, NC. Contract Number DACW 54-97-D-0028.

Dugan, J.E., D.M. Hubbard, M.D. McCrary, and M.O. Pierson. 2003. The Response of Macrofauna Communities to Macrophyte Wrack Subsidies on Exposed Sandy Beaches of Southern California. *Estuarine Coastal and Shelf Science* 58S: 133-148.

Figley, W. and T. McCloy. 1988. New Jersey's Recreational and Commercial Fishing Grounds of Raritan Bay, Sandy Hook Bay and Delaware Bay and the Shellfish Resources of Raritan Bay and Sandy Hook Bay. Tech. Ser. 88-1, N.J. Department of Environmental Protection, Division of Fish, Game and Wildlife, Marine Fisheries Administration, CN 400, Trenton, NJ. 39 pp.

Gorzelany, J.F. and W. Nelson. 1987. The Effects of Beach Replenishment on the Benthos of a Sub-Tropical Florida Beach. Department of Oceanography and Ocean Engineering, Florida Institute of Technology, Melbourne, FL.

Hurme, A.K., and E.J. Pullen. 1988. Biological Effects of Marine Sand Mining and Fill Placement for Beach Replenishment. *Marine Mining* (7): 123-136.

Lindquist, N., and L. Manning. 2001. Impacts of Beach Nourishment and Beach Scraping on Critical Habitat and Productivity of Surf Fishes. Final Report to the North Carolina Fisheries Resource Grant Program. 41 pp. plus appendices.

Minerals Management Service. 2001. Final Report Development and Design if Biological and Physical Monitoring Protocols to Evaluate the Long-Term Impacts of Offshore Dredging

Operations on the Marine Environment. Prepared for the U.S. Department of the Interior, Minerals Management Service, International Activities and Marine Minerals Division Under Contract No. 14-35-0001-31051. 166 pp. plus Appendix.

Naqvi, S.M., and E.J. Pullen. 1982. Effects of Beach Nourishment and Borrowing on Marine Organisms. Fort Belvior: U.S. Army Corps of Engineers, Coastal Engineering Research Center. MR 82-14.

Mitsch, W.T., and J.G. Gosselink. 1986. Wetlands. Van Nostrand Reinhold Company, New York, NY.

New York State Department of Environmental Conservation. 2003a. List of Endangered, Threatened and Special Concern Fish and Wildlife Species of New York State.

New York State Department of Environmental Conservation. 2003b. New York State Amphibian and Reptile Atlas Project 1990-1998.

New York State Department of Environmental Conservation. 2003c. Peregrine Falcon Fact Sheet.

New York State Department of Environmental Conservation. 2004. New York State Breeding Bird Atlas 2000-2004.

NWTC. 1979. Scientists' Report: The National Symposium on Wetlands Lake Buena Vista, Florida, November 6-9, 1978, ed. J. Clark and J. Clark. National Wetlands Technical Council.

O'Conner, J.M., D.A. Neumann, and J.A. Sherk, Jr. 1976. Lethal Effects of Suspended Sediments on Estuarine Fish. TP 76-20.

Parr, T., E. Diener, and S. Lacy. 1978. Effects of Beach Replenishment on Nearshore Sand

Fauna at Imperial Beach, California. Fort Belvior: U.S. Army Corps of Engineers, Coastal Engineering Research Center. MR-74.

Peterson, C.H., and L. Manning. 2001. How Beach Nourishment Affect the Habitat Value of Intertidal Beach Prey for Surf Fish and Shorebirds and Why Uncertainty Still Exists. *Proceedings of the Coastal Ecosystems and Federal Activities Technical Training Symposium*, August 20-22, 2001. 2 pp.

Pfister, C., B.A. Harrington, and M. Lavine. 1992. The Impact of Human Disturbance on Shorebirds at a Migration Staging Area. *Biological Conservation* (60): 115-126.

Profiles and Research Consulting Groups, Inc. 1980. Seasonal Restrictions on Dredging Projects by NMFS in the Northeast. Volume 1. Prepared for the National Marine Fisheries Service under Contract SB 1408(a) -79-C-169.

Reid, R.N., D.J. Rodosh, A.B. Frame, and S.A. Fromm. 1991. Benthic Macrofauna of New York Bight 1979-1989. NOAA Technical Report, NMFS 103. 50 pp.

Reilly, F., and V.J. Bellis. 1978. A Study of the Ecological Impact of Beach Nourishment with Dredged Materials on the Intertidal Zone. Inst. For Coastal and Marine Resources, East Carolina University Technical Report No. 4. East Carolina University, Greenville, NC.

Ruhlen, T.D., S. Abbott, L.E. Stenzel, and G.W. Page. 2002. Evidence that Human Disturbance Reduces Snowy Plover Chick Survival. *Journal of Field Ornithology* 74(3): 300-304.

Schubel, J.R., and D.P. Wang. 1973. The Effects of Suspended Sediment in Northern Chesapeake Bay. Power Technology 6: 9-16.

Sherk, J.A., J.M. O'Conner, and D.A. Neumann. 1974. Effects of Suspended and Deposited Sediments on Estuarine Organisms, Phase II. Reference No. 74-02, National Research

Institute, Solomons, MD.

Stern. E.M., and W.B. Stickle. 1978. Effects of Turbidity and Suspended Material in Aquatic Environments. Vicksburg: U.S. Army Corps of Engineers, Waterways Experiment Station. Technical Report D-78-21.

Tiner, R.W. 2000. Wetlands of Staten Island, New York. Valuable Vanishing Urban Wildlands. U.S. Fish and Wildlife Service, Ecological Services, Northeast Region, Hadley, MA. 19 pp.

U.S. Army Corps of Engineers. 1976. General Design Memorandum No. 1 – Fort Wadsworth to Great Kills Park, Fort Wadsworth to Arthur Kill Project, Staten Island, New York.

U.S. Army Corps of Engineers. 1995. South Shore of Staten Island, New York. Beach Erosion Control and Storm Damage Protection Reconnaissance Study. U.S. Army Corps of Engineers, New York District, New York, NY. 78+ pp.

U.S. Army Corps of Engineers. 1998. Atlantic Coast of Long Island New York, Jones Inlet to East Rockaway Inlet, Long Beach Island, New York, Final Feasibility Report with Final Environmental Impact Statement. U.S. Army Corps of Engineers, New York District, New York, NY. 89 pp.

U.S. Army Corps of Engineers. 2001. The New York District's Biological Monitoring Program for the Atlantic Coast of New Jersey, Asbury Park to Manasquan Section Beach Erosion Control Project Final Report. Engineer Research and Development Center, Waterways Experiment Station, Vicksburg, MS.

U.S. Army Corps of Engineers. 2002. South Shore of Staten Island Feasibility Study, Draft Preliminary Alternatives Report. U.S. Army Corps of Engineers, New York District,

New York, NY. 81+ pp.

U.S. Army Corps of Engineers. 2004a. (Supplement to) South Shore of Staten Island Feasibility Study, Line of Protection and Interior Drainage Alternatives Report. U.S. Army Corps of Engineers, New York District, New York, NY. 46 pp.

U.S. Army Corps of Engineers. 2004b. Year 2 Recovery from impacts of Beach Nourishment and Surf Zone Fish and Benthic Resources on Bald Head Island, Caswell Beach, Oak Island, and Holden Beach, North Carolina – Final Study Findings. Prepared for U.S. Army Corps of Engineers, Wilmington District, Wilmington, NC. Contract No. DACW54-00-D-0001.

U.S. Army Corps of Engineers. 2005. Preliminary Draft Environmental Impact Statement for the South Shore of Staten Island Beach Erosion Control and Storm Damage Reduction Project. U.S. Army Corps of Engineers, New York District, New York, NY.

U.S. Fish and Wildlife Service. 1981. U.S. Fish and Wildlife Service Mitigation Policy. U.S. Department of the Interior, Washington, DC. Federal Register v.46 n.15. pp. 7644-7663.

U.S. Fish and Wildlife Service. 1992. Planning Aid Report. Raritan Bay-Sandy Hook Bay Reconnaissance Study: Fish and Wildlife Resources. 135 pp.

U.S. Fish and Wildlife Service. 1995. Fish and Wildlife Coordination Act Section 2(b) Report, Atlantic Coast of Long Island, Jones Inlet to East Rockaway Inlet, Long Beach Island, New York, Storm Damage Reduction Project. U.S. Fish and Wildlife Service, Long Island Field Office, Islip, NY. 32 pp.

U.S. Fish and Wildlife Service. 1997. Significant Habitat Complexes of the New York Bight

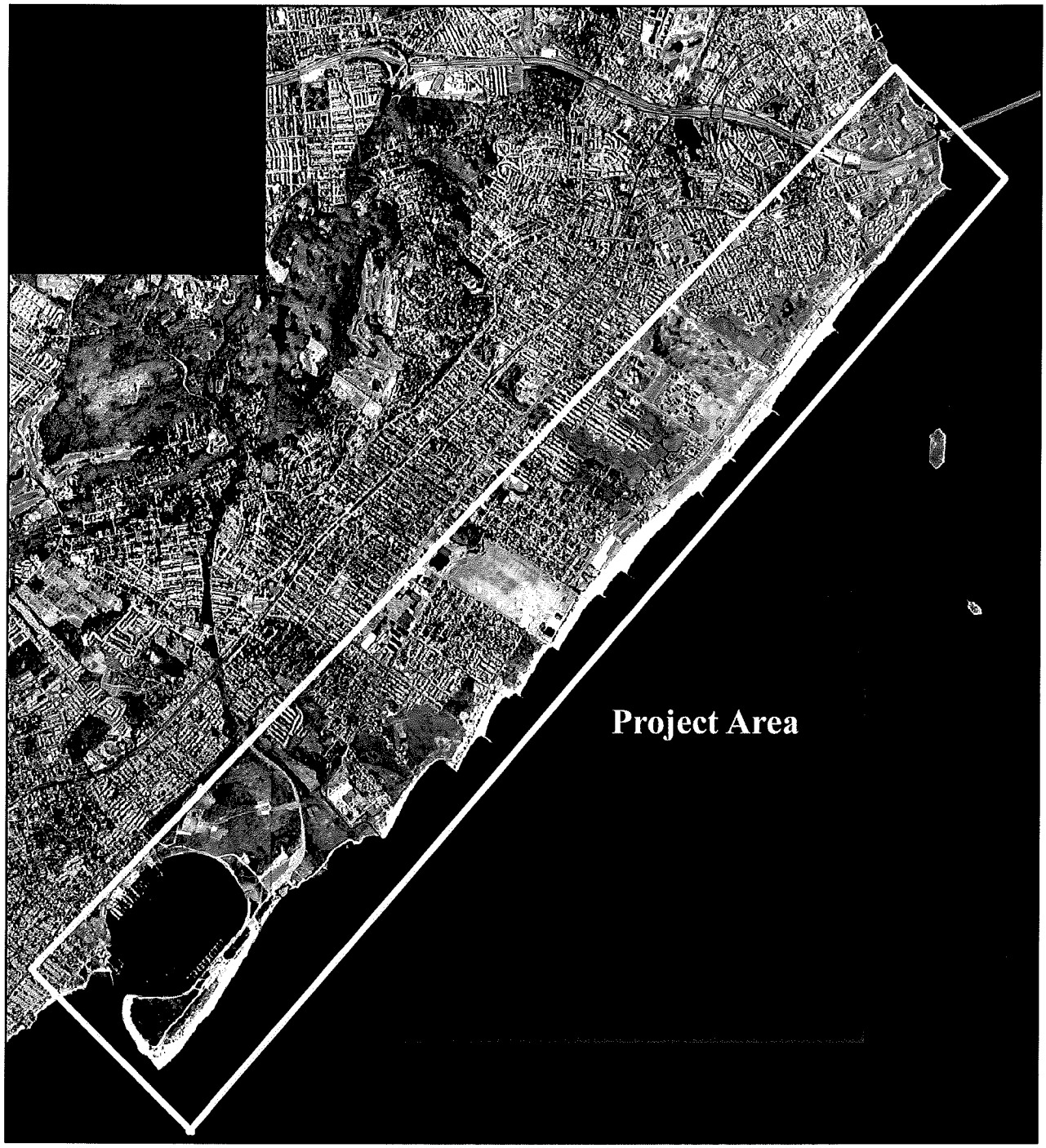
Watershed. U.S. Fish and Wildlife Service, Southern New England - New York Bight Coastal Ecosystems Program, Charlestown, RI.

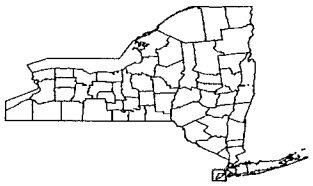
U.S. Fish and Wildlife Service. 2002. Biological Opinion on the Effects of Beach Nourishment and Restoration Activities Townsend Inlet to Hereford Inlet, Cape May County, New Jersey on the Piping Plover and Seabeach Amaranth. U.S. Fish and Wildlife Service, New Jersey Field Office, Pleasantville, NJ.

Van Dolah, R.F., P.H. Wendt, R.M. Martore, M.V. Levisen, and W.A. Roumillat. 1992. A Physical and Biological Monitoring Study of the Hilton Head Beach Nourishment Project. Unpublished Report Prepared by South Carolina Wildlife & Marine Resources Department for Town of Hilton Head Island, SC. *In* Greene, K. 2002. Beach Nourishment: A Review of the Biological and Physical Impacts. Atlantic States Marine Fisheries Commission Habitat Management Series #7, Washington, DC.

Woodhead, P.M.J. 1992. *Assessments of the Fish Community and Fishery Resources of the Lower New York Bay Area in relation to a Program of Sand Mining Proposed by New York State*. Stony Brook: Marine Sciences Research Center, SUNY at Stony Brook, NY.

Figure 1: Location of Project Area South Shore of Staten Island





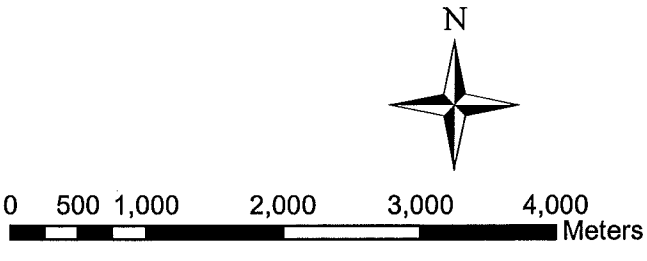
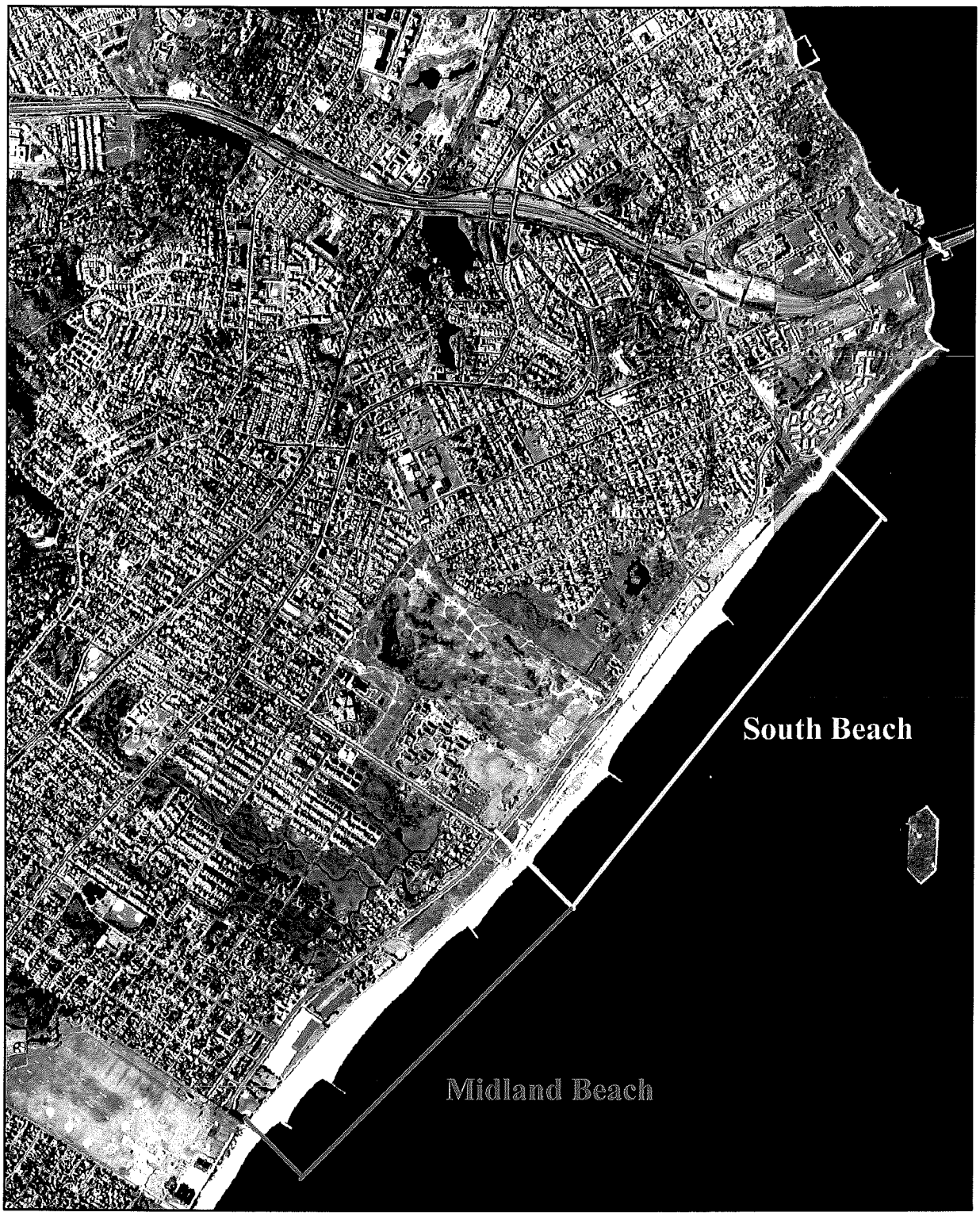
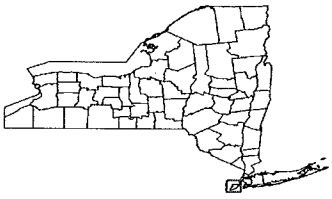


Figure 2: Fort Wadsworth to Midland Beach Project Area

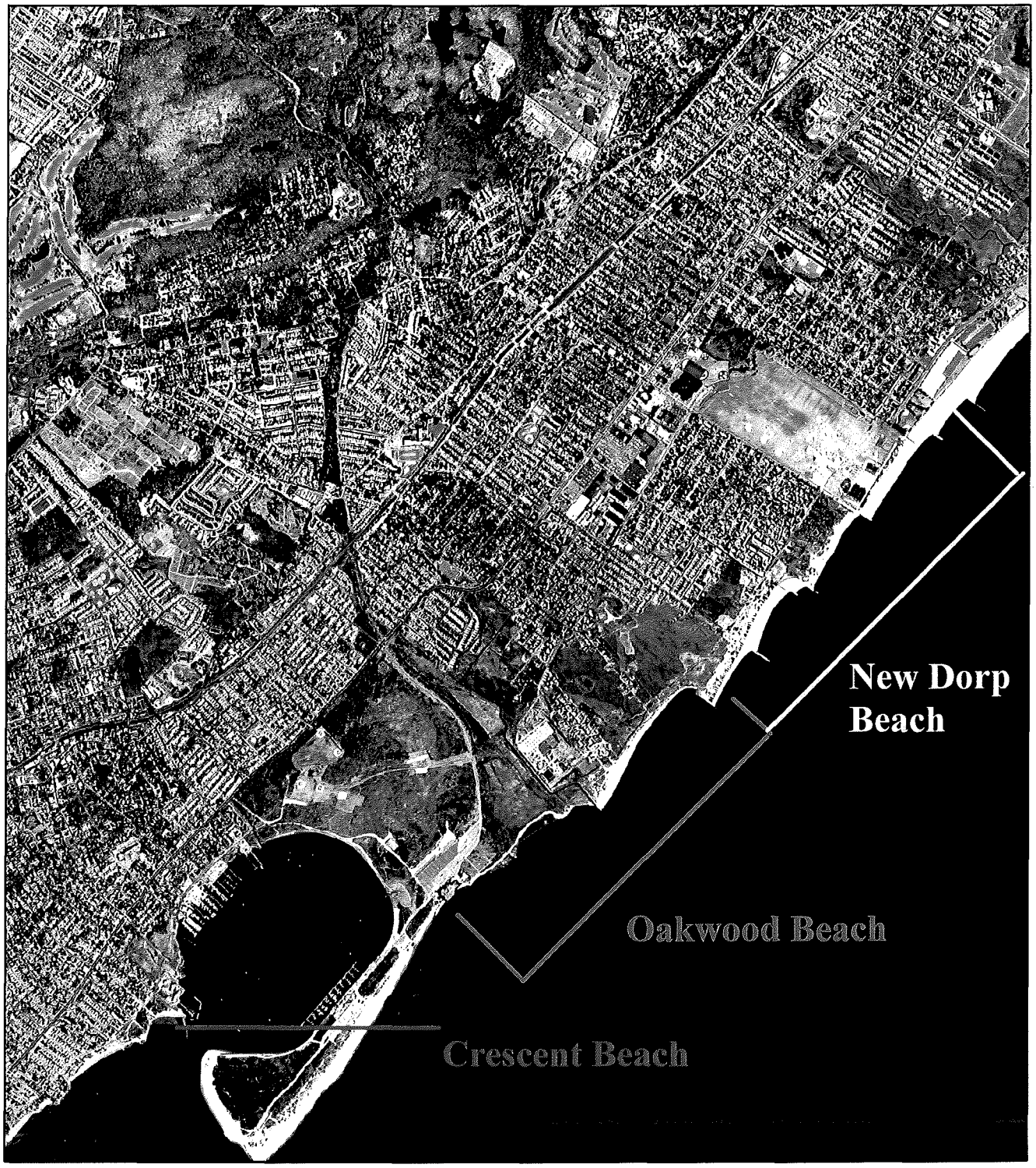


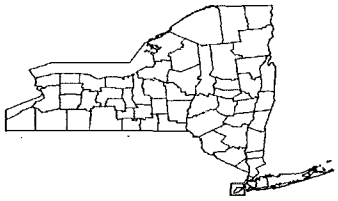


N

0 312.5 625 1,250 1,875 2,500 Meters

Figure 3: New Dorp Beach to Crescent Beach Project Area





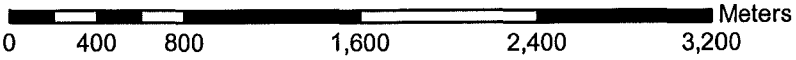
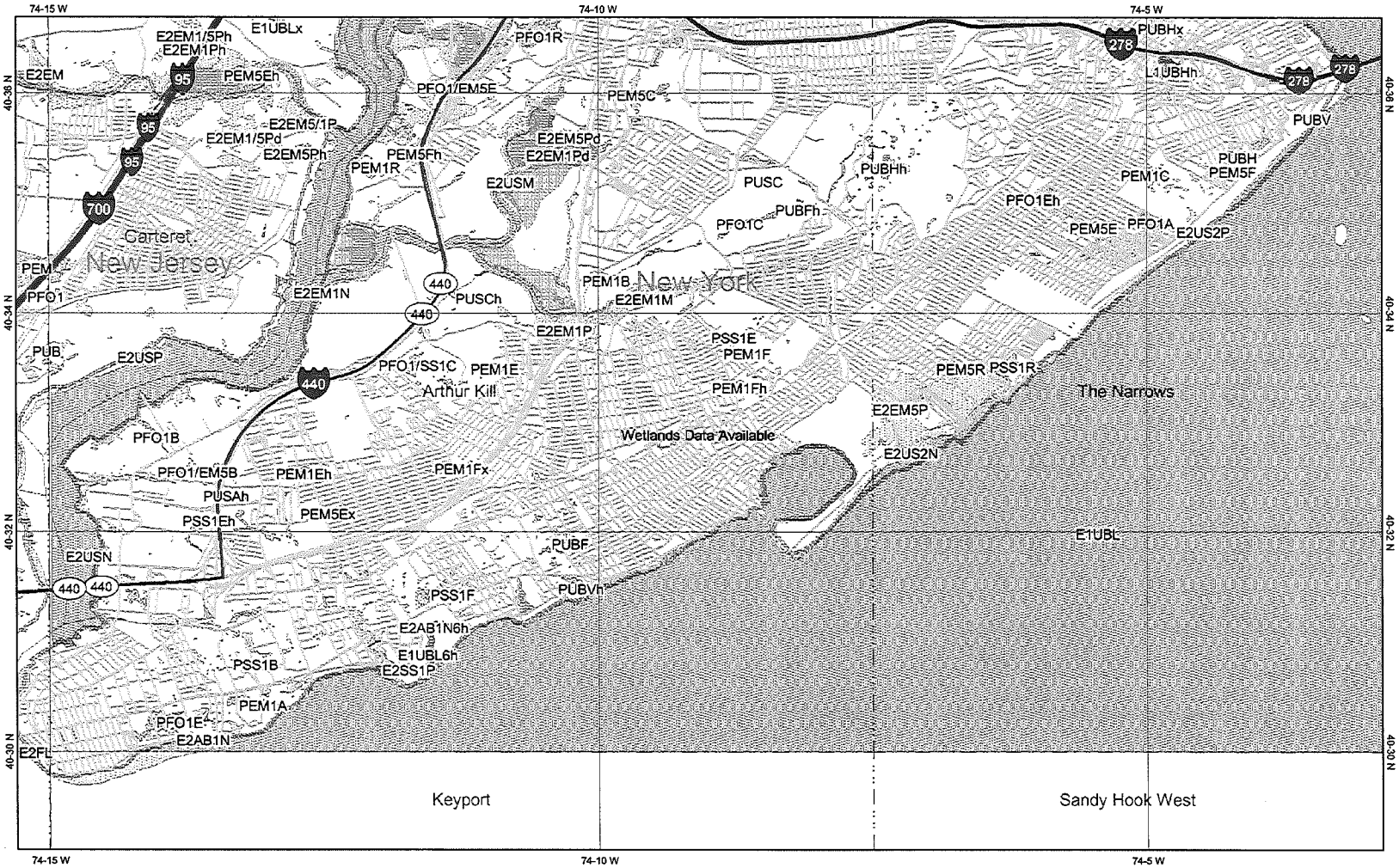
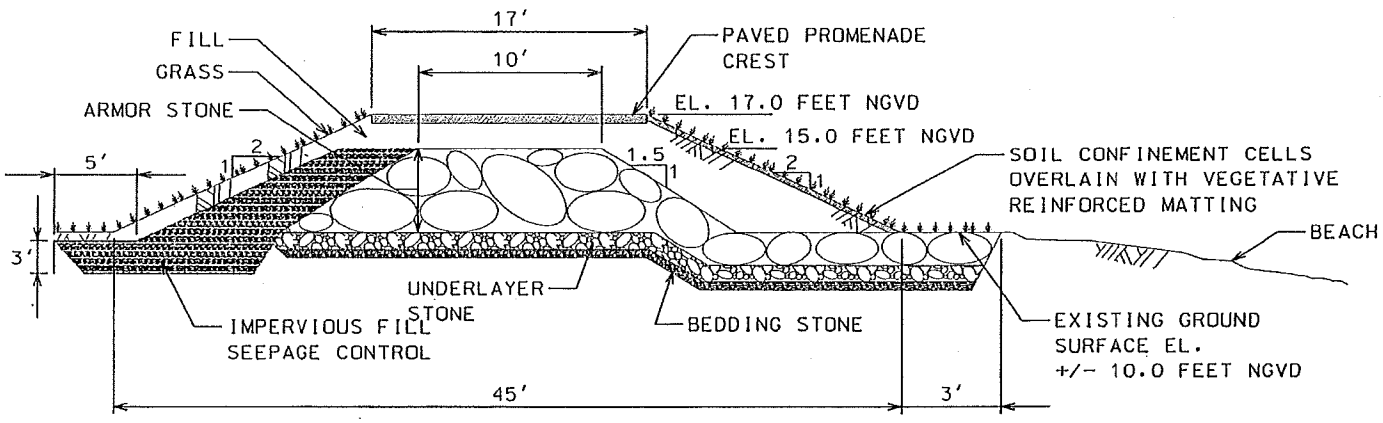


Figure 4: South Shore of Staten Island National Wetland Inventory Map



This map is a user generated static output from an Internet mapping site and is for general reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable. THIS MAP IS NOT TO BE USED FOR NAVIGATION.

Figure 5: Typical Buried Seawall and Raised Promenade



BURIED SEAWALL/RAISED PROMENADE

NTS

REVISION	DESCRIPTION	DATE	APPROVED

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
NEW YORK, NEW YORK

DESIGNED BY: SC
DRAWN BY: DI
CHECKED BY:

SOUTH SHORE OF STATEN ISLAND
FEASIBILITY STUDY
NEW YORK

TYPICAL BURIED SEAWALL &
TYPICAL RAISED PROMENADE

REVIEWED BY: SECTION CHIEF
CONCURRED BY: CHIEF, DESIGN BRANCH
APPROVAL RECOMMENDED: CHIEF, ENGINEERING DIVISION
APPROVED BY: COLONEL, C.E. DISTRICT ENGINEER
SHEET REFERENCE NUMBER:
DATE: 5-9-2002
SCALE: NTS

FIGURE F

Figure 6: Typical Floodwall/ Seawall

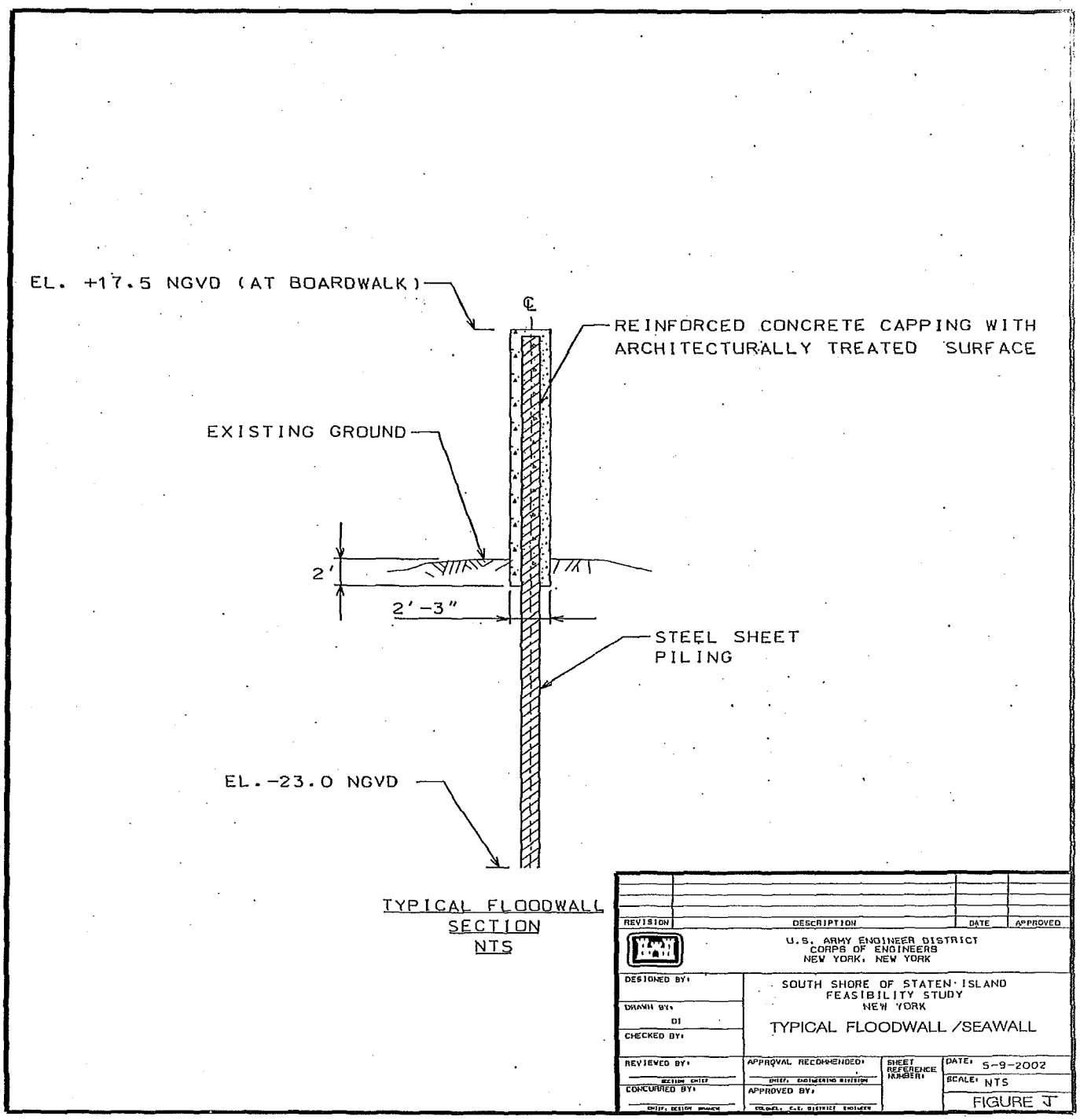


Figure 7: Typical Floodwall/ Seawall

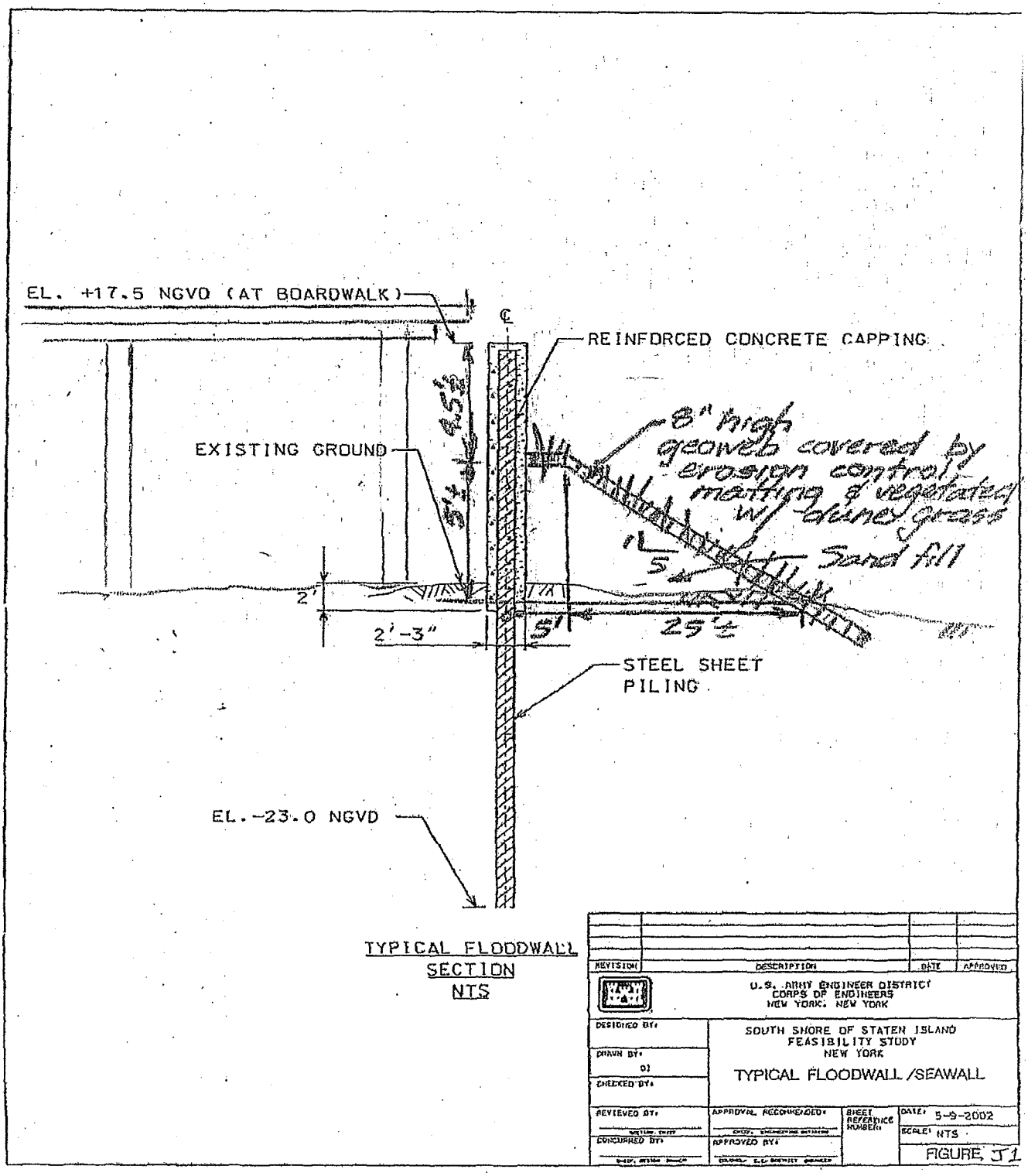


Figure 8: Typical Double Sheet Pile Wall

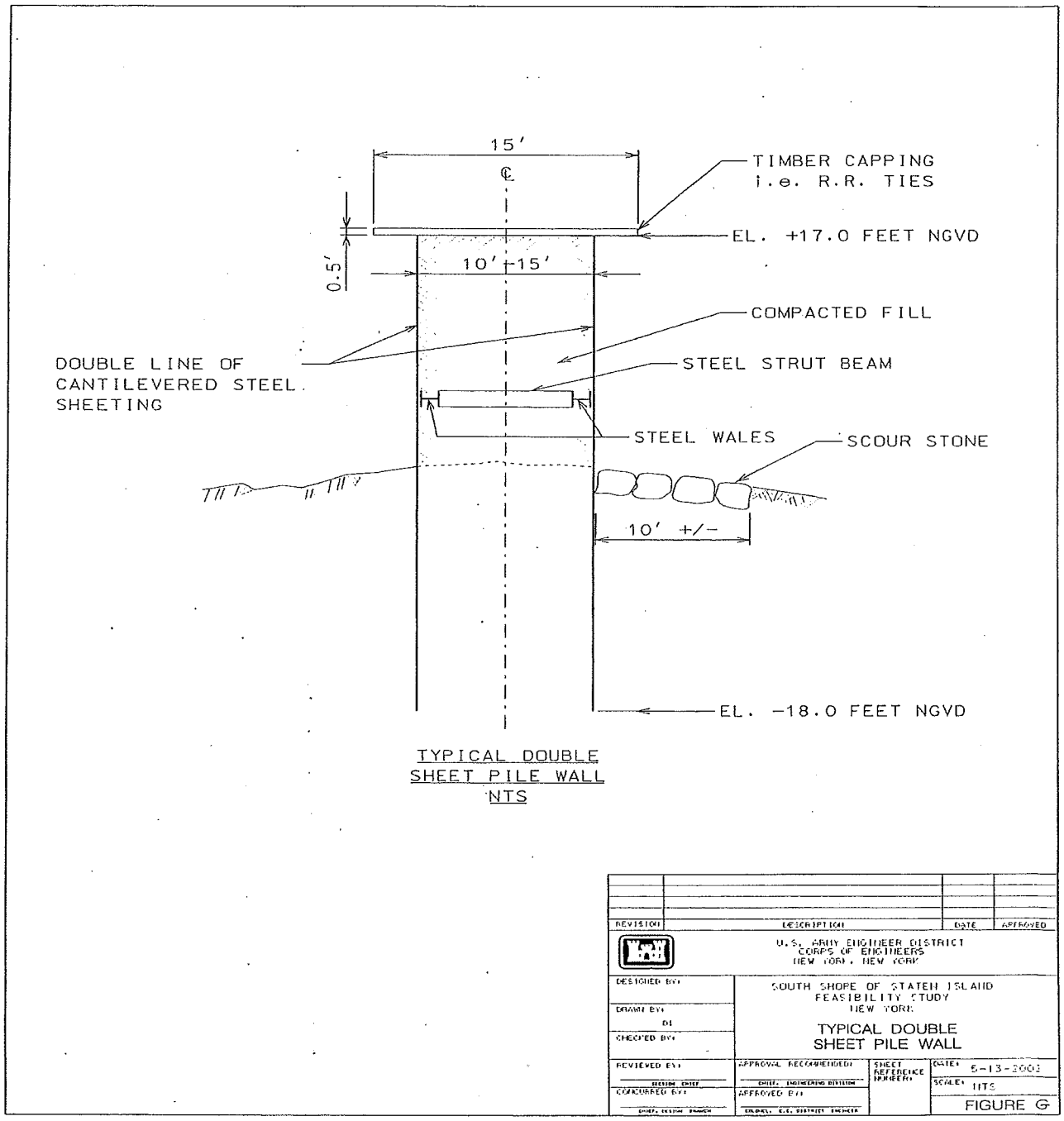
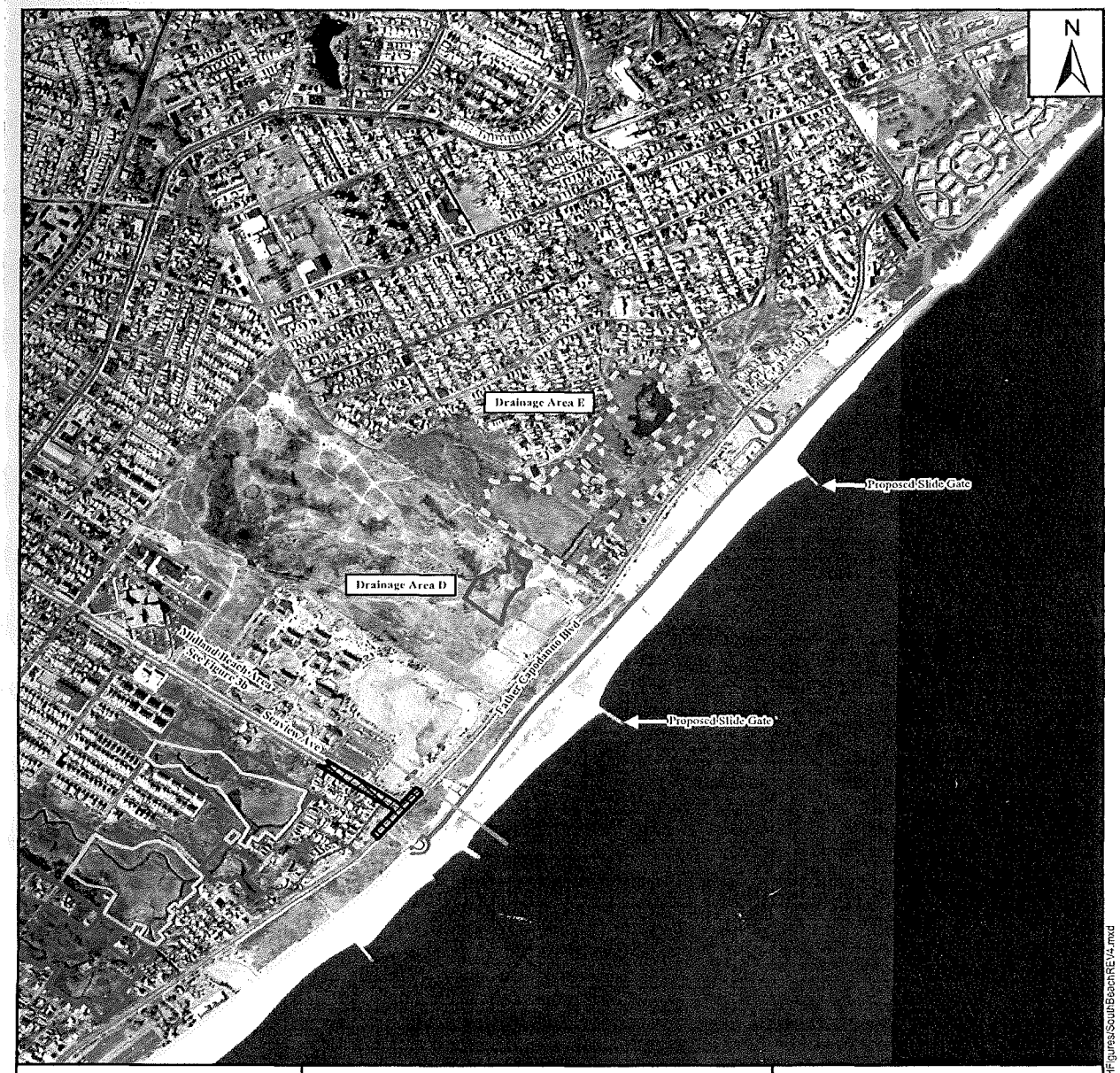
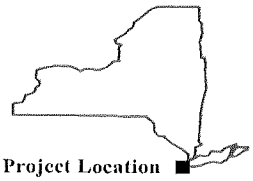


Figure 9: Proposed Line of Protection and Interior Drainage Facilities at Oakwood Beach





Source: New York State Department of State Digital Ortho Imagery, 1994-1999.

500250 0 500 1,000 1,500

Feet

LEGEND

- Proposed Road Raising
- Matchline
- **Line of Protection:**
- Proposed Sheet Pile Seawall
- Proposed Buried Seawall
- Excavation for Ponding and Storage for Interior Drainage (acquire/preserve for openspace)
- Storage for Interior Drainage (acquire/preserve for open space)

Figure 3a. Proposed Line of Protection and Interior Drainage Facilities at South Beach, (From Fort Wadsworth to Midland Beach) South Shore of Staten Island Beach Erosion Control and Storm Damage Reduction Project.

U.S. Army Corps of Engineers

Date: 07/05

z:/projects/Statenisle/2005maps/Figures/EFHFigures/SouthBeachREV4.mxd

Figure 10: Proposed Line of Protection and Interior Drainage Facilities at Midland Beach

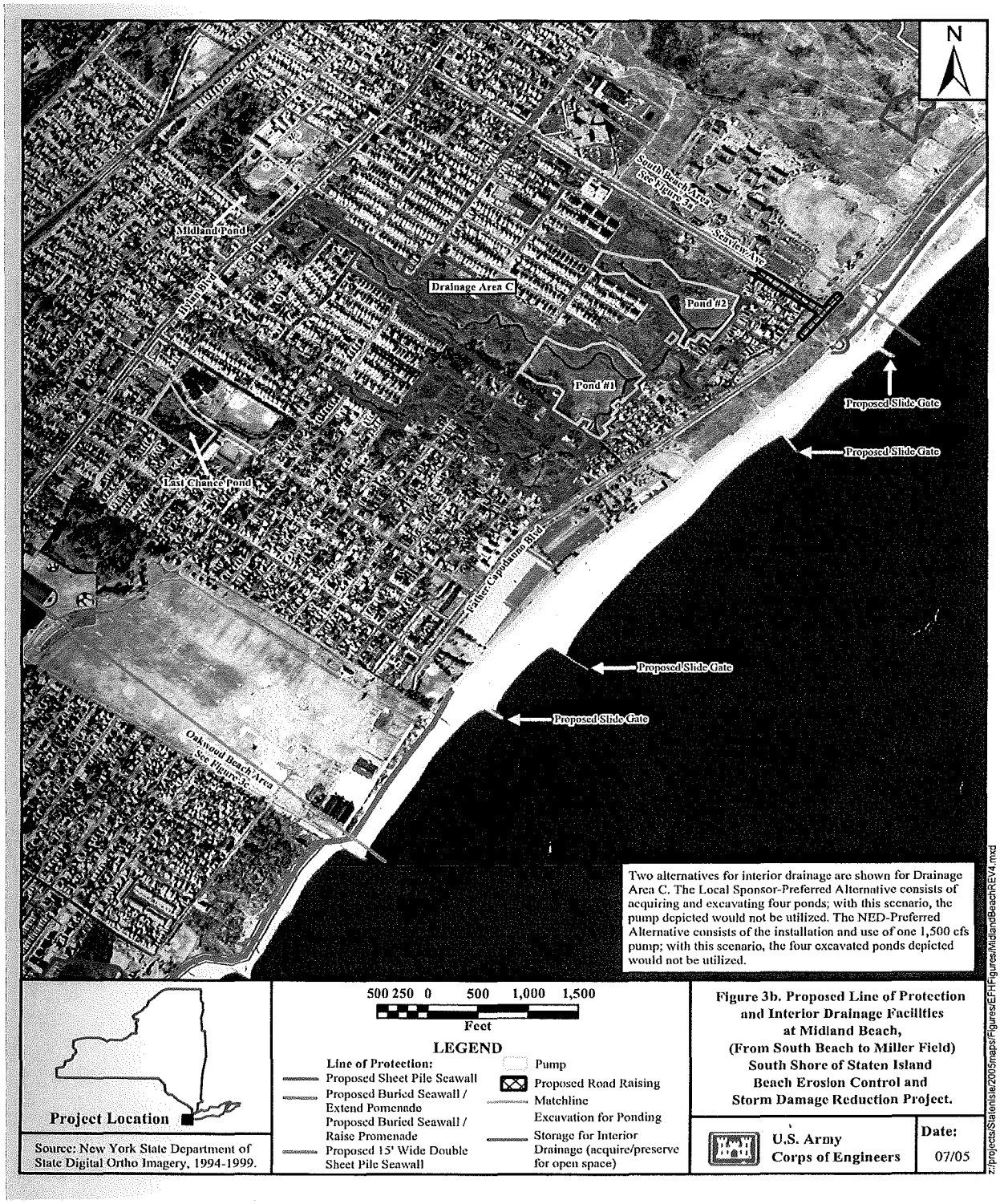


Figure 11: Proposed Line of Protection and Interior Drainage Facilities at South Beach

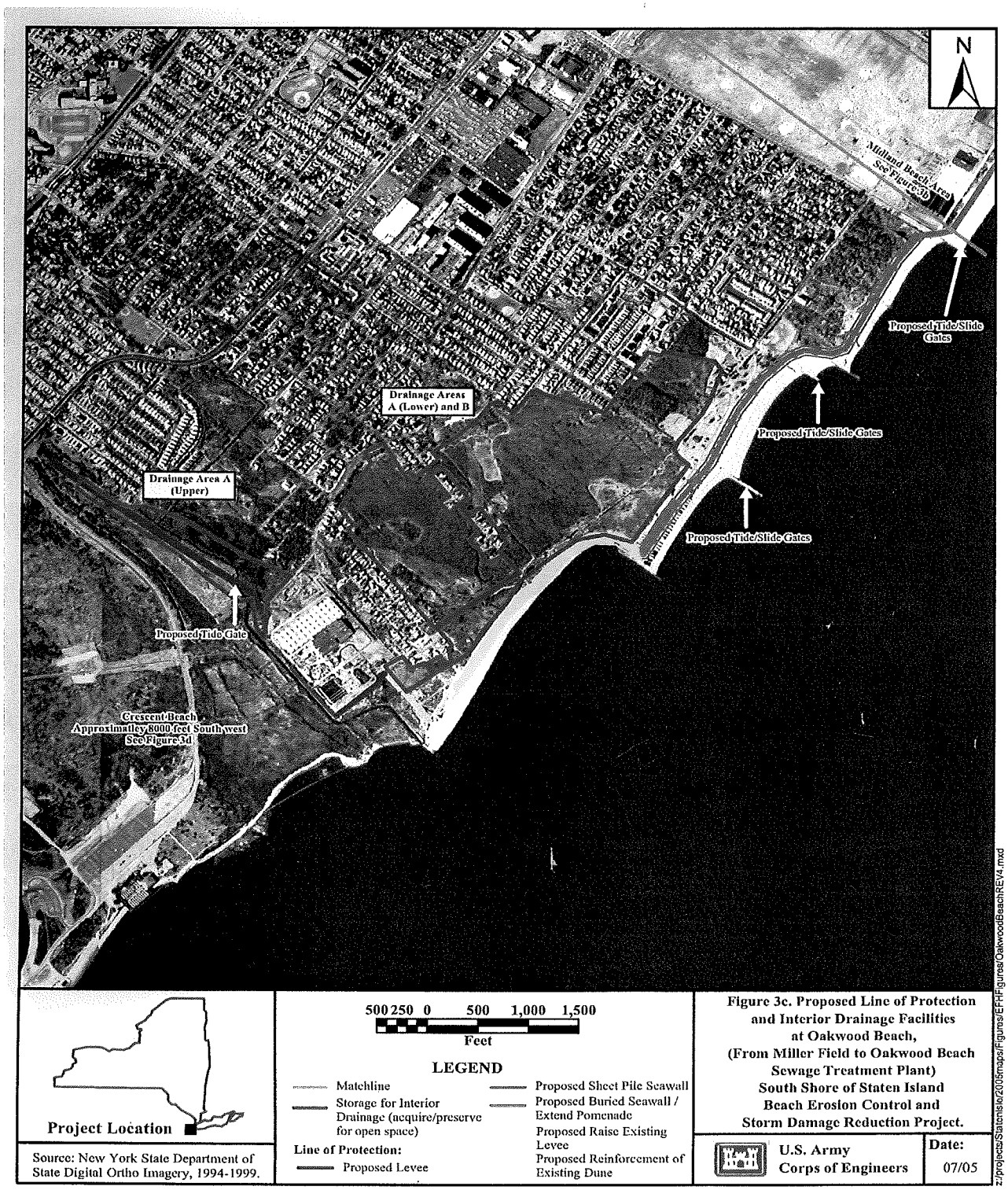
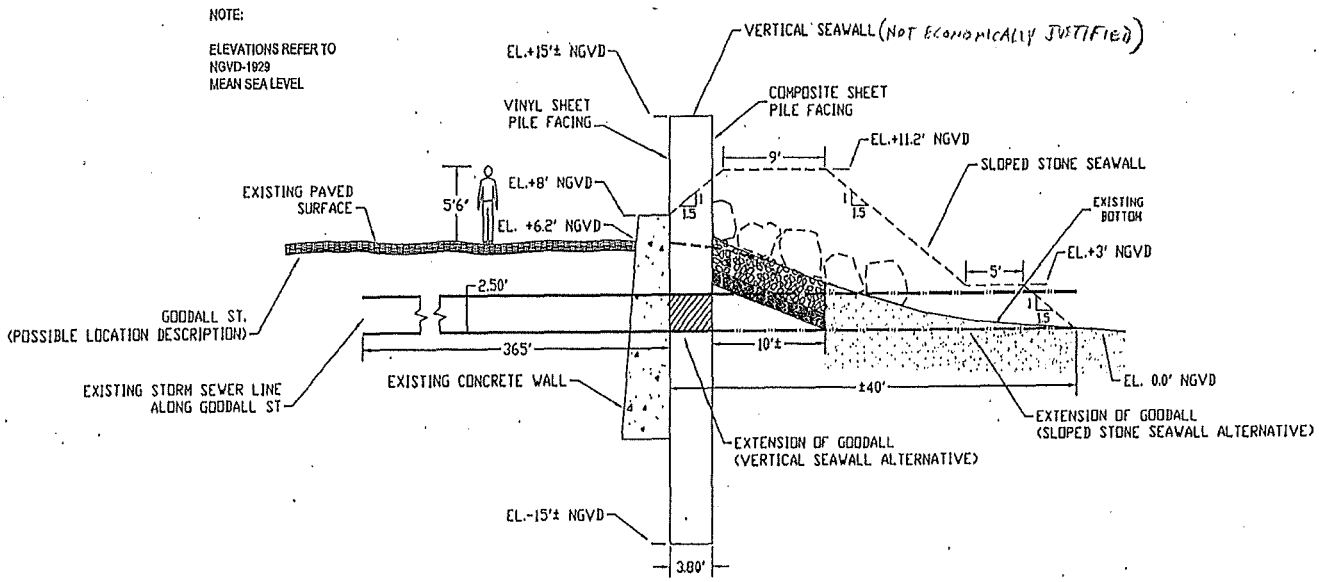
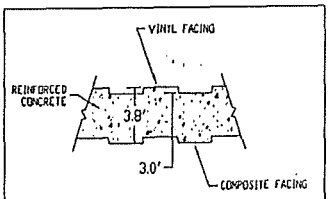


Figure 12: Typical Cross-Section of Seawall at Crescent Beach and Extension of Goodall Outfall



TYPICAL CROSS-SECTION
SEAWALL @ CRESCENT BEACH
AND
EXTENSION OF GOODALL OUTFALL



PLAN VIEW SECTION
SEAWALL @ CRESCENT BEACH

Figure K

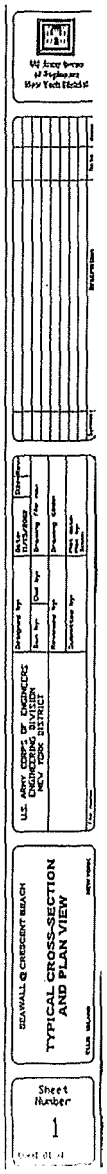


Figure 13: Typical Levee

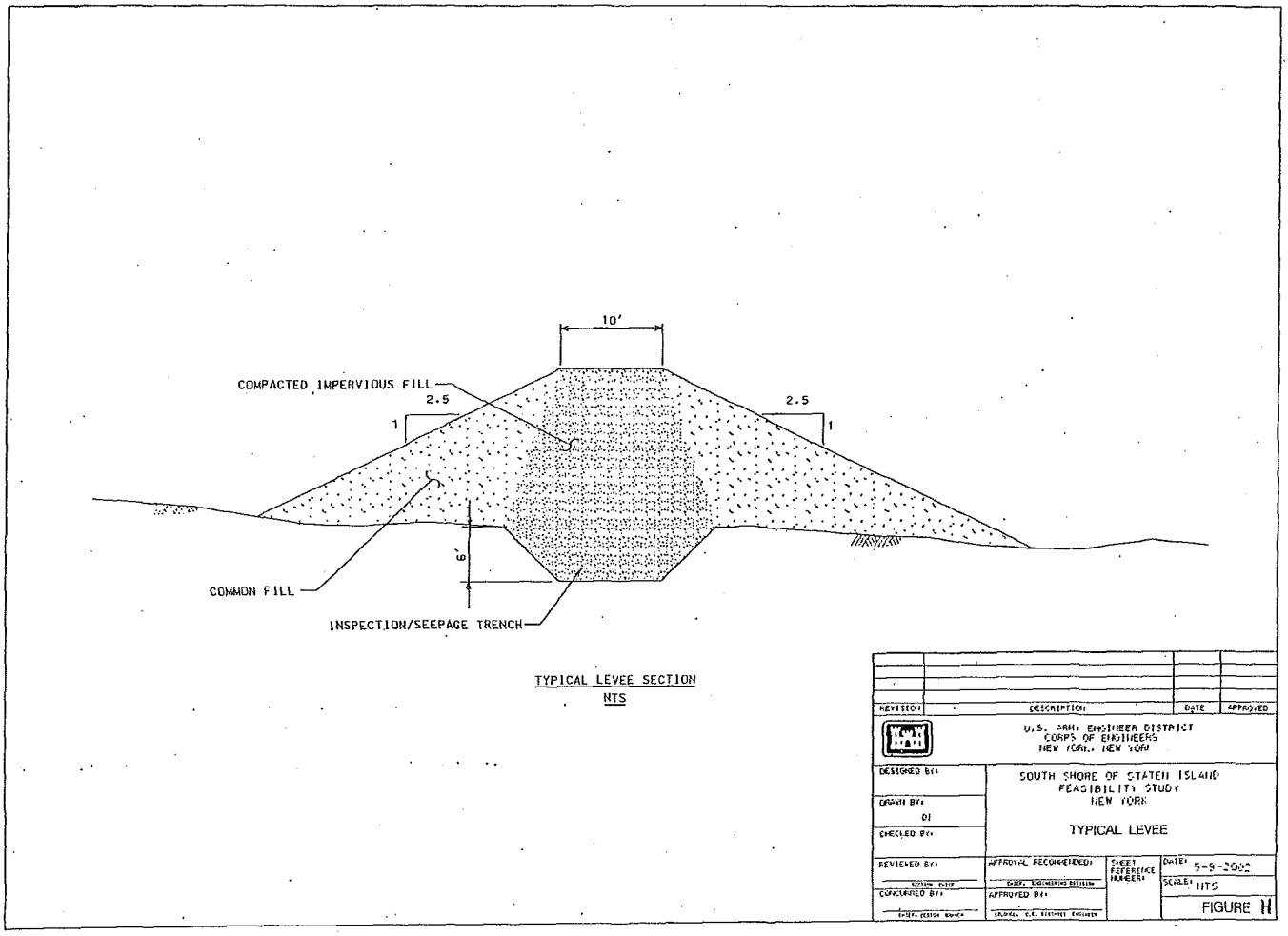
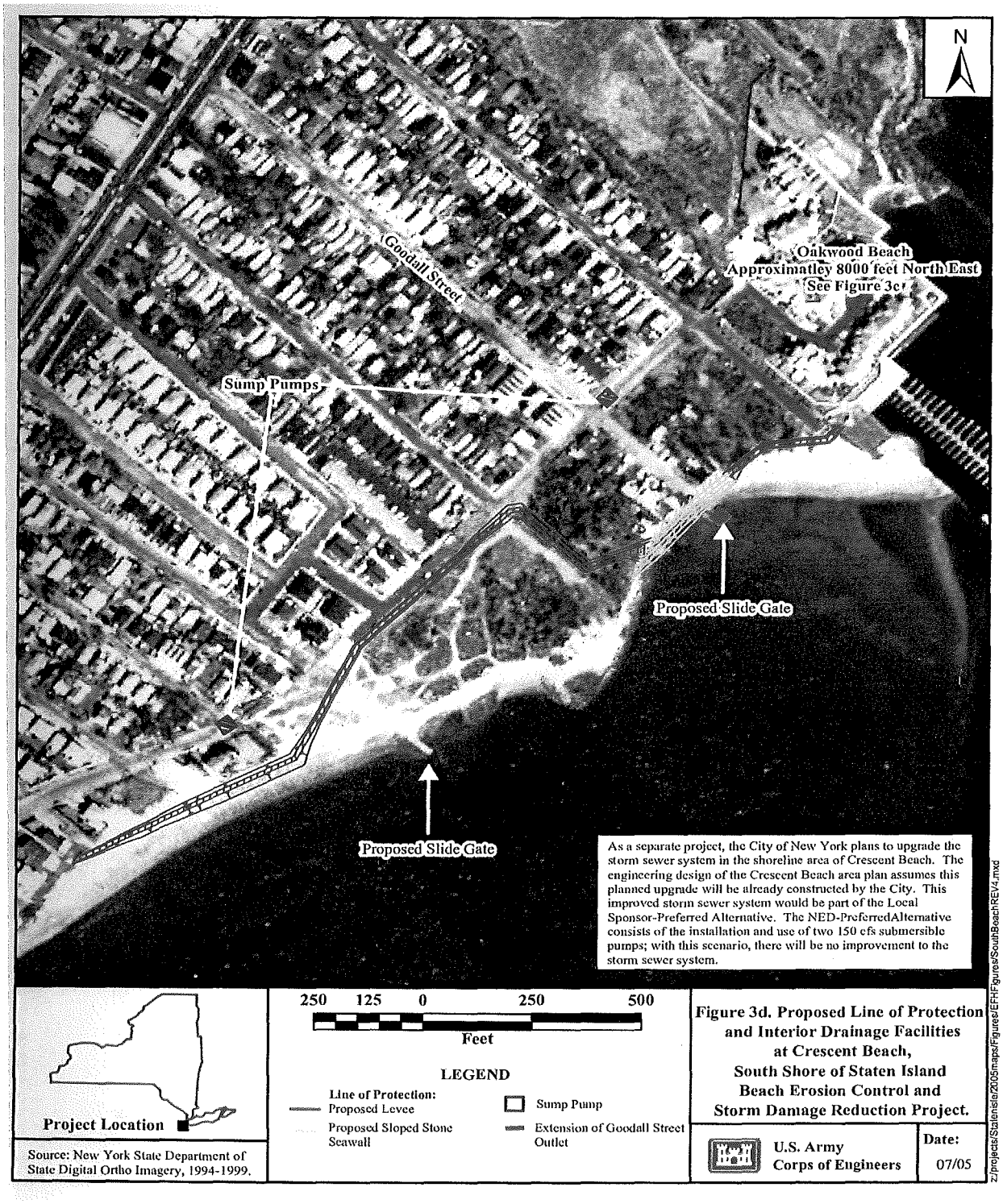


Figure 14: Proposed Line of Protection and Interior Drainage Facilities at Crescent Beach



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 22, 1994

Environmental Assessment Section
Environmental Analysis Branch

Mr. J. Winthrop Aldrich
New York State Office of Parks,
Recreation and Historic Preservation
Historic Preservation Field Services Bureau
Peebles Island, P.O. Box 189
Waterford, NY 12188-0189

Dear Mr. Aldrich,

The U.S. Army Corps of Engineers, New York District (Corps) is conducting a reconnaissance level study for a Section 14 flood control project at Oakwood Beach, Staten Island, Richmond County, New York.

A cultural resource assessment of the study area was undertaken by the Corps. The report is enclosed for your review. Please provide us with any comments you may have on our proposed strategy for archaeological investigations. As project planning proceeds, further cultural resource evaluation and consultation with your office will be undertaken.

If you or your staff require additional information or have any questions, please contact Lynn Rakos, Project Archaeologist, (212)264-4663. Thank you for your assistance.

Sincerely,

Stuart Piken, P.E.
Chief, Planning Division

Enclosure

OFFICE OF PARKS · RECREATION · HISTORIC PRESERVATION
NEW YORK STATE

Joan K. Davidson
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 6, 1994

Stuart Piken, P.E.
Chief, Planning Division
Environmental Analysis Branch
U.S. Army Corps of Engineers
New York District
Jacob K. Javits Federal Building
New York, New York 10278-0090

Attn: Lynn Rakos

Re: CORPS
Oakwood Beach Flood Control
Staten Island, Richmond Co.
94PR2506

Dear Mr. Piken:

Thank you for requesting the comments of the State Historic Preservation Office (SHPO) with regard to the proposed strategy for archeological investigations associated with the above project. We have reviewed the proposal in accordance with Section 106 of the National Historic Preservation Act of 1966 and the relevant implementing regulations.

Based upon our review of *A Cultural Resources Reconnaissance Study, Oakwood Beach, Staten Island, Richmond County, New York*, prepared by Lynn Rakos and dated November 1994, the SHPO concurs with the conclusions and recommendation for subsurface testing at the location of the northern proposed levee only.

If you have any questions or comments on this matter, please contact me at 518/237-8643, ext. 280.

Sincerely,

James Warren

James Warren
Program Analyst
Field Services Bureau

JPW:cm

An Equal Opportunity/Affirmative Action Agency

printed on recycled paper

Attachment 3

OFFICE OF PARKS · RECREATION · HISTORIC PRESERVATION
NEW YORK STATE

~~Jean K. Davidson~~
~~Commissioner~~
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

May 25, 1995

Stuart Piken
Chief, Planning Division
Department of The Army
New York District, Corps of Engineers
Jacob K. Javits Federal Building
New York, NY 10278-0090

Dear Mr. Piken:

Re: CORPS
Oakwood Beach Flood Control
Staten Island
94PR2506

Thank you for requesting the comments of the State Historic Preservation Office (SHPO). We have reviewed the project 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 Cultural Resource Reconnaissance Study. We look forward to receiving the results of the additional investigations when that work is completed.

When responding, please be sure to refer to the SHPO project review (PR) number noted above. If you have any questions, please feel free to call me at (518) 237-8643 ext. 255.

Sincerely,

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

RDK:cm

An Equal Opportunity/Affirmative Action Agency

Printed on recycled paper

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

October 11, 1996

Stuart Piken, P.E.
Dept. of The Army
New York District - Corps of Engineers
Jacob K. Javits Federal Building
New York, NY 10278-0090

Dear Mr. Piken:

RE: CORPS
Oakwood Beach Flood Control Project
Staten Island, Richmond County
94PR2506

Thank you for requesting the comments of the State Historic Preservation Office (SHPO). We have reviewed the project in accordance with Section 106 of the National Historic Preservation Act of 1966.

Based upon this review, it is the SHPO's opinion that your project will have No Effect upon cultural resources eligible for inclusion in the National Register of Historic Places.

If further correspondence is required regarding this project, please be sure to refer to the OPRHP Project Review (PR) number noted above.

Sincerely,

Ruth L. Pierpont

Ruth L. Pierpont
Director, Historic Preservation
Field Services Bureau

RLP:cm

An Equal Opportunity/Affirmative Action Agency
printed on recycled paper

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

September 30, 1996

Environmental Assessment Section
Environmental Analysis Branch

Mr. J. Winthrop Aldrich
New York State Office of Parks,
Recreation and Historic Preservation
Historic Preservation Field Services Bureau
Peebles Island, P.O. Box 189
Waterford, NY 12188-0189

Dear Mr. Aldrich,

The U.S. Army Corps of Engineers, New York District (Corps), is conducting studies at Oakwood Beach, Staten Island, Richmond County, New York in connection with the Oakwood Beach Section 103 Storm Damage Reduction Project, originally initiated under Section 14 authority. Our previous cultural resources study of this area, conducted in 1994, recommended subsurface testing along the northernmost of two proposed levee alignments. The cultural resources report resulting from the 1994 study was forwarded to you by letter dated November 22, 1994 (Attachment 1). The 1994 study was reviewed by your office as project number 94PR2506 (Attachments 2 and 3).

A limited program of subsurface testing was undertaken in August 1995 and prehistoric artifacts were recovered from several of the tests. Further investigations were anticipated, however, the project schedule was delayed due to extensive coordination with New York City planning agencies. During the delay, a private developer constructed several dwellings in the location of the proposed northern levee alignment and on the prehistoric site. As a result, project plans for the proposed northern levee were changed to reflect the presence of the new dwellings in the project area. The new plans, as proposed, call for segments of project area roads to be raised instead of the levee construction. Testing adjacent to the roads indicates that the area is disturbed by road construction. A recently installed sewer

line also impacted the preservation of intact soils in the project area. The attached document (Attachment 4) describes the fieldwork under-taken in 1995 and subsequent cultural resources activities conducted in August 1996.

The southern levee, as proposed, runs through the wetlands fringing the beach. This alignment has not changed. The 1994 study determined that subsurface testing for archaeological deposits was not necessary in this area and your office concurred with this assessment.

It is in the opinion of the Corps that the Oakwood Beach Section 103 Storm Damage Reduction Project will have no effect on any National Register of Historic Places properties or on any properties eligible for the Register if project plans remain as proposed and work is limited to the road rights-of-way. Please provide us with Section 106 comments, pursuant to 36 CFR 800.5.

If you or your staff require additional information or have any questions, please contact Lynn Rakos, Project Archaeologist, at (212)264-4663.

Sincerely,

Stuart Piken

Stuart Piken, P.E.
Chief, Planning Division

Attachments

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

October 11, 1996

Stuart Piken, P.E.
Dept. of The Army
New York District - Corps of Engineers
Jacob K. Javits Federal Building
New York, NY 10278-0090

Dear Mr. Piken:

RE: CORPS
Oakwood Beach Flood Control Project
Staten Island, Richmond County
94PR2506

Thank you for requesting the comments of the State Historic Preservation Office (SHPO). We have reviewed the project in accordance with Section 106 of the National Historic Preservation Act of 1966.

Based upon this review, it is the SHPO's opinion that your project will have No Effect upon cultural resources eligible for inclusion in the National Register of Historic Places.

If further correspondence is required regarding this project, please be sure to refer to the OPRHP Project Review (PR) number noted above.

Sincerely,

Ruth L. Pierpont

Ruth L. Pierpont
Director, Historic Preservation
Field Services Bureau

RLP:cm

An Equal Opportunity/Affirmative Action Agency
printed on recycled paper

THE CITY OF NEW YORK LANDMARKS PRESERVATION COMMISSION
100 Old Slip, New York, NY 10005 (212) 487-6800

ENVIRONMENTAL REVIEW

USACE/106-R — PROJECT NUMBER

10/02/96 — DATE RECEIVED

PROJECT OAKWOOD BEACH SECTION 103: OAKWOOD BEACH STORM DAMAGE RED

[X] No architectural significance

[ ] No archaeological significance

[ ] Designated New York City Landmark or Within Designated Historic District

[ ] Listed on National Register of Historic Places

[ ] Appears to be eligible for National Register Listing and/or New York City Landmark Designation

[X] May be archaeologically significant; ~~requesting additional materials~~ see below

COMMENTS Results from the summary of archaeological investigations (Rakos 1996) are accepted. The Commission concurs with the Corps finding that the project will have no effect on any National Register of Historic Places properties or on any properties eligible for the Register if the proposed project plans remain as proposed and work is limited to the road rights-of-way.

Daniel Pagano — SIGNATURE

10/31/96 — DATE

THE CITY OF NEW YORK LANDMARKS PRESERVATION COMMISSION
100 Old Slip, New York, NY 10005 (212) 487-6800

ENVIRONMENTAL REVIEW

USACE/106-R — 10/02/96
PROJECT NUMBER — DATE RECEIVED

PROJECT OAKWOOD BEACH SECTION 103: OAKWOOD BEACH STORM DAMAGE REDU

[X] No architectural significance

[ ] No archaeological significance

[ ] Designated New York City Landmark or Within Designated Historic District

[ ] Listed on National Register of Historic Places

[ ] Appears to be eligible for National Register Listing and/or New York City Landmark Designation

[X] May be archaeologically significant; requesting additional materials

COMMENTS The archaeological field report and supplemental research (Rakos 1994) is accepted.

Daniel Pagano — 10/31/96
SIGNATURE — DATE

Attachment 3

OFFICE OF PARKS · RECREATION · HISTORIC PRESERVATION
NEW YORK STATE

~~Jean K. Davidson~~
~~Commissioner~~
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

May 25, 1995

Stuart Piken
Chief, Planning Division
Department of The Army
New York District, Corps of Engineers
Jacob K. Javits Federal Building
New York, NY 10278-0090

Dear Mr. Piken:

Re: CORPS
Oakwood Beach Flood Control
Staten Island
94PR2506

Thank you for requesting the comments of the State Historic Preservation Office (SHPO). We have reviewed the project 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 Cultural Resource Reconnaissance Study. We look forward to receiving the results of the additional investigations when that work is completed.

When responding, please be sure to refer to the SHPO project review (PR) number noted above. If you have any questions, please feel free to call me at (518) 237-8643 ext. 255.

Sincerely,

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

RDK:cm

An Equal Opportunity/Affirmative Action Agency

Printed on recycled paper

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

19 July 2005

Environmental Analysis Branch

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
South Shore of Staten Island-Phase I Combined Erosion Control and Storm Damage Protection Feasibility Study
Richmond County, New York

Dear Ms. Pierpont:

The U.S. Army Corps of Engineers, New York District (Corps), is pleased to furnish you with a copy of *South Shore of Staten Island-Phase I Combined Erosion Control and Storm Damage Protection Feasibility Study.* This document will be included in the Feasibility Study that is being prepared for the South Shore of Staten Island Storm Damage Protection Feasibility Report.

In keeping with Section 106 compliance of the Historic Preservation Act of 1966, as amended, please provide any comments and/or concurrence with this report within 30 days of receipt of this letter.

Thank you for your participation in the Section 106 process for this project. If you have any questions, please contact the Project Archaeologist, Kirsten Davis, (212) 264-0248.

Sincerely,

Leonard Houston
Chief, Environmental Analysis Branch

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

July 9, 1997

Stuart Piken
Chief, Planning Division
Environmental Analysis Branch
New York District, Corps of Engineers
Jacob K. Javits Federal Building
New York, NY 10278-0090

Dear Mr. Piken:

Re: CORPS
South Shore Shoreline Protection
Project
Richmond County, NY
97PR1475

Thank you for requesting the comments of the State Historic Preservation Office (SHPO). We have reviewed the "Cultural Resources Reconnaisance Study of the South Shore of Staten Island," 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 study and we look forward to receiving the results of the additional investigations when that work is completed.

Please note that this letter replaces our letter of May 25, 1995, which incorrectly identified the project number and name.

When responding, please be sure to refer to the SHPO project review (PR) number noted above. If you have any questions, please feel free to call me at (518) 237-8643, ext. 264.

Sincerely,

Peter D. Shaver
Historic Preservation
Program Analyst

An Equal Opportunity/Affirmative Action Agency
printed on recycled paper

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

May 15, 1995

REPLY TO
ATTENTION OF

Environmental Analysis Branch
Environmental Assessment Section

Mr. J. Winthrop Aldrich
New York State Office of Parks,
Recreation and Historic Preservation
Historic Preservation Field Services Bureau
Peebles Island, P.O. Box 189
Waterford, NY 12188-0189

Dear Mr. Aldrich,

The U.S. Army Corps of Engineers, New York District (Corps), is studying the feasibility of implementing a shoreline protection project along the south shore of Staten Island, from Fort Wadsworth to Annadale, Richmond County, New York. This work is being undertaken to examine current field conditions and study criteria to determine whether the recommendations of an earlier study remain valid or if other alternatives are necessary. Proposed project plans include levees, beach fill, flood walls and ponding areas.

The cultural resource appendix associated with this study, "A Cultural Resource Reconnaissance Study of the South Shore of Staten Island, Richmond County, New York," has been enclosed for your review. A substantial amount of information for this study was obtained from an earlier Corps survey entitled "Phase I: Cultural Resources Reconnaissance. Beach Erosion Control and Hurricane Protection Project at Staten Island" by Clara Lipson, John Piet, Michael Alterman and Kris Egelhof of the Museum of Archaeology at Staten Island. This earlier work was reviewed by your office in 1978 (letters attached).

Numerous prehistoric sites have been documented along Staten Island's New York Bay shoreline. The New York State Museum has assessed the project area as sensitive with regard to Native American cultural resources. Of particular concern are areas of higher ground above what were once marshes such as in the vicinity of Fort Wadsworth and Oakwood Beach. Subsurface testing is proposed for a portion of high ground at Oakwood Beach for an on-going Corps project that ties into this current study. The cultural resources reconnaissance report for Oakwood Beach was supplied to your office for review in November 1994 (letters attached).

Historically, stretches of the south shore experienced substantial development. Two areas, Oude Dorp and Oakwood Beach, were the sites of 17th and 18th century settlements. South Beach and Midland Beach were lined with seaside amusements and amenities in the late 19th and early 20th centuries. A portion the Miller Airfield at New Dorp Beach is listed on the National Register of Historic Places. A group of turn-of-the-century wooden bungalows in Cedar Grove may form an historic district.

On the basis of current project plans, and pending review by your office, the Corps is of the opinion that the project feasibility phase should include additional historical research coupled with selected subsurface testing to identify archaeological sites and determine their eligibility. Standing historic structures should also be evaluated for significance. Please provide us with any comments you may have on the findings and recommendations of this study.

If you or your staff require additional information or have any questions, please contact Lynn Rakos, Project Archaeologist, (212)264-4663. Thank you for your assistance.

Sincerely,

Stuart Piken

Stuart Piken, P.E.
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 22, 1994

Environmental Assessment Section
Environmental Analysis Branch

Mr. J. Winthrop Aldrich
New York State Office of Parks,
Recreation and Historic Preservation
Historic Preservation Field Services Bureau
Peebles Island, P.O. Box 189
Waterford, NY 12188-0189

Dear Mr. Aldrich,

The U.S. Army Corps of Engineers, New York District (Corps) is conducting a reconnaissance level study for a Section 14 flood control project at Oakwood Beach, Staten Island, Richmond County, New York.

A cultural resource assessment of the study area was undertaken by the Corps. The report is enclosed for your review. Please provide us with any comments you may have on our proposed strategy for archaeological investigations. As project planning proceeds, further cultural resource evaluation and consultation with your office will be undertaken.

If you or your staff require additional information or have any questions, please contact Lynn Rakos, Project Archaeologist, (212)264-4663. Thank you for your assistance.

Sincerely,

Enclosure

Stuart Piken, P.E.
Chief, Planning Division

OFFICE OF PARKS · RECREATION · HISTORIC PRESERVATION
NEW YORK STATE

Joan K. Davidson
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 6, 1994

Stuart Piken, P.E.
Chief, Planning Division
Environmental Analysis Branch
U.S. Army Corps of Engineers
New York District
Jacob K. Javits Federal Building
New York, New York 10278-0090

Attn: Lynn Rakos

Re: CORPS
Oakwood Beach Flood Control
Staten Island, Richmond Co.
94PR2506

Dear Mr. Piken:

Thank you for requesting the comments of the State Historic Preservation Office (SHPO) with regard to the proposed strategy for archeological investigations associated with the above project. We have reviewed the proposal in accordance with Section 106 of the National Historic Preservation Act of 1966 and the relevant implementing regulations.

Based upon our review of *A Cultural Resources Reconnaissance Study, Oakwood Beach, Staten Island, Richmond County, New York*, prepared by Lynn Rakos and dated November 1994, the SHPO concurs with the conclusions and recommendation for subsurface testing at the location of the northern proposed levee only.

If you have any questions or comments on this matter, please contact me at 518/237-8643, ext. 280.

Sincerely,

James Warren

James Warren
Program Analyst
Field Services Bureau

JPW:cm

An Equal Opportunity/Affirmative Action Agency

printed on recycled paper

NEW YORK STATE PARKS & RECREATION Agency Building 1 Empire State Plaza, Albany New York 12238 Information 518 474-3176
Orin Lehman Commissioner

May 10, 1978

Mr. J.A. Weiss
Chief, Engineering Division
Department of the Army
N.Y. District Corps of Engineers
26 Federal Plaza
New York, N.Y. 10007

Dear Mr. Weiss:

Re: Staten Island Beach Erosion
and Hurricane Protection

The State Historic Preservation Officer has reviewed the Cultural Resource Reconnaissance Report for the above referenced project. As outlined in the report, Section I contains three(3) areas of concern. It is recommended that a Stage II investigation be carried out on the Britton Cottage Site if this site is to be impacted. The Lake Tide Mill Site within the Great Kill Park Area and the Oude Dorp Area should be tested to determine extent of disturbance and to locate any buried cultural remains. Within Section 2, it is recommended that the shipwreck and area around the Wolfe's Pond and Farmhouse should have a Stage I investigation. Section 3 contains two areas where a Stage I investigation is recommended. These are The Tottenville Beach Area and the Barron Area.

Should you have any questions regarding these recommendations, please contact Bruce Fullem at 518-474-3176.

Sincerely,

Stephen J. Raiche
Director
Historic Preservation Field
Services

SJR:mr

NEW YORK STATE PARKS & RECREATION Agency Building 1 Empire State Plaza, Albany New York 12238 Information 518 474-0456
Orin Lehman, Commissioner

XXX
3176

May 26, 1978

Mr. J.A. Weiss
Chief, Engineering Division
Dept. of the Army
New York District, Corps of Engineers
26 Federal Plaza
New York, N.Y. 10007

Dear Mr. Weiss:

Re: Beach Erosion and Hurricane Protection Facilities
Fort Wadsworth to Arthur Kill
Staten Island South Shore
Richmond County
Cultural Resource Reconnaissance Report

The State Historic Preservation Officer's staff has reviewed the cultural resources report for the above project which was submitted by you on March 30.

No cultural resources were identified through testing in the Oakwood Beach area. Therefore, the project will have no effect in this location.

The Great Kill Park area contains the site of a Lake Tide Mill. It is not clear whether or not the project will have an effect upon this site.

With regard to the New Dorp Beach area - Britton Cottage; will the project have a direct effect upon this site? If so, the need for further investigation should be discussed.

We recommend that the Corps determine the extent of prior disturbance in the Oude Dorp area. The test borings could probably be used for this purpose.

The effect of the project in the Wolfe's Pond area is not clear. It is recommended that the shipwreck and the area containing Wolfe's Pond and farmhouse be investigated if there will be any effect.

The presence or absence of cultural resources has not been determined in the Tottenville Beach or borrow areas.

Should you have any questions, please contact the project review staff at 518-474-3176.

Sincerely,

F.L. Rath, Jr.
Deputy Commissioner for
Historic Preservation

LRK:mr

Appendix H

General Conformity Analysis

Environmental Analysis Branch
(CENAN-PL-E)

RECORD OF NON-APPLICABILITY (RONA)

Project Name: South Shore of Staten Island (SSSI) Feasibility Study
Reference: Equipment list and schedule provided 9/4/2014*

Project/Action Point of Contact: Catherine Alcoba

Begin Date:

End Date:

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

2. The requirements of this rule do not apply because the total direct and indirect emissions from this project are significantly less than the 100 tons trigger levels for NO_X, VOC, $PM_{2.5}$, or CO for each project year (40CFR§93.153(b)(1) & (2)). The estimated annual NO_X emissions for the project are: 13.8 tons for 2016, 51 tons for 2017, 45.7 tons for 2018, and 20.2 tons 2019. VOC, $PM_{2.5}$, and CO are significantly lower than the NO_X emission estimates as NO_X is the primary mass criteria pollutant from diesel equipment. Total annual emissions by pollutant provided in attachment.

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

_____
Date

_____
Peter Weppler
Chief
Environmental Analysis Branch

Encl

*This conformity analyses is standard across all/any calendar years and dependent upon duration of construction, regardless of year of initiation of construction.

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

$$E = hrs \times LF \times EF$$

Where:

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

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

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

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

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

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

Emission factors have also been sourced from a variety of documents and other sources depending on engine type and pollutant. The NO_x emission factors for marine engines have been developed primarily from EPA documentation for the Category 1 and 2 standards (RIA, "Control of Emission from Marine Engines, November 1999) and are consistent with emission factors used in documenting emissions from the HDP, while the VOC emission factors for marine engines are from the Port Authority of New York and New Jersey's "2010 Multi-Facility Emissions Inventory" which represent the range of marine engines operating in the New Jersey harbor and coastal region in terms of age and regulatory tier level. Nonroad equipment NO_x emission factors have been derived from EPA emission standards and documentation, while the nonroad VOC emission factors have been based on EPA's Diesel Emissions Quantifier (DEQ, accessed at: *www.epa.gov/cleandiesel/quantifier/*), run for moderately old equipment (model year 1995). On-road vehicle emission factors have also been developed from the DEQ, assuming a mixture of Class 8, Class 6, and Class 5 (the smallest covered by the DEQ) on-road trucks.

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

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

USACE - New York District
NAN - Sandy-Related Projects
South Shore of Staten Island (SSSI) Feasibility Study
Equipment Emission Estimates
29 October 2014
DRAFT

Overall Summary

	Total Tons for Project				
Equipment Type	**NO_x**	**VOC**	**SO_x**	**$PM_{2.5}$**	**CO**
Off-road equipment	53.8	1.08	0.03	0.91	6.9
On-road vehicles	76.8	3.69	0.06	3.80	21.8
Totals	**130.7**	**4.77**	**0.08**	**4.70**	**28.7**

Schedule of Construction Activity

Months of Construction Activity

Work Area	Schedule	2016	2017	2018
Oakwood to Miller Field	29 June 2016 through 16 October 2018	6.0	12.0	9.5
Miller Field to Fort Wadsworth	14 December 2016 through 15 October 2019	0.5	12.0	12.0
		6.5	24.0	21.5

General Conformity-applicable emissions per calendar year

	Year of Construction Activity			
Emissions by Year	**2016**	**2017**	**2018**	**2019**
NOx	13.8	51.0	45.7	20.2
VOC	0.50	1.86	1.67	0.74
SO_2	0.01	0.03	0.03	0.01
$PM_{2.5}$	0.50	1.84	1.64	0.73

*This conformity analyses is standard across all/any calendar years and dependent upon duration of construction, regardless of year of initiation of construction.

USACE - New York District
NAN - Sandy-Related Projects
South Shore of Staten Island (SSSI) Feasibility Study
Equipment Emission Estimates
21 October 2014
DRAFT

Description, off-road equipment*	Category	Horsepower (approx.)	Load Factor	Hours	hphrs	grams per hphr* NO_x	VOC	SO_x	$PM_{2.5}$	CO	tons NO_x	VOC	SO_x	$PM_{2.5}$	CO
Air compressor	Compressor	100	0.43	400	17,200	9.5	0.19	0.0050	0.16	1.21	0.180	0.004	0.0001	0.003	0.02
Air compressor	Compressor	100	0.43	745	32,035	9.5	0.19	0.0050	0.16	1.21	0.335	0.007	0.0002	0.006	0.04
Asphalt paver	Other diesel engines	225	0.59	281	37,303	9.5	0.19	0.0050	0.16	1.21	0.391	0.008	0.0002	0.007	0.05
Compactor , vibroplate	Other diesel engines	250	0.59	620	91,450	9.5	0.19	0.0050	0.16	1.21	0.958	0.019	0.0005	0.016	0.12
Compactor roller vibratory	Other diesel engines	250	0.59	353	52,068	9.5	0.19	0.0050	0.16	1.21	0.545	0.011	0.0003	0.009	0.07
Crane , hydraulic, self-propelled, rough terrain	Crane	225	0.43	137	13,255	9.5	0.19	0.0050	0.16	1.21	0.139	0.003	0.0001	0.002	0.02
Crane , hydraulic, self-propelled, yard	Crane	225	0.43	492	47,601	9.5	0.19	0.0050	0.16	1.21	0.498	0.010	0.0003	0.008	0.06
Crane , hydraulic, truck mounted	Crane	225	0.43	408	39,474	9.5	0.19	0.0050	0.16	1.21	0.413	0.008	0.0002	0.007	0.05
Crane , hydraulic, truck mounted	Crane	225	0.43	560	54,180	9.5	0.19	0.0050	0.16	1.21	0.567	0.011	0.0003	0.010	0.07
Crane , hydraulic, truck mounted	Crane	225	0.43	35	3,386	9.5	0.19	0.0050	0.16	1.21	0.035	0.001	0.0000	0.001	0.00
Crane , mechanical, lattice boom, crawler, dragline/clamshell	Crane	225	0.43	2,245	217,204	9.5	0.19	0.0050	0.16	1.21	2.275	0.045	0.0012	0.038	0.29
Crane , mechanical, lattice boom, crawler, dragline/clamshell	Crane	225	0.43	709	68,596	9.5	0.19	0.0050	0.16	1.21	0.718	0.014	0.0004	0.012	0.09
Crane , mechanical, lattice boom, crawler, lifting,	Crane	225	0.43	745	72,079	9.5	0.19	0.0050	0.16	1.21	0.755	0.015	0.0004	0.013	0.10
Cranes , hydraulic, self-propelled, yard	Crane	225	0.43	960	92,880	9.5	0.19	0.0050	0.16	1.21	0.973	0.019	0.0005	0.016	0.12
Generator set, skid mounted	Generator	100	0.43	296	12,728	9.5	0.19	0.0050	0.16	1.21	0.133	0.003	0.0001	0.002	0.02
Grader , motor, articulated	Grader	135	0.59	860	68,499	9.5	0.19	0.0050	0.16	1.21	0.717	0.014	0.0004	0.012	0.09
Hydraulic excavator, crawler	Excavator	250	0.59	458	67,555	9.5	0.19	0.0050	0.16	1.21	0.707	0.014	0.0004	0.012	0.09
Hydraulic excavator, crawler	Excavator	250	0.59	4,828	712,130	9.5	0.19	0.0050	0.16	1.21	7.457	0.149	0.0039	0.126	0.95
Hydraulic excavator, crawler	Excavator	300	0.59	824	145,848	9.5	0.19	0.0050	0.16	1.21	1.527	0.031	0.0008	0.026	0.19
Hydraulic excavator, crawler	Excavator	300	0.59	10,639	1,883,103	9.5	0.19	0.0050	0.16	1.21	19.720	0.394	0.0104	0.332	2.51
Loader , front end, crawler	Skid Steer Loader	175	0.21	43	1,580	9.5	0.19	0.0050	0.16	1.21	0.017	0.000	0.0000	0.000	0.00
Loader , front end, crawler	Skid Steer Loader	175	0.21	13	478	9.5	0.19	0.0050	0.16	1.21	0.005	0.000	0.0000	0.000	0.00
Loader , front end, wheel, articulated	Rubber tired loader	110	0.59	210	13,629	9.5	0.19	0.0050	0.16	1.21	0.143	0.003	0.0001	0.002	0.02
Loader , front end, wheel, articulated	Rubber tired loader	110	0.59	34	2,207	9.5	0.19	0.0050	0.16	1.21	0.023	0.000	0.0000	0.000	0.00
Loader , front end, wheel, articulated	Rubber tired loader	175	0.59	93	9,602	9.5	0.19	0.0050	0.16	1.21	0.101	0.002	0.0001	0.002	0.01
Loader , front end, wheel, articulated	Rubber tired loader	175	0.59	633	65,357	9.5	0.19	0.0050	0.16	1.21	0.684	0.014	0.0004	0.012	0.09
Loader/backhoe , wheel	Rubber tired loader	110	0.59	2,989	193,986	9.5	0.19	0.0050	0.16	1.21	2.031	0.041	0.0011	0.034	0.26
Loader/backhoe , wheel	Rubber tired loader	135	0.59	11	876	9.5	0.19	0.0050	0.16	1.21	0.009	0.000	0.0000	0.000	0.00
Pile hammer, double acting, diesel	Other diesel engines	100	0.59	709	41,831	9.5	0.19	0.0050	0.16	1.21	0.438	0.009	0.0002	0.007	0.06
Pile hammer, driver/extractor, vibratory	Other diesel engines	100	0.59	2,245	132,455	9.5	0.19	0.0050	0.16	1.21	1.387	0.028	0.0007	0.023	0.18
Pile hammer, single acting, pnuematic (steam/air)	Other diesel engines	100	0.59	745	43,955	9.5	0.19	0.0050	0.16	1.21	0.460	0.009	0.0002	0.008	0.06
Roller , static, self-propelled, pneumatic	Other diesel engines	150	0.59	281	24,869	9.5	0.19	0.0050	0.16	1.21	0.260	0.005	0.0001	0.004	0.03
Roller , static, self-propelled, pneumatic	Other diesel engines	150	0.59	860	76,110	9.5	0.19	0.0050	0.16	1.21	0.797	0.016	0.0004	0.013	0.10
Roller , vibratory, self-propelled, double drum, padded drum	Other diesel engines	100	0.59	984	58,056	9.5	0.19	0.0050	0.16	1.21	0.608	0.012	0.0003	0.010	0.08
Roller , vibratory, self-propelled, double drum, smooth	Other diesel engines	100	0.59	1,681	99,179	9.5	0.19	0.0050	0.16	1.21	1.039	0.021	0.0005	0.017	0.13
Roller , vibratory, self-propelled, double drum, smooth	Other diesel engines	100	0.59	80	4,720	9.5	0.19	0.0050	0.16	1.21	0.049	0.001	0.0000	0.001	0.01
Roller , vibratory, towed, single drum, sheepsfoot	Other diesel engines	250	0.59	706	104,135	9.5	0.19	0.0050	0.16	1.21	1.091	0.022	0.0006	0.018	0.14
Scraper , tandem powered, standard loading	Other diesel engines	100	0.59	393	23,187	9.5	0.19	0.0050	0.16	1.21	0.243	0.005	0.0001	0.004	0.03
Tractor , agricultural, wheel	Other diesel engines	56	0.59	360	11,894	9.5	0.19	0.0050	0.16	1.21	0.125	0.002	0.0001	0.002	0.02
Tractor , crawler (dozer)	Crawler tractor	75	0.59	208	9,204	9.5	0.19	0.0050	0.16	1.21	0.096	0.002	0.0001	0.002	0.01
Tractor , crawler (dozer)	Crawler tractor	100	0.59	372	21,948	9.5	0.19	0.0050	0.16	1.21	0.230	0.005	0.0001	0.004	0.03
Tractor , crawler (dozer)	Crawler tractor	135	0.59	8	637	9.5	0.19	0.0050	0.16	1.21	0.007	0.000	0.0000	0.000	0.00
Tractor , crawler (dozer)	Crawler tractor	250	0.59	961	141,748	9.5	0.19	0.0050	0.16	1.21	1.484	0.030	0.0008	0.025	0.19
Tractor , crawler (dozer)	Crawler tractor	300	0.59	178	31,506	9.5	0.19	0.0050	0.16	1.21	0.330	0.007	0.0002	0.006	0.04
Tractor , crawler (dozer)	Crawler tractor	440	0.59	596	154,722	9.5	0.19	0.0050	0.16	1.21	1.620	0.032	0.0009	0.027	0.21
Trencher , chain type cutter	Other diesel engines	50	0.59	497	14,662	9.5	0.19	0.0050	0.16	1.21	0.154	0.003	0.0001	0.003	0.02
Truck , water, off-highway	Other diesel engines	250	0.59	860	126,850	9.5	0.19	0.0050	0.16	1.21	1.328	0.027	0.0007	0.022	0.17
Welder , engine driven, diesel	Other diesel engines	35	0.59	193	3,985	9.5	0.19	0.0050	0.16	1.21	0.042	0.001	0.0000	0.001	0.01
Totals					**5,141,940**						**53.85**	**1.08**	**0.03**	**0.91**	**6.86**

* Emission factors consistent with NAN ABU emission estimates and documented with that work.

Description, on-road vehicles*	Category	Hours	Miles	grams per mile** NO_x	VOC	SO_x	$PM_{2.5}$	CO	tons NO_x	VOC	SO_x	$PM_{2.5}$	CO
Dump truck, highway, 35,000 lbs	Class 6 diesel truck	747	26,145	20.6	1.2	0.017	1.1	6.3	0.594	0.033	0.0005	0.031	0.18
Dump truck, highway, 75,000 lbs	Class 8 diesel truck	13,202	462,070	29.7	1.0	0.017	1.3	7.3	15.125	0.516	0.0087	0.685	3.72
Truck , highway, 25,000 lbs	Class 6 diesel truck	510	17,850	20.6	1.2	0.017	1.1	6.3	0.405	0.023	0.0003	0.021	0.12
Truck , highway, 45,000 lbs	Class 6 diesel truck	46,407	1,624,245	20.6	1.2	0.017	1.1	6.3	36.896	2.064	0.0304	1.909	11.28
Truck , highway, 45,000 lbs	Class 6 diesel truck	1,393	48,755	20.6	1.2	0.017	1.1	6.3	1.108	0.062	0.0009	0.057	0.34
Truck , highway, 50,000 lbs	Class 8 diesel truck	11,024	385,840	29.7	1.0	0.017	1.3	7.3	12.629	0.431	0.0072	0.572	3.10
Truck , highway, conventional, 8,800 lbs	Class 6 diesel truck	12,685	443,975	20.6	1.2	0.017	1.1	6.3	10.085	0.564	0.0083	0.522	3.08
Totals		**85,968**	**3,008,880**						**76.84**	**3.69**	**0.06**	**3.80**	**21.83**

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

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

** Emission factors estimated from EPA's Diesel Emission Quantifier.
While not valid for SIP work, provides close approximation for these project-level estimates.
Based on 1995 model year vehicles in CY 2015 to provide conservatively high emission estimates.
The exception is SOx EFs which are taken from the PANYNJ 2012 emissions inventory report for heavy-duty diesel vehicles

Land-side Equipment Types	Load Factor
Backhoe	21%
Booster pump	43%
Compactor	43%
Compressor	43%
Concrete saw	59%
Conveyor	43%
Crane	43%
Crawler tractor	59%
Dozer	59%
Drilling rig	43%
Excavator	59%
Forklift	59%
Generator	43%
Grader	59%
Light plants	43%
Off-road truck	59%
Other diesel engines	59%
Pump	43%
Rubber tired loader	59%
Screen	43%
Skid Steer Loader	21%
Winch	43%

Appendix I

Comments and Responses on the Draft EIS

TABLE OF CONTENTS

Section Page

I.1 INTRODUCTION I-1
I.1.1 Public Comment Period and Public Information Meetings I-1
I.1.2 Summary of Coordination I-1
I.1.3 Public Views and Comments I-1
I.1.4 Organization of this Comment Response Document I-2

I.2 COMMENT PERIOD COMMENTS AND RESPONSES I-3

I.3 OTHER COMMENTS AND RESPONSES I-70

LIST OF TABLES

Table Page

Table I-1. Comments from Organizations I-2
Table I-2. Comments from Individuals I-3

I.1 INTRODUCTION

This Comment Response Document (CRD) provides an overview of the public comment process for USACE's South Shore of Staten Island Coastal Storm Risk Management Project Environmental Impact Statement (EIS). This Section presents introductory material, including the public comment period and the public information meetings (Section I.1.1). Sections I.1.2 and I.1.3, respectively, provide an overview of coordination efforts related to the draft EIS and a summary of the public views and comments. Section I.1.4 describes the organization of this CRD and how to use it. Section I.2 presents the specific comments that were received on the Draft EIS and USACE's responses. Lastly, Section I.3 provides other comments and responses that were received prior to the public comment process, as well as internal USACE comments and responses.

I.1.1 Public Comment Period and Public Information Meetings

USACE published the Draft EIS on June 16, 2015, which initiated a 45-day public comment period on the Draft EIS that was scheduled to end on August 10, 2015. USACE extended the comment period until September 9, 2015. USACE requested public comments via mail, e-mail, and facsimile. Section I.2 contains all of the comments received, as well as USACE's responses.

During the comment period, two public information meetings were held at the Staten Island University Hospital, McGinn Center on August 19-20, 2015, to provide information to the public about the Project. The public meetings used a format that included an informal open house to allow two-way interaction between USACE representatives and the public. After the open house, USACE presented an overview of the Project and the Draft EIS.

I.1.2 Summary of Coordination

During this EIS process, USACE has coordinated closely with other Federal, State, and local agencies, and the public. In addition to the public information meetings described in Section I.1.1, USACE has met with Federal, State, and local agencies on many occasions. These meetings have provided the parties an opportunity to better understand the Project, discuss issues of interest, and develop proposed improvements to the Project. The description of the proposed NED Plan in Section 2.5 of this EIS is reflective of these coordination efforts. In addition, Chapter 4 of this EIS contains many specific commitments made by USACE as a result of these coordination meetings. For example, Section 4.3.2 includes a discussion of the USFWS-recommended conservation measures which USACE has committed to incorporate into the NED Plan related to the function of the wetlands. Details related to the correspondence between the USACE and Federal, State, and local agencies can be found in Appendix G [Project Correspondence]). The specific agency comments related to the Draft EIS, and USACE’s responses, are contained in Section I.2 of this appendix.

I.1.3 Public Views and Comments

As described in Section I.1.1, the public was provided a 75-day period in which to provide comments on the Draft EIS. The specific public comments related to the Draft EIS, and USACE’s

responses, are contained in Section I.2 of this appendix. A summary of the public views and comments is as follows:

- Commenters expressed support for the Project;
- Commenters advocated that even greater protection measures be proposed;
- Commenters stated that the Project should be implemented more quickly;
- Commenters requested more details related to the Project, including additional Project renderings and more details on the location of the LOP and interior drainage areas;
- Commenters requested an extension of the comment period and additional public meetings in which formal comments could be stated and officially recorded;
- Commenters requested additional information and details regarding the potential impacts of the Project on wetlands, trees, recreation, and businesses.

I.1.4 Organization of this Comment Response Document

This CRD is organized into the following sections:

- Section I.1 includes a description of the public comment process, the public information meetings, the organization of this document, and the use of this document.
- Section I.2 contains the comments USACE received during the public comment period.

Table I-1 lists organizations that submitted comments on the Draft EIS, while Table I-2 lists individuals who submitted comments. The tables show the page number on which each organization/individual's comments begins, along with USACE's responses.

Table I-1. Comments from Organizations

Organization (listed alphabetically)	Page
Natural Resources Protective Association	I-4
New York City Agencies	I-9
The Nature Conservancy	I-18
United States Department of Commerce, National Oceanic and Atmospheric Administration and National Marine Fisheries Service	I-23
United States Department of Interior	I-24
United States Environmental Protection Agency	I-28

Table I-2. Comments from Individuals

Individual (listed alphabetically by last name)	Page
Joanne Amore	I-36
Alan Benimoff, PhD	I-36, I-46
Linda Cohen	I-45
Robert DeBiase	I-47
Debra A. Derrico, District Manager, Community Board 2, Staten Island	I-45
Giovanna Fabozzi	I-36
Linda Farina	I-49
Catherine G.	I-38
Joseph Herrnkind	I-40
William Hussin	I-45
James Jacobi	I-39
William Johnson	I-39
Kate Kamish	I-37
Connie Kelly	I-36
Michael Krugolets	I-38
Louise Lessard	I-36, I-43, I-45, I-48
Geraldine Mackey	I-45
Assemblywoman Nicole Malliotakis	I-45
Paul Marrone for Assemblywoman Nicole Malliotakis	I-41
Steven Matteo, Minority Leader Council Member 50th District	I-40
James O'Brien	I-40, I-43
James S. Oddo, Staten Island Borough President	I-40
Eileen Pepel	I-39
Merylie Peters	I-41
Dr. Stevan Peters	I-41
J.C. Rooney	I-50
John Rooney	I-36, I-38, I-39, I-41, I-42, I-44, I-47
Patrick Ryan for Rep. Daniel M. Donovan, Jr.	I-39
Mark E. and Giuseppa (Cirmi) Ruquet	I-48
Caitlin Saunders	I-49
James Scarcella	I-36, I-37, I-38, I-44
Rachel Shapiro, Staten Island Advance Political Reporter	I-41
Chris Tierno	I-40
Joanna Tierno	I-40
Mark Tranchina	I-47
Barbara Tromer	I-45
Dee Vandenburg	I-48

I.2 PUBLIC COMMENT PERIOD COMMENTS AND RESPONSES

All comments received during the public comment period, along with responses to those comments, are presented in this section.

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

February 29, 2016

Planning Division

Mr. James Scarcella
Natural Resources Protective Association
PO Box 050328,
Staten Island, New York 10305

Dear Mr. Scarcella:

Thank you for your review and providing comments on the Draft Feasibility Report and Environmental Impact Statement ("DEIS") for the South Shore of Staten Island Coastal Storm Risk Management project that was posted for public review in June 2015. Please find the U.S. Army Corps of Engineers New York District's responses to your August 19, comments attached.

The New York District appreciates your organization's interest regarding the proposed project. Should you require any additional information, please contact Ms. Catherine Alcoba of my staff at (917) 790-8216 or myself at (917) 790-8634.

Sincerely,

WEPPLER.PETER.M.1228647353

Digitally signed by WEPPLER.PETER.M.1228647353
DN: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=USA, cn=WEPPLER.PETER.M.1228647353
Date: 2016.02.29 11:16:51 -05'00'

Peter Weppler
Chief, Environmental Analysis Branch

Enclosure

We urge the Corps, along with additional Federal, State, and local authorities, to request that all property and parcels in the affected area, be returned to its natural drainage flood plain. Is there funding in the Plan for buyouts?

The current plan does not include buyouts of developed parcels, but does include acquisition of easements to prevent development of low lying open space necessary to store stormwater runoff. The plan builds on buyouts funded under other Federal, State and Local programs.

We are also very grateful and concerned about the pumps. They are very necessary. Who will provide long term maintenance? Need the long term Legal agreement with DEP. In addition, a legal agreement is needed with NYC Parks Dept about long term use of Parks property for the LOP.

> *There are no pumps associated with the proposed plan, instead open storage is utilized as part of the interior drainage plan. Once construction is complete, the project is turned over to the local sponsor (New York State Department of Environmental Conservation [NYSDEC] who is then responsible for all operations and maintenance (O&M) activities. The local sponsor may delegate these responsibilities to the local partner (New York City).*

USACE will sign a Project Partnership agreement with NYSDEC. NYSDEC will then sign legal agreements with NYC agencies.

The DEIS needs additional information as follows:

> Biology: New Creek: Please note the Three Spine Stickleback and Golden Shiners are in the waters of the creek/Bluebelt ecosystem
>
> Birds: in the Project area, it's documented that Red Tailed Hawks and Turkey Vultures reside and forage here, and there are non-native parrots that escaped years ago from transport at JFK airport
>
> Smaller birds in the area seasonally include Juncos, northern flicker, red headed woodpecker, goldfinch, house finch. Tree swallows and sparrows forage on the existing dunes at Miller Field and Midland Beach.
>
> Finfish in addition to the species mentioned in the DEIS, you should be aware that we have Atlantic Needlefish, pilotfish, Hickory Shad, mullet, alewife, atlantic croaker, spot, and more in our near shore estuary waters.
>
> Crustaceans: please include the Calico (Lady) Crab, and the reclusive Spider Crab in the species to be affected by the proposed Project.

Invertebrate: please be especially careful with the beach sand at Ft Wadsworth. It contains the mole crabs and the sand shrimp, rare on the beaches of Staten Island.

Thank you for your comments and have been acknowledged. Best management Practices (BMPs) will be used during construction to avoid and minimize disturbance to species.

Question, where is ACOE going to get the Sand for the constructed Line of Protection? The beach will be reduced as a result of the Project. When and how will the beach be replenished? Where will the funding for replenishment come from? Question, will the Corps continue to allow removal of sand for construction purposes from the Lower Bay? Removal of sand allows for greater wave height and more damage.

Sand that is excavated to build (footer depth) the LOP will be reused by placing on the slopes of the buried seawall. The slopes will then be planted with native vegetation. The beach will not be reduced. The proposed plan does not include removal of sand from the beach or from the Lower Bay for this project. Further, taking into account sea level change (including accelerated sea level rise) and erosion rates, no replenishment, because of the project, will be required.

There are numerous species of Amphibians in the project area: spring peeper frogs, bullfrogs, garter snakes.

Noted. Best management Practices (BMPs) will be used during construction to avoid and minimize disturbance to species.

Miller Field - we can understand the removal of a dilapidated Airplane Hangar to build the LOP Line of Protection, but we are not pleased that the plan calls for the demolition of the airfield transport control tower. If possible Please leave the Tower intact. Also, please note that the Hanger staging areas north of the hangers have settlement ponding and vegetation, and are a forage for wading birds and seabirds

The seaplane hangar (Hangar 38) is part of the National Register of Historic Places (NRHP) Miller Army Air Field historic district. The NRHP boundary does not presently include the WWII fire tower. A determination of the tower's individual eligibility or eligibility as a contributing element of the historic district has not yet been made. NRHP listing does not provide protection for a resource. However, Section 106 of the National Historic Preservation Act requires that a federal agency take into account impacts of an undertaking on NRHP-listed or eligible resources and provides the Advisory Council on Historic Preservation (ACHP) an opportunity to comment. As part of Section 106 consultation, the New York State Historic Preservation Office (SHPO) must also be consulted. The USACE has consulted with the ACHP, New York SHPO, the National Park Service and other interested parties. The fire tower will be addressed through

the Programmatic Agreement that was prepared for the project and included in the Draft EIS.

Additionally, the plan will propose restoring the settlement ponding and vegetation north of the hangars as a biological offset at Miller Field. The Final Report and EIS will include this information and is being coordinated with the National Park Service.

We are very grateful that the plan seeks to create 46 acres of tidal wetlands. This is extremely important to the success of the coastline protection plan. However, we are concerned with the pending loss of 10 acres of freshwater wetlands, we respectfully request that loss of freshwater wetlands be minimized. We need mitigation for the loss of FW wetlands.

As you noted, the proposed project's Tidal Wetland feature will include the construction of 46 acres of a mosaic of habitats (approximately 12.9 acres low marsh, 6 acres high marsh, 6.9 acres shrub, 3.2 acres maritime forest and 17 acres of dune grass). The 18.9 acres of wetland that are part of this constructed project feature (12.9 acres low marsh + 6 acres high marsh) is greater than the existing 16.5 acres of functionally degraded wetlands.

Additionally, Section 4.3.2 of the EIS has been updated to clarify wetland impacts associated with the construction of the Line of Protection (LOP), the interior drainage and the Tidal Wetland (Mosaic of Habitat) features. As you noted, this does include the loss of 10.89 acres from construction of the LOP. The proposed project also includes the improvement of 117.25 acres of wetland for the combined interior drainage features and the improvement of 16.5 acres associated with the Tidal Wetland Complex via the removal of invasive species followed by seeding/planting of native species post excavation. The conversion of 11.3 acres of upland to wetland associated with the interior drainage project features (specifically areas B, C & E where excavation will take place) has also been considered. The following table will be included in EIS Section 4.3.2 to assist in this clarification:

	Acres of Wetland Impact (excavation or fill in wetlands)	*Acres of Upland Impact*
Interior Drainage		
Area B (39.31 acres excavated)	*38.73*	*0.68*
Area C (54.79 acres excavated)	*46.03*	*8.77*
Area E (34.34 acres excavated)	*32.49*	*1.85*
Interior Drainage subtotal	*117.25*	*11.3*
Line of Protection (LOP)	*10.89*	*40.20*
Tidal Wetland (46 acre Mosaic of Habitat)	*16.5*	*3.6 (upland shrub/scrub)*
Total Impact	*144.64*	*55. 1*

As part of the demolition for the construction of the LOP, trees will be lost. The DEIS needs to state exactly how many trees will be lost, and how and when the Trees will be replaced.

The proposed plan is at the feasibility phase of the project and a more complete design will be developed during Planning Engineering and Design (PED) phase. USACE coordination with New York City Department Parks and Recreation Tree Preservation and Restitution Program is ongoing. USACE will complete a tree survey during the PED phase of work and will coordinate impacts of construction (including number and type of trees lost) and tree restitution with NYC Parks Arborist.

Projects of this magnitude frequently have fifteen percent cost overuns due to unanticipated factors. Where and how will the contingency funds materialize?

A contingency was applied to the project costs and certified, accordingly. Therefore, contingency funds are included in the project costs and will be cost shared by the Federal Government and the non-Federal sponsor.

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

February 29, 2016

Planning Division

Ms. Esther Brunner
New York City Mayor's Office of Sustainability
253 Broadway – 7th Floor
New York, New York 10007

Dear Ms. Brunner:

Thank you for your comments on the U.S. Army Corps of Engineers (USACE) *Draft Environmental Impact Statement* (DEIS) and *Draft South Shore of Staten Island Coastal Storm Risk Management Feasibility Report* (Draft Report) for South Shore of Staten Island Coastal Storm Risk Management Project. In the attachment, please find USACE's responses to the City's January 22 and 29, 2016 comments regarding the USACE's January 5, 2016 responses to the City's September 9, 2015 comments.

USACE appreciates the City of New York's continued support regarding the proposed project. Should you require any additional information, please contact Ms. Catherine Alcoba of my staff at (917) 790-8216 or myself at (917) 790-8634.

Sincerely,

WEPPLER.PETER.M.1228647353

Digitally signed by WEPPLER.PETER.M.1228647353
DN: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=USA, cn=WEPPLER.PETER.M.1228647353
Date: 2016.02.29 11:11:56 -05'00'

Peter Weppler
Chief, Environmental Analysis Branch

Enclosure

New York City Department of Transportation

1. The proposed grade and elevation changes will require changing the legal grade of the mapped streets, which is a ULURP action. DOT understands that the USACE is at 15 percent design and has not yet identified exact grade changes. DOT looks forward to coordinating with the State and USACE to secure the necessary grade changes once the information becomes available and requests notification when USACE has the necessary information.

   USACE will provide all required information regarding the proposed grade and elevation changes for the ULURP action, during the design phase of this project that will be conducted upon study approval.

2. If any portion of the proposed levee's footprint is located on DOT's mapped right-of- way, then right-of-way needs to be demapped. Accordingly, street demapping should be added to the list of ULURP actions in the FEIS (see proposed language in the Department of Parks and Recreation comment 3 below).

   In accordance with the existing design, no portion of the proposed levee footprint is located on DOT's mapped right-of-way. However, during the design phase of this project, site specific surveys will be conducted to determine the exact location of the levee footprint. If any of the levee footprint is to be located on DOT's mapped right-of-way, USACE will notify DOT immediately to coordinate and provide the appropriate documentation for the required ULURP action.

New York City Department of Parks and Recreation

3. USACE Response to Comment 1.2 (p.2) – Please make the following edits:

- A Site Selection and Acquisition for ~~two~~ twenty-three lots (twenty-two full lots and p/o one lot) ~~under the jurisdiction of the New York City Department of Parks and Recreation.~~ Jurisdiction of specific lots to be determined at a later date.
- A Disposition of the levee, ~~and~~ drainage, restrictive, pipeline, road, wetlands, and temporary construction areas for easements to the USACE.
- City Map change for demapping of streets.

Acknowledged.

4. Real Estate Plan (p.21) - The parcel list was outdated on the Draft Main Report (published June 12, 2015), and needs to be updated to reflect the current situation:

a. The following parcels on the parcel list should be eliminated as they are no longer

considered for the project:

- Block 4772, Lot 1 (Traub property)
- Block 4722, Lot 1
- Block 4793, Lots 50, 53, 54, 55, 57, 58, 59, 62, 64, 67, 68, 80, 88, 92, 94, 96, 98, 100 (no longer needed for temporary construction)

b. The following lots should be added to an updated list:

- Lots needed for Wetlands easement (once final list is complete)
- Block 4792, Lots 58, 61, 63, 66, 68, 69, 71, 72, 73, 76, 78, 82, 83, 84, 90, 92, 93

Please note that the parcel list is current as to develop the real estate costs for the study document. The parcel list is dynamic and therefore had to be stabilized for report purposes. The Real Estate Plan and the parcel list will be updated during the design phase of the project as additions or deletions to the list may still be required. However, those parcels listed will be reviewed and if required to be eliminated for the project will be removed.

5. New Comment: The latest language and requirements for easements and estates should be included in the revised Report. For example, in the last month, NYC Parks has come to understand that the USACE's proposed constructed tidal wetland seaward of the LOP at Oakwood Beach will require an easement. The revised report should reflect this with appropriate language and detail.

All required easements and parcel information will be provided in the real estate plan. The Tidal wetland and ponding easements are "non-standard" easements that require the approval of HQUSACE for use in the project. Easement language approval is an on-going process within USACE and is not required to be finalized and approved for the final report submittal. However, if it is available to be included in the final report, the District will ensure that the language is provided. Please note that waiting for approval of the "non-standard estate" easement language so that it may be included in the report will unnecessarily delay study approval. It should also be noted that execution of the PPA is contingent upon finalizing the estate language. Therefore, it provides the City will review authority prior to PPA execution and commitment to acquiring easements for construction.

6. USACE Response to Comment 58 (p.17)

a. To clarify, please confirm that the USACE will consider future project adaptation if beaches naturally erode to a minimum width of 75-feet?

Confirmed. Adaptation of the project will be considered if it is determined that the beach width seaward of the line of protection erodes greater than the

minimum beach width of 75 feet that is required for the project to function as designed.

b. NYC Parks advises that one location that may be at risk to not maintaining the minimum 75-foot beach width throughout the life of the USACE project is the 'pinch point' at New Dorp Beach adjacent to Miller Field (south-eastern end of New Dorp Lane).

Noted

c. What (city, state, federal) agency would identify the need for and initiate the referenced "decision document"? Who would be responsible for evaluating and recording changed meteorological [presumed correction from "metrological"] and oceanographic conditions? What discussion and decision procedures would be followed to determine whether a "project adaptation" would be approved? Who would pay for any agreed upon project adaptation?

The identification of any adaptation requirements that would result in the initiation of a decision document would be conducted jointly with the City, State and USACE. This identification would be conducted as the result of regularly scheduled Operation and Maintenance tasks that are to be conducted in accordance with the Operation, Maintenance, Repair, Replacement and Rehabilitation (OMRR&R) manual that will be prepared by USACE in coordination with the State and the City. The manual will be prepared to include surveys and inspections that will provide the data necessary to make the determination if adaptation is required in response to accelerated sea level rise. The non-federal sponsor would submit the request to initiate a post-authorization study to the District. The post-authorization study would be initiated based on the results of the Operations and Maintenance data, receipt of appropriation funds and the execution of cost-sharing agreement with the non-federal sponsor. The post-authorization study would be cost-shared 65% federal and 35% non-federal.

d. Draft Main Report pg.9-6 (para.367) states that the sand cover on the buried seawall will "help supply sediment to the beach" through erosion. Such erosion, however, would require the non-federal project partner to replenish the sand cover of the buried seawall, and therefore does not address any needed sand replenishment.

- New Comment: Please ensure that cost, timeline, minimum standard, and responsibility of replenishment of sand cover of the buried seawall are accounted for in the emerging maintenance plan.

The sand cover on the buried seawall will be required to be maintained by the non-federal sponsor/partner is accordance with the OMRR&R manual that will

be prepared by USACE in coordination with the State and the City. The estimated O&M Costs for sand cover maintenance are included in the Feasibility Report.

7. USACE Response to Comment 61 (p.18) – Reiterating our comment, NYC Parks asks the USACE to work with NYC Parks to explore opportunities to accommodate a bicycle pathway seaward of the proposed floodwall at Oakwood Beach. This is not a functional replacement, and NYC Parks understands the non-federal responsibility associated with such measures. We ask the USACE to work with NYC Parks to consider the feasibility of such an amenity as their design and specification proceed.

   Acknowledged. USACE will coordinate the project design with the State and the City during the design phase regarding a bicycle pathway seaward of the proposed floodwall at Oakwood Beach.

8. USACE Response to Comment 62 (p.18) – The service vehicle access road is not an existing feature, and therefore will not be accounted for in the USACE's functional replacement of relocated features. Instead, NYC Parks reiterates our request to work with the USACE to address maintenance, access, and recreational needs and opportunities associated with the service vehicle access road.

   Acknowledged. The service vehicle access road will be designed in cooperation with the State and City during the design phase of this project.

9. USACE Response to Comment 63 (p.19) – NYC Parks asks to work closely with the USACE during PED to ensure that designs to address localized flood drainage are adequate and feasible from the maintenance and recreational perspective of NYC Parks.

   Acknowledged. USACE will coordinate with the State and NYC during the design (PED) phase with the intent of achieving designs that address interior flood drainage and are adequate and feasible from the maintenance and recreational perspective of NYC Parks and must be in accordance with USACE guidelines and design requirements, accordingly.

10. USACE Response to Comment 67 (p.20):

a. It remains unclear whether pond excavation can be designed to meet storage volume requirements without impacting high value ecological communities. Due to sensitive elevation requirements of existing habitats on the one hand, and needed excavation depth on the other hand, it remains unclear that existing islands of wetland and upland native habitat can be protected or restored on site. NYC asks to work with the USACE during the PED design and specification phase to ensure grading plans are designed to maximize opportunities for the protection of existing habitat.

USACE acknowledges elevation requirements for environmental habitats are sensitive and therefore concur that coordination with the State and City will be conducted to ensure the minimum impact to ecological communities. Coordination will ensure that the appropriate grading plans are designed to maximize opportunities for the protection of existing habitat while maintaining the storage requirements for the project.

b. Please clarify what "target stage vs. storage relationships" means. This will help NYC Parks understand the habitat preservation approach the USACE is proposing here.

The interior drainage alternatives analysis identified an economic optimized flood storage volume at each location. For each pond excavation alternative, specific locations sufficient to provide the storm water storage volume have been identified to develop the "stage vs. storage curves" incorporated into the hydraulics & hydrology modeling. As you have noted, there are vegetation and soil variations within the identified ponding areas. This data is not completely known at this time and development of the detailed grading plans is deferred to Preconstruction Engineering and Design. The grading plan will target providing the same stage-storage relationship and total excavation volumes identified in the Feasibility Report.

11. USACE Response to Comment 68 (p.21): This comment has not been adequately addressed. The Draft Main Report states that no mitigation is required because the removal of Phragmites would result in greater plant diversity (para 384). However, reiterating our comment, if ponds are excavated to a depth to ensure Phragmites will not survive (greater than two-feet depth), then concurrently few other emergent wetland species will survive either – and thus, the pond would not function as an emergent wetland (which the USFWS recognizes as the requirement to their finding of "a net benefit to wetland functions and values".) If ponds are excavated to less than 18-inches depth, such that a range of native freshwater emergent plants could survive and the pond could function as an emergent wetland, then Phragmites invasion will have to be continuously, actively managed. The Report does not present an adequate plan to manage Phragmites invasion, other than through depth of excavation.

Ponds are proposed to be excavated to a depth of 2-5 feet below land surface. The actual depth of the pond will be determined once a comprehensive survey of the project area is conducted and subsequently a more detailed pond design can be determined. The comprehensive project area survey will be conducted in the design phase of the project. Because the current study phase does not include survey details, USACE includes a comprehensive Monitoring & Adaptive Management Plan to monitor and manage Phragmites for five (5) years to ensure the survival of emergent wetland species. A copy of the Monitoring & Adaptive Management Plan will be included in the Final Report. Once the five (5) year

monitoring and adaptive management period concludes and it has been determined that emergent wetland species have survived, maintenance of the ponds will become a non-federal requirement. If the emergent wetland species do not survive within the specifications of the Monitoring Plan (typically 85% survival rate after 2 growing seasons), adaptive management will be implemented by USACE as a cost-shared project cost.

12. USACE Response to Comment 74 (p.22) – Is the updated construction phasing information available for City review yet?

    USACE does not typically specify order of work/phasing within a contract since that could increase the project cost. USACE will usually specify only the overall contract duration which is based on one possible sequence of construction activities. Therefore, the actual schedule of construction activities won't be known until the contract is awarded and schedule is provided by Contractor and approved by USACE. Therefore, updated construction phasing information available during Plans & Specifications is still only an estimate.

13. USACE Response to Comment 75 (p.23) – Are the additional renderings available for City review yet?

    The additional renderings referenced in the USACE original response are presented in the report. These are the only project renderings that were prepared for the study. No additional renderings are being prepared.

14. Please note that the USACE's responses address the City's comments to both the DEIS and the Main Report (not just the DEIS, as the January 5, 2016 USACE letter introduction states).

    Acknowledged.

New York City Department of Environmental Protection

While the City recognizes that the NEPA process is undertaken at an early stage in project formulation (approximately 15% design, as opposed the traditional 30% design for City projects). Numerous responses (i.e. - #12, 13, 16, 19, 23, 23, 25, 37-41, 44, 49) defer to coordination during future design; there are several environmental issues that will require resolution. These include:

- Coordination where the USACE project may differ from or potentially conflict with NYCDEP's Bluebelt program. The City notes that consistency with the Bluebelt program was removed from the project's objectives. While NYCDEP's implementation schedule may not be the same as USACE's, many of the plans have been advanced to nearly

complete design with costs understood as such. In the event the USACE project is built in a manner requiring modifications to the Bluebelt project, the costs and responsibilities of such modification must be understood. The response to comment #47 in particular could be read to indicate that the USACE project will modify NYCDEP's Bluebelt designs and the expectation is that additional work would be at the City's expense. There needs to be an understanding of the implications of any design changes and resulting funding needs.

As stated in previous USACE responses, the term "objective" has changed to "consideration". The term "objective" has specific USACE "Planning" guidelines that require objectives to be consistent with a federal project. "Consistency with the Bluebelt program" is not a federal objective for participation in a coastal storm risk management project. However, the project has been designed to be consistent with the Bluebelt program and has incorporated where practicable the Program into the design, accordingly. Any modification to the Bluebelt program required for project implementation is a project cost. However, if NYC must modify the Bluebelt program in response to project implementation, it is a non-federal responsibility and cost outside the project requirements for a coastal storm risk management project. It should be emphasized that the project's interior drainage is to be constructed to offset any interior flooding that may be caused by the construction of the line of protection. However, during the PED phase, coordination will continue on this interior drainage system and its relationship to the Program to maximize the Program's design parameters as feasibly possible while still remain in compliance with USACE requirements for federal participation.

- In the event that the impact profile of the project changes as design advances – for changes to street grades, connections or potential conflict with municipal features, increases in construction disturbance and/or wetland impacts, etc – who would be responsible for disclosing the full extent of the impacts to support permitting and approvals, and what would be the process for updating the review to support local agency environmental review findings? It is the City's understanding that USACE's consultant would perform any necessary supplemental analysis to confirm that there are no new significant adverse impacts from any changes to the project or refinement of the project design please clarify.
  Any design changes and subsequent impact evaluation/analysis is a project cost. USACE would perform any subsequent analysis to confirm that there are no significant adverse impacts from any of the design changes to the project or

refinement of the project design. USACE would coordinate with the appropriate regulatory agencies to support the project permits and required agency approvals. Any updated documents required to be submitted for regulatory review and approval will be coordinated with the State and NYC, accordingly.

- Comment #34 requires clarification, particularly regarding the flood storage requirements. What is meant by this and how are the referenced plans (i.e. – Minimum facility, "project interior drainage requirements", "Bluebelt plan for excavation") compared?

  The Project interior drainage requirements are based on flood storage volumes that are expected to be available to store runoff volumes that can be discharged through the various outfalls and tide gate structures. In order to account for the presence of groundwater, these volumes exclude natural or excavated storage below elevation 2 NGVD. Because the Bluebelt plan includes significant excavation below the anticipated ground water levels, these volumes are not considered effective flood storage.

- Comment #23: In response to the inquiry about what construction projects are in progress, USACE's response indicates the language will be changed to construction "contracts" in progress; however, it is still unknown what construction is being described – please clarify.

  For clarification purposes, the inquiry above refers to the response to Comment #21. To clarify the USACE response, for the level of design and accounting for "existing conditions", the study made assumptions regarding the progress of the Bluebelt program construction. Those assumptions (for the study) include Bluebelt acquisition at the time of the hydrologic modeling as part of the existing condition. However, during the design phase, additional coordination will be required to update the baseline conditions to reflect any element of the Bluebelt program to be completed at the time that the Project is implemented by USACE contracts. This will include coordination with the City to identify opportunities to reduce the overall construction costs.

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

February 29, 2016

Planning Division

Mr. Stuart F. Gruskin
Chief Conservation and External Affairs Officer
The Nature Conservancy
New York City Office
322 Eighth Avenue
16th Floor, New York, New York 10001

Mr. Gruskin

Thank you for your comments, dated September 9, 2015 on the U.S. Army Corps of Engineers (USACE) *Draft Environmental Impact Statement* (DEIS) and *Draft South Shore of Staten Island Coastal Storm Risk Management Feasibility Report* (Draft Report) for South Shore of Staten Island Coastal Storm Risk Management Project. The comments from your office specifically reference the Oakwood Beach portion of the Draft Report's study area. In the attachment, each comment is numbered and a response provided.

USACE appreciates TNC support and comments regarding the proposed project. Should you require any additional information, please contact Ms. Catherine Alcoba of my staff at (917) 790-8216 or myself at (917) 790-8634.

Sincerely,

WEPPLER.PETER.M.1228647353

Digitally signed by WEPPLER.PETER.M.1228647353
DN: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=USA, cn=WEPPLER.PETER.M.1228647353
Date: 2016.02.29 10:55:37 -05'00'

Peter Weppler
Chief, Environmental Analysis Branch

Enclosure

1. *The Nature Conservancy strongly encourages USACE to utilize a comprehensive restoration approach to Oakwood Beach that takes advantage of both nature-based infrastructure features and built systems to ensure that decisions made today will provide resiliency, capture co-benefits, and last into the future. The buy-outs that occurred in Oakwood Beach provide a unique opportunity to optimize resiliency measures that take advantage of the benefits of natural infrastructure for ecosystem values and community quality of life.*

   USACE concurs that comprehensive approach that maximizes economic, ecological, and recreational benefits should be utilized for planning of coastal storm risk management projects. As proposed, the 46 acre tidal wetland complex is an ecosystem-based approach to manage risk from coastal storms drawing upon the capacity of wetlands to reduce the impacts of storm surge and waves. This feature provides not only coastal storm risk management benefits, but also ecological benefits associated with the restoring the functionality of the tidal creek to restore the natural flushing of the wetlands and providing native species of plants to support the sustainability of this natural feature.

   In reference to the New York State's Buyout program, the State will be removing all structures from the area. Further, as part of the proposed coastal storm risk management project, the area is being restored by to account for the temporary construction related impacts by replanting the area with native trees (in compliance with the New York City Department of Parks & Recreation's Tree Replacement Program).

2. *The Nature Conservancy acknowledges that the Draft Report moves back the proposed sea-wall from the original proposed location to accommodate some tidal wetland restoration and includes some natural features, as well as public access. The Nature Conservancy urges USACE to further utilize natural infrastructure and restoration, including those detailed in the Oakwood Beach Flood Attenuation Study submitted by Dewberry to the New York State Office of General Services (Dewberry Report), in the final plan.*

   Please note that the proposed line of protection was moved landward after Hurricane Sandy to account for overtopping allowance and to minimize the crest height of this feature. Please also refer to the response to Comment #1 above for the additional natural infrastructure and restoration features such as the 46 acre tidal wetland complex and the restoration of the State's Buyout area as it relates to temporary impacts caused by construction.

In particular, The Nature Conservancy believes the USACE plan should achieve the following outcomes:

Fully incorporate sea level rise projections:

3. *USACE should fully account for future climate change including projected sea level rise and changes in depth to groundwater. In order to ensure that these investments are lasting and can withstand future climate change scenarios, it is imperative that the USACE fully consider potential impacts in the final plan. The New York State Energy and Research Development Authority updated their report "Responding to Climate Change in New York State: The ClimAID Integrated Assessment for Effective Climate Change Adaptation in New York State" as recently as 2014 to include the most up to date science based sea level rise projections. These New York based projections should inform the Draft Report.*

   Current USACE guidance requires that potential relative sea level change must be considered in all USACE coastal activity as far inland as the extent of estimated tidal influence. The base level of potential relative sea-level change is considered the historically recorded changes for the study site, which is estimated to be an increase of 0.013 feet/year. All economic analyses for which results are tabulated in previous sections of the report were based on this historic rate of sea level change. However, in accordance with Engineering Regulation ER 1100-2-8162 (incorporating Sea Level changes in Civil Works Program, 31 Dec 2013), proposed projects must be also evaluated for a range of possible sea level rise rates: In addition to the historical rate ("low") which is a 0.7 ft. increase over the period of analysis, the project must also be evaluated using "intermediate" and "high" rates derived from modified NRC Curves I and III, which for this Interim Study are estimated to be 1.1 ft. and 2.6 ft. increases, respectively over the fifty year period-of-analysis.

   Analysis was conducted with the three anticipated rates of sea level change for the 100-yr, 250-yr, and 500-yr storm events for the recommended plan to ensure that the project is adaptable to future sea level rise.

Return areas to natural habitat:

4. *This area provides a unique opportunity to convert the hundreds of former residential properties in Oakwood Beach to a fully integrated storm water protection, flood mitigation and habitat restoration buffer area, which will demonstrate innovative ways of adapting to climate change. The Nature Conservancy supports the restoration design detailed in the Dewberry Report, which includes 11 unique habitat types including freshwater pond, freshwater*

emergent wetland, floodplain wetland, freshwater scrub-shrub/riparian buffer, palustrine forested wetland, upland forest, native upland grasses, tidal wetland/living shoreline, maritime forest, maritime scrub-shrub, and maritime herbaceous zones.

The State's buy-out of the above referenced properties was accomplished with hazard mitigation funding which does not allow future development. The requirements under this funding only allows for the preservation of lands and the subsequent return to natural conditions. Additional work, including some of what is described it the Dewberry Report cannot be accomplished on these lands utilizing federal funds.

Fully incorporate natural infrastructure with built infrastructure:

5. *To the fullest extent possible, USACE should incorporate natural assets into resiliency solutions. A hybrid infrastructure solution to flood protection and resilience that involves nature and nature-based infrastructure (freshwater emergent wetlands, tidal wetlands, maritime forest, and stream channel restoration), as a complement to gray infrastructure (rock revetment and flood walls), provides a higher level of risk reduction and many co-benefits to the surrounding communities.*

As part of the integrated approach for the Oakwood Beach area, the USACE considered increasing human and ecosystem community resilience as part of the overall solution to manage risk. To attenuate storm surge and wave energy that can cause scour to the Project area and reduce sedimentation that may occur through the creek and tide gate into the freshwater wetland, the NED Plan has been designed to preserve the functional effectiveness of tidal exchange. This feature will also facilitate wetland drainage.

USACE has committed to incorporating natural assets such as those related to wetlands into the NED plan. These measures include: planting of wetland vegetation/increase diversity in excavated wetland and upland areas; the restoration of wetlands not proposed for excavation (an additional buffer area of *Phragmites* removal and native planting/seeding around each drainage pond has been added); and providing five years of monitoring and maintenance in all areas of wetland restoration. It should be also noted that the 46 acre tidal wetland complex consists not only tidal wetlands, but maritime forest and stream channel restoration) and the interior drainage areas are designed to be emergent freshwater wetlands during non-storm events.

Increase public access:

6. *The Nature Conservancy supports efforts to increase public access and educational opportunities. To the extent possible the Draft Plan should consider ways to restore public access to restored natural habitats and open space in the buyout area. Comprehensive restoration of the Oakwood Beach area has the potential to create additional recreational opportunities that will provide a significant benefit to the community and we encourage full access to those areas for public use*.

   USACE is coordinating with New York State Department of Environmental Protection and New York City (Mayor's Office, Department of Planning, Department of Parks and Recreation, Department of Transportation and the Department of Environmental Protection) to ensure the appropriate public access is provided. Further, New York City has requested additional access coordination during the design phase to incorporate additional public access and recreational features in the Oakwood Beach area that can be included as a NYC initiative for which the federal project funds are not qualified for use.

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

March 7, 2016

Planning Division

Mark Murray-Brown, Section 7 Coordinator
Protected Resources Division
National Marine Fisheries Service
Greater Atlantic Regional Fisheries Office
55 Great Republic Drive
Gloucester, MA 01930-2276

Dear Mr. Murray-Brown:

Thank you for your review and comments submitted on September 10, 2015 regarding the Draft Feasibility Report and Environmental Impact Statement ("DEIS") for the South Shore of Staten Island Coastal Storm Risk Management project that was posted for public review in June 2015.

As your comment letter requested, Section 3.5.1 of the EIS has been updated to include the additional information regarding the threatened and endangered species that were listed in your letter. Please note that your letter indicated that Section 7 consultation is still required. Please be aware that coordination occurred in October 2015 between the New York District and Mr. Daniel Marrone of the Protective Resource Division. It was determined that since there will be no in-water work proposed (i.e., the construction is utilizing land-based equipment), listed species under NMFS jurisdiction will not be exposed to any effects of the proposed project. Therefore, it was determined that no further ESA Section 7 consultation is necessary.

The email correspondence between the New York District and Mr. Marrone will be included in the FEIS pertinent correspondences and is attached to this letter.

Additionally, in accordance with the Magnuson-Stevens Fishery Conservation and Management Act, a formal Essential Fish Habitat (EFH) consultation was not required as no in-water work is proposed.

The New York District appreciates the support and comments regarding the proposed project. Should you require any additional information, please contact Ms. Catherine Alcoba of my staff at (917) 790-8216 or myself at (917) 790-8634.

Sincerely,

WEPPLER.PETER.M.1228647353

Digitally signed by WEPPLER.PETER.M.1228647353
DN: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=USA, cn=WEPPLER.PETER.M.1228647353
Date: 2016.03.07 15:43:45 -05'00'

Peter Weppler
Chief, Environmental Analysis Branch

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

February 29, 2016

Planning Division

Ms. Jennifer Nersesian, Superintendent.
Gateway National Recreation Area
210 New York Avenue
Staten Island, New York 10305

Dear Superintendent Nersesian:

Thank you for your comments on the U.S. Army Corps of Engineers (USACE) *Draft Environmental Impact Statement* (DEIS) and *Draft South Shore of Staten Island Coastal Storm Risk Management Feasibility Report* (Draft Report) for South Shore of Staten Island Coastal Storm Risk Management Project. In the attachment, please find USACE's responses to your September 9, 2015 comments regarding the June 2015 Draft Environmental Impact Statement ("DEIS") for the South Shore of Staten Island Coastal Storm Risk Management project that was posted for public review.

USACE appreciates Gateway's continued support regarding the proposed project. Should you require any additional information, please contact Ms. Catherine Alcoba of my staff at (917) 790-8216 or myself at (917) 790-8634.

Sincerely,

WEPPLER.PETER.M.1228647353

Digitally signed by WEPPLER.PETER.M.1228647353
DN: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=USA, cn=WEPPLER.PETER.M.1228647353
Date: 2016.02.29 10:48:21 -05'00'

Peter Weppler
Chief, Environmental Analysis Branch

Enclosure

1. The DEIS indicates that CERCLA action for Great Kills Park, located in Gateway National Recreation Area, was initiated in 2010. However, CERCLA was initiated in 2007 with the Preliminary Assessment report.

   USACE Response: The DEIS will be updated to reflect 2007 as the start of the CERCLA action for Great Kills Park, located in Gateway National Recreation Area.

2. The National Park Service (NPS) will continue to work with USACE, NY State and NY City for coordination between the Great Kills Park CERCLA remediation and SSSI Coastal Storm Risk Management Project.

   USACE Response: USACE acknowledges and appreciates this ongoing coordination.

3. The USACE has provided renderings to assist with evaluation of impacts to the Miller Army Airfield Historic District. NPS will continue to work with USACE and NY SHPO regarding adverse impacts to the Miller Army Airfield Historic District and to identify appropriate mitigation strategies.

   USACE Response: USACE acknowledges and appreciates this ongoing coordination.

4. The DEIS, Appendix F, Draft Programmatic Agreement includes the following statement that should be revised as indicated:

   > "WHEREAS, the New York District shall continue to consult with the NYSHPO ~~NYCLPC~~ and with the NPS for portions of the Undertaking that affect NPS land and resources, regarding plans and surveys to identify, evaluate and treat historic properties as the New York District implements all phases of the Undertaking; and.."

   In general NPS provides information to NYCLPC as a courtesy. They are not included in consultation between NY SHPO, USACE and NPS for work on NPS property.

USACE Response: Concur. USACE will edit the Programmatic Agreement accordingly.

5. The DEIS and the June 11, 2015, SSSI-Beach Erosion technical note provide SBEACH model results that indicate the line of protection (LOP) will not impact existing sediment budgets as long as the beach width is greater than 75 feet.

The SBEACH model has not been made available to NPS for external peer review. Nor have the model assumptions, including initial beach width, been provided. The project operations and maintenance plan should provide for maintenance of beach widths greater than 75 feet throughout the project lifespan.

USACE Response Please see Section 3.2 of the Engineering & Design Appendix documents the model assumptions in the SBEACH model. A range of initial beach widths were tested with SBEACH to determine the critical beach width, 75 feet, at which the structure begins to effect the storm induce profile change. Section 9.3.2 of the Main Report states that beach maintenance/restoration activities may be evaluated as a future project adaptation, if beach erosion accelerated to the extent that a minimum beach width to 75 feet cannot be maintained. The implementation of future project adaption measures would be dependent on a future decision document that would evaluate and record the changed metrological and oceanographic conditions.

6. The DEIS provides a 50 year period of analysis. NPS is required "...to conserve the scenery and the natural and historic objects and the wild life therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations." (16 U.S.C. l 2 3, and 4). Although USACE indicates that the seawall will not be exposed or impact sediment budgets over the 50 year period of analysis, USACE analysis of historic shoreline change indicate that the shoreline is retreating within most of the project. USACE analysis of shoreline change indicates historic rates of change in the project area range from retreat of 3.9 ft/yr to expansion of 1.6 feet per year. Given projections for increased rates of sea level rise and increased frequency and intensity of future storms, it is reasonable to expect that historic rates provide a conservative estimate for future shoreline change. At some time beach widths will be less than 75 feet and LOP will affect the sediment budget. USACE analysis indicates average annual shoreline retreat of 15.7 ft/yr at Great Kills. A reduction in sediment will exacerbate erosion at Great Kills. Eventually the seawall will no longer be buried and the dune and beach habitat at Miller Field will be lost. The project does not account for the long-term impacts to NPS resources.

   USACE Response: Section 9.3.2 of the Main Report states that beach maintenance/restoration activities may be evaluated as a future project adaptation, if beach erosion accelerated to the extent that a minimum beach width to 75 feet cannot be maintained. The implementation of future project adaption measures would be dependent on a future decision document that would evaluate and record the changed metrological and oceanographic conditions.

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

February 29, 2016

Planning Division

Ms. Judy-Ann Mitchell
Chief, Sustainability and Multimedia Branch
United States Environmental Protection Agency
Region 2
290 Broadway
New York, New York 10007-1866

Attention: Shane Nelson

Dear Ms. Mitchell:

Thank you for your review and providing comments on the Draft Feasibility Report and Environmental Impact Statement ("DEIS") for the South Shore of Staten Island Coastal Storm Risk Management project that was posted for public review in June 2015. Please find the U.S. Army Corps of Engineers New York District's responses to your September 3, comments attached.

The New York District appreciates your comments regarding the proposed project. Should you require any additional information, please contact Ms. Catherine Alcoba of my staff at (917) 790-8216 or myself at (917) 790-8634.

Sincerely,

WEPPLER.PETER.M.1228647353

Digitally signed by WEPPLER.PETER.M.1228647353
DN: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=USA, cn=WEPPLER.PETER.M.1228647353
Date: 2016.02.29 10:38:52 -05'00'

Peter Weppler
Chief, Environmental Analysis Branch

Enclosure

1. Monitoring, maintenance and stewardship of the created natural features of the project (wetlands, maritime forests, etc.) will be necessary for the long term in order for these features to remain functional and to provide resiliency as designed. The DEIS states that the non-federal sponsor will be responsible for maintenance. The final EIS should identify specifically how this monitoring and maintenance will be done, how this will be financed and for what time period.

   Section 4.3.2 of the EIS has been updated to note U.S. Army Corps of Engineers (USACE) commitment to incorporate several U.S. Fish and Wildlife Service (USFWS) recommended Conservation Measures into the NED plan related to the function of these wetlands. USACE response to FWS's draft Planning Aid letter and the final Fish and Wildlife Coordination Act report detailing these conservation measures can also be found in Appendix G (Pertinent Correspondence) of the EIS. These conservation measures will be incorporated as part of the Project's Adaptive Management and Monitoring Plan (as a project cost) and will include 5 years of monitoring and maintenance in all areas of the Project's wetland work. Beyond these 5 years of monitoring and maintenance specific to wetlands, the non-Federal sponsor will be responsible for all maintenance of the Project features (Line of Protection, Interior Drainage, Tidal Wetland) in perpetuity as part of the Project Partnership Agreement and Operation, Maintenance, Repair, Replacement and Rehabilitation Manual (OMRR&R). These procedures will be developed during the plans and specifications phase of work.

2. Please clarify the planting scheme for the excavated flood storage areas and estimate the amount of open water that will be present under normal conditions.

   The current feasibility level design includes plans to plant and seed native species. A specific planting plan (i.e., number of plugs and species to be planted) will be developed during the plans and specifications phase of work. USFWS has expressed interest in making recommendations for species to be planted and USACE will incorporate these recommendations where practicable. The interior drainage features are designed and will be excavated to hold water after both major and minor storm events, including water run-off from surrounding areas of higher elevation. There may also be some groundwater input to these areas. It is not possible to calculate how much water will be present at any one time, as this will primarily depend on the frequency and amount of rainfall. However, please note that during non-storm periods, these ponds are designed to be emergent freshwater wetlands and will be monitored after construction to ensure the survival. A Monitoring and Adaptive Management plan is being prepared to be included in the final report. Monitoring and adaptive management is a project cost, cost-shared with the non-federal sponsor and USACE in accordance with the executed funding agreement.

3. We understand that the Oakwood Creek tide gate would typically be in an open

position to allow for tidal flushing, but would only be actively closed under potential storm surge conditions. Please confirm that this is true.
Confirmed, the Oakwood Creek tide gate would typically be in an "open" position and would only be actively closed under potential storm conditions.

4. It is our understanding that there is no work planned for the wetland area on the inland side of the Oakwood Creek tide gate. Please confirm the intended as built condition of this wetland area.

   The existing Oakwood Creek tide gate is proposed to be removed (and replaced as noted to allow for tidal creek flushing with the wetlands landside of the line of protection), the creek realigned and the area restored as part of temporary construction impacts. Please note that this referenced area is also in the area of the 46 acre tidal wetland restoration feature.

5. Page 4-14 of the DEIS discusses a proposed construction/restoration of a 46 acre mix of tidal wetlands, shrub, maritime forest and dunes at Oakwood Beach. Of this 46 acre total it appears that about 19 acres will be low and high marsh. However, Table 4-3 and other locations in the document and public slide presentation imply that the total 46 acres will be tidal wetlands. Please clarify this in the final EIS.

   The final EIS has been revised to clarify that this Project Tidal Wetland feature is a 46 acre mosaic of habitat, including 12.9 acres of low marsh, 6 acres of high marsh, 6.9 acres of shrub, 3.2 acres of maritime forest and 17 acres of dune grass.

6. It is our understanding that the existing Oakwood Beach tide gate would be removed to allow for flushing of the proposed 46 acre restoration. Is the area landward of this structure currently freshwater wetland?

   The commenter is correct that the existing Oakwood Beach tide gate will be removed as part of removing the existing Section 103 Levee project and will be replaced under the NED plan. The area landward of this structure is currently a segment of the East Branch. The East Branch begins in Great Kills Park east of Kissam Avenue and flows southwest to a tide gate that is situated immediately south of the Oakwood Beach Wastewater Treatment Plant.

7. If it has not already been done, we recommend that a hydrologic study be undertaken to determine if there will be adequate tidal flushing to maintain the constructed low/high marsh area. We recommend reporting the results in the final EIS

   A hydrologic study has not been undertaken and will not be conducted for this Project. However, the NED plan is incorporating a 5 year monitoring and

adaptive management plan in all areas of Project wetland work.

8. It is our understanding that no forested wetlands will be impacted by excavation or other aspects of this project. If our understanding is accurate, we recommend confirming this in the final EIS.

   Section 4.3.2 of the final EIS has been updated to clarify that there are no forested wetlands located in areas of the Project that will be excavated.

9. The existing New York City Bluebelt plan focuses on managing stormwater and habitat restoration in many of the same areas that the USACE plan proposes to do work in, especially the areas to be excavated. Clearly explain how the USACE plan fits into the Bluebelt plan.

   Section 2.7 of the EIS details the relationship between the NED plan and the Bluebelt plan. The plans are consistent and complementary and use much of the same real estate/open space to accomplish their intended purpose. The NED plan interior drainage project feature is designed for flood storage that will function as an emergent wetland during non-storm events. The Staten Island Bluebelt Program was introduced to incorporate Best Management Practices (BMPs) and other plans and actions to provide stormwater management, and to decrease flood hazards and increase water quality. Table 2-4 presents the current overlap between the Bluebelt and USACE interior drainage areas and features. As shown in that table, the locations of all the proposed ponds generally correspond to Bluebelt BMPs.

10. Please provide a table that explicitly describes the acreage of each type of habitat/wetland that is being lost or converted in each segment and what is being created/restored in each segment. Please include a calculation of the wetland creation/restoration to loss ratio.

    EIS Section 4.3.2 has been updated to clarify wetland impacts from the construction of the LOP, the interior drainage and the Tidal Wetland (Mosaic of Habitat) features. This includes the loss of 10.89 acres (dominated by a monoculture of Phragmites) from construction of the LOP and the improvement of 117.25 acres of wetland (currently dominated by Phragmites that will be excavated and replaced with native plantings /seeding) for the combined interior drainage features and of the improvement of 16.5 acres associated with the Tidal Wetland Complex Feature (consisting of a Mosaic of Habitats) from removal of invasive species, seeding/planting of native species post excavation. The conversion of 11.3 acres of upland to wetland associated with the interior drainage project features (specifically areas B, C & E where excavation will take place) is also noted.

    Existing conditions for the 46-acre area of proposed tidal wetland (mosaic of

habitat) consists of estuarine emergent wetlands with a tidal channel (16.5 ac), sandy beach (15.6 ac), littoral zone (7.7 ac), upland shrub/scrub areas (3.6 ac), and upland developed area (2.6 ac). The predominant species within the impacted emergent wetland community is common reed, and in many areas of the wetlands this species grows in monotypic stands.

The following table will be included in EIS Section 4.3.2.

	Acres of Wetland Impact (excavation or fill in wetlands)	**Acres of Upland Impact**
Interior Drainage		
Area B (39.31 acres excavated)	38.73	0.68
Area C (54.79 acres excavated)	46.03	8.77
Area E (34.34 acres excavated)	32.49	1.85
Interior Drainage subtotal	117.25	11.3
Line of Protection (LOP)	10.89	40.20
Tidal Wetland (46 acre Mosaic of Habitat)	16.5	3.6 (upland shrub/scrub)
Total Impact	144.64	55. 1

11. As identified in Section 3.12 of the DEIS, the NEPD project site demonstrates high potential for discovery of hazardous and toxic materials during construction. We encourage the USACE to provide in the final EIS detailed information on the results of the comprehensive research conducted for the project and the 2003 and 2013 environmental site assessments, including identification of contaminants and locations and levels at which they were discovered. In addition, we recommend the USACE include a plan for management of any hazardous materials that are discovered during construction. The plan should identify the procedures and practices that will be employed to prevent and, if necessary, respond to exposure of workers and residents to contaminants.

    USACE policy is to only undertake projects on lands that are free of contaminants prior to construction. It is the non-Federal sponsor's

responsibility to coordinate all necessary cleanup and response costs of any regulated Hazardous, Toxic and Radioactive Waste (HTRW) materials located in, on, or under lands, easements, or rights-of-way that the Federal Government determines to be necessary for the construction, operation, or maintenance of the Project. Therefore if lands are free from contaminants prior to construction, USACE's assumption is that there will be no exposure to contaminants for workers or residents. Regardless, USACE will develop a plan to identify the procedures and practices that will be employed to prevent and, if necessary, respond to exposure of workers and residents to contaminants for the contractors in the event hazardous and toxic materials are encountered during construction.

12. Construction activities will result in increased diesel emissions in residential areas adjacent to construction sites. We recommend implementation of idle-reduction policies and the use of cleaner fuel and cleaner diesel control technology to reduce particulate matter (PM) emissions on non-road and on-road diesel powered equipment used at a site. Alternative fuels such as biodiesel or natural gas-powered vehicles can also be considered.

    The project's estimated $PM_{2.5}$ emissions for both onroad vehicles and nonroad equipment are estimated at 0.5 tons (2016), 1.84 tons (2017), 1.64 tons (2018), and 0.73 tons (2019), which is less than 5 tons over the entire project life. There are only two years the project is anticipated to exceed 1 ton $PM_{2.5}$ (over the course of the entire year). EPA already mandates the use of ultra low sulfur diesel (USLD) in onroad trucks and nonroad equipment; cleaner diesel control equipment and alternative fuels are not anticipated to provide a significant regional/local benefit, as the project is considered "de minimis" and ranges from 54 to 200 times below the General Conformity trigger level (40CFR§93.153(b)(1)).

13. We believe the Council on Environmental Quality's December 2014 revised draft guidance for Federal agencies' consideration of greenhouse gas (GHG) emissions and climate change impacts in NEPA outlines a reasonable approach, and we recommend that USACE use that draft guidance to help outline the framework for its analysis of these issues. Accordingly, we recommend the final EIS include an estimate of the GHG emissions associated with the project, qualitatively describe relevant climate change impacts, and analyze reasonable alternatives and/or practicable mitigation measures to reduce project-related GHG emissions. The final EIS should make clear whether commitments have been made to ensure implementation of design or other measures to reduce GHG emissions or to adapt to climate change impacts.

    The Council on Environmental Quality's December 2014 revised draft guidance will be used as a framework for describing the Project in terms of

its GHG emissions and its effects on climate change. GHG emissions have been estimated and the final EIS includes the quantification and a discussion of relationship between the Project and the potential effects of climate change on the surrounding area.

14. Estimate the GHG emissions associated with construction of the proposal and its alternatives. Example tools for estimating and quantifying GHG emissions can be found on CEQ's NEPA.gov website. For actions which are likely to have less than 25,000 metric tons of C02-e emissions/year, provide a qualitative estimate unless quantification is easily accomplished. In most cases quantification of GHG emissions involves a relatively straightforward calculation.

    Direct GHG emissions of less than 9,000 metric tons have been estimated for the proposal, well below the reference point of 25,000 metric tons. These emissions have been included in the final EIS.

15. The estimated GHG emissions can serve as a reasonable proxy for climate change impacts when comparing the proposal and alternatives. In disclosing the potential impacts of the proposal and reasonable alternatives, consideration should be given to whether and to what extent the impacts may be exacerbated by expected climate change in the action area, as discussed in the "affected environment" section.

    The Project itself is in part an adaptive measure designed to protect against the long-term effects of climate change, particularly increased storm intensity and higher mean sea levels. As such, the limited short-term increase in GHG emissions will result in a net longer-term benefit that outweighs any potential effect of the emissions on the climate. This discussion has been added to the final EIS.

16. Describe measures to reduce GHG emissions associated with the project, including reasonable alternatives or other practicable mitigation opportunities and disclose the estimated GHG reductions associated with such measures; for example, construction of the saltwater wetlands. EPA further recommends that the Record of Decision commits to implementation of reasonable mitigation measures that would reduce or eliminate project-related GHG emissions.

    The Council on Environmental Quality's December 2014 revised draft guidance does not require mitigation of GHG emissions. However, beneficial effects of the project have been considered, and are primarily related to improvements in the wetlands areas associated with the project. The area to be affected by the project includes impacting approximately 10 acres of currently low-quality wetlands, which will be compensated for per regulation,

and with the project adding nearly 135 acres of higher-quality wetlands area to be seeded and planted with native species. The area will see improved habitat quality and the improvements may result in increased uptake and sequestration of carbon. In addition, as noted above, the project is, in part, an adaptive measure designed to protect against the long-term effects of climate change, and consideration of the effects of climate change is a component of the revised draft guidance. In terms of GHG emissions from project equipment operation, diesel-powered equipment is very efficient compared to other readily available construction equipment. Therefore, there are no better equipment alternatives for completing the project.

South Shore of Staten Island (SSSI) Draft Environmental Impact Statement (DEIS)

Public Comments

	Commentor	Comment	Date	USACE Response
1	John Rooney & James Scarcella	Request a 90 day extension of public comment period There must be a public hearing in addition to public information session planned. Hearing must in legal and press notice, speaker registration, and public spoken testimony recorded by a stenographer Was there a scoping hearing or scoping comment period?	6/17/2015	USACE granted 30 days in addition to the original 45 day review period. Meetings will consist of USACE presentation, poster sessions and the opportunity for the public to speak with the project subject matter experts. Initial scoping meeting was held Oct 3, 2001.
2	Giovanna Fabozzi	My family and I all SAY YES for any safety to be put onto our beautiful Staten Island!	6/19/2015	Thanks you for your comment.
3	Joanne Amore	Looking foward to the start of the sea wall. Hope it will protect our communities and less stress for families. Don't want to go through another Sandy. Hope and pray this will be approved.	6/22/2015	Thanks you for your comment.
4	Alan Benimoff PhD	I would like to access a copy of the Staten island Plan, which calls for a buried seawall from Fort Wadsworth to Oakwood beach, as well as a levee and a flood wall in Oakwood beach.	6/23/2015	Frank Verga responded on 6/23/15 with a link to the Draft Feasiblity Report and EIS for Staten Island
5	Connie Kelly	In regard to yesterdays newspaper article, I see the comments about implementing a plan for Fort Wadsworth, and Oakwood Beach for protection against future hurricanes. I, however live on the South Shore, in Annadale, on Mayberry Promenade which took on heavy damage as Im sure you must know, from Sandy. My home is only about 40 feet from the ocean, which no longer boasts a cement seawall that once gave us somewhat of a barrier from storms and ocean surges, yet I see no mention of our Promenade getting some sort of help from the Army Corp. I, like the rest of my neighbors meet quite frequently to discuss the ongoing events of proposed repair, but our neighborhood is never mentioned. We have contacted our community leaders, attended meetings, and it seems like no one has an answer as to what is happening. We are frightened, as there is absolutely no protection for our homes, or our lives, from the ocean, we are completely vulnerable to whatever mother nature may have in store. Our seawall is now a pile of broken up cement, some that washed up on our front lawns. Last year a meeting with a local congressman assured us that we were part of the "phases" to get repair, yet we feel as though we are being looked over....please, we need help, we need someone to come out and assess the damage, and give us some hope of repair and or protection from something that we once had, but no longer do. I appreciate your time and thank you for listening.	6/23/2015	Phase 2 of the South Shore of Staten Island is under analysis in coordination with NYSDEC and NYC. Phase 2 encompasses the study area from Great Kills to Tottenville. The results of this analysis will be released to the public upon completion.
6	Louise Lessard	Please send me notification for upcoming public information meetings for The U.S. Army Corps of Engineers, New York District, hurricane mitigation plans for Staten Island seawall and levee.	6/29/2015	Public meetings will be held on 19 & 20 August 20015.

	Commentor	Comment	Date	USACE Response
7	Vincent Tomo	Please excuse the length of the message. My wife and I, as well as our neighbors, are 100% in favor of the proposed levees. Our home is located on Diaz Place in New Dorp Beach and was flooded by 7 feet of water during Hurricane Sandy. Unless people have had a similar experience, they could never imagine the feelings that we have had since October 2012 - - fear, confusion, anxiety, frustration, depression, etc. My wife and I are alive only because our daughter begged us to stay at her home during the storm. When Hurricane Irene hit us in 2011, we had 18 inches of water in our garage and basement. That storm left such an impression on my wife & me that whenever we hear the weather reporters talk about 'heavy rains and possible flooding,' we begin worrying and preparing to prevent water from getting into our home, basically under our garage door. When the rains actually begin, we go into the garage to place towels along the bottom of the garage door. Well, if we weren't at my daughter's home when Sandy's flood waters came, we would have been in our garage. The 7 feet of water that entered our home, came in after crushing our garage door, destroying the garage and then crashing through two more doors and filling & destroying the basement. Being in our 70s, my wife & I would have drowned had we been in our garage when the flood-waters arrived. Anything that can be done to protect us from the devastation of another Sandy, would be greatly appreciated. Immediately following Sandy, we were forced to leave our home for almost a month as our repairmen came in to restore our home. First, they came in to remove all of our destroyed possessions. Then, they had to tear down the walls, ceilings, stairs & doors in our basement & garage, remove the mold, take steps to prevent mold from returning, replace all electrical wiring, outlets and lights, remove & replace our circuit breaker box, etc. Finally, we had people delivering & installing a new washing machine, a clothes dryer, a heating unit, an A/C unit and a freezer. This month was extremely depressing. Anything that can be done to protect us from the depressing devastation of another Sandy, would be greatly appreciated. We had both flood and homeowners' insurance, yet, when the dust settled, we were still in the red for over $40,000. Meetings with representatives from FEMA an Build It Back were frustrating and unproductive. Anything that can be done to protect us from the financial devastation of another Sandy, would be greatly appreciated. With all of the indecisiveness of our elected officials, we had no idea of what the future had in store for us and our home. Our first thought was to sell our home and move to higher ground. But, with no one being willing to pay pre-Sandy prices for flood zone homes, we found that we were forced to stay put. As I mentioned above, we are in our 70s and cannot afford to sell our home and have enough cash to purchase a non-flood zone home. Also, the work involved with packing and unpacking would be problematic for us. We're hoping that the installation of the levees will restore our homes' market values and will encourage our elected officials to add enhancements to our neighborhoods. We've been in this house since 1998 and would prefer not to leave our beloved home and the memories it holds. Anything that can be done to protect us from the emotional devastation of another Sandy, would be greatly appreciated. I trust that this message will give you some idea as to why we are 100% in favor of this project.Thank you for taking the time to read this e-mail. Enjoy your day.	7/3/2015	USACE acknowledges and appreciates your support for the proposed project and thanks you for your comment.
8	James Scarcella	Catherine hope you had a great weekend. Any news on availability of printed docs and the date of the Public Hearing? People are trying to go on vacation but we are worried that will be the week you schedule the meeting Please respond by Thursday . Thank you	7/6/2015	Kate responded 7/8/15 Provided information on the EIS extension and general information on public meeting. See copy of email in folder for full text.
9	Kate Kamish	This note responds to the article featured in the Advance "Have Your Say on the New Hurricane Plan" dated June 22 . the Army Corps has come up with good, innovative, environmentally supportive plans for the East shore// we were impressed and commend the Army Corps 100%. At the same time on behalf of the 750+ people living in Atlantic Village we ask you for due support and innovation for the South shore as you approach Phase II // Frank, you've visited the coastline at AtlanticVillage and you have been to our meetings - The Army Corps is creatively stabilizing the Island - thankyou very much but please continue to the process -- lives and property are at stake and in jeopardy .. equally innovative solutions are needed along vulnerable pockets of the South shore.	7/9/2015	Phase 2 of the South Shore of Staten Island is under analysis in coordination with NYSDEC and NYC. Phase 2 encompasses the study area from Great Kills to Tottenville. The results of this analysis will be released to the public upon completion.
10	James Scarcella	Kate hope you're having a great summer (attached a copy of notice printed in the SI Advance)	8/5/2015	Thank you sending a copy of the printed notice.

	Commentor	Comment	Date	USACE Response
11	James Scarcella	Kate hope you're well. Is there any way we can get a set of CD's with the DEIS and appendices written on it? It would be greatly appreciated. Jim Scarcella 400 Delaware Ave Staten Island, N Y, 10305 Thanks very much	8/7/2015	Hello Mr. Scarcella, Apologies for the delay replying, I have been out of the office. A CD as well as printed copy of the FS, DEIS and all associated appendices will be delivered to both the Community Board 2 and Community Board 3 offices in the next few days. Documents will be available there for your review. The addresses and phone number for Community Board 2 and 3 are below. Staten Island Community Board 2 Sea View Hospital Lou Caravone Community Service Building 460 Brielle Ave Staten Island, NY 10314 718-317-3235 Staten Island Community Board 3 655-218 Rossville Ave Staten Island, NY 10309 718-356-7900 Thanks, Kate
12	John Rooney	Ms. Alcoba: I am finding that reviewing the DEIS and Appendices online is not optimal. For example, just to download Appendix G took a few minutes, and switching back and forth between Appendices and DEIS chapters is difficult. Can you send me a paper copy of the DEIS and Appendices, as well as a CD with the files? Thanks. John Rooney	8/7/2015	Hello Mr. Rooney, Apologies for the delay replying, I have been out of the office. I also received your voicemail. A CD as well as printed copy of the FS, DEIS and all associated appendices will be delivered to both the Community Board 2 and Community Board 3 offices in the next few days. Documents will be available there for your review. Thanks, Kate
13	Michael Krugolets	Hi Frank, I am a resident on the east shore of Staten Island. Are there pictures available of the proposed seawall? Something like an artist's rendering?	8/17/2015	Frank responded 8/17/15 with information on public meeting and link to presentation online.
14	John Rooney	Based on our phone conversation yesterday afternoon, I expect to pick up a copy of the CD from you this evening.	8/18/2015	Mr. Rooney was provided a CD of report at Public Meeting on 8/19/15.
15	James Scarcella	Kate , hope you had a great vacation. If possible, please bring a CD to the meeting on Wednesday night Thanks Jim Scarcella	8/18/2015	Mr.Scarcella was provided a CD of report at Public Meeting on 8/19/15.
16	John Rooney	In person request at 8/19/15 public meeting that printed material and CD's be made available at Mr. Rooney's local library rather than the community board office as initially offered.	8/19/2015	Mr. Rooney, Based on your request at Wednesday's nights public meeting, USACE will be happy to re-direct one of the printed copies of the Draft Feasibility Study and Draft Environmental Impact Statement to your local library, rather than send both copies to the community board offices. Can you please tell me the name and address of the library and community board office (board 2 or 3) that are most convenient to your home. Thank you, Kate
17	John Rooney	In person request at 8/19/15 public meeting to be provided contact information for Mr. Curtis Cravins	8/19/2015	Mr. Rooney, I saw Curtis Cravens last night and told him you would like his contact information. He provided the following: Curtis Cravens NYC Office of the Mayor Senior Program Manager, Coastal Protection Office and Recovery and Resiliency 253 Broadway, 10th Floor New York, NY 10007 212-788-4075 ccravens@cityhall.nyc.gov Kate

	Commentor	Comment	Date	USACE Response
18	Catherine G.	As I have learned about the Plan to protect Staten Island from Hurricane Sandy like events I am more than pleased to hear that something is being done. I understand the cost is $579 million. That being said I have read about how volunerable we are and have witnessed it first hand living in Midland Beach. It is something I never thought I would see in my lifetime and hope to never see again.I believe we need flood gates. The East River, Narrows strait where the atlantic flows into manhattan. I read an article by a forensic engineer that states we need high grade metal barriers-(mini dams) to contain flooding the streets and subways.cost around $17 billion. If we do not do this properly we will fail and the cost will be even greater and more lives will be lost. How could the A.C.E say that there is to much cost for not enough benefit?How could they tell that to people who have lost their homes, possessions and loved ones in sandy. Our infrastructures are failing and its scary. I cringe when i go over the verrazanno bridge hoping this will not be the day it collapses. There is so much to fix and I am aware of the costs but fixing the problems now will cost less than waiting for their demise completely. These are just my thoughts of course. I wanted to also ask, If the phase II from great kills to tottenville does not get the green light for any improvement how will this impact the improvements that will be made in phase I? Thank you for your time in reading this and for any reply you may have. Have a Great Day catherine G Midland Beach	8/19/2015	A study, separate from the study and recommended project for the South Shore of Staten Island, Phase 1, has been authorized by Congress in response to Hurricane Sandy to identify a more comprehensive solution to reduce the risk to life and property in and around the New York and New Jersey Harbor from coastal storm events. The U.S. Army Corps of Engineers must execute a cost-share funding agreement with NYSDEC and/or NYC to initiate the study.
19	James Jacobi	Mrs. Alcoba, I was reading up on the proposed Staten Island Seawall and the plan looks fantastic. We could really use the infrastructure on Staten Island. The only question I have is what do we do in the interim for protection? I'm sure due to red tape and funding the project won't start for 3 or so years. Add the construction time and we could be unprotected for 5+ years. What do we do for that time being unprotected? The Army Corp & NYC Parks did a great job installing barriers on Conference House, Crescent, New Dorp and Midland Beaches. Due to Federal & State property they missed Miller Field and other large stretches of beach, leaving us vulnerable to the next few years of storm seasons. Can we have the barriers installed "temporarily" until the main seawall project is installed? Thank you again for a great job protecting Staten Island!!! James	8/19/2015	Interim measures may be implemented by the municipality or other non-federal interest. Interim measures are not supported for federal funding.
20	Patrick Ryan for Rep. Daniel M. Donovan, Jr.	See attached letter for comments	8/19/2015	See attached letter for comments
21	William Johnson	-No Public Comment or Questions allowed from the audience. Yes it is a Public Information Meeting but Common Courtesy would dictate that these audience members many of whom have had neighbors die during Sandy and have gone through three years of trials and tribulations in holding on to home and just surviving, deserve a chance to be heard. There has not been a full reckoning of due diligence and accountability. Where was the wall three years ago-ten years ago? There has been No justice.	8/19/2015	Public comments and questions were received directly by USACE project staff during the poster session before and after the presenation was given. In addition public comments were solicited via comment cards and email during a 75 day comment period.
22	Eileen Pepel	If I understand correctly, this huge expensive project, which in best case scenario will be completed in 2021, is only planned for 2 feet over the Sandy Storm Surge? How short-sighted could we be? The Army Corps of Engineers was responsible for raising Fr. Cap. years ago, unfortuantely this was not high enough for 3 years ago. Now we are plannign another project that will not work in the long term. Yes, protect the shore, but do the whole job!	8/19/2015	The U.S. Army Corps of Engineers must recommend the plan that maximizes the net benefits in order to qualify for federal participation. The plan that has been proposed provides a .03%probability of annual exceedance (sometimes expressed as a 300 year level of protection). A plan that provides more than this level of protection may be implemented if it is still economically justifiable and requested by the non-federal sponsor (NYSDEC and/or NYC) and fund 100% of the additional cost.

	Commentor	Comment	Date	USACE Response
23	Joseph Herrnkind	Where is Ocean Breeze and Graham Beach on your maps? 1) Agree with the elective officials the wall should meet the 500 year storm requirments 2) Why go into the hall for question and answer, should be in public forum 3) Need more details for the gates? Electric, manual or by water?	8/19/2015	1) Acknowledged. 2) Public comments and questions were received directly by USACE project staff during the poster session before and after the presenation was given. In addition public comments were solicited via comment cards and email during a 75 day comment period. 3) Detailed design of the gates will be completed during development of the construction bid package, but at this point it is anticipated that the gates will have electric operators with manual backup.
24	James O'Brien	1) Your website mentions "49 structures required raising' Where are these structures? 2) I live on Fr. Capadanno Blvd north of Same Lane South of Lily Pond Area how will I be impacted regarding A) Noise and Air pollution from traffic? B) Construction under, near, or around my house? C) Protection from flooding? D) Requirements to elevate my house? E) Aquisition or Eminent Domain?	8/19/2015	1) The proposed project does not involve raising any homes. 2a) Your home is located landward of the Line of Protection construction. Short-term moderate effects from noise would be expected. However, the NED Plan would not create any permanent or long-term sources of noise. 2b) No direct impacts from construction are expected near the commenter's home. Road raising of Father Capodanno Boulevard could result in short-term traffic impacts. 2c) The NED plan provides a .03% probability of exceedance of flooding and associated damage from a coastal storm event. Precipitation event "protection" is also increased. However, the interior drainage plan is to compensate for any flooding induced by the plan. However, the interior drainage design does alleviate some of the existing drainage problems. 2d) The proposed project does not involve nor requires raising of any structures. 2e) The proposed project is not acquiring any structures. However, the plan does require the purchase of open space land. The parcel list may be found in the Real Estate Appendix.
25	Natural Resources Protective Association	See attached letter for comments	8/19/2015	See attached letter for comments and USACE responses
26	Steven Matteo, Minority Leader Council Member 50th District	See attached letter for comments	8/19/2015	See attached letter for comments
27	Staten Island Borough President James S Oddo	See attached letter for comments	8/19/2015	See attached letter for comments
28	Joanna Tierno	I am very grateful for and excited about this project. As a resident I am always concerned about possible storm surge since Sandy. This project will give residents peace of mind and may help keep flood insurance affordable. Thank you for working to keep residents safe.	8/20/2015	USACE acknowledges and appreciates your support for the proposed project.
29	Chris Tierno	I am very please and grateful for the new seawall. I believe the project will make us safer and will protect our lives and property values.	8/20/2015	USACE acknowledges and appreciates your support for the proposed project.

	Commentor	Comment	Date	USACE Response
30	Dr. Stevan Peters	Looks like a great idea. Minimal imposition on communities with great benefit.	8/20/2015	USACE acknowledges and appreciates your support for the proposed project.
31	Merylie Peters	It looks like a well thought out plan. I hope it is implemented.	8/20/2015	USACE acknowledges and appreciates your support for the proposed project.
32	James O'Brien	Hi Kate, I met you last night at the presentation. You gave me the CD. I have a further question: On page 4-45, figure 4-17 of your website it shows the end of the boardwalk in South Beach, near ocean ave, more or less at the point where Capodanno Blvd. turns into Lilly Pond Ave. But the waterfront continues. Does the projected seawall extend PAST the end of the boardwalk and continue all the way to Ft. Wadsworth (Ft. Bliss) or the VZ Bridge? Where does the wall stop? Or, where does it start? This area is completely open to the ocean. Also, in the past, whenever construction has taken near my house or in the street, it has resulted in a lot of personal garbage ending up on our property. Can you give me the person (and phone number) to contact in the event that I have any complaints against any of the contractors. If you feel comfortable doing so, would you provide me with your phone number and those of other folks who may be able to handle later issues? I have difficulty using e-mail. Thank you.	8/20/2015	Contingent on a land survey that will be conducted during the design phase (after study approval), the seawall and associated boardwalk will tie into high ground in the vicinity of Ft. Wadsworth.
33	Paul Marrone for Assemblywoman Nicole Malliotakis Assemblywoman Nicole Malliotakis	See attached letter for comments	8/20/2015	See attached letter for comments
34	Rachel Shapiro Staten Island Advance Political Reporter	Hi Vince, Yes, I'm aware of the meetings. What's the next step after that one public comment is over? Best, Rachel	8/20/2015	Hi Rachel: I've copied the project manager re the next step. Regards Vince
35	Rachel Shapiro Staten Island Advance Political Reporter	Hi Chris, I hope all is well with you. You may have given this to me at some but I don't seem to have it — do you have a timeline for the Staten Island seawall project? An outline of what happens when? And I know the public comment period ends Sept. 9 but I think you said it might be extended. Is that still an option? Best, Rachel	8/20/2015	We're at SIU Hospital Seaview from 6 to 9. 475 Seaview ave McGinnn Center All the Subject matter experts are here. Sincerely Regarding this. Vince
36	John Rooney	Ms. Alcoba: Last nights USACE Public Information Session on "South Shore of Staten Island, New York Coastal Storm Risk Management" was poorly attended. I would say 1/3 to 1/2 of the people there were Corps people, Corps consultants, elected reps, agency reps etc. It was held during the week of the year when, according to the MTA/NYCT, it is their lowest ridership week, because so many people are on vacation. It was held at 6 PM, when standard meeting time on Staten Island is 7:30, because many commuters can't make 6 o'clock meetings. In addition, the outreach could have been better. Although it was a useful and pleasant event, there was no record kept of last nights proceedings. There was no opportunity for public question/answer in the auditorium. There should be a public hearing on the DEIS. New York State and New York City EIS process includes a public hearing on the DEIS. Besides the public record that a hearing generates, there is the education value and the synergy that it creates when everyone hears the insightful questions and statements made. I request that a public hearing be held, and the comment period extended to ten days following the hearing. Time is of the essence. Failure to promptly address this concern may limit the public's rights under other laws, for which you may be held liable. Respectfully submitted, John Rooney	8/20/2015	We choose the meeting date, time, and place based on criteria, including access for community members. The meeting was advertised in a variety of ways, including a Corps press release, posting meeting information and documents for review on the Corps website, an article in local newspapers, a formal notice in the Federal Register, as well as notifying local elected representatives so they could share this information with their constituents. We do not as a matter of course have a verbatim recording of the event, however we do note what topics have been discussed and solicit comments in multiple ways. Per the National Environmental Policy Act (NEPA) and the Council of Environmental Quality (CEQ) NEPA procedures, USACE has the option of what public meeting format to hold.Your request for a public hearing is not granted.

	Commentor	Comment	Date	USACE Response
37	John Rooney	Ms. Alcoba: Please send me link to and CD (and paper copy of, if available)of the scoping documents. The Draft Scope, Final Scope, including comments and responses. Time is of the essence. Thank you for your attention to this matter. Regards John Rooney	8/20/2015	Mr. Rooney, To submit a Freedom of Information Request: VIA FAX: 212-264-8171, Attn: Annette Baden or VIA EMAIL: foia-nan@usace.army.mil or SUBMIT IN WRITING TO: Attn: Annette Baden (Assistant to the Freedom of Information Act Officer) U.S. Army Corps of Engineers 26 Federal Plaza Office of Counsel, Room 1837 New York , NY 10278-0090 917-790-8058 Thank you, Kate
38	John Rooney	Ms. Alcoba: Are you kidding me? We are in the middle of a project public environmental review process, and all documents in the process should be available upon demand. The Scoping documents should have already bee up on your website on the same page as the DEIS and Feasibility Study. You are digging yourself into a public relations hole. And what is the first rule when you find yourself in a hole? Regards, John Rooney	8/21/2015	All prior scoping event documents requested were provided via the F.O.I.A. process at no cost to the requestor. Additionally, current documents were provided in several formats, including availability at local library, via the Corps website, and provided on a CD per the commenter's request.
39	John Rooney	Attn: Annette Baden (Assistant to the Freedom of Information Act Officer) U.S. Army Corps of Engineers 26 Federal Plaza Office of Counsel, Room 1837 New York , NY 10278-0090 917-790-8058 Dear USACE-NAN FOIA Records Officer: Please send me link, a CD(and paper copy of, if available) of the scoping documents for the South Shore of Staten Island Coastal Storm Risk Management Plan. The scoping hearing was held on October 3, 2001, according to p. 1-14 of the project DEIS. Please send me a copy of and provide a link to the Draft Scope, Final Scope, including comments and responses. I will not pay copying or shipping costs. Do not bill me. I expect you to provide this material gratis. Time is of the essence. Failure to provide this material in a timely manner may violate my rights under other laws, for which you may be held liable. Thank you for your attention to this matter. Regards	8/21/2015	Good Morning Mr. Rooney, We are in receipt of your request for documents. It is not quite yet a proper FOIA request. For it to be a proper request, it must contain a few essential elements. A first read indicates that you have listed the documents you want. Willingness to pay applicable fees is also part of a proper FOIA request. However, you state that you have no intentions to pay for any of the information. As a private citizen, you would be in the "other requestor" FOIA category. We will be able to provide 2 hours search time, free of charge, and 100 pages of documents. If the information is available via electronic media, we will provide it in that form. Anything more than 2 hours or over 100 pages will result in a cost to you. That cost will be determined by the amount of search time ($44/hour) and pages ($.15 per page). Also, you do not provide your contact information. For us to mail any information to you, we would need your address. We will gladly provide whatever information we can find within 2 hours and up to 100 pages, or what we can find electronically. Please let us know, how you would like us to proceed. Please visit our FOIA homepage below on how to submit a proper FOIA request and submit it to foia-nan@usace.army.mil Annette Baden
40	John Rooney	Ms. Alcoba: Is their a transcript of oral comments made at the scoping hearing in 2001 for the SI coastal storm risk management plan? Thanks. John Rooney	8/22/2015	All prior scoping event documents requested were provided via the F.O.I.A. process at no cost to the requestor.

	Commentor	Comment	Date	USACE Response
41	John Rooney	Ms. Baden: Thank you for your prompt response. Before any next steps, lets see what you can provide electronically. We should not be going through this process, wasting your time and mine. Ms. Alcoba should have already had all the scoping material up on the project web page. John Rooney	8/24/2015	Current scoping documents are available on the Corps' project webpage. Prior scoping event documents were provided at no cost to the requestor.
42	Louise Lessard	Ms. Ashton, As a follow up to our conversation this week at the Staten Island Coastal Storm Risk Management Study information session, I'd like to request an enlarged map of the Interior Drainage Plan Elements, Drainage Area "C", including clearly identified street names. Any detailed description you could provide or direct me to regarding specific construction plans of the 7 proposed Retention Ponds, their location and function, as well as projected ponding parameters and depth in various event scenarios, would be helpful and appreciated.	8/21/2015	Proposed response, not yet sent: Please find attached the requested maps that show the street names in the vicinity of your address (Graham Boulevard) in Interior Drainage Area C. For additional information of the design of the ponds, please refer to the study Interior Drainage Appendix located at: http://www.nan.usace.army.mil/Portals/37/docs/civilworks/projects/ny/coast/StatenIsland/June2015files/AppendixII-InteriorDrainageAppendix.pdf Please note that in the Feasibility stage (the study stage we are in now for which we are seeking approval to enter into the design and construction phase) we are not fully designed. Once the study is approved, the Corps will need to conduct detailed surveys to determine the exact parameters and dimensions of the ponds.
43	James O'Brien	Hi again Kate, One more question: With the seawall in place, what happens to the water that pushes against it? During a heavy storm, will the ocean (Bay) water go under the seawall, under Capodanno, and under the houses, only to rise into the basements or come through the ground? Also, are the drainage areas going to absorb heavy rainfall, so that the flood gates don't back up, and so that the ground under and around the homes does not become over-saturated? Thanks again for all your help	8/24/2015	The potential for seepage flow under the wall was evaluated as part of the structure stability analysis. Sheet pile cutoffs under the wall were included to reduce seepage to very low levels. When flood gates are closed due to high storm surges the ponds and natural areas will hold a large portion of the stormwater runoff. As indicated in the residual flood mapping, the combination of extreme rainfall with a storm tide will cause some, relatively shallow, flooding beyond these open storage areas.
44	James Scarcella	Dear Kate : Thank you and Mr Verga for the good presentation on 8-19-15. We have some additional comments to the Draft DEIS 1) Legal agreement - We note the agreement is in place for NPS. We need NY State to provide the required agreement with NYC DEP for operations and maintenance funding of the numerous tidal gates and pumps , and we need a dedicated funding source for this. 2) We also need the legal agreement with NYC DPR Regarding Freshwater wetlands, If ten acres of freshwater wetlands are going to be lost , the DEIS needs to state specifically what is the mitigation for this loss. Note that creation of tidal wetlands is not mitigation for loss of FW wetlands. 3) We need the DEIS to speak of the possibility of Transfer of Development Rights, which could be used to achieve buyouts of floodplain property, in exchange for development rights in a different area of the city. 4) Tree removal - The DEIS needs to quantify all of the trees to be removed and replaced. Tree replacement is expensive and required by law. 5) Alienation of Park land - Please outline the exact acreage of parcels to be alienated by the project execution , and the requirements of State legislation to enact this. 6) Beach replenishment - If the enactment of the project will eventually require beach replenishment, then provide the necessary steps and funding to have the replenishment happen. Need guaranteed funding to keep the drainage basin pumps in operation for 30 years , if the basis get silted in, they will not function properly. ACOE has stated the Project will last 25 years, what happens after that? Thank you James Scarcella	8/26/2015	1)An agreement with NYSDEC will be executed upon Study approval. 2) EIS Section 4.3.2 has been updated to clarify wetland impacts: loss of 10.89 acres from construction of the Line of Protection, improvement of 117.25 acres for the interior drainage features and of 16.5 acres associated with the Tidal Wetland Feature (consisting of a Mosaic of Habitats) from removal of invasive species, seeding/planting of native species post excavation. As supported by USFWS, the functions of the existing freshwater wetlands (low quality Phragmites monoculture) do not support replacement of their function with anything greater than equal acres of project mitigation features. The project's creation of 11.34 acres of native seeded/planted emergent wetland where upland previously existed (for interior drainage feature), more than compensates for 10.98 acres low quality Phragmites monoculture lost as a result of the LOP.

	Commentor	Comment	Date	USACE Response
				USFWS concluded that the proposed action will not have significant adverse impacts on fish and wildlife resources in the project area. Wetland mitigation is not required. 3. Acquisiton of real estate is the responsibility of the non-Federal sponsor. "Transfer of development rights" is not a project purpose for federal funding elegibility. 4). The proposed plan is at the feasibilty phase of the project and a more complete design will be develoiped during the plans and specification phase. USACE coordination with NYC Parks and Recreation Tree Preservation and Restitution is ongoing. USACE will complete a tree survey during the Planning Engineering and Design (PED) phase of work and will coordinate impacts of construction (including number and type of trees lost) and tree restitution with NYC Parks Arborist. 5). The final report will include a discussion on the alienation of parkland, 6). The project lofe is not 25 years. It will be operated and maintained by the non-federal sponsor in perpetuity. Additionally, models determine that beach renourishment is not required.
45	John Rooney	Mr. Verga, On p. 55 of the presentation given in the auditiorium at the Public Information session there is a map/graphic and a table (Table 30) showing units affected with or without the project for the 50 and 100 year storms. Did you model the 300 and 500 year storm? If so, is there a graphic and table table similar to Table 30 which shows the same data (units affected, with and without project) for the 300 and 500 year storms? You say the project is built for the 300 year storm. Is that all parts of the project, including the inland storm water retention? Regards, John Rooney	8/26/2015	The stormwater retention features are designed to significantly smaller events than the seawall/ line of protection. As presented in the residual risk sections of the Interior Drainage Appendix, a limited number of structures will experience some flooding at a 10 year storm event. Modelling included a 500 year event, but the 300 year value was interpolated. Because the structure design level would be exceeded it is estimated that there will be no change in inundation limits during that event and approximately 7300 structures would be subject to damage.
46	John Rooney	Ms. Alcoba: Outreach and publicity for the midsummer meeting was poor. I suggest that you put materials at all libraries on the East and South Shores: http://www.nypl.org/locations/ I also suggest you do outreach to churches, which were important centers in the aftermath of Sandy. I would also suggest you make presentations to PTA's at the public schools, and parents guilds at the private schools. This is in addition to press work and outreach to the various civil society organizations (e.g Civic Associations, environemental groups, AARP chapters, etc.). Just a thought. John Rooney	8/26/2015	As requested, documents were provided in hard copy to a local library convenient to the requestor and to his local community board. He also had access to them electronically via the Corps project website and a CD specifically requested and provided. The meeting was advertised in a variety of ways, including an Army Corps press release, posting information and documents for review on the Corps website, an article in local newspapers, a formal notice in the Federal Register, as well as notifying local elected representatives so they could share this information with their constituents.

	Commentor	Comment	Date	USACE Response
47	John Rooney	Ms. Alcoba: The Community Board most convenient for me and all project area residents is Board 2, located in Seaview Hospital grounds. The most convenient branch of the public library for me (I live in the upland portion Oakwood Beach watershed) is the Richmondtown Branch. Richmondtown Branch New York Public Library 200 Clarke Avenue Staten Island, NY 10306 Attn: Ms. Bridget Salvato, Branch Manager 718-668-0413 bsalvato@nypl.org Regards, John Rooney	8/26/2015	Mr. Rooney, Thank you for the information. USACE has contacted Ms. Salvato at the library and the documents/CDs have been express mailed to the locations you note below. Kate
48	William Hussin Cashman Dredging & Marine Contracting Co., LLC	Hello, Catherine. Regarding the Phase 1 - Ft. Wadsworth to Oakwood Beach work, I am trying to understand how many contracts are expected to be advertised and the timing/sequencing of those contracts. Would you be able to provide the information or else steer me to the appropriate person? Thanks you in advance, Bill	8/26/2015	Contract number and sequencing information is not available during this phase of work, we are currently focused on finishing the Feasibility Study and Environmental Impact Statement. The information you are looking for will be available when the contract is solicited.
49	Louise Lessard	The "Staten Island New York Coastal Damage Reduction Project Public Information Meeting" was anticipated and appreciated. It did not, however, take the customary, required form of a hearing in which questions, comments and discussion take place in an open forum and are recorded for the public record. It would seem that that lacking element should take place before the comment period is closed. I request that a follow-up event be scheduled and well publicized after the height of vacation season.	8/28/2015	Per the National Environmental Policy Act (NEPA) and the Council of Environmental Quality (CEQ) NEPA procedures, USACE has the option of what public meeting format to hold. Your request for a public hearing is not granted.
50	Linda Cohen	Please incorporate bicycle and pedestrian pathways into the sea wall infrastructure along with connections to local streets and thru Great Kills Park.	8/30/2015	USACE is coordinating with NYC Department of Parks and Recreation to determine how a bikepath may be incorporated.
51	Barbara Tromer	My residence is Sea Cliff Towers 20 Cliff Street SI, NY 10305. Our property overlooks Station New York. Super storm Sandy inflicted much damage to the base. The closure was long and expensive. Their service was missed for many, many months post-Sandy. Revetment here is essential and important. Has it been included? http://www.silive.com/news/index.ssf/2012/10/coast_guard_still_working_to_s.html If you wish to speak to me: 347-628-7157. Our Block and Lot is 02833 Lot 31. Please keep me informed so I can inform our Board of Directors. Thank you	9/2/2015	Frank responded 9/2/15 The Staten Island feasibility study includes the area from Fort Wadsworth to Tottenville. The area you note below, which is north of Fort Wadsworth, is not part of this feasibility study.
52	Debra A. Derrico / District Manager Community Board 2, Staten Island	The chairperson of the Land Use committee wants to know if CB2 could get an extension on the comment period.	9/4/2015	Frank responded, It was already previously extended. We will close next week.
53	Geraldine Mackey	I am writing to you with great hope that you can help me and many neighbors on Staten Island. My concern is with the area I live in. My family was homeless for 10 months after hurricane Sandy. It destroyed 65% of out home (FEMA told us that). It took 10 months to reconstruct our home. I understand a project for seawalls and floodwalls are being studied and will go into place in 2018 and end in 2021. This will not include my area unless "Phase II" goes into affect. It was determined its not needed. This is wrong! It is needed! We lost people in Sandy - in fact a woman lost her husband, daughters and home, as well as others. I lost a neighbor who lived down the street from me. Please, oh please help us to get the same protection for our families and homes. We cannote wait many years for this project, it must go into affect as soon as possible. Please help all of us. Sincerely, Geraldine Maackey.	9/4/2015	Phase 2 of the South Shore of Staten Island is under analysis in coordination with NYSDEC and NYC. Phase 2 encompasses the study area from Great Kills to Tottenville. The results of this analysis will be released to the public upon completion.
55	Assemblywoman Malliotakis	See attached letter for ammended testimony from Assemblywoman Malliotakis	9/8/2015	See attached letter for ammended testimony from Assemblywoman Malliotakis
56	EPA	See attached letter for comments	9/8/2015	See attached letter for comments
57	NYD Department of Parks and Recreation	See attached letter for comments	9/9/2015	See attached letter for comments

	Commentor	Comment	Date	USACE Response
58	US Department of the Interior	See attached letter for comments	9/9/2015	See attached letter for comments
59	Alan I. Benimoff Ph.D.	How is the Army Corps of Engineers plan going to address what is termed "compound flooding"? This is flooding due to storm surge and rainfall from coastal storms at the same time (Wahl et al. 2015). Will the proposed ponds be able to hold storm water from 12-16 inches of rain at the same time that a 14 foot storm surge is present? How would the storm water drain? In September 1999 Hurricane Floyd dumped 12-16 inches (figure 1) on adjacent New Jersey. Our weather station at CSI recorded 6.08 inches of rain. If the storm track from Floyd moved about 5-10 miles east Staten Island could have received 12-16 inches of rain. Suppose this event were to happen again with a 14 foot storm surge. How would this plan deal with the compound flooding?	9/9/2015	Thank you for your comment. The Formulation and selection of interior drainage features considered various combinations of storm surge and rainfall events. As described in the Interior Drainage Appendix, the worst case combinations were identified as a storm surge with a 10 % annual chance of exceedance (commenly called a 10 year storm) coincident with rainfalls events of upto a 0.2% annual chance of exceedance (commonly called a 500 year storm). The rainfall/ storm tide correlation analysis described in the Interior Drainage Appendix indicated that there is no precedent for larger coincident events. The Interior drainage ponds and natural storage areas were selected based on a comparison of the expected annual flood damages and to the cost of various alternatives. Because the combination of 12-16 inches of rain coincident with a 14 ft storm surge has such a negligible chance of occurrance, the ponds are not sized to store these volumes and extensive interior flooding would occur untill tides recede allowing the stormwater outfalls to operate normally.
60	Alan I. Benimoff Ph.D.	In the DEIS on page 5-1, For the Reference of Benimoff and Ohan 2003 which is no longer at the URL: http://www.library.csi.cuny.edu/dept/as/geo/sigeo.htm. It is now at: http://csivc.csi.cuny.edu/geology/files/sigeo.htm RE: page 5-1 draft EIS, Change FROM: Benimoff and Ohan 2003 Benimoff, A.I., and A.A Ohan. The Geology of Staten Island. http://www.library.csi.cuny.edu/dept/as/geo/sigeo.htm. Accessed on November 28, 2003. TO: Benimoff A.I. 2003. The Geology of Staten Island. http://csivc.csi.cuny.edu/geology/files/sigeo.htm Rationale: the site has migrated to new server and A. I. Benimoff is the author.	9/9/2015	Thank you, the EIS has been edited to use the updated citation per your comment .

	Commentor	Comment	Date	USACE Response
61	Mark Tranchina	The proposed seawall will have a major negative impact on our operation of the Vanderbilt Catering Hall, South Fin Grill Restaurant and boardwalk concessions. One possible remedy is the renovation or reconstruction of the facility. In order to accommodate this potential new construction, we request consideration that the USACE enhance the piling structure along an approximately 850 foot stretch adjacent to existing Vanderbilt structure and a new proposed expanded structure. The comments below offer some suggestions to help us salvage our business and give it a possibility to survive the long process. Comment # 1: We suggest that the USACE enhance the piling structure along an approximately 850 foot stretch adjacent to proposed Vanderbilt Village. This equates to altering approximately 27 piling to meet the proposed building substructure needs. Preliminary analysis suggests a design load of 100 tons for these 27 pilings. (Instead of the likely wooden pile boardwalk design load. This increased design load would mitigate the additional costs for the retrofit and minimize cost and interruption for the new proposed 2 story facility. Alternatively, the steel king pile wall as shown on Sheet C506 could be redesigned to handle the bearing loads of the retro-fitted and new structures. No other alterations to the original seawall design are anticipated. Comment #2 The second suggestion is to schedule this pile construction for this section of the waterfront well in advance of the seawall and in the early winter season. We would time the additional primary landside piling (necessary for alternative #4) in coordination with the USACE timeline. Comment # 3 Further, we suggest that the area around the Vanderbilt (sheet Identification C-109 of the "Coastal Storm Risk Management Feasibility Study") be the initial stage for seawall "proper" construction. Since the construction of this section is not contingent on the acquisition of land nor any major environmental delays are foreseen here, fast-tracking this section may set the project off with the best foot forward. This would allow flexibility in the planning and construction timeline without interfering or complicating the remaining sections of the seawall construction. Comment #4. Dig out Pond # 2 in Drainage Area E during the initial construction period of section C-109. This may help alleviate the disruptions to the neighborhood. Comment #5. We would also like to suggest the possibility of building a pier which could provide a long term boating facility and/or amphibious boat landing. This pier can initially help alleviate some construction burden from the surrounding neighborhoods and roadways. In summary, with an inevitable, yet open development approach to the project, an aggressive timeline for C-109 would allow the waterfront to remain active, causing the least disruption and largest enhancement for the waterfront.	9/9/2015	The proposed plan is at the feasibility phase of the project and a more complete design will be developed during the plans and specification phase. USACE will continute to coordinate with NYSDEC and NYC (in particular NYC Dept of Parks and Recreation regarding boardwalk resturants and concessions) during the Planning Engineering and Design (PED) phase of work and will coordinate impacts of construction
62	John Rooney	See attached letter for comments	9/9/2015	See attached letter for comments
63	The Nature Conservancy	See attached letter for comments	9/9/2015	See attached letter for comments
64	Robert DeBiase	There appear to be plans to integrate bicycle and pedestrian infrastructure into the sea wall structure. My additional comment is that there be sufficient access and connectivity of the pathway to local streets. For example in C-100: Ramps with appropriate bicycle acceptable grades connecting pathway with Buffalo St. in Great Kills Park, Pendale St and Grayson St. connecting to Chesterton Ave (no current connections are listed but are needed). C-101: Connection to Mill Rd near the Oakwood Waste Water Treatment Plant (are the current MVA connections appropriate for bicycle?). C-102: Connection to Kissam Ave (DTP connection OK). C-103: Connection to Tysens Lane (currently MVA – does it provide appropriate bicycle access?) and Ebbits Street (current DTP OK). C-104: Connection to New Dorp Lane (has MVA and DTP). C-105: Connections to Greeley Ave. (DTP) and Midland Ave (new – needs better connection to existing bike lane). C-106: Connections to Jefferson Ave. and Graham Blvd (currently a PA and DTP). C-107: Connections to Slater Blvd. (new), Naughton Ave., Seaview Ave. (DTP) and Ocean Breeze Fishing Pier (change a PA to DTP for bicycle access). C-108: Connection with the Staten Island Recreational Association (new?). C-109: Connection with Sand Lane (change from PA to DTP for bicycle access). C-110: Connection at Doty Ave (may currently be PA – need a bike connection), corner of Drury and Ocean Avenues (current DTP OK).	9/9/2015	The proposed plan is at the feasibility phase of the project and a more complete design will be developed during the plans and specification phase. USACE will continute to coordinate with NYSDEC and NYC (in particular NYC Dept of Parks and Recreation regarding public access and recreation features) during the Planning Engineering and Design (PED) phase of work and will coordinate impacts of construction
65	The City of New York	See attached letter for comments	9/9/2015	See attached letter for comments
66	National Oceanic and Atmospheric Administration	See attached letter for comments	9/9/2015	See attached letter for comments

	Commentor	Comment	Date	USACE Response
67	Dee Vandenburg, President STATEN ISLAND TAXPAYERS' ASSOCIATION, INC	We would like to thank you for our long awaited shoreline protection on our Island. 1) First we would ask that the title have an addition to it. It needs to read: Phase I - East Shore Our Organization works with all of the areas of Staten Island and one of the problems that we have run into is that the "South Shore" of Staten Island is from Great Kills National Park (Gateway) to Tottenville. It is exhausting attempting to explain to people that this DEIS is NOT for that area. The area that this is for is considered the "East Shore" of Staten Island. Part of our job is to assist, advise and keep the Civics calm. An exhausting job as volunteers, to say the least. 2) We have concerns brought to us on the 45.85 acre Pond in Oakwood Beach as there is a development there that we failed to get the NY State Enhanced Area Buyout for. That is Pelican Circle Development. Those homeowners are scared and we will try to explain it to them in layman's terms. 3) Additionally, although more of the part of the design & engineering part of this project, we would like to bring to your attention the condition of our small streets that lead to the areas you will need to work in. These non-arterial roads have no sub-structure under the road bed, some of our main arterials don't either. We need to make sure that there is language put into this project to restore the roads as each section of the wall is completed.	9/9/2015	1) USACE will incorporate "East Shore" into the project description in the Feasibility Study and EIS. 2) the non-federal sponsor is responsible to obtain all real estate requirements for the project. Please refer to Appendix VIIc of the Real Estate Plan that details easement requirements. The referenced pond will be required for interior drainage purposes. 3) The proposed plan is at the feasibility phase of the project and a more complete design will be developed during the plans and specification (P&S) phase. The development of P&S will document existing conditions. Any damage during construction due to the presence of heavy equipment would be returned to pre-construction conditions.
68	Mark E. and Giuseppa (Cirmi) Ruquet	My wife and I are submitting comments in favor of the Staten Island New York Coastal Damage Reduction Project that was presented at the Public Information Meeting held August 19 and 20, 2015. My family is a victim of Superstorm Sandy. We sustained about eight feet of water, filling our basement and coming close to the upper floor of the house. While we did not suffer damage to the upper floor living quarters, with the flood we lost some valuable items and memories that can never be regained. I also lost my car to the flood, which I have not replaced. Aside from the physical items, we have lost the security of living in our home. My wife says her heart is in her throat every time there is the threat of a storm nearby. With the added burden of an SBA loan and the rising cost of flood insurance, we have still not financially recovered and are just making ends meet. While we have signed up for the Build it Back program to raise our home, so far, what the city has offered is less than advantageous to us. Their rebuild proposal eliminates half of the house. The basement – which is eight foot high with a ceiling – would be filled in and the footage would not be replaced when the house is raised. The mechanicals would be crammed into the first floor and window elements my wife enjoys would be removed. We have seen some of the construction the Build it Back program has done, similar to what they proposed for us and it is hideous. From our observation, what value my wife now has in this house would be seriously ruined under their plan. Selling the home in our current situation is a poor option because too many homes in this area are on the market, diminishing the seller's advantage. The proposed Seawall and related flood remediation plans would be a welcomed relief. It would help with our peace of mind, knowing there is a credible barrier between our home and another serious storm flooding the area. It would help increase the value of our home, knowing the threat of flood from a serious storm was lessened considerably. It should also help with the assessment of risk from flooding, reducing, or at the least, stabilizing the cost of our flood insurance. My wife has lived at this address for over 30 years and finds it difficult to casually leave her home that she has invested so much into, not just in terms of money, but the memories of raising her family here. She should not be forced to abandon her home when a credible solution is just a few years from realization. For peace of mind and economic viability, she and I fully support this project. Sincerely, Mark and Giuseppa (Cirmi) Ruquet	9/9/2015	USACE acknowledges and appreciates your support for the proposed project.
69	Louise Lessard	The Army Corp Plan for Coastal Storm Management is based on calculated projections for the future. It is distressing that "Historic" Sea Level Rise is the chosen projection employed here. It is critical to use the most current best available data. We have known that emissions released in the burning of fossil fuels increases global warming, but we have become aware that extraction and distribution processes release significant emissions as well. These results in melting of glaciers and glacial sheets, thermal expansion, changes in salinity, temperature and currents, all of which contribute to rising waters. Other factors to be incorporated are subsidence in the New York City area and gravitational and rotational changes. Additionally, there is a consensus of expectation for increasing climate volatility, storm frequency and intensity. New York City and New York State have done extensive studies and reports to produce models for climate change. Please incorporate the NPCC study results. Any less will fall short of the need.	9/9/2015	USACE utilized the most current available data for sea level rise analysis. Further, adaptation features take into account intermediate and high future sea level rise predictions.

	Commentor	Comment	Date	USACE Response
70	Caitlin Saunders	I'm curious where I can find the public comments submitted Sept 9th, regarding Staten Island's sea wall project? Are they publicly available?	9/15/2015	The comments are not yet publicly available. We are currently compiling the comments and working on responses. When all responses are complete, a table with public comments and USACE responses will be available on our website. We'll notify you when the table is posted. Thanks, Kate
71	Linda Farina	Re: Staten Island Advance article 8/30/15 '/slanders' chance to weigh in on Plan to protect East Shore' by Rachel Shapiro To Whom It May CONCERN; This plan, and everything else concerning Hurricane Sandy, has taken WAY TOO LONG! I think it is disgraceful that money is unlimited whenit comes to Foreign aid etc, yet it's like pulling teeth for it to be used on protecting people in flood zone areas from another possible 'Sandy'. This is a life threatening problem- I would think it obvious that money be put toward the PROVEN need of protection from future storms that could, once again, be devastating to many people AND as soon as POSSIBLE! Our Government and city officials are failing us once again! The only one willing to fight for these families is Rep. Daniel Donovan- THANK YOU! My daughter lives in a Flood Zone that will not befunded by this Phase II Plan due to a cost/benefit ratio-ARE YOU KIDDING ME! Lives were lost in her neighborhood! The only protection given to them were sand bags along the beach and the majority of them no longer useful. What a huge and heartless insult to those people hit so hard, who pay high taxes and ridiculous rates for home and flood insurance. FEMA handled this miserably. Those hard hit neighborhoods could have been bought out with the amount of money FEMA wasted. AND NOW YOUABANDON THEM! How many more hurricane seasons must the people in these Flood Zones remain so vulnerable and hold their breath in fear of being hit again?? These families went through a terrible and traumatizing time-They deserve the protection and security that is so quickly offered to other cities and countries around the world. U.S. Army Corps of Engineers, YOU FINALLY HAVE A PLAN? AND IT WILL TAKE SEVERAL YEARS TO EVEN START (2018-2021)?? AND GREAT KILLS TO TOTTENVILLE IS NOT EVEN INCLUDED??? Again, billions spent andyet an area approximately six miles along the shoreline on Staten Island where Devastation occurred is not considered cost worthy! How can that bejustified? IT CAN'T!! Re: Advance article 8/31/15 'Polls Urge City to Buy, Redeveloped Vacant Homes' AND IT GETS even more insulting and mind-boggling- Three Staten Island officials urging the city to use Hurricane Sandy resources to acquire and redevelop vacant and privately owned properties. There's money to buy and redevelop Flood Zone properties in Midland, New Drop, and South Beach YET, due to a cost/benefit ratio, not available to adequately protect thefamilies living in Great Kills to Tottenville! Officials- Steve Mateo, Andrew Lanza and Nicole Malliotakis; TRY WORKING to make funds available to the OCCUPIED properties left WIDE OPEN and still dealing with the effects of that deadly storm! It's hard for me to even express the insanity of it ALL----MAY GOD PROTECT US, BECAUSE NO ONE ELSE IS!! Again, THANK YOU Mr. Donovan for stepping up-we obviously need more officials like you who are looking out for the welfare of ALL on this Island! AND IT GETS even more insulting and mind-boggling- Three Staten Island officials urging the city to use Hurricane Sandy resources to acquire and redevelop vacant and privately owned properties. There's money to buy and redevelop Flood Zone properties in Midland, New Drop, and South Beach YET, due to a cost/benefit ratio, not available to adequately protect thefamilies living in Great Kills to Tottenville! Officials- Steve Mateo, Andrew Lanza and Nicole Malliotakis; TRY WORKING to make funds available to the OCCUPIED properties left WIDE OPEN and still dealing with the effects of that deadly storm! It's hard for me to even express the insanity of it ALL----MAY GOD PROTECT US, BECAUSE NO ONE ELSE IS!! Again, THANK YOU Mr. Donovan for stepping up-we obviously need more officials like you who are looking out for the welfare of ALL on this Island!	9/4/2015	Phase 2 of the South Shore of Staten Island is under analysis in coordination with NYSDEC and NYC. Phase 2 encompasses the study area from Great Kills to Tottenville. The results of this analysis will be released to the public upon completion.

The Likelihood of Success

Primarily because of maintenance considerations, I do not think that the project's preferred alternative will function as designed. As things are structured now, the tide gates will not be maintained, either before or after their 25 year functional life. As things are structured now, the storm water retention ponds will not be maintained, and therefore will not have the retention capacity needed.

Operation and Maintenance of the project is the responsibility of the non-federal sponsor that will be required in accordance with funding agreement to be executed with the United States Army Corps of Engineers (USACE), Failure to provide such operation and maintenance procedures that will be prescribed in an Operation, Maintenance, Replacement, Rehabilitation and Repair (OMRR&R) manual (which includes mandatory inspections and reporting criteria) developed by USACE in cooperation and coordination with the non-federal partner may result in the non-federal partner being removed from the USACE Completed Works program.

The floodwall/levee will be overtopped, as set at 15.6' NGVD - Sandy had a peak surge opposite Rumson, NJ, at Sea Bright, Monmouth County, NJ: "Latitude: 40.37 Longitude: -73.97 Peak storm tide elevation of 19.50 feet, aboveNAVD88, recorded on 10/29/2012 8:00 PM, 12:40:56 AM GMT."[1] Sandy was not the biggest storm we have experienced or will experience.

As described in the report, design was based on a stillwater elevation of 15.6 ft NGVD 1929. This stillwater elevation is roughly equivalent to a future condition of a 300 year storm event based on the frequency of occurrence relationships for the project area and a historic sea level rise allowance.

In addition, the plan was designed to withstand wave forces, wave overtopping, local scour, and coastal erosion. The E&D Appendix (June 2015) shows the Feasibility level design for stillwater level design elevation that equate to the crest elevation design height that encompasses the additional height of the seawall required for wave forces, wave overtopping, local scour, and coastal erosion. For the Buried Seawall/Armored Levee reach, the structure crest elevation corresponds to the aforementioned stillwater design level of 20.5 feet NGVD. The structure crest elevations are greater than the stillwater design levels to meet the desired wave overtopping design limits.

Correct me if I am wrong, but on Staten Island 6 people died in 1992 Nor'easter and 23 people died during Sandy. They died because they did not heed the evacuation order. They died because they stayed in substandard housing, constructed and inhabited with government approval. If this plan is implemented, many residents will have a false sense of security.

Regardless of this plan, everyone who is in the flood zone now, who was in Sandy's surge zone, will be flooded again at some time in the future. They should plan accordingly.

As stated in the report, people must still follow all the required evacuation procedures, accordingly.

Extent of Protection/Design Storm

I wrote to NYSDEC's Venetia Lannon on March 4, 2013:

"The excerpt attached from the ACOE Staten Island Shore feasibility study from 2005 appears to present a plan and design that is a rehash of the Corps 1995 plan (I have a copy of Volume II), which was a rehash of the 1976 plan. Nearly identical. Just a few tweaks. They painted it blue and called it new. It is a seawall plan. Seawalls are eventually undermined, and anything that could be built considering economics realistically will be overtopped at some point."

In terms of sea level rise, the Corps is using the lowest historic value out of a range of projected values for sea level rise. The Corps needs to run its models (simulations) for the range of sea level rise values. What most people don't realize is that climate change or not, sea levels have been rising since the last Ice Age, 12000-19000 years ago. As the glaciers melt, sea levels rise. Climate change is about increasing the pace of melting. Climate change is about thermal expansion – a sea water temperatures rise, the volume expands. Sea levels in NYC were four feet lower when Peter Stuyvesant was running New Amsterdam!

The project sets the levee height for a 300 year return period storm, but only ran modeling for the 50 and 100 year storms.

USACE Response: The Corps evaluated the plan at the intermediate and high level of sea rise as well as the historic rate. The historic rate was used to design the plan and the intermediate/high sea level rise was used to incorporate adaptability into the design due to accelerated sea level rise and/or climate change.

Consider these two paragraphs from the Corps draft feasibility study, with the Orwellian heading "Residual Flooding:"

"Residual Flooding"
ES25. The NED Plan is estimated to reduce damages by about $27.7 million annually. This includes risk management from ocean surges from a Hurricane Sandy-like event over the 50 year period of analysis taking into account Sea Level Change. However, it will not eliminate all flood related damages in the Study Area. For example, if a 1% annual-chance-event (also known as the 100-year storm) was to occur after the project was implemented, there would still be 461 structures within the study area that would experience some level of flooding from interior run-off flooding. That is compared to the 4,682 structures that would experience some level of coastal flooding during a 1% annual-chance-event in the without-project condition. More regular storm events, such as the 20% annual-chance-event (also known as the 5-year storm) will continue to cause low level damages from interior run-off in some parts of the Study Area even with the project in place.

ES26. In the very rare occurrence that coastal stillwater levels exceed the 15.6 feet NGVD 1929 design level of the project (approximately a 0.3% annual-chance-event or about the 300 year storm), the ocean surge could breach the line of protection inundating the study area to the level

of surge.
Therefore it is extremely important that residents follow New York City evacuation orders and protocol to help decrease risks to life safety in the event of a severe coastal storm event."[2]

As stated in the Feasibility Report, people must still follow all the required evacuation procedures, accordingly.

---

[2] USACE New York District. South Shore of Staten Island, New York Coastal Storm Risk Management Feasibility Study for Fort Wadsworth to Oakwood Beach. Draft Main Report. June 2015. p. viii.

Table 4: Stillwater Elevations for Project Area (FEMA)[3]

Return Period (yr.)	ft., NGVD 1929
2	5.3
5	7.2
10	8.5
25	10.0
50	11.3
100	12.6
200	14.0
500	15.9

Again, Sandy had a peak surge height 0f 19.5 feet NAVD88, at Sea Bright, NJ. It was only a matter of a few degrees in the storm track that saved Staten Island from that peak surge. And again, Sandy is not the biggest storm in history or our future.

As described in the report, design was based on a stillwater elevation of 15.6 ft NGVD 1929. This stillwater elevation is roughly equivalent to a future condition of a 300 year storm event based on the frequency of occurrence relationships for the project area and a historic sea level rise allowance.

In addition, the plan was designed to withstand wave forces, wave overtopping, local scour, and coastal erosion. The E&D Appendix (June 2015) shows the Feasibility level design for stillwater level design elevation that equate to the crest elevation design height that encompasses the additional height of the seawall required for wave forces, wave overtopping, local scour, and coastal erosion. For the Buried Seawall/Armored Levee reach, the structure crest elevation corresponds to the aforementioned stillwater design level of 20.5 feet NGVD. The structure crest elevations are greater than the stillwater design levels to meet the desired wave overtopping design limits.

Philosophy

The Corps should probably not be involved with what are strictly local economic development

schemes and call them "National Economic Development" (NED) plans, and the Corps and the Federal government should absolutely not be involved at a 65% funding level in what amounts to a local real estate development project.

Our Federal infrastructure dollars and Federal tax benefits should only be spent on projects that benefit the region and all its taxpayers every day.

If you look at a map of the northeastern U.S., the area affected is thinner than a pencil line! Raise or retreat. We shouldn't get or expect public subsidies except for water dependent public facilities (shipping ports, critical infrastructure that cannot be relocated, naval bases, etc.).

The NED plan as proposed, does not induce development. In fact, the Corps must recommend a plan that does not induce development.

---

[3] Ibid. p. 3-6.

Recommendations:

Let the water in. Let the water out.

For inhabited areas: **Raise or retreat.**

Use no large structural measures.

Implement minor, lower cost structural measures, such as the Mill Road raising and a low berm at the Mill road edge, a floodwall around the sewage treatment plant, and relocating sewer interceptors to higher ground.

Use buyouts only where good planning dictates (meaning enough contiguous parcels can be accumulated so that the property can be used and managed for open space, floodplain, or park purposes). Establish a Voluntary Transfer of Development Rights Program (VTDR). Transfer of Development Rights programs are a power of cities enabled in State Law[4], and programs have been set up and used successfully in the State.[5] The law, written in the late 1980's, was written with Staten Island wetlands in mind. This will require City Planning Commission and City Council action to work out the details. The beauty of VTDR is that, other than administration costs, it doesn't cost the public anything for undeveloped land. Completing a buyout of developed land after VTDR would involve purchase of minor remaining rights and demolition costs.

We need to change the zoning – such as adding a special district overlay for Designated Open Space Zoning - as in the Special South Richmond Development District. This will require City Planning Commission and City Council action.

Stop encouraging development and living in harm's way by subsidizing flood insurance

premiums, and stop giving aid (e.g. SBA loans) without requiring resiliency design (e.g. raisings). We shouldn't have a Build It Back program – it should be Build It Higher!

---

[4] New York State. General City Law, Article 2-A, Section 20-f.
[5] http://www.dos.ny.gov/lg/publications/Transfer_of_Development_Rights.pdf

Establish a Tax Increment District and incentives. We need to enable a Tax Increment District, with dedicated revenue allocated to a public authority charged with funding floodplain-related maintenance, capital and expense work, including surcharges on water bills and real estate taxes. This will require State and City legislation.

Focus our existing hard line of protection: Hylan Boulevard.

For park areas: NYCDPR was warned before Sandy, by this writer and others, against the siting of artificial turf ball fields, asphalt paved bike paths, and tennis courts in the coastal wave velocity zone. We need to stop wasting money on these projects in the coastal zone, where they are subject to water velocity. Projects should not involve hard surfaces, artificial materials, and structures of any kind except throwaways, and retain and expand as many energy absorbing natural features and as much vegetation as possible.

Thank you for your comment. It has been noted for the record.

<u>Gateway/Great Kills Remediation and Tidal Wetland Restoration</u>.

Higher cost measures include the consideration of a joint project with the National Park Service, beginning with a feasibility analysis and hydrologic modeling, with the goal of increased surge energy absorption and flood storage, as well as tidal wetland benefits, by restoring the tidal wetlands and tidal creeks that lie below the garbage landfill area in Gateway's Great Kills Park. This will involve a revision of the NYCDEP Drainage Plan for the Oakwood Beach watershed, and a section of the park main road (Buffalo Street) reconstructed in part as a causeway.

A review of the latest update to the Administrative Record for the remediation of Great Kills Park showed that radium deposits, although small and low-level, are much more widespread than originally thought.[6] See attached .pdf image. The adopted remediation strategy will likely involve a lot of material removal.

It is also very likely that the tidal creek beds and [now decomposed] grass beds that were there in 1933[7] still lie under the garbage, and a careful excavation will reveal their outlines. After careful excavation, tidal marsh grass beds can be replanted, and creek beds would be available to absorb tidal surges, and in concert with a revision of the upland drainage plan, may be restored to functionality. This remains to be evaluated.

USACE is aware of the contamination at Great Kills and is coordinating with the National Park Service regarding their remediation activities prior to construction.

---

[6] Tidewater, Inc. for the USACE, for the National Park Service. "Landfill Delineation and Locations Requiring Additional Investigation." May, 2014. Great Kills Park Site Administrative Record File for Remedial Action. Slide AR0000124. Viewed August 5, 2015.

[7] National Park Service. "Great Kills Park Timeline". Great Kills Park Site Administrative Record File for Remedial Action. Slide AR0000129.

A model for this can be seen at the Bogs at Great Kills, which is the peat bog/saltwater grass/shellfish bed and adjacent mud flat areas just to the east and northeast of the main parking lot. The Bogs and mud flats were revealed years ago after many years of erosion of perhaps as much as 1500' of Robert Moses-era beach sand deposited during the original construction of the park (then called Marine Park). This park was constructed from a collection of sand spits, Crooke's Island, and tidal wetlands. The subsequent coastal erosion included the slow undermining and disintegration of the former park administration building, former beach house, and sewer line, which were all located near the main lot. As I wrote on November 28, 2012: "On Sunday I walked Gateway/Great Kills, in the area from about the main parking lot north to the Oakwood Beach tidal inlet. See attached Google Earth image from 2009. This piece of NPS shoreline was relatively unaffected. The Bogs seem intact! It was approaching high tide, so much was semi- submerged, but they actually looked unaffected. **The structural stability of the Bogs' peat material and the intertwined roots of the grasses is not to be underestimated.** I was thinking if we had more of that we might have saved more shorelines."

As stated in the Feasibility Report, additional geotechnical analysis is being conducted in the Pre-engineering and Design (PED) phase of the project.

Although because of its depth it may not be absolutely necessary, consider the relocation of the main South Shore interceptor sewer from inside Gateway/Great Kills Park (it currently is under the path called Wetland Road) to Hylan Boulevard and the vicinity of Guyon Avenue, placing it and its manholes largely out of the flood zone. This interceptor should never have been sited where it is now. Get it out of the park tidal floodplain.

During alternative formulation, the relocation of the interceptor was considered and rejected.

DEIS: Summary of Deficiencies

This is a project on land in the sovereign state of New York and in New York City, on land not owned by the Federal government. All City and State laws must be obeyed.

Thank you for your comment. It has been noted for the record. The proposed project will comply with all City, State and Federal laws.

As Bluebelt responsibilities are being expanded, land is being acquired, and City funds will be spent, the project will require multiple site-selection ULURP actions by the City Planning Commission and the City Council.

Thank you for your comment. It has been noted for the record. The City of New York is responsible for executing their Blue Belt plan and any associated land acquisition.

The DEIS needs to be revised and re-issued, and a public hearing held, with registered public speakers and a transcript of the hearing. At the Public Information Session held during the week of August 19, during the presentation by Mr. Verga, no public discussion/question/answer session was allowed.

The Public Information Session held during the week of August 19 was poorly attended. In fact 1/3 to 1/2 of the small number of attendees were Corps people, Corps consultants, State and City agency people, and elected officials representatives. The meeting was held during the week that the MTA finds has the lowest ridership, because people are on vacation. The meeting time was at 6 PM, whereas standard meeting time on Staten Island is 7:30, because of commute times. This guaranteed low attendance.

The outreach for this process has been substandard.

USACE disagrees with your comments regarding public outreach. Public discussion was conducted directly with the project team manager, engineers, scientists, planners and economists during the poster sessions. The meeting date, time, and venues were based on criteria, including access for community members. The meeting was advertised in a variety of ways, including a USACE press release, posting meeting information and documents for review on the USACE website, an article in local newspapers, a formal notice in the Federal Register, as well as notifying local elected representatives so they could share this information with their constituents. The public meetings were not recorded but the critical topics were discussed and comments were solicited in multiple ways. While your request for a public hearing format was not given, the meeting format presented in a manner consistent with the National Environmental Policy Act (NEPA).

<u>Legality of Process: Scoping; Exclusion of Post-Sandy Alternatives</u>

On p. 1-14 of the DEIS, beginning on line 37, the USACE writes:

"In accordance with the NEPA, a scoping meeting was held locally on October 3, 2001, to introduce the *South Shore of Staten Island Beach Erosion Control and Storm Damage Reduction Study* and to solicit public and agency comments on the study to date."

The Corps goes on to say where the meeting was held, how notice was given, and how comments were received. I don't recall any scoping hearing. The documents (Draft Scope, Final Scope, Transcript of the Hearing, Written Comments, and Responses) are not on the Corps website project page, as they should have been.

I was somewhat civically active at that time, but do not remember it.

Despite repeated written requests to make the scoping documents available, online or otherwise, none have been forthcoming.

Be that as it may, could a project issuing a DEIS in 2015 be legal based on a scoping process fourteen (14) years prior? This is a new project, with a new local agency sponsor, and is subject to all City and State law. There should have been a new, current, scoping hearing and scoping process.

As a result of there being no contemporaneous scoping hearing, the public had no formal opportunity to influence the current alternatives to be analyzed in the DEIS.

Alternatives that should have been considered: Transfer of Development Rights to supplement a buyout program, a Tax Increment District, and a stronger special district regulatory scheme are not in any alternative. Gateway/Great Kills remediation site tidal wetlands restoration is not in any alternative. These alternatives were not considered because they were not raised in scoping, because no legally required scoping process was held for this new project, a joint new USACE/NYSDEC project. This is a new project, and is not the 2001 project.

Current 2015 public meeting materials were posted to the Corps project website. Additionally, current documents were provided in several formats to the commenter, including availability at his local library of choice, community board and on a CD delivered at the public meeting specifically per the commenter's request. As commenter was aware, the prior 2001 scoping event documents were requested and provided via the FOIA process on September 23, 2015 at no cost to the commenter.

The proposed project has the same features (Line of Protection and Interior drainage) as described in the original scoping effort. The Feasibility study has been updated to reflect current existing conditions and new information post-Hurricane Sandy. The non-Federal sponsor (NYSDEC) and local partner (NYC) have also remained the same.

Scoping was held per NEPA. Suggestions for alternatives as described within the comment would need to have been raised during this time in the process. The current phase of work is not to suggest additional alternatives, but to complete the feasibility study. Additionally, some of the ideas within the comment suggested (i.e., transfer of development rights and a tax increment district) are outside the scope of the USACE mission and this specific project authority. These ideas would more appropriately be raised to State or City of New York outside of this Coastal Storm Risk Management Feasibility Study process.

Parkland Alienation

Parkland alienation. P. 1-15 (Sec. 1.8). The NED plan is a real estate development plan. This is clearly not a park purpose. Replacement is required: at equivalent or better "fair market value, environmental value, and reasonably equivalent usefulness and location."

Easements. How many acres exactly. The DEIS says 124 parcels. 42 private, 82 public. Where are they exactly? Map location? Block and lot numbers? How much park land exactly?

USACE is coordinating with NYSDEC and the City of New York regarding parkland alienation.

State legislation will be drafted to utilize the subject lands for project purposes.

Please see exhibits "A" (Real Estate Maps), "B" (Parcel Data), and "C" (LEERD Summary Table) in Appendix VII (Real Estate Plan) for a summary of the project acres, easements required, property/ownership data, and additional information regarding the project's real estate requirements.

Stoplog Road Closure at Hylan Boulevard.

At the 8/19/15 Public Information Session, Project Manager Frank Verga stated that in the area of Hylan Boulevard where a road closing barrier would be installed, they would need a road upland, a bypass of the stoplog, for emergency vehicles. This is in the Greenbelt's Amundsen Trailway (NYCDPR property no. R-047).8 That would need to be sited, a cost calculation done, including a tree survey/tree replacement plan and costs, and a wetland delineation – all of which must be in the DEIS. This site also contains a drainage swale that is part of NYCDEP's Bluebelt - Oakwood Beach Watershed. BMP OB-5 is just upstream. This proposed road will require a change to the City Map, and State legislation. Adopted City policies and plans9 must also be considered. 10

This "stoplog" has a Rube Goldberg feel to it. North of the stoplog location on Hylan Boulevard in the vicinity of Chesterton to Malone is a stormwater runoff flood zone,[11] absent any coastal storm influence. This is sometimes impassable, so emergency vehicles may not be able to pass anyway.

Once the closure structure is implemented, the road would already be impassable to vehicles because of the flood waters. Additionally, all real estate requirements will be confirmed based on a profession land survey/topographic survey that would be required to be conducted during PED.

Wetland Delineation

This is a project entirely on the land of the sovereign state of New York, and of its administrative entity, the City of New York. All Federal, State, and Local Laws must be obeyed. Federal law is not preemptive in this case. Where Federal law applies, it applies. Where State and local laws apply, they apply – independently, and concurrently, not hierarchically.

This project needs to obey New York State Freshwater Wetlands Act and Tidal Wetlands Act and other relevant State and City laws and regulations, as well as Federal laws and regulations.

New York State Department of Environmental Conservation (NYSDEC) is the Corps partner and sponsor in this project. NYSDEC and the Corps have a long-standing joint application process for wetland permitting in New York State, but that doesn't mean we sink to the level of the least common denominator.

Thank you for your comment. It has been noted for the record. The proposed project will comply with all City, State and Federal laws.

[8] Park Property No. R-047. The *Willowbrook Parkway*. Sign name: *Amundsen Trailway*. Title is held by the City of New York. The New York State Department of Transportation has an "interest" as a consequence of naming in State Highway Law, section 349-f.

[9] Dinkins, David N., Molinari, Guy V. Gotbaum, Betsy, Paulo, Thomas A., Rossi, James M. The Greenbelt Master Plan. South Street Design Company/Jackson & Kihn for the City of New York: Department of Parks & Recreation. Contract No. R-RE-65-605. 1991.

[10] Stern, Henry J., Moss, Alan M, Johnert, Robert C., Carlson, David, Natoli, John; Flynn, - Keller, & Strauch designers. The Construction of The Staten Island Greenbelt Circulation Paths and the Amundsen Trail Bicycle Path, Linking the Gateway National Recreation Area with La Tourette Park, Borough of Staten Island. City of New York. Department of Parks & recreation. Olmstead Center. Contract No. RG-898. Signed March 9, 2000. 34 Sheets signed construction drawings.

[11] FEMA FIRM Map 3604970317F.

In addition to and independently of Federal rules, NYSDEC Classification Regulations Part 664 values vegetation and their ecological associations.[12] Permit regulations, especially as regards mitigation, need to be considered.

On page 2 of Appendix C of the DEIS, the "Wetland Delineation Report," the Corps writes:

"The delineation of wetlands on site was performed in accordance with the currently accepted state and federal methodology, presented in the 1987 *Corps of Engineers Wetlands Delineation Manual, Technical Report Y-87-1* (Environmental Laboratory 1987)."

That is incorrect. The State has its own delineation enabling law and methodology. State wetland delineation is based on its mission, which is habitat-focused. The Corps has other missions. State wetland delineation is based on vegetation, and need not consider soils or hydrology. The result is that on Staten Island, State delineations are many times far larger in contiguous area than Corps delineations. On the other had Corps delineates and regulates very small wetlands, whereas, except in some limited instances, the State regulatory minimum is 12.4 acres.

The State delineation manual was last revised in 1995. I believe it was in part an attempt to harmonize with the Corps methodology. Whether it accurately reflects its legislative mandate is open to question.

Your comment has been noted for the record. The EIS complies with all wetland regulatory requirements, accordingly.

As supported by coordination with the Unites States Fish and Wildlife Service (USFWS), the functions of the existing wetlands (low quality Phragmites monoculture) do not support replacement of their function with anything greater than equal acres of project mitigation features. The creation of 11.34 acres of native seeded/planted emergent wetland where upland

previously existed (via the interior drainage project feature), more than compensates for the loss of 10.98 acres of low quality Phragmites monoculture lost as a result of the fill for the LOP. Provided the wetland enhancements function as designed/intended, the proposed action would result in no net loss of wetland acreage and in a net increase in wetland functional values. As such, USFWS concurred with the USACE and concluded, provided the Fish and Wildlife Coordination Act Report (FWCAR) recommended measures are implemented, that the proposed action will not have significant adverse impacts on fish and wildlife resources in the project area."

The statement on page 2 of appendix C to the EIS is correct, wetland delineation was performed in accordance with currently accepted state and federal methodologies, presented in the 1987 Corps of Engineers Wetlands Delineation Manual, Technical Report Y-87-1 (Environmental Laboratory 1987). Page 2 of the July 1995 New York State Freshwater Delineation Manual states that "This Manual makes use of methods and information found in "Technical Report Y-87-1, Corps of Engineers Wetlands Delineation Manual" (1987)." The USACE will welcome NYSDEC staff's field review of the delineated wetland boundaries to determine whether there are any discrepancies with the surveyed boundaries and to determine state-regulated areas in the Project limits of disturbance.

From p. 3 of the 1995 NYSDEC Delineation Manual:[13]

"The hydrophytic vegetation criterion is mandatory under New York State's Freshwater Wetlands Act [except as listed in §24-0107(8) (b), (c), and (d)]. Hydric soils and wetland hydrology provide additional information and should be used as needed to document the presence of a wetland and the location of its boundary."[14]

Here is the New York State Wetland Law, section 24-0107. This is the section of the law that enables delineation. See 24-0107(d) (3).

---

12 http://www.dec.ny.gov/regs/2485.html
13 http://www.dec.ny.gov/docs/wildlife_pdf/wdelman.pdf
14 Ibid. p. 3

§ 24-0107. Definitions.
1. "Freshwater wetlands" means lands and waters of the state as shown on the freshwater wetlands map which contain any or all of the following:
(a) lands and submerged lands commonly called marshes, swamps, sloughs, bogs, and flats supporting aquatic or semi-aquatic vegetation of the following types:
(1) wetland trees, which depend upon seasonal or permanent flooding or sufficiently water-logged soils to give them a competitive advantage over other trees; including, among others, red maple (*Acer rubrum*), willows (*Salix spp.*), black spruce (*Picea mariana*); swamp white oak (*Quercus bicolor*), red ash (*Fraxinus pennsylvanica*), black ash (*Fraxinus nigra*), silver maple (*Acer saccharinum*), American elm (*Ulmus americana*), and Larch (*Larix laricina*);
(2) wetland shrubs, which depend upon seasonal or permanent flooding or sufficiently water-logged soils to give them a competitive advantage over other shrubs; including,

among others, alder (*Alnus spp.*), buttonbush (*Cephalanthus occidentalis*), bog rosemary (*Andromeda glaucophylla*), dogwoods (*Cornus spp.*), and leatherleaf (*Chamaedaphne calyculata*);

(3) emergent vegetation, including, among others, cattails (*Typha spp.*), pickerelweed (*Pontederia cordata*), bulrushes (*Scirpus spp.*), arrow arum (*Peltandra virginica*), arrowheads (*Sagittaria spp.*), reed (*Phragmites communis*), wildrice (*Zizania aquatica*), bur-reeds (*Sparganium spp.*), purple loosetrife (*Lythrum salicaria*), swamp loosestrife (*Decodon verticillatus*); and water plantain (*Alisma plantago-aquatica*);

(4) rooted, floating-leaved vegetation; including, among others, water-lily (*Nymphaea odorata*), water shield (*Brasenia schreberi*), and spatterdock (*Nuphar spp.*);

(5) free-floating vegetation; including, among others, duckweed (*Lemna spp.*), big duckweed (*Spirodela polyrhiza*), and watermeal (*Wolffia spp.*);

(6) wet meadow vegetation, which depends upon seasonal or permanent flooding or sufficiently water-logged soils to give it a competitive advantage over other open land vegetation; including, among others, sedges (*Carex spp.*), rushes (*Juncus spp.*), cattails (*Typha spp.*), rice cut-grass (*Leersia oryzoides*), reed canary grass (*Phalaris arundinacea*), swamp loosestrife (*Decodon verticillatus*), and spikerush (*Eleocharis spp.*);

bog mat vegetation; including, among others, sphagnum mosses (*Sphagnum spp.*), bog rosemary (*Andromeda glaucophylla*), leatherleaf (*Chamaedaphne calyculata*), pitcher plant (*Sarracenia purpurea*), and cranberries (*Vaccinium macrocarpon and V. oxycoccos*); submergent vegetation; including, among others, pondweeds (*Potamogeton spp.*), naiads (*Najas spp.*), bladderworts (*Utricularia spp.*), wild celery (*Vallisneria americana*), coontail (*Ceratophyl lumdemersum*), water milfoils (*Myriophyllum spp.*), muskgrass (*Chara spp.*), stonewort (*Nitella spp.*), water weeds (*Elodea spp.*), and water smartweed (*Polygonum amphibium*);

(b) lands and submerged lands containing remnants of any vegetation that is not aquatic or semi-aquatic that has died because of wet conditions over a sufficiently long period, provided that such wet conditions do not exceed a maximum seasonal water depth of six feet and provided further that such conditions can be expected to persist indefinitely, barring human intervention;

(c) lands and waters substantially enclosed by aquatic or semi-aquatic vegetation as set forth in paragraph (a) or by dead vegetation as set forth in paragraph (b), the regulation of which is necessary to protect and preserve the aquatic and semi-aquatic vegetation; and

(d) the waters overlying the areas set forth in (a) and (b) and the lands underlying (c).

2. "Freshwater wetlands map" shall mean a map promulgated by the department pursuant to section 24-0301 of this article on which are indicated the boundaries of any freshwater wetlands.

3. "Boundaries of a freshwater wetland" shall mean the outer limit of the vegetation specified in paragraphs (a) and (b) of subdivision one of section 24-0107 and of the lands and waters specified in paragraph (c) of such subdivision.

4. "Local government" shall mean a village, town, city, or county.

5. "State agency" shall mean any state department, bureau, commission, board or other agency, public authority or public benefit corporation.

6. "Person" means any corporation, firm, partnership, association, trust, estate, one or more individuals, and any unit of government or agency or subdivision thereof, including the state.

7. "Board" shall mean the freshwater wetland appeals board.

8. "Pollution" shall mean the presence in the environment of man-induced conditions or contaminants in quantities or characteristics which are or may be injurious to human, plant or wildlife, or other animal life or to property."

It is clear from State law and regulation that the Corps methodology and mandate is different from the State methodology and mandate. Delineations in the project must be done following State and Federal law. We will then find most areas are in common, and some areas regulated only under Federal law and some only under State law. Each must be mapped, quantified, and qualified.

Unlike Federal wetland law and regulation, State freshwater law mandates an adjacent area (FAA), which is a MINIMUM of 100 feet from the wetland boundary (ENV 24-0701(2)). There is also a provision in special cases for an Extended Adjacent Area. FAA and FEAA is regulated, and any taking must be mitigated per the State permit regulations.

NWI Revisions. Also on p. 2 of Appendix C, the Corps cites NWI data from 1994 and 1995. The NWI mapping for Staten Island was completely redone and was reissued in 1998. I am looking at a set of the 1998 maps as I write this. I participated in the field-checking of the draft maps. A nice little booklet about it was published two years later.[15]

The field work for wetland delineation needs to be revisited, and the Appendix needs to be corrected and rewritten.

Wetland Mitigation

Mitigation must be done considering both State and Federal law and regulation.

On p. iv, and p. 4-10 of the DEIS the Corps states 28.7 acres freshwater wetlands (FWW) are impacted. 10.9 acres of freshwater wetlands are to be taken permanently. No FWW mitigation is outlined. 46 acres of tidal wetlands to be created, and the Corps claims this is the tradeoff. Freshwater and tidal habitat and benefits are not the same. Not in value, not in State law or regulation. Any State FWW losses must be mitigated 3 to 1 with FWW, not tidal wetlands, and not 1:1 as the Corps states in the DEIS. My understanding is that the State standard is 3:1 for compensatory mitigation, and 20:1 for punitive.

State Tidal wetland law (ENV Article 25) and regulations must be considered also. In New York City, any activity within 150 feet of the State tidal wetland boundary is regulated.

Local Law 3 of 2010

See p. 4-8 (Sec. 4.31) lines 13-35. Pre-construction surveys should be DEIS surveys! For instance all trees to be taken need to be located and cataloged, and compliance with Local Law 3 of 2010 and NYCDPR regulations should be specified: i.e. the number and species and caliper of replacement trees, and the locations where the replacement will take place, and the cost of that

[15] Tiner, R.W. Wetlands of Staten Island, New York: Vanishing Urban Wildlands. U.S. Fish and Wildlife Service, Ecological Services, Northeast Region, Hadley, MA. Prepared for U.S. Environmental Protection Agency, Region II, New York, NY. Cooperative National Wetlands Inventory Publication. 2000. 19 pp

replacement. This information needs to be in the DEIS. It is environmental impact, and as such must be quantified and published in the DEIS.

Overall, the wetland boundaries were relatively clearly defined and distinguishable by both vegetation and soils in the study area and were analyzed using the appropriate planning guidance conducting delineation within a Corps Civil Works project. For implementation, the project will also comply with all federal, state and local regulatory authorities.

The non-Federal project sponsor, NYSDEC is fully in support of this project and acknowledged as proposed would not require mitigation project based on the ecological benefits that are to be achieved.

As supported by USACE coordination with the USFWS, the functions of the existing wetlands (low quality Phragmites monoculture) do not support replacement of their function with anything greater than equal acres of project mitigation features. The creation of 11.34 acres of native seeded/planted emergent wetland where upland previously existed (via the interior drainage project feature), more than compensates for the loss of 10.98 acres of low quality Phragmites monoculture lost as a result of the fill for the LOP. As designed, the proposed action would result in no net loss of wetland acreage and in a net increase in wetland functional values. As such, USFWS concurred with the USACE and concluded that with the implementation of their recommended measures, the proposed action will not have significant adverse impacts on fish and wildlife resources in the project area.

The most recent USACE wetland delineation field work took place in 2009. At this time, no additional field efforts will not be conducted. Once the reports are approved, updated field work, including wetland delineation if required, will be conducted for drafting the Plans and Specifications.

Maintenance & Major Rehab

Maintenance has environmental impact! A requirement of the NYSDEC wetland permits will be that maintenance is provided **in perpetuity**. We need to see a list of specific performance metrics.

In the Feasibility Study, the Corps writes:

"The Operations and Maintenance (O&M) responsibilities as part of the NED Plan include an annual survey of the Line of Protection, replacement of sand cover and dune grass along the buried seawall/armored levee, the operation and maintenance of the tide gates, gate chambers and intermediate outlets; the mowing and maintenance of the ponds; and the replacement of all gate

structures at a 25 year interval.
Total O&M Annual Cost .....$555,000/year"

Subsequently, in a table on p. 7-28 of the Feasibility Study, O&M costs are broken down by area, and by function.

We need to see the detailed agreements with NYCDEP and Parks. Right now, in an Appendix. There is only a draft programmatic agreement with NPS. NYCDEP in particular is problematic. On p. 4-62 of the DEIS, line 5, it is stated that the NYCDEP's Bluebelt program will provide pond maintenance.

As is standard practice for all USACE projects, an Operations, Maintenance, Repair, Replacement and Rehabilitation (OMRR&R) manual will be developed during construction in partnership with the non-Federal Sponsor NYSDEC. No detailed agreements have been executed at this time. A Project Partnership Agreement (PPA) will be executed with NYSDEC upon Feasibility Study and Environmental Impact Statement approval. NYSDEC will then execute a sub agreement with the local partner, NYC.

Ponds. On p. 4-62 starting in line 4, the Corp's writes: "The ponds are designed to provide

diverse
5 plantings and the Bluebelt program would provide ongoing maintenance to ensure plant
6 diversity, establishment, and growth."

NYCDEP's mandate is wastewater treatment and storm water pre-treatment and discharge, not tidal/coastal flood protection. In addition, their mandate and approved bond issuance is generally is limited to areas impacted only by the five (5) year design storm.

Noted, please see information below previously provided by NYC in response to this comment:

If there is no USACE project (i.e., the no action alternative), USACE will not conduct the excavation for interior drainage and the subsequent native seeding/planting that would have improved the conditions in the area with native emergent wetland.

Further, if there is no USACE project, the City may still implement the Bluebelt program in the area. The Bluebelt program would also involve preserving wetlands and introducing new natural storage areas for stormwater conveyance. The Staten Island Bluebelt Program was introduced to incorporate Best Management Practices (BMPs) and other plans and actions to provide stormwater management, and to decrease flood hazards and increase water quality. These actions are fulfilling DEPs mission."

USACE will clarify the EIS by modifying the last sentence of the paragraph in the referenced Aesthetics and Visual section as follows:

"...the non-federal sponsor is required to maintain the USACE constructed project, including plant diversity, establishment and growth in accordance with local cooperation items and operation and maintenance requirements of federally funded projects."

Dunes. NYCDPR history regarding dune maintenance does not provide much hope. An ex senior Parks employee reports:

[In 1997-98, at South Beach/Midland Beach] "We built a line of dunes with every bit of available sand. It stretched maybe 500-600 feet long as was about 6 foot high. It was planted with ***Ammophila breviligulata*** (Beach Grass). It all worked very nicely, but within a year, maybe two growing seasons it was gone. The high ups requested that it be removed. We can only speculate as to why it was removed."

I remember those dunes. What I heard is NYCDPR Operations upper management did not like them because they were accumulating litter and because NYCDPR is underfunded and they are mechanically oriented, meaning they could not clean the vegetated dunes with mechanical rakes that they use to clean the beach sand. So the dunes had to go.

Noted. NYC maintenance activities on other projects are outside of the scope of USACE South Shore of Staten Island Coastal Storm Rick Management project authority. After construction of this project, maintenance activities will be the responsibility of NYSDEC and their local partner NYC. This responsibility will be documented in a Project Partnership Agreement (PPA).

Maintenance of tide gates. What agency will maintain the tide gates? Where is the funding for the replacement of gates at year 25?

The non-Federal sponsor NYSDEC will be responsible and may delegate this responsibility to the local partner, NYC. This responsibility will be documented in the Project Partnership Agreement (PPA) between USACE and NYSDEC and then further in the sub agreement between NYSDEC and NYC.

Besides wetland and coastal zone permit terms and conditions requiring maintenance "in perpetuity," we need state legislation on the maintenance, which should be enable and be tied to a Tax Increment District.

Noted. State legislation and the actions of Tax districts are outside of the scope of USACE South Shore of Staten Island Coastal Storm Rick Management project authority. Please contact New York State and New York City on this matter.

Coastal Erosion and Sand Transport; Beach Replenishment

All outfalls are groins. I see no analysis of this from the point of view of beach stabilization and sand transport. See NPS comments in Appendix G, "Project Correspondence." I heartily endorse the NPS comments. By the way, design of the outfalls/groins and the areas surrounding the outfall/groins could be enhanced to provide habitat.

Action on beach replenishment will not kick in until beaches reach a 75' minimum, the Corps writes in the DEIS. That is unacceptable. Without beach replenishment, with a seawall you eventually will lose the beaches.

Erosion analysis included in the report determined that the minimum beach width will be maintained and therefore, no beach nourishment is required.

<u>DEIS Items That Need a Lot More Explanation</u>

p. 2-28: "effluent pump"

The Final EIS has been revised to clarify that the reference is to the Oakwood Beach Wastewater Treatment Plant.

p. 3-13: Executive Order 11988

The Final EIS has been revised to add language clarifying that Executive Order 11988 is about Floodplain Management.

pp. 3-13 to 3-17. Separate vs. combined sewer areas. I believe the statement in the DEIS to be so broad as to be incorrect.

The statement on pages 3-13 to 3-17 is correct, the reference is with respect to sanitary versus storm sewers. Language has been added to the Final EIS to clarify.

P. 4-8: "covered with material, primarily sand, with some clay, silts, and topsoil." Dredge spoils, right?

This comment is incorrect as there is no dredging involved in the proposed project. The cover is primarily a reuse of the material is excavated from the construction of the Line of Protection. Language will be added to page 4-8 of the EIS to clarify.

p. 4-28, 4-30: How a World War II fire tower is not historic and protected is beyond me. The Miller Army Air Field is a NATIONAL Historic District.

The National Register of Historic Places (NRHP) Miller Army Air Field historic district boundary does not presently include the WWII fire tower. A determination of its individual eligibility or eligibility as a contributing element of the historic district has not yet been made. NRHP listing does not provide protection for a resource. However, Section 106 of the National Historic Preservation Act requires that a federal agency take into account impacts of an undertaking on NRHP-listed or eligible resources and provides the Advisory Council on Historic Preservation (ACHP) an opportunity to comment. The USACE has consulted with the ACHP, New York State Historic Preservation Office (SHPO), the National Park Service and other interested parties. The fire tower will be addressed through the Programmatic Agreement that was prepared for the project and included in the Draft EIS.

P. 4-34: The preferred project will spur no new development? Are you serious? The Corps preferred alternative project will provide excuse, and in fact, this is clearly a real estate development project.

The Project requires the acquisition of over 256 acres in permanent Flowage Easements (the term "Flowage Easement" in the current draft RE plan will be replaced with "Ponding Easement" in the updated revised version) or Restrictive Easements that will prohibit future development. Additionally, NYC and NYS are undertaking property acquisition programs within the vicinity of the project area that are designed to promote open spaces, further limiting development near the project area.

p. Section 4.23.2 p 4-65 to 4-66: The NYCDPR Staten Island Shoreline Parks Plan must be considered, and is in fact inextricably intertwined with any alternative.[16]

USACE will continue to coordinate with the project's non-federal sponsor NYSDEC and the local partner NYC (which includes representatives from NYCDPR).

Waterfront Zoning and Views; Public Trust Access

The aesthetic impact is enormous. All views of the water will be cut off. Can the DEIS include a Google-Earth style interactive walk-through, with/without the project, so that everyone can see what the impact will be?

Renderings have been added to the EIS (Section 4.10) to depict the viewshed before and after construction.

Is there any consideration being given by the Department of City Planning/City Planning Commission to modifying the New York City Zoning Resolution so that facilities in FEMA Zone V (v for wave velocity) must be non-residential, or even day-use only?

Modification to NYC land use zoning and FEMA zones are outside of the scope of the study and project authority.

What do the Waterfront Zoning Rules and the site specific waterfront zoning such as Great Kills Harbor C3A zone (map 33c) in the Zoning Resolution require?

Great Kills Harbor is not within the South Shore of Staten Island Coastal Storm Risk Management project area.

---

16 http://www.nycgovparks.org/planning-and-building/planning/conceptual-plans/east-shore-shoreline-parks-plan

What is the level of existing conformity to the Waterfront Zoning Rules, including public access to the waterfront and view corridors at street ends? And how would the project's preferred plan conform to or get an exemption from those rules?

Appendix D – Coastal Zone Consistency provides details and analysis regarding consistency with NYC's Local Waterfront Revitalization Plan.

Where is the certification that public trust access to all the shoreline will be maintained? At Oakwood Beach, for instance, there is only one combined vehicle and pedestrian access ramp (labeled DTP).

Pedestrian and Vehicular Access Points are provided in the document Plan Sheets. USACE will continue to coordinate directly with NYSDEC and NYC to ensure the functional replacement of all features that are being relocated in accordance with the project purpose and within USACE authority during the design phase of the project.

Appendix E. Distribution List. NOAA is not copied. Why?

"NOAA is seen as an honest broker for providing science based information, along with the tools and expertise to apply this information effectively in coastal regions."

http://portal.hud.gov/hudportal/HUD?src=/sandyrebuilding/federalpartners

Representatives from The National Marine Fisheries Service (NMFS), an office within the National Oceanic and Atmospheric Administration, are listed on the distribution list in EIS Appendix E and have been coordinated with respect to potential impacts to marine resources.

Included by Reference

Besides the documents cited in my comments text and footnotes, the following documents, in their entirety, are included by reference:

Cryan, John F., Pane, Joseph, et al. "Final Freshwater Wetland Classification for Wetland NA-10." NYSDEC. August 27, 1987. 7 pp.; " Final Freshwater Wetland Classification for Wetland NA-9. NYSDEC. 1987"; " Final Freshwater Wetland Classification for Wetland NA-8. NYSDEC. 1987

Dinkins, David N., Molinari, Guy V. Gotbaum, Betsy, Paulo, Thomas A., Rossi, James M. The Greenbelt Master Plan. South Street Design Company/Jackson & Kihn for the City of New York: Department of Parks & Recreation Contract No. R-RE-65-605. 1991.

South Street Design Company/Jackson & Kihn for the City of New York: Department of Parks & Recreation. The Greenbelt: Existing Conditions and Diagnostic Report. November 1990.

U.S. Fish and Wildlife Service. National Wetlands Inventory. Map sheets "Arthur Kill" and "The Narrows." U.S. Department of the Interior. 1998.

Licata, Angela, Gumb, Dana, et al. Staten Island Bluebelt Drainage Plans for Mid-Island Watersheds: Final Generic Environmental Impact Statement. AKRF, Inc., Hazen & Sawyer, PC. Historical Perspectives In. for NYCDEP. CEQR No. 07DEP063R. 2013.

NYSDEC. Final Generic Environmental Impact Statement for Staten Island's Freshwater Wetlands Program. 1992.

NYSDEC. New York State Freshwater Wetland Maps for Richmond County. Sheets: "Arthur Kill" and "The Narrows." September 1, 1987.

NYSDEC. Tidal Wetland Maps for Richmond County. Map sheets "Arthur Kill" and "The Narrows."

Stern, Henry J., Moss, Alan M, Johnert, Robert C., Carlson, David, Natoli, John; Flynn, Keller, & Strauch designers. The Construction of The Staten Island Greenbelt Circulation Paths and the Amundsen Trail Bicycle Path, Linking the Gateway National Recreation Area with La Tourette Park, Borough of Staten Island. City of New York. Department of Parks & recreation. Olmstead Center. Contract No. RG-898. Signed March 9, 2000. 34 Sheets signed construction drawings.

Tiner, R.W. Wetlands of Staten Island, New York: Vanishing Urban Wildlands. U.S. Fish and Wildlife Service, Ecological Services, Northeast Region, Hadley, MA. Prepared for U.S. Environmental Protection Agency, Region II, New York, NY. Cooperative National Wetlands Inventory Publication. 2000. 19 pp.

I.3 OTHER COMMENTS AND RESPONSES

This section provides copies of other comments and responses that occurred outside of the public comment period, as well as internal USACE comments and responses.

United States Department of the Interior

NATIONAL PARK SERVICE

Gateway National Recreation Area
210 New York Avenue
Staten Island, N.Y. 10305-5019

IN REPLY REFER TO:

L76 (GATE-S)

May 26, 2015

Mr. Peter M. Weppler
Chief, Environmental Analysis Branch
Department of the Army
New York District, Corps of Engineers
Jacob K. Javits Federal Building
New York, New York 10278-0090

Dear Mr. Weppler:

Thank you for your response to our comments dated April 9, 2015 and for the opportunity for pre-public review of how those responses were incorporated into the South Shore of Staten Island Coastal Storm Damage Reduction Project Draft Environmental Impact Statement (DEIS) and Feasibility Study (FS).

We appreciate expansion of the DEIS and FS to provide sub alternatives for the alignment of the line of protection at Miller Field as well as additional text to address impacts to cultural, natural and recreational resources within Gateway National Recreation Area (GNRA). I have enclosed a matrix that cross walks our April 9, 2015 comments (column A), your May 8, 2015 responses (column B), and corresponding revisions to the pre-public DEIS and FS (columns D and E, respectively). Column C of the matrix provides more detailed comments and assessments regarding USACE responses and revisions to DEIS and FS.

Thank you for your consideration of the enclosed comments (column C on the attachment). We are committed to working with USACE to realize a project that manages storm risks, improves public safety, and protects the resources and visitor experiences of GNRA. If you have any questions or require additional information regarding the enclosed comments, please contact me at jen_nersesian@nps.gov or 718-354-4665.

Sincerely,

Jennifer T. Nersesian
Superintendent

Matrix for NPS cross check for USACE responses and DEIS and Feasibility Study revisions

26-May-15

NPS Comment	USACE Response	NPS Document Review	DEIS Pages pdf pagination (report pagination) references USACE track change document	Feasibility Study pdf pagination (report pagination) - references USACE track change document
1. EIS Scope and Process				
We have identified two issues related to Gateway NRA that are missing from the analysis presented in the draft EIS: the alignment of the seawall at Miller Field (either landward or seaward of the hangar), and the location of the multi-use path at Miller Field (on top of the seawall or at ground level). We request that these be addressed in separate alternatives in the EIS analysis in order to fully compare the impacts that the proposed actions will have, adequately weigh the trade-offs among conflicting management goals, and allow for public input into the decision. We are sensitive to the need to keep this project on schedule, so if the timing is such that this analysis is not ready to be released to the public with the draft EIS, a supplemental analysis could be released at a later date as long as it has the opportunity to be publicly vetted and is included in the final decision document for the overall project.	The alignment of the seawall at Miller Field (either landward, seaward of or through the hanger) and the multi-use path at Miller field (on top of the seawall or at ground level) will be described in the draft EIS as sub-alternatives specific to Miller Field.	DEIS provides sub alternatives for LOP alignment and location of multi-use path; presentation of sub alternatives is pre-decisional and allows for public input into the decision as requested; Miller Field dune is not manmade (please see comments in cell C19).	62-63 (2-27 to 2-28); 167 (4-3); 171 (4-7); 173-174 (4-9 to 4-10); 187 (4-11); 188 (4-12); 193 (4-17); 199 (4-23); 201-204 (4-25 to 4-28); 206 (4-30); 209-210 (4-33 to 4-34); 219 (4-43); 223 (4-47); 224 (4-48); 229 (4-53); 230 (4-54); 235 (4-59);	
2. Natural Resources				
Overall we believe the EIS needs more in-depth evaluation of the impacts to natural resources. In particular, we are requesting additional analysis of impacts to the berm and dune system at Miller Field as well as erosional impacts along the entire shoreline. We also request incorporation of appropriate mitigation for likely impacts.	The draft EIS will present additional details to evaluation impacts to the berm and dune at Miller Field. Text will be added to the Feasibility Study as well as to the EIS to address any potential erosional impacts along the shoreline. Additionally, the USACE is committed to working with NPS to avoid and minimize impacts in the Gateway NRA while still providing the coastal storm risk management needed for SSSI. Any mitigation commitments will be identified in the EIS Record of Decision.	DEIS provides revised text that addresses shoreline change in a general sense throughout the project area. DEIS and Feasibility Study do not provide additional details to evaluate impacts to the berm and dune at Miller Field. These details may be provided in revisions to the SSSI Engineering Appendix; however, USACE did not provide a revision of that document (document with that name was a replicate of Attachment E - Plan Sheets.	21-22 (1-11 to 1-12);	
a. Erosional Impacts				
We request that the analysis be revised to incorporate the issues detailed below. We believe there is a high probability of impacts from the loss of sediment transport, and that mitigation should be included in the form of periodic sediment nourishment along the shoreline, with particular attention to Great Kills.	Text will be added to the Feasibility Study as well as to the EIS to address any potential erosional impacts along the shoreline.	Additional text was provided but no additional analysis or mitigation was provided in DEIS or Feasibility Study. This analysis may have been provided in revisions to the SSSI Engineering Appendix; however, USACE did not provide a revision of that document (document with that name was a replicate of Attachment E - Plan Sheets.	188 (4-12); 89 (3-16); 209 (4-33); 21-22 (1-11 to 1-12)	210-211 (9-4 to 9-5)

NPS Comment	USACE Response	NPS Document Review	DEIS Pages pdf pagination (report pagination) references USACE track change document	Feasibility Study pdf pagination (report pagination) - references USACE track change document
Construction of an engineered line of protection from Fort Wadsworth to Great Kills in conjunction with existing and planned groin and groin-like features (sewage discharge pipes) has a high probability of further depleting westward transport of sediment in an already sediment starved system. Reduction of sediment within cells R2, R3 and R5 of the historical sediment budget (Figure 2.3 page 13 of Appendix A: Engineering and Design) would directly impact park resources. Sediment transport through cells R2 and R3 directly impact dune and berm development at Miller Field. Sediment transport to and through cell R5 impacts Great Kills. Over the entire project length, Operations and Maintenance estimates loss of 5% of 135,000 cy annually and an annual nourishment cost for replacement of that sand at $337,000 (p 7-7 South Shore of Staten Island, New York Coastal Storm Risk Management Interim Feasibility Study for Fort Wadsworth to Oakwood Beach Draft Main Rep01i, November 2014). Current annual loss from system is 46,000 cy (Figure 2.3 page 13 of Appendix A: Engineering and Design).		Feasibility Study provides new text to indicate that project shoreline is stable and concludes that additional beach nourishment would disrupt this stability, increase alongshore transport, and make it difficult to maintain designed shorelines. This response does not address NPS comment. This comment references Appendix A; however, USACE did not provide a revision of that document (document with that name was a replicate of Attachment E - Plan Sheets).		126-127 (6-33 to 3-34)
In addition, impacts to sediment budget by existing New York City beach management practices is not identified within the sediment budget or estimates for annual sediment nourishment within project O&M. Please include this in the analysis.		Not addressed in revised DEIS or Feasibility Study.		
We also note that no analysis of how climate change may impact sediment transport processes is provided within the repo1i or appendices, and request its inclusion.		Revisions to DEIS and Feasibility Study do not adequately address this comment. DEIS indicates that if long-term beach erosion rates are affected by climate variability, the beach maintenance/restoration activities would be based on a future decision document. The Feasibility Study indicates that under current sea level conditions risk of flooding will be reduced from 5% to below 0.4 % per year but does not indicate how flooding risks will be reduced throughout 50 year project life span under projected climate change. Feasibility study also indicates a sensitivity analysis to SLR is provided in section 9.2 of the DEIS; however, that section was not provided for review.	188 (4-12)	54 (3-4); 197 (7-33)

NPS Comment	USACE Response	NPS Document Review	DEIS Pages pdf pagination (report pagination) references USACE track change document	Feasibility Study pdf pagination (report pagination) - references USACE track change document
It is not clear that evaluation of the NED plan fully accounts for the impacts of sand loss from the Line of Protection during future storm events. A buried seawall should not impact shoreline processes. However, if sediments in front of the seawall are eroded and the seawall is exposed, shoreline processes would be significantly impacted by an exposed seawall. We request that this be evaluated in the analysis. We note that the economic analysis accounts for substantial storm damage reduction within the project area. To justify the economic analysis, the project area, and thus the Line of Protection, must be assumed to withstand numerous severe storm events during the 50 year project lifespan. The EIS and Appendices do not specify assumptions regarding frequency or intensity of storms used to justify project cost benefits. Appendix A (p 60) indicates that "In general the with-project coastal impacts are minor for the proposed line of protection since the majority of the proposed structures are set back from the shoreline and will only be exposed to nearshore wave processes during extreme storm events. The With Project storm induced erosion results indicate the structures have a minor impact on the profile change during storm events." No detailed analysis of with project shoreline recession and dune/beach recession is presented within the EIS or Appendices. Appendix A (Tables 3-3 and 3-4, p 33) presents without-project shoreline recession and dune/berm recession. At Miller Field, recession rates for storm return periods of2-500 years fall within range of 13-16 feet and 0-12 feet for shoreline and dune/berm, respectively. Recession rates are greater in other project reaches. If the LOP will only have minor impact on profile change during storm events, it follows that recession rates presented in Tables 3-3 and 3-4 should approximate with-project conditions. We request more information be presented in the EIS so that we may understand the assumptions regarding storm frequency and intensity during 50 year project lifespan; otherwise it is not possible to evaluate shoreline and dune/berm recession over the project lifespan to determine likelihood that part or all of the seawall will be exposed during the 50 year project.		Revisions to DEIS and Feasibility Study do not address this comment. DEIS states LOP will be subject to storm induced wave and water levels for 25 year storm event or greater; with project coastal impacts are stated as minor. Projected frequency of storms greater than a 25 year event were necessarily generated for USACE to estimate with project economic benefits. Projected frequency of storms greater that a 25 year event should be used to project dune/beach recession.	187 (4-11); 188 (4-12)	
		Revisions to DEIS and Feasibility Study do not address this comment. DEIS states LOP will be subject to storm induced wave and water levels for 25 year storm event or greater; with project coastal impacts are stated as minor. Projected frequency of storms greater than a 25 year event were necessarily generated for USACE to estimate with project economic benefits. Projected frequency of storms greater that a 25 year event should be used to project dune/beach recession. Direct and indirect (impacts on sediment supply due to dune/beach recession up drift)impacts at Miller Field should be evaluated. Indirect impacts at Great Kills (see line 16 of this spreadsheet) should be evaluated.	187 (4-11)	

NPS Comment	USACE Response	NPS Document Review	DEIS Pages pdf pagination (report pagination) references USACE track change document	Feasibility Study pdf pagination (report pagination) - references USACE track change document
We have concerns for management of the shoreline that extend beyond the 50-year project lifespan; specifically, that without a program of beach and dune nourishment, the buried seawall will become exposed at some time in the future which will greatly alter the sediment budget and sediment transport processes. An exposed seawall is likely to severely decrease sediment transport to Miller Field which may result in erosion of the beach and dune. Great Kills is currently sediment starved due to existing shoreline structures. Reduction in sediment transport will exacerbate erosion and further impact Gateway NRA resources. Understanding that the EIS analysis focuses on a more limited project lifespan, we would still like to gain a better sense of the long-term implications since we will be responsible for this area far into the future.				
The NPS is also interested in understanding more about how the proposed structures will impact Great Kills Park water flow/drainage during future rain events and coastal storm events. We request that the EIS include an analysis of		Not addressed in revised DEIS or Feasibility Study.		
The best examples of "natural" coastal dune systems on Staten Island are at Crooke's Point and Miller Field. Construction of a buried sea wall on the existing sand dunes at Miller Field will replace this natural resource feature. This will also have additional adverse impacts on other specific natural resources, as described in the subheadings below. For this reason we believe that a thorough analysis of natural resource impacts and appropriate mitigation should be included in the EIS. Mitigation proposed should offset the disruption of beach-dune ecosystem functions, especially where they interface with coastal maritime plant communities, such as those existing at Crooke's Point. Ecosystem restoration (removal of invasive exotic vegetation with restoration of native vegetational communities) at Crooke's Point would be one recommendation for such an offset. Construction of a sustainable saltmarsh/beach-dune complex at the erosional zone of Great Kills may be another viable mitigative measure to replace coastal maritime habitats lost along the shoreline affected by the buried sea wall. We are happy to work with your office to identify the appropriate mitigation strategy.	The draft EIS will cite the NPS Gateway General Management Plan to present additional detail as well as impacts (for each sub-alternative, landward seaward or through the Hanger) to the existing dune at Miller Field. The dune at Miller Field has been actively managed by NPS, including re-contouring the slopes to minimize sand moving onto the adjacent parking lot the additions of plantings (most recently Ammophila breviligulata) to attempt to stabilize the sand). USACE's NED plan includes covering the slopes of the line of protection (LOP) with the excavated material (sand) and via coordination with the USFWS, the plan will also include planting native dune grass on the slopes. Existing dune habitat at Miller Field will be disturbed if the LOP seaward of the hanger sub-alternative is constructed; however this habitat will reestablish after construction is complete. In addition, USACE will be constructing a continuous line of dune habitat along the entire line of protection, a total of approximately 21 acres of dune habitat creation.	Not addressed in revised DEIS or Feasibility Study. A circa 1924 photograph of the Vanderbilt estate and military hangar at Miller Field shows naturally vegetated dunes. The vegetated area was less than one-third of the present vegetated area, but it is likely that more area was above full moon tide and that intensive use of the dunes and beach reduced the vegetated area. Miller Field dune is not manmade. While development of dunes at Miller Field has benefited from groins and up drift nourishment; since 1972, NPS has not artificially constructed dunes or performed any other re-contouring of the beach-dune ecosystem. NPS management has encouraged natural dune development. Superstorm Sandy washed a gully in the intertidal zone in the southwest end of the beach and carried that sand onto the dunes and inland side of the dunes. Post Sandy, earth haulers returned sand from the inland deposits to the gullied area in the intertidal zone. Since Sandy, windblown sand has been slowly augmenting the dune elevation. Recent planting are aimed at restoring native vegetation as well as dune stabilization.		
i Natural Processes				

NPS Comment	USACE Response	NPS Document Review	DEIS Pages pdf pagination (report pagination) references USACE track change document	Feasibility Study pdf pagination (report pagination) - references USACE track change document
The identified placement of the buried seawall through the existing dune is generally inconsistent with NPS policies for managing natural systems because it transforms a dynamic feature that is formed and morphed by coastal processes into a static engineered feature. Current management provides for future management altematives, such as strategic retreat, to allow for dune migration. Construction of an engineered seawall through the current dune alignment is essentially an management decision that artificially fixes the location of the dune and berm system. The EIS does not adequately consider natural resource impacts of replacing a dynamic shoreline with a fixed engineered structure within the context of a national park.	The draft EIS will cite the NPS Gateway General Management Plan to present any additional detail as well as impacts (for each sub-alternative) to the existing dune at Miller Field. The LOP is a fixed engineered structure, however, the existing dune at Miller Field is manmade and has been managed by NPS, including the addition of plantings.	Miller Field dune is not manmade. Please refer to comment in cell C19.		
ii Vegetation This alignment of the buried seawall will eliminate a sand dune plant community that colonized the site more than half a century ago. The NPS has undertaken substantial ecological restoration efforts on the dunes (removal of tens of thousands of non-native plants) since 2011, as well as post-Sandy reconstruction that includes about 30,000 grass stems and nearly 2,000 shrubs and trees. The new construction will replace compacted and root-stabilized sand. The existing sand dune crest at Miller Field beach is approximately I0.0 to 12.5 feet NAVD (compared with the NYC berms of 14 feet NAVD on either side of Miller Field). The multi-use path on the inland side of the dunes has an elevation of about 8.0 feet NAVD. These NPS dunes cover an area of approximately 1785 feet by 170 feet, or 7 acres. We request that the EIS include mitigation for these impacts in the form of planting efforts on the buried seawall with an intense and species-rich revegetation plan in order to rapidly re-establish native maritime plant and animal communities.	See response above in Section 2 regarding mitigation. USACE will include native planning efforts on the buried seawall and is in coordination with USFWS regarding the species. USACE would also welcome NPS input on planting efforts, including species list.	NPS will work with USACE to develop an appropriate species list for planting at Miller Field. Based on NPS (GIS data), the acreage of the current dune habitat is 7.3 acres. The NPS requests clarification of the engineering calculations made to determine the acreage of beach–dune habitat created as a result of the LOP construction. NPS will work with USACE to develop an appropriate species list for planting at Miller Field.		

NPS Comment	USACE Response	NPS Document Review	DEIS Pages pdf pagination (report pagination) references USACE track change document	Feasibility Study pdf pagination (report pagination) - references USACE track change document
If the promenade is located on top of the dune rather than alongside it, this will constitute an additional loss of available habitat. This should be factored into the impacts analysis.	The EIS will add detail regarding the potential impacts of disturbing the existing dune for the sub-alternatives in which the LOP is constructed seaward of the hanger and/or the multi-use path at Miller field is on top of the seawall. In this scenario, a boardwalk (replacement of multi-use path) will be located at the top of the line of protection and habitat in this location will not be reestablished after construction is complete. However, USACE will be constructing a continuous line of dune habitat along the entire LOP, a total of approximately 21 acres of dune habitat creation. This habitat creation is greater than the amount that will be impacted because of the boardwalk on top of the LOP.	The NPS requests clarification of the engineering calculations made to determine the acreage of beach–dune habitat created as a result of the LOP construction.		
Long-term disruption to sediment transport and the resulting increased erosion could also lead to the loss of the oceanside saltmarsh at Great Kills. Again, we request that this be evaluated in the impacts analysis.	Text will be added to the Feasibility Study as well as to the EIS to address any potential erosional impacts along the shoreline.	General text regarding erosion added; however NPS comment was not addressed in DESI.	89 (3-16); 209 (4-33); 21-22 (1-11 to 1-12)	
iii. Fauna				
We request that the EIS analyze potential impacts to fauna, including a projection and timeline for the reestablishment of habitat and the wildlife it supports. Such impacts may include: how the loss of the Miller Field dune system may deprive this area of habitat for native pollinators and migratory passerines during construction and re-vegetation as the new system gets established	The EIS will add detail to consider the impacts of temporary habitat entire LOP, a total of approximately 21 acres of dune habitat creation. loss as the dune at Miller Field is disturbed during construction. This habitat will reestablish and USACE will be constructing a continuous line of dune habitat along the	No additional analysis provided in revised DEIS; NPS will work with USACE to develop an appropriate species list for planting at Miller Field.		
the cumulative impacts of erosion of the remaining beach over time on nesting habitat for Horseshoe Crabs, feeding and resting habitat for shorebirds, and habitat needed for feeding and resting by migratory passerines and raptors.	Text will be added to the Feasibility Study as well as to the EIS to address any potential erosional impacts along the shoreline.	DEIS expanded to address listing of red knot; otherwise no additional analysis provided in revised DEIS.	113 (3-40)	
3. Cultural Resources				
We request a more thorough analysis of impacts to cultural resources be included in the EIS (such as on pages 2-34 and 4-41). Please note that compliance with Section 106 does not fulfill compliance with the analytic requirements of NEPA, which also includes cultural resources.	Additional analysis will be added to the EIS.	Additional analysis provided.	124-129 (3-51 to 3-56); 199-205 (4-23 to 4-29)	69-70 (3-19 to 3-20);

NPS Comment	USACE Response	NPS Document Review	DEIS Pages pdf pagination (report pagination) references USACE track change document	Feasibility Study pdf pagination (report pagination) - references USACE track change document
Regardless of the alignment of the buried seawall, the project will have an unavoidable major adverse impact on the historic district at Miller Field. We are ready to assist if requested in describing the impacts, such as severing Hangar 38 from its seaplane context, driving sheet piling near the Hangar and Elm Tree Light, etc. We believe this will constitute a major adverse impact under NEPA and an adverse effect under Section 106. We are happy to work with your office and the SHPO to identify the appropriate mitigation strategy.	USACE, as stated in the EIS, concurs with NPS that there will be impacts to the Miller Field Historic District. We will continue to coordinate with NPS and SHPO to develop mitigation strategies.	DEIS acknowledges adverse impacts. NPS will continue to work with USACE and SHPO to identify appropriate mitigation strategies.	36 (2-1); 124 (3-51); 204-205 (4-28 to 4-29); 240 (4-64); 242 (4-66);	69-70 (3-19 to 3-20);
a. 1.5 Project Area Description The extent of the project area within the legislated boundaries of Gateway NRA and their National Register (NR) status should be clearly identified. For example, Lines 22 - 27 read as follows: "The shoreline in the Project area consists entirely of city-owned beaches and lands of the Gateway National Recreation Area (NRA), owned by the Federal government and administered by the former military installation, currently a historic site) at the northeast end of the Project area, Miller Field (a former Army airfield, currently a park with athletic fields) in the New Dorp Beach area, and Great Kills Park (an undeveloped natural area) southwest of Oakwood Beach." It should be noted that the project begins adjacent to the National Register Fort Wadsworth Historic District, runs through the Miller Field Historic District and to Great Kills, all units of Gateway NRA, a national park. Figure 1.3 should clearly identify NPS property. All three units are identified, but only Fort Wadsworth is indicated to be part of Gateway NRA. The reference to Fort Wadsworth lists it as a former military site, suggesting the history of the site; we request that this history and/or the impacts to Fm1Wadsworth be discussed in the EIS. Maps throughout the document should clearly identify Gateway NRA sites. The references to the sites should be consistent as well.	The draft FS and EIS will update figures to clearly identify Gateway NRA sites.	The text in this section is still unclear. Modification of Figure 1-3 to clearly show land owners and define names might provide greater clarity. Page 149 compounds the problem by showing an NPS map, but again referring to it as an NYC site.	21 (1-11); 149 (3-76)	
b. 3.1 Affected Environment The description of the South Beach area should clearly indicate that this begins at Fort Wadsworth and describe the topography at this location.	The draft EIS will update the description of the South Beach area per the comment above	Words "Fort Wadsworth" were added to text but no description of topography was added.	82 (3-9)	
c. 3.7 Cultural Resources The first lines of this section appear to discuss archaeological sites but it is not identified as such. The paragraph noted below begins with a discussion about historic structures but continues with the archaeology discussion, so should be clarified. Page 3-39 lines: "The only historic structures noted in the APE are at Miller Field. Although the Phase I study did not identify any Native American resources along the proposed alignment, the shoreline was determined sensitive for deeply buried sites (Panamerican 2005). The potential for deeply buried sites was corroborated by a geomorphological study conducted for the District's New York and New Jersey Harbor Navigation Project (Geoarchaeological Research Associates 2014). While this study's APE was offshore, it suggested that the south shore of Staten Island is moderately sensitive for now inundated or deeply buried shoreline sites."	Will edit.	Text was edited.	124 (3-51)	

NPS Comment	USACE Response	NPS Document Review	DEIS Pages pdf pagination (report pagination) references USACE track change document	Feasibility Study pdf pagination (report pagination) - references USACE track change document
Page 40 - lines 24-43 discuss Miller Field. The hangar is identified as is the concrete fire tower. There is little information on the history or significance of Miller Field; Elm Tree Light and the apron are not identified at all. All are part of the historic district. The history of Miller Field should be included in the text, and all historic resources should be clearly identified.	The EIS will include additional details on the history and significance of Miller Field, the Elm Tree Light and the apron. The apron is mentioned already in the EIS on line 27. In reference to the apron, the USACE is not clear on the location and extent of it as the NRHP nomination form is vague about it, the GMP does not mention the apron at all and the GMP Figure 3-12, which outlines the historic district, depicts what is assumed to be the apron to the south of Hangar 38. It seems to make more sense that apron is to the north of the hangar.	Page 3.54 Line 10 - Suggest adding the phrased "Army Airfield" after Miller Field. Please strike the reference to the GMP Map in the text and the discussion about the gravel parking lot. Please revise the text to indicate that the concrete apron was determined to be eligible by NY SHPO.	127-129 (3-54 to 3-56); 199 (4-23); 200 (4-24)	
In this section there is no discussion about Fort Wadsworth and its historic structures, although Fort Wadsworth is discussed under many other headings in the text. Given that Fort Wadsworth is discussed and identified, a description of the site should be included and the impact if any should be discussed in 4.0. There is also no discussion about Great Kills, and although this is not a historic district, there are archaeology sites. These sites are outside of the APE, but the fact that they exist and are outside of the APE should be noted.	A discussion of Fort Wadsworth will be included in the EIS. The archaeological sites at Great Kills will be noted.	Comment addressed.	125-126 (3-51 to 3-52); 127 (3-56); 199 (4-23); 200 (4-24)	
We suggest that a map of each Gateway NRA area should be included and each area should be clearly described. A subheading titled "Gateway NRA" or a subheading for each site might be helpful.				
d. Consultation				
"In accordance with the NHPA, implementing regulations, and New York State laws, the District has been in consultation with the New York SHPO and has prepared a Programmatic Agreement (Appendix F), which describes the roles and responsibilities of all parties in complying with cultural resource requirements."	This section will be removed as Consultation was included in Chapter 4 under “Section 106 Coordination” where coordination with NPS is already included. The comments on the Programmatic Agreement were received by email. Thank you.	Comment addressed.	204-205 (4-28 to 4-29);	
Please add the NPS to this consultation. We will submit comments on the Programmatic Agreement separately.				
e. 4.7 Cultural Resources Environmental Consequences				
We concur with the process and impacts identified in the following statement: "The District would continue to work with the NPS to minimize and/or mitigate for impacts to the Miller Army Airfield Historic District. The District would also evaluate the NRHP-eligibility of the 1943 fire control tower. The proposed Project would sever the connection of Hangar No. 38, a seaplane hangar, from the sea, thereby impacting the setting of this historic district. Construction of the proposed alignment would require that the fire tower be demolished."				
Additionally we request that the analysis incorporate the visual impact as well as direct impacts on Miller Field's historic resources, including the hangar, Elm Tree Light and the apron. Given the proposed alignment within feet of the Hangar and virtually wrapping around the Elm Tree Light, we anticipate a major adverse impact.	The USACE will incorporate an analysis of the visual impact to the district as well potential for direct impacts. Renderings are being prepared for Miller Field.	Some images have been provided to date. NPS will continue to work with USACE regarding visual impacts.	204-205 (4-28 to 4-29); 240 (4-64); 242 (4-66); enclosure 2	

NPS Comment	USACE Response	NPS Document Review	DEIS Pages pdf pagination (report pagination) references USACE track change document	Feasibility Study pdf pagination (report pagination) - references USACE track change document
We also request that an analysis of the impacts on Fort Wadsworth and Great Kills be included in the text, particularly in regards to the viewsheds.	The USACE will provide an analysis of impacts to the Fort Wadsworth Historic District and Great Kills and their viewsheds. Please see enclosed views from Fort Wadsworth (Attachment 1).	Some images have been provided to date. NPS will continue to work with USACE regarding visual impacts.	204-205 (4-28 to 4-29); 240 (4-64); 242 (4-66); enclosure 2	
f. Section 106 coordination As discussed during a recent call, NPS consults with 3 federally recognized tribes. Please add the Stockbridge Munsee tribe to this list.	USACE has since the phone call initiated consultation with the Stockbridge-Munsee.	Comment addressed.	204-205 (4-28 to 4-29)	
g. Tribal Consultation We would like to confirm whether USACE has initiated tribal consultation, and if so, whether this has been limited to submission of the draft Programmatic Agreement or has the USACE submitted (or will it submit) the draft EIS and/or archeological reports to the tribes for review. We request to be kept informed regarding the extent of tribal consultation the USACE has completed and plans to complete.	As per Section 4.7 of the EIS, the USACE has initiated tribal consultation. As per correspondence in the EIS, the USACE provided the tribes with the Draft Programmatic Agreement and a CD with the Phase I cultural resources report. As per the correspondence in the EIS, the Delaware Tribe concurred with the Phase I recommendations for deep testing. The Delaware Nation indicated that the USACE should continue with the project as planned. The tribes will be provided copies of the Draft EIS. The USACE will keep NPS informed of all future tribal consultation.	Comment addressed.	204-205 (4-28 to 4-29); 240 (4-64); 242 (4-66)	
h. 4.10 Aesthetics and Scenic Resources This section does not include any discussion of the impact on NPS resources. Impacts should include a discussion of the view sheds at Great Kills, Fort Wadsworth and Miller Field.	The draft EIS will be updated to include a discussion of impacts to NPS resources, including viewsheds at Great Kills, Fort Wadsworth and Miller Field. Images from Fort Wadsworth are enclosed (Enclosure 2). Renderings are being prepared for Miller Field.	Some images have been provided to date. NPS will continue to work with USACE regarding visual impacts.	200-204 (424-428); enclosure 2; 240 (4-64); 242 (4-66)	
Chart 4.5 Table 4-5. Summary Comparison of the No-Action Alternative a 1 and the NED Plan This chart indicates that the NED plan will have no additional impacts to cultural resources. As proposed, the construction of the wall will have an adverse impact at Miller Field, and may have visual impacts at Great Kills and Fort Wadsworth, pending analysis of these viewsheds as noted above.		DEIS acknowledges the adverse impact to the historic district at Miller Field. Some images have been provided to date. NPS will continue to work with USACE regarding visual impacts.	200-204 (424-428)	
4. Recreational Resources As a National Recreation Area, these resources are fundamental to our mission. If the buried seawall is located landward of Hangar 38 at Miller Field, there will be a loss of the recreational fields currently occupying that area. This should be considered as an adverse impact to the park. Mitigation measures should be specified an included as a part of the EIS analysis.	See response above in Section 2 regarding mitigation. The draft EIS will add analysis of impacts to portions of the recreational fields if the landward of the hanger sub-alternative is constructed.	Not addressed pending determination of LOP alignment at Miller Field.		

NPS Comment	USACE Response	NPS Document Review	DEIS Pages pdf pagination (report pagination) references USACE track change document	Feasibility Study pdf pagination (report pagination) - references USACE track change document
The buried seawall will also impede public access to the shoreline. We request that the EIS specifically state that public access to the waterfront will be provided, and include the impacts from the change in access in the analysis, including potential mitigation.	See response above in Section 2 regarding mitigation. USACE NED Plan will replace the amount of access to the shore that is currently in place. On a recent field visit, USACE staff observed rope lined access points through the dune. If the seaward of the hanger sub-alternative is constructed, the same number of access points would be constructed over the buried seawall for access to the shoreline. Language will be added to the draft EIS to clarify this.	Comment addressed. Pedestrian access points will be spaced approximately every 500 ft.	209 (4-33)	
We request that the EIS assess other potential impacts to the visitor experience, which may include: 11 • the seawall may block sea breezes, creating a hotter and drier microclimate inland • the loss of the visitors' sense of connection with the sea and the natural environment, especially in the context that this is one of the few areas on Staten Island where a visitor can currently experience a natural dune system.	The draft EIS will add language stating that there could be minimal impact to sea breezes or the microclimate. Regarding visitor's sense of connection, CEQ states that NEPA does not require that an EIS speculate with respect to the potential impacts associated with feelings and personal perceptions.	DEIS states no impact on sea breezes, acknowledges change in visitor experience but impact is minimal.	209-210 (4-33 to 4-34)	

NPS Comment	USACE Response	NPS Document Review	DEIS Pages pdf pagination (report pagination) references USACE track change document	Feasibility Study pdf pagination (report pagination) - references USACE track change document
Seawall construction will destroy the recently constructed Multi-Use Path, but will replace it with a promenade. The location of the promenade on top of or behind the seawall will have differing impacts. A seawall topped with a heavily-trafficked promenade through the middle of the vegetated dune community may create an enforcement issue for NPS. Alternatively, the visitor experience behind the dune will be substantially different than what visitors currently experience, or will experience on lands adjacent to NPS lands under this scenario. We ask that these and any other tradeoffs be addressed and analyzed in the EIS alternatives.	Correct, if the seaward of the hanger sub-alternative is constructed, the Multi-Use Path would be impacted and USACE's project would provide a functional equivalent pathway in the form of a promenade on top of the buried sea wall or a promenade at ground level behind the buried seawall (sub-alternatives), based on input from NPS. If NPS selects the on top of the buried seawall sub-alternative, the promenade would be on the crest of the seawall and the vegetated dune would be on the slopes of the seawall, therefore traffic on the promenade would be over and not through the vegetated dune. Many beaches have wooden platforms located above planted communities to allow pedestrian traffic (over) but not impact the plantings. If NPS is concerned about promenade users stepping off the path and into the dune, the project includes a fixed railing on either side of the promenade for safety. It's a federal requirement if you have a drop of 3 feet or more adjacent to the walkway. This could help with NPS's enforcement concern by discouraging people from walking off of promenade and into the vegetated dune on the slopes of the seawall.	Comment addressed.	209-210 (4-33 to 4-34); 219-221 (4-43 to 4-45);	
Long-term, the disruption of sediment transport and resulting erosional impacts could lead to the eradication of recreational opportunities along the shoreline, such as access to the beaches. Of particular concern is any acceleration of erosion near the narrow area at Great Kills leading to the marina. If this area is breached, it would mean a loss of the road that is the only land access to the marina and Crooke's Point. We request that these potential long-term impacts be analyzed in the EIS and appropriate mitigation measures be evaluated.	Text will be added to the Feasibility Study as well as to the EIS to address any potential erosional impacts along the shoreline	DEIS states no adverse erosional impacts on recreational resources. No additional text or analysis was provided in DEIS or Feasibility Study to address NPS comment.	209 (4-33)	
5. Great Kills Park CERCLA site				

NPS Comment	USACE Response	NPS Document Review	DEIS Pages pdf pagination (report pagination) references USACE track change document	Feasibility Study pdf pagination (report pagination) - references USACE track change document
The USACE proposed plan for Reach 1 calls for a vertical flood wall around the Oakwood Waste Water Treatment Facility and then an earthen levee extending up to Hylan Blvd. The construction footprint of these storm protection structures will likely overlap with the eastern boundary of the Great Kills Park CERCLA project (the Site). Based on current information on the Site, the radioactive contamination was brought to the Site with the waste fill material. The extent of the waste fill material along the park's southeastern boundary has not yet been fully delineated. The first phase of the Remedial Investigation (planned to start in 2015) will include further investigation of the footprint of the former landfill area. The current steps for the GKP CERCLA project are: • Remedial Investigation 2015-2017 • Feasibility Study 2018 • Proposed Plan • Record of Decision • Remedial Design/Remedial Action To the extent practicable, NPS will consider prioritizing the investigation and clean up along the eastern boundary. However, the CERCLA process will still take several years to complete. We will work with you to factor this into the planning and construction of the project, both in terms of design as well as schedule.	Noted, thank you for the schedule and potential prioritization of the eastern boundary information. USACE will continue to coordinate closely with NPS on the cleanup at Great Kills Park.	Text added per request.	223-224 (4-47 to 4-48)	73-74 (3-23 to 3-24)
6. Permitting NPS is working to determine the legal authority and instrumentation under which the project will take place on NPS lands. It may not be the permanent easement mentioned in the EIS and we ask that you take this out of the draft EIS. We will continue to work with your office on this.	Reference to the permanent easement in the EIS will be replaced with a note saying that NPS is working with USACE to determine the legal authority and instrumentation under which the project will take place on NPS lands. Thank you.	Text added per request. NPS will continue to work with USACE to determine legal authority and instrumentation.	206 (4-30)	
few more textual errors and housekeeping issues: • Need to ensure accurate differentiation throughout the EIS between the NYC's Great Kills Park, and that of Gateway NRA	The draft EIS will be updated to ensure the language is clear when referring to NYC's Great Kills Park and that of Gateway NRA.	DEIS provided clarification in parts of the report; however, additional clarification is required [examples of text where further clarification is needed in DEIS 155 (3-82); 223 (4-47) and Feasibility study 73 (3-23)]	examples where this is done well: 150 (3-77); 77 (3-4); 158 (3-85);	
Page 3-52: There seems to be some misclassification and misstatements about Gateway throughout this page. (e.g. Fort Wadsworth is a national park, Miller Field is an "abandoned" airfield, etc.). Please correct these inaccuracies in the draft EIS. We will be glad to help with this.	The draft EIS will be corrected per the comment above.	Additional clarification in nomenclature and boundaries is needed throughout the document.	127-129 (3-54-356)	
Missing words in the paragraph about Gateway on p. 1-10 that states "Tenain..."	The draft EIS will be corrected per the comment above.	Corrections made.	21 (1-11)	
1.6 Planning Objectives				

NPS Comment	USACE Response	NPS Document Review	DEIS Pages pdf pagination (report pagination) references USACE track change document	Feasibility Study pdf pagination (report pagination) - references USACE track change document
Please add the following objective: Where project activities are proposed for NPS lands, project will consider consistency with NPS policies (2006 NPS Management Policies) and Gateway National Recreation Area General Management Plan (2014).	The draft EIS (and FS) will add language per the comment above, to the extent practicable.	Text added per request.	25 (1-15);	
1.8 Permits, Approvals, and Regulatory Requirements Please include in Table 1-1: NPS o 2006 NPS Management Policies o Gateway National Recreation Area General Management Plan (2014)o Authorization, through a yet to be determined instrument, to conduct work on NPS land	The draft EIS (and FS) will add language per the comment above, to the extent practicable.	Additions made to Table 1-1.	27 (1-17);	

THE CITY OF NEW YORK
OFFICE OF THE MAYOR
NEW YORK, NY 10007

MEMORANDUM

TO: Frank Verga, United States Army Corps of Engineers, New York District
Peter Weppler, United States Army Corps of Engineers, New York District
Karen Ashton, United States Army Corps of Engineers, New York District
Steve Zahn, New York State Department of Environmental Conservation

FROM: Esther Brunner, Mayor's Office of Sustainability (MOS)
Terrell Estesen, NYC Department of Environmental Protection (DEP)
Naim Rasheed, NYC Department of Transportation (DOT)
Owen Wells, NYC Department of Parks and Recreation (DPR)

DATE: May 26, 2015

SUBJECT: **South Shore of Staten Island Coastal Storm Risk Management Revised Draft Environmental Impact Statement – New York City Agency Comments**

Thank you for the opportunity to submit comments on the updated draft Feasibility Study, draft Environmental Impact Statement and related documents submitted to the City for review on May 15, 2015. The City appreciated the many changes made in response to previous comments and submits the following comments for consideration. City agencies are still reviewing the extensive updates to the drafts and, accordingly, may submit additional comments during the public comment period.

Below are various City Agencies' comments about the revised draft EIS. The comments are organized by City Agency.

DOT Comments

1. There may be issues with the closure of Hylan Boulevard due to stoplog in place with NYPD and FDNY. Please coordinate with NYPD/FDNY to ensure stoplog will not interfere with their operations.

2. *Attachment A-Closure Structure*, states that the stoplog closure will take several hours. The attachment also discusses how the closure structure alternatives (roller gate and swing gate) provide a faster method of closing. Can more details be provided as to how long the alternatives would take to close this 110-foot section of Hylan Boulevard. In addition, Attachment A states "all closure structures will be evaluated for construction and environmental impacts to ensure that the appropriate cumulative impacts are evaluated if the closure structure is revised during the design phase"; however, we don't see this evaluation in the DEIS.

3. *Attachment B-Road Raising Details* states that the road raising at Father Capodanno and Seaview Avenue would result in driveway slopes at least 10-15%. Will these driveways also provide pedestrian access/access to the properties front door? Is this legal as the slope may exceed ADA guidelines? (in response to comments 1:12 maximum slope required by ADA is cited for pedestrian access points to the beach). In addition, 10-15% slopes will affect residents in many ways. For example during snow/ice event residents would have a hard time entering and exiting their property. Also during rain events the properties might flood.

4. *Attachment B-Road Raising Details* states the Seaview Avenue roadway transition onto Quincy and Oceanside Avenues may also impact a few structures on the north side of the road. Please explain what structures would be impacted and how.

5. *Attachment B-Road Raising Details* states the following:

   > Items of note include the need to make sure that the raising does not cause any clearance issues with the traffic signals, sight distance issue, lights etc. Additionally, some raising/adjustment of hydrants, valves, inlets, manholes etc. may be required.

   Wouldn't road raisings require full-depth reconstruction of roadways and sidewalks, and as part reconstruction wouldn't traffic signals and lighting and all associated conduits need to be removed, redesigned and installed? According to the USACE, the road raisings are 100% non-Federal responsibility subject to credit towards construction cost share requirements. Also, according to the USACE legal grade determination is also a non-Federal responsibility. Please confirm if DOT would have to undertake the reconstruction and if so, when would DOT be expected to complete the reconstruction by?

6. Page B-4 of the EIS recommends potentially using dredged materials for fill for grade change for roadways. Please note that this is not acceptable practice in NYC.

7. *Attachment B-Road Raising Details* states the following:

   > The levee crown should be maintained and all crown roadways, ramps, and access roads should be properly maintained and kept serviceable. This work involves periodically grading and gravelling road surfaces.

   Are there any specific maintenance requirements DOT should be aware?

8. Figure 1: Typical Road Raising Detail in *Attachment B-Road Raising Details* is not legible. Please insert a legible figure into the attachment.

9. In the "Stoplog Plan and Elevation" (Sheet Identification C-515) the 4"concrete slab and T-Wall are shown to be outside the ROW on both sides of Hylan Boulevard. Whose property is this and does it require acquisition? If acquisition is required, who is responsible and does the cost identified in *Attachment A – Closure Structure* include acquisition costs.

10. What types of trucks will use the combined truck and pedestrian access? How will pedestrian safety be ensured at these common access points?

11. Provide all back-up information used in preparing "Existing AADT and LOS on Nearby Roadways" (Table 3-9). Also, please explain how the existing Level of service was estimated. Please note that the Staten Island Expressway is under NYSDOT's jurisdiction.

12. Please explain the purpose of including "Nearby Parking Facilities with Capacity and Hours of Operation" (Table 3-10) in the DEIS. The table fails to indicate occupancy during the peak periods. Also, NYSDOT is indicated as the source for Table 3-10. Please verify the source, as this information is not usually provided by NYSDOT.

13. The DEIS on page 3-85 states the Staten Island ferry transports more than 1,000 vehicles and approximately 70,000 pedestrians per day. Please provide the source. Also, the Staten Island Ferry does not carry cars so it is not clear where this information was obtained.

14. Please define short-term minor adverse effects on transportation and traffic identified on Page 4-48. How many months would transportation/traffic be affected by construction workers, truck deliveries and road/sidewalk closure?

15. "Initial Level of Protection Alternative" (Table 2-1) states alternatives FM4, FO3, FO3A and FO3B may result in major traffic delays during construction; however these alternatives will have no significant environmental impacts. These statements contradict each other. Furthermore, page 4-34 states the (NED) Plan would not result in potential significant adverse impacts to traffic during construction. Please clarify the discrepancies.

16. Section 3.3.1 – Uplands; This section neglects to mention the very common native Mulberry trees (Morus rubra) that are arguably the dominant native tree species in the Uplands west of Richmond Road, particularly in Drainage Areas C and D. This species should be included in this section.

17. Section 3.4.3 – Birds; Feral wild turkeys are very common on the South Shore, particularly near Seaview Avenue between the beach and Hylan Boulevard in Drainage Area C.

18. Section 3.4.4 – Mammals; Wild deer are very common in the uplands of Drainage Areas C and D west of Richmond Road. http://www.dnainfo.com/new-york/20141016/pleasant-plains/deer-population-on-staten-island-leaps-3200-percent-6-years. This species should be included in this section.

DPR Comments

19. (Page 3-45, L.28) NYC DPR's records indicated the park is 315 acres. Please revise accordingly.

20. (Page 4-8, L17) Indicates that mitigation for tree loss will be accomplished by planting at a ratio of two new trees for each tree lost. Please note that restitution requirements for removal of street trees or trees within park property are dictated by Local Law 3 of 2010 and associated DPR rules and valuation methodology.

21. (Page 4-8, L.37) Indicates that USACE will monitor and control phragmites on the covered seawall portion. For how long will this monitoring, and associated invasives control as necessary, be expected to occur?
22. As per comment #11of the DPR Comment Letter dated May 20, 2015*, NYC DPR asks the USACE to consider the use of this agency's Staten Island-based Greenbelt Native Plant Center as a resource

for plant material for the project. The Center's banked, locally sourced seed may provide a valuable opportunity to mitigate impact on local habitats from the project.

a. Replanting of removed trees (page 4-8, L.14)
b. Planting of LOP slopes (page 4-8, L.28)
c. Planting of upland areas disturbed by construction (page 4-9, L.9)
d. Revegetation of temporary haul roads and staging areas (page 4-9, L.16)
e. Wetland planting (page 4-17, L.16)

* Comment #11 is about the Main Report/Feasibility Study: NYC DPR asks the USACE to consider the use of this agency's Staten Island-based Greenbelt Native Plant Center as a resource for plant material for the project. The Center's banked, locally sourced seed may provide a valuable opportunity to mitigate impact on local habitats from the project.

a) Proposed creation of 46 acres of maritime forest/scrub-shrub, low marsh, high marsh, and dune habitats in Oakwood Beach (page 7-6)
b) Native beach vegetation on the slopes of the buried seawall (pages 7-7, 7-8)
c) Fort Wadsworth tie-off (page 7-8)
d) Drainage Area pond plantings (page 7-13)

23. In the discussion of permits and approvals (Section 1.8), it may be worthwhile to note the need for parkland alienation legislation.

DCP Waterfront Division Comments

24. In addition to the policy analysis of the NYC Waterfront Revitalization Program, please fill out a coastal consistency form available here: http://www.nyc.gov/html/dcp/pdf/wrp/wrpform.pdf

25. On NYC Policy 6, please provide a description of how the level of protection of the NED plan was selected and how this process considered sea level rise.

26. On NYC Policy 8, please describe how the current public access structures and waterfront public spaces will be affected by the NED plan and how the NED plan will provide for continued use of existing open space resources

DEP Comments

Please note that these comments do not reflect DEP's input on operational concerns, which we understand is being addressed separately.

General

27. In Section 4-1, the disturbed area for Reach 3 should include the 25' splash apron and 15' scour blanket as described in Section 2.5.1. If the project width of Reach 3 would be on DEP property or potentially encroach on the wastewater facilities it should be coordinated to avoid conflicts.

Hazardous Materials

28. For those project drainage areas which overlap with DEP's Bluebelt area where DEP's 2013 EIS indicated additional testing or remediation would need to be conducted, who would be responsible for further investigation and approvals?

29. What investigation has been or will be performed to assess the condition of the soils to be used for backfill on the Line of Protection slopes and those drainage areas outside of DEP's Bluebelt area? Will there be public access or passive/active recreation on the Line of Protection slopes?

30. Regarding the CERCLA clean-up at Great Kills Park, there should be a description of what the remedial measures are likely to consist of and how whether the proposed project could interfere with remediation (for instance, could it happen that removal is the only feasible remedy and the project would construct over contaminated area before the clean-up process is complete?).

Air Quality

31. Page 4-51 states that the General Conformity analyses and determination for the proposed action is a Record of Non-Applicability (RONA) for the NED plan. The document should include an explanation of why the RONA is appropriate (i.e. – why the action is exempted or why conformity is not applicable).

Comments on the May 2015 preliminary DEIS from DEP's Bluebelt Unit (page references made using track changes version of document):

32. **Page 1-15** – Why was planning objective #3, regarding consistency with the Bluebelt, taken out?

33. **Page 2-3**—The Mid-Island Bluebelt requires 204 acres of wetland property. This area includes mapped but unbuilt streets. As of spring 2015, 129 of those acres have been vested in the City of New York.

34. **Page 2-13** – In Oakwood Beach, the 17.19 acres in Drainage Area A are expected to be under jurisdiction of NYCDEP, not NYCDPR.

35. **Page 2-14** – You might want to point out that the real estate required for Interior Drainage Area A is already acquired for Bluebelt purposes or slated to be acquired.

36. **Page 2-14** – In Figure 2-2, it looks like Oakwood Creek tide gate call-out is in the wrong place. It should be pointing to symbol in the wall for drainage structures.

37. **Page 2-15** – Why take out reference to one of the proposed ponds being analogous to BMP OB-2 in the Bluebelt plan? Also you should note that the east pond is on City parkland while the west pond is on private property.

38. **Page 2-18** – Please demonstrate consistency with Bluebelt plan by stating that all the proposed ponds correspond to Bluebelt BMPs except for one. Here is a table showing that consistency:

USACE Designation	Bluebelt Designation
Midland Pond	BMP NC-6
Last Chance Pond	BMP NC-11
Pond #7	BMPs NC-13, 14
Pond #4	BMP NC-16
Pond #1	BMP NC-17
Pond#2	BMP NC-18

The one exception is the water body labeled Pond #3 on Figure 2-4. In the DEP plan, that pond is divided into two: BMPs NC-9 and NC-10. BMP NC-10 has its own new outfall into the Raritan Bay. This is necessary because from a hydrological point of view, all the stormwater cannot drain to the existing Naughton Avenue outfall. There is not enough grade change to make that flow path a physical possibility. Please change your design for Pond #3 to make it consistent with the Bluebelt plan.

For your reference, the following table presents the current overlap between the Bluebelt and USACE interior drainage areas and features:

USACE Drainage Area	Bluebelt Watershed	USACE Designation	Bluebelt Designation
A	Oakwood Beach	Natural flood storage	BMP OB-3
B	Oakwood Beach	West Pond	Cancelled BMP OB-1
B	Oakwood Beach	East Pond	BMP OB-2
C	New Creek	Pond #1	BMP NC-17
C	New Creek	Pond #2	BMP NC-18
C	New Creek	Pond #3	BMP NC-9, NC-10
C	New Creek	Pond #4	BMP NC-16
C	New Creek	Last Chance Pond	BMP NC-11
C	New Creek	Midland Pond	BMP NC-6
C	New Creek	Pond #7	BMP NC-13
E	South Beach	One of two ponds	BMP SBE-1A
E	South Beach	One of two ponds	BMP SBE-1B

39. **Page 2-18** – Figure 2-4 shows all ponds having an invert of 2 ft NGVD. How can they all have the same invert and still flow by gravity? How does that invert compare to inverts in Bluebelt plan?

40. **Page 2-20** – The 46.7 acres of available natural storage is all within the area to be acquired for the South Beach Bluebelt. Please point out that that the Bluebelt drainage plan requires a new ocean outfall at McLaughlin Street.

41. **Page 2-32** – Hylan Boulevard misspelled “Hyland.”

42. **Page 2-33** – Please mention the two proposed ocean outfalls – one in the New Creek watershed (Drainage Area C) draining BMP NC-10 and the other in the South Beach Bluebelt at McLaughlin Street.

43. **Page 2-33** – Is it possible to identify alternatives at this time to the stop-log structure at Hylan Boulevard?

44. **Page 2-33** – Should not the "Pedestrian and Vehicular Access" section include a discussion of vehicular access to the interceptor sewer or at least cross-reference where that discussion is in the document?

45. **Figure 3-1** – This figure is difficult to read. I think there are some inaccuracies in the map. In Drainage Area B, the west pond is not shown, and the acquisition necessary for that pond is also not presented. Excavated ponds in Drainage Area C are not shown. In addition, excavated ponds are not shown in Drainage Area E.

46. **Figure 3-2** – DEP is no longer planning to build BMP OB-1 because the neighborhood it would have served is being bought out and emptied. Please remove it from the maps.

47. **Page 3-17** – Identify NYC DEP as the agency responsible as the Bureaus mentioned are in that agency.

48. **Page 3-18** – Please remove BMP OB-1 from this figure.

49. **Page 3-60** – The 61 acre number for DEP Bluebelt property in Oakwood Beach is old. The new number is 42 acres. The numbers for Bluebelt property in New Creek are 107 and in South Beach 56.

50. **Page 4-7** – This figure, showing the proposed tidal wetlands on the seaward side of the wall, could use some work. Is the "proposed access road" on top of the interceptor sewer or the seawall? Please show the seawall on this figure and some streets on the landward side for orientation. Please show location of interceptor sewer.

51. **Page 4-8** – Reference is made to "inviting volunteer hydrophytic/wetland plants to establish" in the excavated ponds. DEP in its Bluebelt program will plant the flood storage areas or BMPs with wetland plants. The Bluebelt program will replace low quality wetlands dominated by *Phragmites* with diverse wetland plantings and other features to enhance wildlife habitat.

52. **Figure 4-5** – This map showing the difference in potential flooding with and without the project is a very important graphic. Can the document contain some discussion of the process whereby the new floodplain with the seawall in place would be mapped by FEMA and a new FIRM issued?

53. **Page 4-29** – Approximately 204 (not 300) acres of the Project Area will be or is already owned by the NYCDEP Bluebelt program. What about fee simple acquisitions required for the seawall's interior drainage system where excavation is proposed? This section only mentions easements necessary.

54. **Page 4-35** – In the third paragraph down, mention is made of the resulting landscapes after the ponds are excavated being "consistent with existing conditions." In fact, the excavated ponds will remove many acres of *Phragmites* and create vistas completely different from existing conditions. The vistas looking out over the permanent pools of the ponds will be an improvement over existing conditions.

55. **Figure 4-12 and 4-13** – The South Beach legend is the correct one for the photo.

56. **Page 4-69** – The Bluebelt acreage number is 204 acres, not 300.

DEP Natural Resources Comments

57. DEP is currently planning a wetland restoration at the Oakwood Beach Wastewater Treatment Plant (WWTP). This tidal wetland restoration will remove historic fill material and the invasive plant Phragmities to create low salt marsh and coastal dune habitats. The invasive Phragmites has been responsible for frequent wildfires in the region which are a substantial threat to the surrounding communities. Therefore, the restoration of salt marsh habitat will reduce the risk of wildfire and associated property damage to the Oakwood Beach community that has been plagued by wildfire for decades. With the efforts of the DEP to remove Phragmities adjacent to the Oakwood Beach WWTP, highly coordinated efforts between the two projects will be needed to ensure there are no negative effects to the created habitat/projects for both agencies.

58. Section 4.4.1 Benthic Resources. Albeit not major, there are several problems with this section. First, the beginning of this section only implies mortality to benthic macroinvertebrates and does not acknowledge the mortality to the entire benthic community. Second, DEP disagrees with the statement in the document that “The existing benthic organisms have the ability to burrow through sand and would not be impacted from the slight increase in sedimentation caused by the Project”. Surely benthic organisms with great vagility will be able to burrow out from the sedimentation, but the vast majority of the organism that the sedimentation may impact would not have the ability to burrow out from underneath the sand.

Mayor's Office of
Recovery & Resiliency

USACE South Shore of Staten Island Phase I
Draft Feasibility Study for Fort Wadsworth to Oakwood Beach,
May 2015

NYC DPR Comments to:

A. USACE Response to DPR Comments
B. Draft Main Report

A. <u>USACE RESPONSE TO DPR COMMENTS</u>

DPR supplemental comments dated 10 February, 2105.

1. (DPR Comment 1) This comment asked for recognition in the Feasibility Report that the USACE *will work with NYC DPR to refine the design of project components that interface with recreational facilities*. In this response, USACE has reiterated the design components already described in the Feasibility Report, but has not satisfactorily addressed NYC DPR's comment; similarly, the revised Main Report does not reflect the intention to work with NYC DPR on refining design components. Add a reference within the Feasibility Report to note that USACE will work with NYC DPR on these refined design components, such as the materials and finishes of the raised promenade, and the number, location, and a design of access points over the LOP.
2. (DPR Comment 1-a) NYC DPR has not yet received the referenced Attachment I - Recreational Features.
3. (DPR Comment 2) The USACE response that no sediment transfer is being disrupted or modified by the project is noted. USACE interim findings show the project area as a mild or low erosional setting with a net loss of sand (although in Oakwood Beach, *shoreline erosion has been as high as 20 feet per year* [page 7-6]). Therefore, NYC DPR will want to work with USACE, as warranted, on any final beach nourishment recommendations.
4. (DPR Comment 2-a) NYC DPR's comment has not been adequately addressed. NYC DPR would like the Feasibility Report to reference an existing or planned analysis or calculation of the likelihood and storm event frequency that would expose the buried seawall's scour apron, due to the implications to the City's obligation to maintenance, operation and public safety if such an event were to occur.
5. (DPR Comment 3) NYC DPR's comment has not been adequately addressed. Drainage at the base of the levee will need to be planned for to prevent localized flooding within NYC DPR's facilities. The Feasibility Report should recognize that localized flooding at the base

of the levee is expected, and should reference a planned analysis to avoid this issue. For example, will grading along the base of the levee direct stormwater runoff to the sluice gates?

B. DRAFT MAIN REPORT

Existing Conditions

6. (Para. 88-89) Add to the description of threatened and endangered species to adequately capture known plant species and ecological communities. (Oakwood Beach has two populations of the state-listed *Iris prismatica* and a population of the state-listed *Tripsacum dactyloides*. All along the south shore are also populations of the state-listed *Cenchrus tribuloides*. There are also many locally imperiled plant species within these areas.)

7. (Para. 102) The acreage for FDR Boardwalk and Beach is given as 638.5 acres; however, NYC DPR's records indicate 644.5 acres. Please revise accordingly.

8. (Para. 109) A portion of NYC DPR's Great Kills Park property is within the CERCLA boundary. Update this section accordingly.

National Economic Development Plan

9. As commented on earlier drafts, the Feasibility Report should note that the refined design of project components that interface with park and recreational facilities will be developed in collaboration with NYC DPR. This revised Report has not adequately characterized the intention to work with NYC DPR to refine the design of relevant project components.

10. NYC DPR asks the USACE to consider the use of this agency's Staten Island-based Greenbelt Native Plant Center as a resource for plant material for the project. The Center's banked, locally sourced seed may provide a valuable opportunity to mitigate impact on local habitats from the project.

a. Proposed creation of 46 acres of maritime forest/scrub-shrub, low marsh, high marsh, and dune habitats in Oakwood Beach (page 7-6)
b. Native beach vegetation on the slopes of the buried seawall (pages 7-7, 7-8)
c. Fort Wadsworth tie-off (page 7-8)
d. Drainage Area pond plantings (page 7-13)

11. (Page 7-8) The description of deck surface finishing options (*timber, timber-composite, or concrete panel*) should be omitted. Instead, note that the refined design of materials and finishes will be developed in collaboration with NYC DPR.

12. (Page 7-8) The reference to a split boardwalk has been presented without adequate engagement with NYC DPR. Omit the reference to the split boardwalk, and instead note that the refined design of the functional replacement promenade will be developed in collaboration with NYC DPR.

13. (Page 7-8) Replace "restaurant" with "concession" (concession is an inclusive term that more accurately captures a broader variety of existing vendors).

14. (Para. 284) Include a schematic showing the 38-foot width functional replacement promenade <u>within the body of the Main Report</u> (schematics currently provided in Attachment F, page 4).

15. (Para. 278) Does the proposed *access road seaward of the buried seawall* run across NYC DPR property? What are the alignment, specifications, and maintenance obligations of this proposed road?

16. (Page 7-13) The extent of the flowage easement shown in graphic (Drainage Area B) does not appear to include the excavated west pond. If this omission is intentional, please clarify the flowage easement for this pond.

17. (Page 7-13) The ponds show in the graphic have very straight edges and sharp corners, which may be more challenging to maintain over the long term, and are less pleasant to local communities as a scenic and passive recreational amenity (should such use be permitted). The design of these ponds should be refined to provide more naturalized contours. NYC DCP welcomes the opportunity to collaborate on refined design of these edges.

18. (Paras. 317-320) NYC DPR asks to be consulted to develop more refined maintenance and operation costs, taking into account NYC DPR's operational practices and constraints.

19. (Para.211) Reword to clarify that Alternative #4 was supported because it "includes the replacement of existing promenade facilities" (rather than wording that suggests the provision of additional facilities).

20. (Para.240) Clarify that the "17.19 acres of currently available natural flood storage" will be preserved by the City (not solely DPR), as this site is comprised of adjacent DPR and DEP jurisdictions.

National Economic Development Plan

21. (Para.275) Update the description of the buried sea wall to reflect a revised crest promenade that accommodates a functional replacement of the existing boardwalk and esplanade, discussed in meetings between the City and USACE. NYC DPR's preferred solution is the maximum width that can be accommodated without extending the promenade beyond the at-grade footprint of the buried seawall.

22. (Para.274) NYC DPR welcomes the opportunity to work with USACE to design surface treatments to address the recreational context of the LOP, including the need to restrict public access over the seawall; planting maintenance; accommodating a variety of recreational users; etc.

23. (Para. 279-283) Include a reference that the location, number and design of pedestrian and vehicular access points will be determined in consultation with NYC DPR, to address visitor, operational, and emergency needs, in addition to M&O requirements of the seawall itself. This coordination will ensure access points meet the needs of park users and prevent the LOP from causing a loss of access to some locations or to segments of the current user population.

24. (Para. 282) Although stairs on the landward and seaward side of the seawall are included in the design, ADA accessible access over the seawall will need to be provided.

25. What is the likelihood that the buried seawall 10'-wide scour apron may become exposed over the life of the project (e.g.: due to erosion or wave action)?

26. Please clarify whether the east end of the buried seawall at Fort Wadsworth runs on to private property.

- USACE map files show the LOP on private property (Block 3125 / Lot 116); however, the property was not included in list of required acquisitions that USACE shared with the city. Could the LOP be realigned here onto NPS' Fort Wadsworth, to avoid acquisition of private property?

27. (Para.305) Provide a comprehensive investigation to avoid new localized flooding. Drainage at the base of the levee should be provided to prevent localized flooding within NYC DPR's facilities. For example, will grading along the base of the levee direct stormwater runoff to the sluice gates?

28. (Paras.295-298) A more detailed breakdown of M&O tasks is required in order for the City to better evaluate scope and cost over the life of the project. Please provide more detailed information on the exact amount of each service required, and cost multipliers used to calculate costs.

29. NYC DPR expects to incur addition staff and equipment costs due to the project, as the beach will be more challenging to clean and operate.

Plan Implementation

30. (Para.340-15) Clarify the level / type of storm event that will trigger a surveillance and reporting requirement.

Public Involvement

31. Section 11 should outline a more specific plan for comprehensive public engagement, to ensure community stakeholders are aware of the protective measures and impacts of this project.

Other

32. A plan for soil stabilization, planting and site security of the drainage areas should be presented.

33. A plan for wildlife connectivity between the interior drainage areas should be presented.

34. Is there any accommodation for fish & wildlife to pass through the culverts or levee? Specifically, catadromous fish, such as American eel and alewife, are known to use small freshwater ponds upstream of tidal channels for breeding. If local funding can contribute to

enhanced ecological services (or mitigation for impacts) of the projects, will the USACE consider these in the design alternative evaluation?

35. Note should be made of the probability of archeological resources in the area.

36. Generally, further information should be provided on the ecological impacts of the levee itself on the tidal ecosystem.

APPENDIX 2 – DRAFT INTERIOR DRAINAGE

37. (Page 122) The Appendix shows the extents of 100 year flooding with and without the project. Please confirm that the without the project the 100 year flood area will be reduced to the extent shown on the map.

38. (Figure 4) Will the project eliminate the transfer of sea water to the interior marsh areas? Some of the areas shown as freshwater wetlands in Figure 4 may have some tidal flow (particularly at the Cedar Grove and Oakwood areas) and loss of tidal inflow could cause damage to these areas.

APPENDIX 7 – REAL ESTATE PLAN

39. Include reference in the Real Estate Plan to the State buyout program, in terms of federal restrictions for permanent improvements.

40. (Exhibit A – Plan Sheets) Sheet C-11-, it is unclear if a portion of Block 3125 / Lot 116, which is privately owned, is required for the eastern end of the LOP. If so, is it possible to realign the LOP so the end does not extend onto private property?

41. (Page 3, Section III) Please clarify the timing of construction contract details here, which differ from Figure 37 of Main Draft Report.

42. (Page 3, para.D) NYC DPR requests a copy of the appraisal cost estimate.

43. (Page 7, para.18) Note that radiological testing at federal Great Kills Park has extended to DPR parkland, within the alignment of the project.

44. (Exhibit B) Provide full addresses or cross streets, as the public doesn't necessarily readily know their block and lot numbers.

New York City DOT

Attachment B:

(1) Road raisings: Will the Corp construct these as part of their project or will the City be required to construct?
(2) Road raising details: The standard detail is shown for a street in NJ. The detail itself is **illegible**. We need to see the detail that they have included bc their cost estimate is based upon their understanding of the standard detail.
(3) Road raising cost estimates: We think their estimates are low. Our Detailed Damage inspection Report (DDIR) for FHWA funding was over twice the cost estimate for the same area of Seaview Ave at Father Capodanno Blvd.
(4) Crown Roadway and Access Ramps: "The levee crown should be maintained and all crown roadways, ramps, and access roads should be properly maintained and kept serviceable. This work involves periodically grading and gravelling road surfaces." Is there a specific maintenance protocol that needs to be followed for this work?

(5) Road raisings as "Relocation": the Corp has stated that "), road raisings are considered a "relocation" and therefore, are subject to LERRDs cost sharing requirements, accordingly. Relocations are 100% non-Federal responsibility subject to credit towards construction cost share requirements. As such, legal grade determination is also a non-Federal responsibility." Clarification on the relocation definition and the cost sharing strategy for the City.

Attachment A:
(1) Value engineering: "Additionally, the 100% design (including the closure structure) will undergo Value Engineering. During this required review, an alternate closure structure may be identified and incorporated into the final design. However, if the result of the Value Engineering study again identifies the stop-log as the recommended closure structure, then the non-Federal sponsor must pay 100% of the design and construction for an alternate closure structure. Please refer to policy guidance ER 11-1-321 for Value Engineering requirements." Does the Value Engineering exercise also include the costs associated with O&M and life cycle replacement?

New York City DEP

Comments of Bluebelt Unit

Page ES8 – Why is planning objective #3, related to consistency with the Bluebelt plan and park resources, omitted?

Page xii – In the real estate requirements section, only different kinds of easements are discussed. Are not fee simple acquisitions needed for areas to be excavated?

Page 4-1 – Two new ocean outfalls are proposed in the future drainage plans developed by NYCDEP as part of the Bluebelt plan. The new outfall in the Midland Beach area drains BMP NC-10 and will pass under Father Capodanno Boulevard between Jefferson Avenue and Hunter Avenue. The new ocean outfall in South Beach is at McLaughlin Street. The new outfall in Oakwood Beach has been dropped from DEP's plans because BMP OB-1, that made the outfall necessary, is now itself no longer needed because of the State's buy-out program.

Page 4-2 – The proper number for the size of the Bluebelt acreage in South Beach, New Creek, and Oakwood Beach is 204 acres.

Page 6-3 – Why was this taken out of the list of Planning Constraints: "Integrate with and be complementary to other related programs in the study area"?

Page 6-47 – In Table 18, why was the objective of consistency with the Bluebelt program removed?

Page 6-49 – Under Area B, please include the note that the site for the East Pond is owned by the City of New York and will be the site for BMP OB-2 as part of the Bluebelt program. The site for the West Pond is privately owned. If that site is not successfully acquired, could an enlarged East Pond (BMP OB-2) do the job of providing all the necessary flood storage?

Page 7-8 – Under the section entitled "Stormwater Outfalls/Gate Chambers," please mention the two proposed new ocean outfalls, one at McLaughlin Street in South Beach and the other in New Creek draining BMP NC-10.

Page 7-11 – Under the section entitled "Pedestrian and Vehicular Access," please explicitly present the access points for the interceptor sewer on the seaward side of the wall in Oakwood Beach.

Page 7-14 – Please provide more detail under "Pond Restoration" of what planting and *Phragmites* control would be considered part of Area B: Minimum Facility.

Page 7-11 – Please change the design for Pond #3 so it is consistent with the plans for BMPs NC-9 and NC-10.

Appendices – NYCDEP submitted comments regarding Interior Drainage Aerials, Appendix 1: Engineering and Design, Appendix 2: Interior Drainage, Appendix 3: Geotechnical Evaluation, Appendix 4: Cost Appendix, and Appendix 5: Economic Appendix. Will revisions to the appendices be made available before the final draft is completed?

US Army Corps of Engineers South Shore of Staten Island Coastal Storm Risk Management

Interim Feasibility Study for Fort Wadsworth to Oakwood Beach

Draft EIS

Revision May 13, 2015

NYC DPR Comments

Priority items to be addressed prior to June 12, 2015 public release.

Addendum to NYC DPR Comments submitted by ORR on May 26, 2015.

---

1. The Draft EIS should note that the refined design of project components that interface with park and recreational facilities will be developed in collaboration with NYC DPR. This revised EIS has not adequately characterized the intention to work with NYC DPR to refine the design of relevant project components.

    a. (Page 4-33, L.21) Omit statement that *access to beaches would be maintained throughout construction*, as the design of the project has not been adequately developed to date to allow NYC Parks to determine whether public access and maintenance operations could be safely maintained during construction.

    b. (Page 4-33, L.39) Omit reference to *timber*. The USACE is expected to work with NYC DPR to refine the design of materials and finishes atop the proposed seawall.

    c. (Page 4-33, L.41) Omit *… and would allow for path/bike/pedestrian usage*. The refined design of the boardwalk functional replacement itself, as well as the location and design of access points will determine the degree to which such functions can be accommodated.

    d. (Page 4-36, L.10) Add sentence noting that the USACE will work with NYC DPR to refine the number, location, and design of pedestrian and vehicular access points across the buried seawall.

2. The Draft EIS should acknowledge a more significant expected impact on recreational facilities.

    a. (Page 4-33, L.19-21) It is not accurate to describe impacts to recreational facilities solely as *short-term .. during construction*. Rather, impacts on recreational activities that occur along the beachfront should be characterized as long-term and direct (for example, required relocation of buildings or portions of fields), in addition to short-term impacts during construction

b. (Page 4-33, L.22-23) Revise statement that *comfort stations and concession stands may be temporarily impacted by construction* to more accurately acknowledge the expectation that the project (nb: the project itself, not just the construction period) is expected to require the relocation and reconstruction of some park facilities, potentially including comfort stations, concessions, and recreational components such as playgrounds or athletic fields. Specific impacts to facilities will be identified during the refined design of the project, and in collaboration with NYC DPR.

c. (Page 4-33, L.23-25) It is not accurate to characterize these impacts as *primarily due to construction noise* – see comments above. Rephrase this sentence instead to "Short-term, indirect impacts include construction noise and the temporary limitations on access to the beach …"

d. (Page 4-33, L.27) Revise to clarify that *USACE will be in close coordination with NYC DPR during* design and specification and *construction to minimize any potential impacts*.

e. (Page 4-56, L.35-41) Revise as per above.

3. Tree restitution:

a. (Page 4-8, L.18-19) Add statement to acknowledge that restitution requirements for removal of street trees and trees within park property are dictated by Local Law 3 of 2010 and NYC DPR's restitution valuation methodology.

4. Alienation:

a. (Section 1.8) In the discussion of permits and approvals, it would be worthwhile to note the need for State and Local approvals. Notably, a reference to the need for State legislation granting parkland alienation should be included.

Ashton, Karen NAN02

From: Ashton, Karen NAN02
Sent: Wednesday, May 27, 2015 8:02 AM
To: 'Jay.Rose@tetratech.com'; 'michael.cannon@aecom.com'
Subject: Fw: [EXTERNAL] SSSI FS Phase I, Draft Main Report and EIS, May 2015

State

From: Servidone, Anna (DEC)
[mailto:anna.servidone@dec.ny.gov] Sent: Tuesday, May 26,
2015 12:33 PM Pacific Standard Time
To: Verga, Frank NAN02; Ashton, Karen NAN02
Cc: Fuchs, Alan (DEC) <alan.fuchs@dec.ny.gov>; McCormick, Susan D (DEC)
<susan.mccormick@dec.ny.gov> Subject: [EXTERNAL] SSSI FS Phase I, Draft Main Report and EIS, May 2015

Karen and Frank,

A couple of questions/comments to the draft report:

1. Stillwater elevations for project area in Table 4 and Table 11 for Stillwater elevation obtained from FEMA are different than the Stillwater design heights for optimization and NED Plan Identification, Tab.22, 23, 24, 25, etc. Please explain. What storm events were used in the analysis?

A RESPONSE TO THIS COMMENT WILL PROVIDED IN THE DRAFT REPORT PRIOR BEING RELEASED TO THE PUBLIC.

2. Please stay consistent in the whole report with the same maximum water level reached during Sandy for the same locations.

A RESPONSE TO THIS COMMENT WILL PROVIDED IN THE DRAFT REPORT PRIOR BEING RELEASED TO THE PUBLIC.

3. Could the information on New York City work (project location, type of the project, project length, fill quantity) that was done after Hurricane Sandy be included in the Report with other projects completed prior? Why this information is not available?

REQUESTS FOR THIS INFORMATION WERE NOT PROVIDED BY THE CITY. THEREFORE, THIS INFORMATION CANNOT BE INCLUDED IN THE REPORT. IF NYSDEC OR THE CITY CAN PROVIDE THIS INFORMATION PRIOR TO PUBLIC RELEASE OF THE DRAFT REPORT, THE CORPS CAN INCLUDE, ACCORDINGLY.

JUST FOUND OUT ABOUT DEP OAKWOOD BEACH TIDAL RESTORATION PROJECT LAST WEEK IN THE COMMENT LETTER FROM THE CITY.

4. **There is a concern regarding beach erosion in the study area and potential impact from the proposed buried seawall on fronting beaches. It sounds like, from the revised language in the Draft Main Report and EIS, that the results of the analysis of the shoreline changes indicated that the rate of erosion over most large areas of the shoreline is low. Wave damages in the study area would be small and limited to events greater than Hurricane Sandy. Most of the residential and commercial structures, boardwalk, and roadways are at least 200 feet landward of the projected 50-year future shoreline location, and protective shoreline structures were considered stable and able to withstand such erosion, etc…. It has been determined that there is not beach erosion evaluation required from the potential impact of the proposed buried seawall because of its proposed location; there is not impact anticipated from the propose structure - please confirm?**

CONFIRMED – THE LINE OF PROTECTION IS LOCATED WITHIN THE WATER AND THEREFORE DOES NOT CONTRIBUTE TO BEACH EROSION. HOWEVER, TO ENSURE THAT THE LINE OF PROTECTION IS PROTECTED FROM ANY "FUTURE" EROSION DUE TO HIGH SEA LEVEL RISE CONDITIONS AN ANALYSIS OF EROSION OF 50 YEARS WAS CONDUCTED AND THE CORPS DETERMINED THAT THE LINE OF PROTECTION WOULD STILL PERFORM WITH THE REQUIRED MINIMUM 75 FEET BEACH WIDTH FOR THE PROJECT DESIGN EVEN UNDER THE EXTREME CONDITIONS NOTED.

5. It reads in the report that a total of approx.. 296.51 acres of wetlands (freshwater and tidal) were found in the Project area. There is also a statement in the report that there are more than 500 acres of freshwater wetlands and approx.. 50 acres of tidal in the study area. Please verify.

THE DISCREPANCY OF WETLAND ACREAGE WILL BE CORRECTED IN THE DRAFT REPORT PRIOR TO RELEASE TO THE PUBLIC.

Thanks

-Anna

THE CITY OF NEW YORK
OFFICE OF THE MAYOR
NEW YORK, NY 10007

MEMORANDUM

TO: Frank Verga, United States Army Corps of Engineers, New York District
Peter Weppler, United States Army Corps of Engineers, New York District
Karen Ashton, United States Army Corps of Engineers, New York District
Steve Zahn, New York State Department of Environmental Conservation

FROM: Esther Brunner, Mayor's Office of Sustainability (MOS)
Terrell Estesen, NYC Department of Environmental Protection (DEP)
Naim Rasheed, NYC Department of Transportation (DOT)
Owen Wells, NYC Department of Parks and Recreation (DPR)

DATE: January 29, 2015

SUBJECT: **South Shore of Staten Island Coastal Storm Risk Management Draft Environmental Impact Statement – New York City Agency Comments**

Representatives of New York City (NYC) agencies and the NYC Mayor's Office would like to thank the United States Army Corps of Engineers, New York District, for hosting a productive meeting last Friday, January 23, 2015 at their offices. This memorandum includes a summary of City-agency comments that were discussed during this meeting. The comments are provided in two categories: general comments are discussed first and specific comments second. The following City agencies represented at the meeting are City sponsors of the project and/or potentially involved agencies for environmental review purposes: NYC Department of Environmental Protection (DEP), NYC Department of Parks and Recreation (DPR), and NYC Department of Transportation (DOT).

During the meeting, DEP raised a major concern in regard to the relationship of the proposed seawall and critical infrastructure, which relates to the question of feasibility but may affect the analysis in the DEIS. DEP is concerned that the Oakwood Beach Wastewater Treatment Plant (WWTP)'s ability to hydraulically function/not flood may be compromised by the proposed seawall and location of interceptor and seawall. Specifically, if the interceptor sewer is on the seaside of the line of protection and not properly protected the WWTP could flood and/or the drainage system could flood behind the line of protection. Additionally, the WWTP may need an effluent pump station (at great capital expense and logistical difficulty, with a seawall on site) to

continue to treat and discharge wastewater during a storm (meeting between Corps and DEP will be set up by Curtis Cravens, ORR).

South Shore of Staten Island Coastal Storm Risk Management
Draft Environmental Impact Statement (DEIS)

A. General Comments

1. Based on the conversation from Friday, January 23, 2015, City agencies are aware that many components of the plan and technical details are not fully developed at this point in time and procedurally will be developed as part of the plans and specs phase in the Summer of 2016, after the FEIS is released. However, as articulated in the meeting, where ever possible, please disclose conceptual and basic technical information that is currently available. Also, please include explanations of how certain components of the plan are anticipated to work. You should be clear that the information provided is based on a design-level of 15-20%.
2. Please use language from the Feasibility Study and related reports to provide more detailed information in the DEIS.
3. Once City agency comments are addressed, as discussed, please provide the revised DEIS to City agencies for review before the release of the document, currently anticipated for April 2015.

B. Specific Comments

For City agencies to make findings under SEQRA, *see* 6 NYCRR 617.15, the City believes that the DEIS should be revised to include (more detailed) information as follows:

- **Tentatively Selected Plan:** Please clarify upfront in the DEIS that the "Tentatively Selected Plan" is the proposed plan/project and describe it in detail (use language from the Feasibility Study).
- **Construction process details:** Please include a construction section in the NEPA EIS document - as opposed to include construction related information in several different analysis areas. The construction section should discusses the following:
    - Anticipated construction operations and schedule
    - Roadway closure, construction duration, detour, traffic analyses showing whether the proposed roadway closures would create significant adverse traffic impacts, Traffic Management Plan, emergency vehicle access
    - Interface with adjacent recreational facilities. To the extent possible, the anticipated construction phasing concept and staging areas should be described, noting that detailed locations will be refined in consultation with DPR. The intention would be to provide an understanding of how public access to waterfront recreational amenities and parking lots will be affected and managed (e.g., will DPR parking lots continue to be available for public use or restricted during certain periods?) and to disclose the construction period disruptions or short-term impacts that are likely.
    - Assessment/avoidance of localized flooding impacts on DPR property

  - More detail on methods, duration and intensity needed to make conclusions on noise, air quality – more analysis could be appropriate depending on what is done, how and for how long. Depending on duration and intensity, quantitative analysis may be appropriate for the construction phase – in that case, NYC standards should be assessed (i.e. – 3 dBA noise increase, local PM2.5 incremental impact thresholds).
- **Road raising:** Please describe specifics about the three locations where streets would be raised (provide figures); by how much, how many lots would be affected, and their impacts on the adjacent properties and utilities, responsible entity, sidewalk and property access, legal grade (indicate the legal grades and why the proposed road raisings will not meet legal grade), funding. Please also describe the NY Rising Residential buy-out program coordination (meeting between Corps and DOT will be set up by Curtis Cravens, ORR).
- **Community outreach:** Please include language when, by whom, and how property owners affected by road raising would be contacted and how the community would be involved.
- **Stoplog Structure:** More details are needed regarding design and operation/ maintenance, public safety issues including pedestrian & vehicular access, evacuation route. Coordination with DOT, OEM, NYPD, and FDNY is recommended (meeting between Corps and DOT, OEM, NYPD, and FDNY will be set up by ORR).
  - Please include as much detail as is currently known. If conceptual drawings are available, please include. State that operation & maintenance will be addressed and describe some parameters that will guide the Corp's consideration of public safety.
- **Air Quality placeholder:** Section needs to be provided.
- **Recreation/Open Space:** A more detailed description of the integration of the levee and promenade with adjacent recreation facilities would be useful to explain how the waterfront and amenities will operate. This would include discussion of any recreational assets that would be affected by the levee, identification of location of access ramps and pedestrian access points, any replacements of existing facilities with functionally equivalent facilities, and maintenance obligations.
- **Natural Resources:** Please include estimates of the amount of tree removals anticipated to be required. Any plans or accommodations to allow for wildlife connectivity should also be described.
- **Coastal Zone Management:** Status of conversations with DCP and DOS: Cate Alcoba of the Corps is in conversation with Terra Stern of DOS. Terra Stern and Mary Kimball of DCP's Waterfront and Open Space Division are in contact as well.
- **Hazardous Materials:** More information on areas of disturbance and what kind of testing/remediation may be needed; please provide more information relationship to CERCLA activities in Great Kills Park and any potential impacts on the proposed project.
  - Please provide the Hazardous Materials Report mentioned during the meeting to Curtis Cravens, ORR.

ANDREW M. CUOMO
GOVERNOR

JOE MARTENS
COMMISSIONER

STATE OF NEW YORK
DEPARTMENT OF ENVIRONMENTAL CONSERVATION
ALBANY, NEW YORK 12233-1010

January 21, 2015

Colonel Paul E. Owen
United States Army Corps of Engineers
New York District
26 Federal Plaza, Room 2109
New York, NY, 10279-0090

Re: South Shore Staten Island Phase I, Oakwood Beach

Dear Colonel Owen:

The New York State Department of Environmental Conservation (Department) has received the November 2014 draft proposal on the above referenced project from the United States Army Corps of Engineers (Corps). As currently formulated for the Oakwood Beach area of this project, the Corps' proposed alternative will not include a large parcel known as the "Traub property" as well as the vast majority of the properties obtained in this area through the New York Rising flood buy-out program. The Corps has tentatively elected to design the project in the Oakwood Beach area to provide necessary storm water storage capacity by excavating 200,000 cubic yards of earth to create a pond in an adjacent area.

The Department requests that the Corps reconsider this project attribute in the Oakwood Beach portion of the project, while keeping the project's schedule on track. The Department has continuously sought to have the Corps include the recommendations contained in the Oakwood Beach Dewberry Feasibility Study in the South Shore Staten Island Phase I project, as stated in the Department's April 10, 2014, letter to Colonel Owen (attached). Apparently based on discussions with certain agency staff from New York City, the Corps pursued a project attribute in the Oakwood Beach area that resulted in the exclusion of the Traub property, along with the vast majority of the New York Rising flood buy-out lots.

By this letter, the Department is requesting that the Corps reconsider this draft proposal and perform a design and economic analysis which includes the Traub property (with an appraised value reflecting its condition as mostly regulated wetlands) along with the buy-out lots (government-owned and available at no cost to the Corps), as an alternative project element to the one that involves excavating over 200,000 cubic yards of material for storm water storage. The Department will assist the Corps in this design and economic analysis by providing the Department's assessment of what portions of the Traub property may be available for construction under State regulations.

The Department understands that the Corps has had to extend by two months the target date for the public release of the draft report in order to address government agency comments (federal, state, and city). The Department requests that the Corps undertake best efforts to perform the requested reassessment (including the design and economic analysis) within the current schedule.

If you have any questions regarding this high priority request please contact me at the above number. As always, the Department looks forward to working with you and your staff to finalize the South Shore of Staten Island project.

Sincerely,

Joseph J. Martens

c: F. Santomauro
A. Ciorra
F. Verga
J. Rubin
K. Dineen
J. Tierney
V. Lannon
A. Fuchs
S. Zahn
S. McCormick
D. Zarrilli
C. Cravens

New York State Department of Environmental Conservation
Division of Water
Bureau of Flood Protection and Dam Safety, 4th Floor
625 Broadway, Albany, New York 12233-3504
Phone: (518) 402-8185 • **FAX:** (518) 402-9029
Website: www.dec.ny.gov

Joe Martens
Commissioner

April 10, 2014

Colonel Paul E. Owen
United States Army Corps of Engineers
New York District
26 Federal Plaza
New York, New York 10278

RE: South Shore of Staten Island (SSSI), New York Beach Erosion Control and Storm Damage Reduction Feasibility Study
New York State Department of Environmental Conservation Oakwood Beach Flood Attenuation Feasibility Study

Dear Colonel Owen:

The New York State Department of Environmental Conservation (Department) has completed its Flood Attenuation Feasibility Study of the Oakwood Beach area on the south shore of Staten Island. A CD of the final report dated January 31, 2014, which was previously provided to your staff, and the April 4, 2014 Supplemental Report is being forwarded to Mr. Frank Verga (Project Manager) by our consultant, Dewberry. Mr. Verga has also been given direct access to the final report via internet. The Department wishes to express our gratitude for all of the cooperation and assistance received from your staff during the course of the Department's study to help insure that its scope can be incorporated into the United States Army Corp of Engineer's (Corps) SSSI Feasibility Study

The purpose of the Department's study was to evaluate conceptually if the Corps' SSSI Feasibility Study, the New York City Mid-Island Bluebelt Study, the New York Rising Buy-out Program and restoration of natural infrastructure could all be combined in a fashion that would provide protection from coastal and rainfall flooding while preserving and restoring the wetlands within the Oakwood Beach watershed. The Dewberry Study has shown that this can be accomplished.

The Dewberry Study concluded that the revetment currently proposed in the Corps' Study can be moved landward and lowered which would allow for tidal wetlands to be constructed between the revetment and the ocean. The Buy-out Program will allow for more of the upland area to be used as stormwater storage to meet the needs of the City's Bluebelt Plan. The Supplement to the Study further evaluated the City's needs in regards to protecting and accessing their sewers that run parallel to the revetment alignment. Solutions have been found to accommodate all needs.

The Department is officially requesting that the Dewberry Oakwood Beach Flood Attenuation Feasibility Study be incorporated into the Corps' SSSI Feasibility Study. Please incorporate Alternative 1 and the modifications to it contained in the Supplemental Report into the SSSI Feasibility Study.

If you or your staff have any questions, you may contact Ms. Sue McCormick, P.E., Chief of the Coastal Erosion Management Program at (518) 402-8127 or myself at (518) 402-8185. Thank you for your and your staff's assistance in moving this very important resiliency component of the SSSI Feasibility Study forward in an expedited manor. The Department looks forward to the completion of the SSSI Feasibility Study and movement toward the construction phase.

Sincerely,

Alan A. Fuchs, P.E.
Director
Bureau of Dam Safety and Flood Protection

Cc: F. Verga, Corps Project Manager (CD sent by Dewberry)
J. Tierney, NYSDEC
V. Lannon, NYSDEC, Region 2
S. McCormick, NYSDEC (2 CDs sent by Dewberry)
C. Cravens, NYC Mayor's Office (CD sent by Dewberry)
J. Garin, NYCDEP
D. Gumb, NYCDEP (CD sent by Dewberry)
N. Maher, TNC (CD sent by Dewberry)
J. Huang, Dewberry

Alcoba, Catherine J NAN02

From: Verga, Frank NAN02
Sent: Wednesday, May 20, 2015 5:11 PM
To: Ashton, Karen NAN02; Couch, Stephen NAN02; Weppler, Peter M NAN02; Alcoba, Catherine J NAN02; Rakos, Lynn NAN02; Rice-Mcdonnell, Sheila R NAN; Chauncey, Andre T NAN02; Gonzalez, Carlos E NAN02; 'MPirrello@moffattnichol.com'; 'michael.cannon@aecom.com'; Simon, Ellen B NAN02
Cc: Brickman, Eugene NAN02; Ciorra, Anthony NAN02
Subject: Fw: [EXTERNAL] South Shore Staten Island Phase I request for moving forward on one Pond alternative
Attachments: 2015-4-6 Fuchs Ciorra SSSI Phase1two ponds.pdf

All, see below from NYS. As discussed we will need to update the draft report's proposed plan before public release.

Please coordinate with AEs as necessary to revise the main report, costs, figures, appendices, real estate plan and eis to meet our new schedule, as discussed.

Thanks.

From: Fuchs, Alan (DEC) [mailto:alan.fuchs@dec.ny.gov]
Sent: Wednesday, May 20, 2015 03:29 PM
To: Ciorra, Anthony NAN02; Verga, Frank NAN02
Cc: Tierney, James M (DEC) <james.tierney@dec.ny.gov>; Lannon, Venetia A (DEC) <venetia.lannon@dec.ny.gov>; Zarrilli, Dan <dzarrilli@cityhall.nyc.gov>; Cravens, Curtis <ccravens@cityhall.nyc.gov>; Murphy, Eileen (DEC) <eileen.murphy@dec.ny.gov>; McCormick, Susan D (DEC) <susan.mccormick@dec.ny.gov>; Zahn, Steve M (DEC) <steve.zahn@dec.ny.gov>; Klotz, Mark A (DEC) <mark.klotz@dec.ny.gov>; Dineen, Kate (STORMRECOVERY) <Kate.Dineen@stormrecovery.ny.gov>; Sinclair, Rebecca (STORMRECOVERY) <Rebecca.Sinclair@stormrecovery.ny.gov>; Santomauro, Frank NAN02; Shah, Ajay (DEC) <ajay.shah@dec.ny.gov>
Subject: [EXTERNAL] South Shore Staten Island Phase I request for moving forward on one Pond alternative

Anthony and Frank,

On April 6, 2015 I sent the attached letter to Anthony Ciorra by which NYS DEC requested that the Army Corps include within the South Shore Staten Island Phase I Project a component that has been referred to as the “Two Pond” alternative in the Oakwood Beach area of the overall project site. As discussed in my April 16th letter, the NYS DEC acknowledged that during the multiple remaining phases in the development of the final plan for this large scale project certain elements may be required to be modified to address actual conditions.

NYS DEC has come to the conclusion that a prior assumption on the availability of land for the Two Pond alternative is now uncertain to the extent that it cannot be assumed that the property necessary will be available. Therefore, NYS DEC is requesting the Army Corps revise

the documents/plans that are currently being developed for public review and consultation to reflect the previously developed “One Pond” alternative in this small portion of the overall project site. This will provide a more accurate presentation of the South Shore Staten Island Phase I Project for stakeholder consideration. NYS DEC is of the opinion that this modification should be made prior to the upcoming public presentation.

I thank you both for assisting NYS DEC and in moving this important project toward implementation.

Al

Alan A, Fuchs, P.E.

Director, Bureau of Flood Protection and Dam Safety, Division of Water

New York State Department of Environmental Conservation

625 Broadway, Albany, NY 12233-3504

P: 518-402-8185 | F: 518-402-9029 | Alan.Fuchs@dec.ny.gov

www.dec.ny.gov <http://www.dec.ny.gov/> | cid:image002.gif@01D01928.215FD820 <https://www.facebook.com/NYSDEC> | cid:image001.gif@01D01927.D33C0790 <https://twitter.com/NYSDEC>

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Division of Water, Bureau of Flood Protection and Dam Safety
625 Broadway, Albany, New York 12233-3504
P: (518) 402-8185 | F: (518) 402-9029
www.dec.ny.gov

April 6, 2015

Anthony Ciorra, P.E.
Chief – Coastal Restoration and Special Project Branch
United States Army Corps of Engineers – New York District
26 Federal Plaza – Room 2119C
New York, New York 10278

Re: South Shore of Staten Island Phase I Project

Dear Mr. Ciorra:

At a meeting on March 4, 2015, the United States Army Corps of Engineers (Army Corps) provided a number of potential alternatives on the above referenced matter to the Army Corps' non-federal sponsor, the New York State Department of Environmental Conservation (DEC). These alternatives addressed project elements in and around the Oakwood Beach area, which is within and adjacent to the proposed alignment of the South Shore of Staten Island Phase I Project (Project). At that meeting the Army Corps indicated that they needed to know the non-federal sponsor's preferred alternative for the Oakwood Beach area. This letter provides the Army Corps with this direction on behalf of DEC.

DEC requests that the Army Corps move forward with the "two pond" alternative, which includes a drainage pond on the area between Kissam Avenue and Fox Lane. New York State Governor's Office of Storm Recovery is implementing an extensive flood buy-out program in the Oakwood Beach area such that all properties within that program should be considered available for the Project, including the above identified areas. DEC understands that this alternative qualifies as the National Economic Development (NED) Plan.

DEC is aware that the Project may require mitigation focused in the Oakwood Beach area. Should mitigation be required, New York is ready and willing to work with the Army Corps to make the buy-out properties along and west of Fox Lane, and potentially northwest of Mill Road, available at no cost to the Army Corps for use in developing appropriate habitat for any necessary mitigation.

DEC acknowledges that during the development of the final plan and the design of the Project certain elements may be required to be changed to meet actual conditions. DEC looks forward to working through these issues with the Army Corps and will continue to work with you to expedite the development and timely construction of this important Project.

Sincerely,

Alan A. Fuchs, P.E.
Director
Bureau of Flood Protection and Dam Safety

ec: Commissioner Martens
Jamie Rubin
James Tierney
Venetia Lannon
Sue McCormick
Frank Santomauro
Frank Verga
Dan Zarrilli
Curtis Cravens

United States Department of the Interior

NATIONAL PARK SERVICE
Gateway National Recreation Area
210 New York Avenuet
Staten Island, NY 10305

IN REPLY REFER TO:

A00(NER/GATE)

April 9, 2015

Frank Verga
Programs and Project Management Division
US Army Corps of Engineers, NY District
26 Federal Plaza
New York, NY 10278

Re: NPS comments on USACE Draft South Shore EIS

Mr. Verga:

Thank you for the advance opportunity to comment on the South Shore of Staten Island Coastal Storm Risk Management Draft Environmental Impact Statement (EIS) being conducted by US Army Corps of Engineers (USACE). We appreciate the outreach and coordination shown by your agency in this matter. We are sensitive to the critical nature of this project, and the impact it will have on the future safety of the highly vulnerable shore communities of Staten Island during major storm events. Towards this end, we look forward to continuing to work with you to see this project to fruition.

On National Park Service (NPS) lands it is our mission to manage for the preservation of and access to natural, cultural and recreational resources. Understanding that this project is necessary for the protection of the adjacent communities, our focus is to avoid and minimize adverse impacts of any proposed interventions from the project on park resources, and incorporate appropriate mitigation measures where such impacts are unavoidable. We also seek to ensure that the project is planned in coordination with the CERCLA response effort being conducted at Great Kills. Lastly, we are looking to see that tradeoffs in management objectives are weighed and analyzed through alternatives in the EIS process. More detailed comments are provided below in the following sections:

1. EIS scope and process
2. Natural Resources
3. Cultural Resources
4. Recreational Resources
5. Great Kills CERCLA site
6. Permitting

1. EIS Scope and Process

We have identified two issues related to Gateway NRA that are missing from the analysis presented in the draft EIS: the alignment of the seawall at Miller Field (either landward or seaward of the hangar), and the location of the multi-use path at Miller Field (on top of the seawall or at ground level). We request that these be addressed in separate alternatives in the EIS analysis in order to fully compare the impacts that the proposed actions will have, adequately weigh the trade-offs among conflicting management goals, and allow for public input into the decision. We are sensitive to the need to keep this project on schedule, so if the timing is such that this analysis is not ready to be released to the public with the draft EIS, a supplemental analysis could be released at a later date as long as it has the opportunity to be publicly vetted and is included in the final decision document for the overall project.

2. Natural Resources

Overall we believe the EIS needs more in-depth evaluation of the impacts to natural resources. In particular, we are requesting additional analysis of impacts to the berm and dune system at Miller Field as well as erosional impacts along the entire shoreline. We also request incorporation of appropriate mitigation for likely impacts.

a. Erosional Impacts

We request that the analysis be revised to incorporate the issues detailed below. We believe there is a high probability of impacts from the loss of sediment transport, and that mitigation should be included in the form of periodic sediment nourishment along the shoreline, with particular attention to Great Kills.

- Construction of an engineered line of protection from Fort Wadsworth to Great Kills in conjunction with existing and planned groin and groin-like features (sewage discharge pipes) has a high probability of further depleting westward transport of sediment in an already sediment starved system. Reduction of sediment within cells R2, R3 and R5 of the historical sediment budget (Figure 2.3 page 13 of Appendix A: Engineering and Design) would directly impact park resources. Sediment transport through cells R2 and R3 directly impact dune and berm development at Miller Field. Sediment transport to and through cell R5 impacts Great Kills. Over the entire project length, Operations and Maintenance estimates loss of 5% of 135,000 cy annually and an annual nourishment cost for replacement of that sand at $337,000 (p 7-7 South Shore of Staten Island, New York Coastal Storm Risk Management Interim Feasibility Study for Fort Wadsworth to Oakwood Beach Draft Main Report, November 2014). Current annual loss from system is 46,000 cy (Figure 2.3 page 13 of Appendix A: Engineering and Design).

- In addition, impacts to sediment budget by existing New York City beach management practices is not identified within the sediment budget or estimates for annual sediment nourishment within project O&M. Please include this in the analysis.

- We also note that no analysis of how climate change may impact sediment transport processes is provided within the report or appendices, and request its inclusion.

- It is not clear that evaluation of the NED plan fully accounts for the impacts of sand loss from the Line of Protection during future storm events. A buried seawall should not impact shoreline processes. However, if sediments in front of the seawall are eroded and the seawall is exposed, shoreline processes would be significantly impacted by an exposed seawall. We request that this be evaluated in the analysis.

- We note that the economic analysis accounts for substantial storm damage reduction within the project area. To justify the economic analysis, the project area, and thus the Line of Protection, must be assumed to withstand numerous severe storm events during the 50 year project lifespan. The EIS and Appendices do not specify assumptions regarding frequency or intensity of storms used to justify project cost benefits. Appendix A (p 60) indicates that "In general the with-project coastal impacts are minor for the proposed line of protection since the majority of the proposed structures are set back from the shoreline and will only be exposed to nearshore wave processes during extreme storm events. The With Project storm induced erosion results indicate the structures have a minor impact on the profile change during storm events." No detailed analysis of with-project shoreline recession and dune/beach recession is presented within the EIS or Appendices. Appendix A (Tables 3-3 and 3-4, p 33) presents without-project shoreline recession and dune/berm recession. At Miller Field, recession rates for storm return periods of 2-500 years fall within range of 13-16 feet and 0-12 feet for shoreline and dune/berm, respectively. Recession rates are greater in other project reaches. If the LOP will only have minor impact on profile change during storm events, it follows that recession rates presented in Tables 3-3 and 3-4 should approximate with-project conditions. We request more information be presented in the EIS so that we may understand the assumptions regarding storm frequency and intensity during 50 year project lifespan; otherwise it is not possible to evaluate shoreline and dune/berm recession over the project lifespan to determine likelihood that part or all of the seawall will be exposed during the 50 year project.

- We have concerns for management of the shoreline that extend beyond the 50-year project lifespan; specifically, that without a program of beach and dune nourishment, the buried seawall will become exposed at some time in the future which will greatly alter the sediment budget and sediment transport processes. An exposed seawall is likely to severely decrease sediment transport to Miller

Field which may result in erosion of the beach and dune. Great Kills is currently sediment starved due to existing shoreline structures. Reduction in sediment transport will exacerbate erosion and further impact Gateway NRA resources. Understanding that the EIS analysis focuses on a more limited project lifespan, we would still like to gain a better sense of the long-term implications since we will be responsible for this area far into the future.

- The NPS is also interested in understanding more about how the proposed structures will impact Great Kills Park water flow/drainage during future rain events and coastal storm events. We request that the EIS include an analysis of how these structures will impact the effectiveness of a particular treatment technology, and whether there will be a different erosion rate to consider.

b. Dune System

The best examples of "natural" coastal dune systems on Staten Island are at Crooke's Point and Miller Field. Construction of a buried sea wall on the existing sand dunes at Miller Field will replace this natural resource feature. This will also have additional adverse impacts on other specific natural resources, as described in the subheadings below. For this reason we believe that a thorough analysis of natural resource impacts and appropriate mitigation should be included in the EIS.

Mitigation proposed should offset the disruption of beach-dune ecosystem functions, especially where they interface with coastal maritime plant communities, such as those existing at Crooke's Point. Ecosystem restoration (removal of invasive exotic vegetation with restoration of native vegetational communities) at Crooke's Point would be one recommendation for such an offset. Construction of a sustainable saltmarsh / beach-dune complex at the erosional zone of Great Kills may be another viable mitigative measure to replace coastal maritime habitats lost along the shoreline affected by the buried sea wall. We are happy to work with your office to identify the appropriate mitigation strategy.

i. Natural Processes

The identified placement of the buried seawall through the existing dune is generally inconsistent with NPS policies for managing natural systems because it transforms a dynamic feature that is formed and morphed by coastal processes into a static engineered feature. Current management provides for future management alternatives, such as strategic retreat, to allow for dune migration. Construction of an engineered seawall through the current dune alignment is essentially an irreversible management decision that artificially fixes the location of the dune and berm system. The EIS does not adequately consider natural resource impacts of replacing a dynamic shoreline with a fixed engineered structure within the context of a national park.

ii. Vegetation

- This alignment of the buried seawall will eliminate a sand dune plant community that colonized the site more than half a century ago. The NPS has undertaken substantial ecological restoration efforts on the dunes (removal of tens of thousands of non-native plants) since 2011, as well as post-Sandy reconstruction that includes about 30,000 grass stems and nearly 2,000 shrubs and trees.

- The new construction will replace compacted and root-stabilized sand. The existing sand dune crest at Miller Field beach is approximately 10.0 to 12.5 feet NAVD (compared with the NYC berms of 14 feet NAVD on either side of Miller Field). The multi-use path on the inland side of the dunes has an elevation of about 8.0 feet NAVD. These NPS dunes cover an area of approximately 1785 feet by 170 feet, or 7 acres.

- We request that the EIS include mitigation for these impacts in the form of planting efforts on the buried seawall with an intense and species-rich revegetation plan in order to rapidly re-establish native maritime plant and animal communities.

- If the promenade is located on top of the dune rather than alongside it, this will constitute an additional loss of available habitat. This should be factored into the impacts analysis.

- Long-term disruption to sediment transport and the resulting increased erosion could also lead to the loss of the oceanside saltmarsh at Great Kills. Again, we request that this be evaluated in the impacts analysis.

iii. Fauna

We request that the EIS analyze potential impacts to fauna, including a projection and timeline for the reestablishment of habitat and the wildlife it supports. Such impacts may include:

- how the loss of the Miller Field dune system may deprive this area of habitat for native pollinators and migratory passerines during construction and re-vegetation as the new system gets established

- the cumulative impacts of erosion of the remaining beach over time on nesting habitat for Horseshoe Crabs, feeding and resting habitat for shorebirds, and habitat needed for feeding and resting by migratory passerines and raptors.

3. Cultural Resources

We request a more thorough analysis of impacts to cultural resources be included in the EIS (such as on pages 2-34 and 4-41). Please note that compliance with Section 106 does not fulfill compliance with the analytic requirements of NEPA, which also includes cultural resources.

Regardless of the alignment of the buried seawall, the project will have an unavoidable major adverse impact on the historic district at Miller Field. We are ready to assist if requested in describing the impacts, such as severing Hangar 38 from its seaplane context, driving sheet piling near the Hangar and Elm Tree Light, etc. We believe this will constitute a major adverse impact under NEPA and an adverse effect under Section 106. We are happy to work with your office and the SHPO to identify the appropriate mitigation strategy.

More specific textual comments are included below.

a. 1.5 Project Area Description

The extent of the project area within the legislated boundaries of Gateway NRA and their National Register (NR) status should be clearly identified. For example, Lines 22 - 27 read as follows:

> "The shoreline in the Project area consists entirely of city-owned beaches and lands of the Gateway National Recreation Area (NRA), owned by the Federal government and administered by the former military installation, currently a historic site) at the northeast end of the Project area, Miller Field (a former Army airfield, currently a park with athletic fields) in the New Dorp Beach area, and Great Kills Park (an undeveloped natural area) southwest of Oakwood Beach."

It should be noted that the project begins adjacent to the National Register Fort Wadsworth Historic District, runs through the Miller Field Historic District and to Great Kills, all units of Gateway NRA, a national park.

Figure 1.3 should clearly identify NPS property. All three units are identified, but only Fort Wadsworth is indicated to be part of Gateway NRA. The reference to Fort Wadsworth lists it as a former military site, suggesting the history of the site; we request that this history and/or the impacts to Fort Wadsworth be discussed in the EIS.

Maps throughout the document should clearly identify Gateway NRA sites. The references to the sites should be consistent as well.

b. 3.1 Affected Environment

The description of the South Beach area should clearly indicate that this begins at Fort Wadsworth and describe the topography at this location.

c. 3.7 Cultural Resources

The first 46 lines of this section appear to discuss archaeological sites but it is not identified as such. The paragraph noted below begins with a discussion about historic structures but continues with the archaeology discussion, so should be clarified. Page 3-39 lines:

> "The only historic structures noted in the APE are at Miller Field. Although the Phase I study did not identify and Native American resources along the proposed alignment, the shoreline was determined sensitive for deeply buried sites (Panamerican 2005). The potential for deeply buried sites was corroborated by a geomorphological study conducted for the District's New York and New Jersey Harbor Navigation Project (Geoarchaeological Research Associates 2014). While this study's APE was offshore, it suggested that the south shore of Staten Island is moderately sensitive for now inundated or deeply buried shoreline sites."

Page 40 - lines 24-43 discuss Miller Field. The hangar is identified as is the concrete fire tower. There is little information on the history or significance of Miller Field; Elm Tree Light and the apron are not identified at all. All are part of the historic district. The history of Miller Field should be included in the text, and all historic resources should be clearly identified.

In this section there is no discussion about Fort Wadsworth and its historic structures, although Fort Wadsworth is discussed under many other headings in the text. Given that Fort Wadsworth is discussed and identified, a description of the site should be included and the impact if any should be discussed in 4.0. There is also no discussion about Great Kills, and although this is not a historic district, there are archaeology sites. These sites are outside of the APE, but the fact that they exist and are outside of the APE should be noted.

We suggest that a map of each Gateway NRA area should be included and each area should be clearly described. A subheading titled "Gateway NRA" or a subheading for each site might be helpful.

d. Consultation

"In accordance with the NHPA, implementing regulations, and New York State laws, the District has been in consultation with the New York SHPO and has prepared a Programmatic Agreement (Appendix F), which describes the roles and responsibilities of all parties in complying with cultural resource requirements."

Please add the NPS to this consultation. We will submit comments on the Programmatic Agreement separately.

e. 4.7 Cultural Resources Environmental Consequences

We concur with the process and impacts identified in the following statement:

> "The District would continue to work with the NPS to minimize and/or mitigate for impacts to the Miller Army Airfield Historic District. The District would also evaluate the NRHP-eligibility of the 1943 fire control tower. The proposed Project would sever the connection of Hangar No. 38, a seaplane hangar, from the sea, thereby impacting the setting of this historic district. Construction of the proposed alignment would require that the fire tower be demolished."

Additionally we request that the analysis incorporate the visual impact as well as direct impacts on Miller Field's historic resources, including the hangar, Elm Tree Light and the apron. Given the proposed alignment within feet of the Hangar and virtually wrapping around the Elm Tree Light, we anticipate a major adverse impact.

We also request that an analysis of the impacts on Fort Wadsworth and Great Kills be included in the text, particularly in regards to the viewsheds.

f. Section 106 coordination

As discussed during a recent call, NPS consults with 3 federally recognized tribes. Please add the Stockbridge Munsee tribe to this list.

g. Tribal Consultation

We would like to confirm whether USACE has initiated tribal consultation, and if so, whether this has been limited to submission of the draft Programmatic Agreement or has the USACE submitted (or will it submit) the draft EIS and/or archeological reports to the tribes for review. We request to be kept informed regarding the extent of tribal consultation the USACE has completed and plans to complete.

h. 4.10 Aesthetics and Scenic Resources

This section does not include any discussion of the impact on NPS resources. Impacts should include a discussion of the view sheds at Great Kills, Fort Wadsworth and Miller Field.

i. Chart 4.5 Table 4-5. Summary Comparison of the No-Action Alternative a 1 and the NED Plan

This chart indicates that the NED plan will have no additional impacts to cultural resources. As proposed, the construction of the wall will have an adverse impact at Miller Field, and may have visual impacts at Great Kills and Fort Wadsworth, pending analysis of these viewsheds as noted above.

4. Recreational Resources

As a National Recreation Area, these resources are fundamental to our mission. If the buried seawall is located landward of Hangar 38 at Miller Field, there will be a loss of the recreational fields currently occupying that area. This should be considered as an adverse impact to the park. Mitigation measures should be specified an included as a part of the EIS analysis.

The buried seawall will also impede public access to the shoreline. We request that the EIS specifically state that public access to the waterfront will be provided, and include the impacts from the change in access in the analysis, including potential mitigation.

We request that the EIS assess other potential impacts to the visitor experience, which may include:

- the seawall may block sea breezes, creating a hotter and drier microclimate inland
- the loss of the visitors' sense of connection with the sea and the natural environment, especially in the context that this is one of the few areas on Staten Island where a visitor can currently experience a natural dune system.

Seawall construction will destroy the recently constructed Multi-Use Path, but will replace it with a promenade. The location of the promenade on top of or behind the seawall will have differing impacts. A seawall topped with a heavily-trafficked promenade through the middle of the vegetated dune community may create an enforcement issue for NPS. Alternatively, the visitor experience behind the dune will be substantially different than what visitors currently experience, or will experience on lands adjacent to NPS lands under this scenario. We ask that these and any other tradeoffs be addressed and analyzed in the EIS alternatives.

Long-term, the disruption of sediment transport and resulting erosional impacts could lead to the eradication of recreational opportunities along the shoreline, such as access to the beaches. Of particular concern is any acceleration of erosion near the narrow area at Great Kills leading to the marina. If this area is breached, it would mean a loss of the road that is the only land access to the marina and Crooke's Point. We request that these potential long-term impacts be analyzed in the EIS and appropriate mitigation measures be evaluated.

5. Great Kills Park CERCLA site

The USACE proposed plan for Reach 1 calls for a vertical flood wall around the Oakwood Waste Water Treatment Facility and then an earthen levee extending up to Hylan Blvd. The construction footprint of these storm protection structures will likely overlap with the eastern boundary of the Great Kills Park CERCLA project (the Site). Based on current information on the Site, the radioactive contamination was brought to the Site with the waste fill material. The extent of the waste fill material along the park's southeastern boundary has not yet been fully delineated. The first phase of the Remedial Investigation (planned to start in 2015) will include further investigation of the footprint of the former landfill area.

The current steps for the GKP CERCLA project are:

- Remedial Investigation 2015-2017
- Feasibility Study 2018
- Proposed Plan
- Record of Decision
- Remedial Design/Remedial Action

To the extent practicable, NPS will consider prioritizing the investigation and clean up along the eastern boundary. However, the CERCLA process will still take several years to complete. We will work with you to factor this into the planning and construction of the project, both in terms of design as well as schedule.

6. Permitting

NPS is working to determine the legal authority and instrumentation under which the project will take place on NPS lands. It may not be the permanent easement mentioned in the EIS and we ask that you take this out of the draft EIS. We will continue to work with your office on this.

A few more textual errors and housekeeping issues:

- Need to ensure accurate differentiation throughout the EIS between the NYC's Great Kills Park, and that of Gateway NRA

- Page 3-52: There seems to be some misclassification and misstatements about Gateway throughout this page. (e.g. Fort Wadsworth is a national park, Miller Field is an "abandoned" airfield, etc.). Please correct these inaccuracies in the draft EIS. We will be glad to help with this.

- Missing words in the paragraph about Gateway on p. 1-10 that starts "Terrain..."

- **1.6 Planning Objectives**

  Please add the following objective:

  Where project activities are proposed for NPS lands, project will consider consistency with NPS policies (2006 NPS Management Policies) and Gateway National Recreation Area General Management Plan (2014).

- **1.8 Permits, Approvals, and Regulatory Requirements**

  Please include in Table 1-1:

  NPS
  - 2006 NPS Management Policies
  - Gateway National Recreation Area General Management Plan (2014)

- Authorization, through a yet to be determined instrument, to conduct work on NPS land

Thank you for your consideration of these issues. We look forward to working with you to achieve a project that best serves the overall interests of the public, provides for the safety of the South Shore communities, and maintains the type of experience expected at a National Park. If you have any questions or wish to convene another call or meeting with our team, please feel free to contact me at *jen_nersesian@nps.gov* or 718-354-4665. Additionally, if there is any data or assistance we can provide for the analyses we have requested, please let us know.

Sincerely,

Jennifer T. Nersesian
Superintendent

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

8 May 2015

Environmental Analysis Branch

Jennifer T. Nersesian
Superintendent
Gateway National Recreation Area
210 New York Avenue
Staten Island, New York 10305

Dear Ms. Nersesian:

Thank you for your comments on the U.S. Army Corps of Engineers, New York District, (District) South Shore of Staten Island Coastal Storm Damage Reduction Project Draft Environmental Impact Statement (DEIS). Please find enclosed our responses (Enclosure 1). Your concerns are addressed in greater detail in the DEIS which will be provided for your review prior to public release.

The District is committed to working with you to ensure we consider the needs and mission of the National Park Service as this project proceeds. Should you require additional information or have any questions, please contact me at (917) 790-8634 or by email at Peter.M.Weppler@usace.army.mil.

Sincerely,

Peter M. Weppler
Chief, Environmental Analysis Branch

Enclosure

1. EIS Scope and Process

We have identified two issues related to Gateway NRA that are missing from the analysis presented in the draft EIS: the alignment of the seawall at Miller Field (either landward or seaward of the hangar), and the location of the multi-use path at Miller Field (on top of the seawall or at ground level). We request that these be addressed in separate alternatives in the EIS analysis in order to fully compare the impacts that the proposed actions will have, adequately weigh the trade-offs among conflicting management goals, and allow for public input into the decision. We are sensitive to the need to keep this project on schedule, so if the timing is such that this analysis is not ready to be released to the public with the draft EIS, a supplemental analysis could be released at a later date as long as it has the opportunity to be publicly vetted and is included in the final decision document for the overall project.

USACE Response: The alignment of the seawall at Miller Field (either landward, seaward of or through the hanger) and the multi-use path at Miller field (on top of the seawall or at ground level) will be described in the draft EIS as sub-alternatives specific to Miller Field.

2. Natural Resources

Overall we believe the EIS needs more in-depth evaluation of the impacts to natural resources. In particular, we are requesting additional analysis of impacts to the berm and dune system at Miller Field as well as erosional impacts along the entire shoreline. We also request incorporation of appropriate mitigation for likely impacts.

USACE Response: The draft EIS will present additional details to evaluation impacts to the berm and dune at Miller Field. Text will be added to the Feasibility Study as well as to the EIS to address any potential erosional impacts along the shoreline. Additionally, the USACE is committed to working with NPS to avoid and minimize impacts in the Gateway NRA while still providing the coastal storm risk management needed for SSSI. Any mitigation commitments will be identified in the EIS Record of Decision.

a. Erosional Impacts

We request that the analysis be revised to incorporate the issues detailed below. We believe there is a high probability of impacts from the loss of sediment transport, and that mitigation should be included in the form of periodic sediment nourishment along the shoreline, with particular attention to Great Kills.

USACE Response: Text will be added to the Feasibility Study as well as to the EIS to address any potential erosional impacts along the shoreline.

- Construction of an engineered line of protection from Fort Wadsworth to Great Kills in conjunction with existing and planned groin and groin-like features (sewage

discharge pipes) has a high probability of further depleting westward transport of sediment in an already sediment starved system. Reduction of sediment within cells R2, R3 and R5 of the historical sediment budget (Figure 2.3 page 13 of Appendix A: Engineering and Design) would directly impact park resources. Sediment transport through cells R2 and R3 directly impact dune and berm development at Miller Field. Sediment transport to and through cell R5 impacts Great Kills. Over the entire project length, Operations and Maintenance estimates loss of 5% of 135,000 cy annually and an annual nourishment cost for replacement of that sand at $337,000 (p 7-7 South Shore of Staten Island, New York Coastal Storm Risk Management Interim Feasibility Study for Fort Wadsworth to Oakwood Beach Draft Main Rep01i, November 2014). Current annual loss from system is 46,000 cy (Figure 2.3 page 13 of Appendix A: Engineering and Design).

- In addition, impacts to sediment budget by existing New York City beach management practices is not identified within the sediment budget or estimates for annual sediment nourishment within project O&M. Please include this in the analysis.

- We also note that no analysis of how climate change may impact sediment transport processes is provided within the repo1i or appendices, and request its inclusion.

- It is not clear that evaluation of the NED plan fully accounts for the impacts of sand loss from the Line of Protection during future storm events. A buried seawall should not impact shoreline processes. However, if sediments in front of the seawall are eroded and the seawall is exposed, shoreline processes would be significantly impacted by an exposed seawall. We request that this be evaluated in the analysis.

- We note that the economic analysis accounts for substantial storm damage reduction within the project area. To justify the economic analysis, the project area, and thus the Line of Protection, must be assumed to withstand numerous severe storm events during the 50 year project lifespan. The EIS and Appendices do not specify assumptions regarding frequency or intensity of storms used to justify project cost benefits. Appendix A (p 60) indicates that "In general the with-project coastal impacts are minor for the proposed line of protection since the majority of the proposed structures are set back from the shoreline and will only be exposed to nearshore wave processes during extreme storm events. The With Project storm induced erosion results indicate the structures have a minor impact on the profile change during storm events." No detailed analysis of with- project shoreline recession and dune/beach recession is presented within the EIS or Appendices. Appendix A (Tables 3-3 and 3-4, p 33) presents without-project shoreline recession and dune/berm recession. At Miller Field, recession rates for storm return periods of2-500 years fall within range of 13-16 feet and 0-12 feet for shoreline and dune/berm, respectively. Recession rates are greater in other project reaches. If the LOP will only have minor impact on profile change during storm events, it follows that recession rates presented in Tables 3-3 and 3-4

should approximate with-project conditions. We request more information be presented in the EIS so that we may understand the assumptions regarding storm frequency and intensity during 50 year project lifespan; otherwise it is not possible to evaluate shoreline and dune/berm recession over the project lifespan to determine likelihood that part or all of the seawall will be exposed during the 50 year project.

- We have concerns for management of the shoreline that extend beyond the 50-year project lifespan; specifically, that without a program of beach and dune nourishment, the buried seawall will become exposed at some time in the future which will greatly alter the sediment budget and sediment transport processes. An exposed seawall is likely to severely decrease sediment transport to Miller

  Field which may result in erosion of the beach and dune. Great Kills is currently sediment starved due to existing shoreline structures. Reduction in sediment transpo1t will exacerbate erosion and further impact Gateway NRA resources. Understanding that the EIS analysis focuses on a more limited project lifespan, we would still like to gain a better sense of the long-term implications since we will be responsible for this area far into the future.

- The NPS is also interested in understanding more about how the proposed structures will impact Great Kills Park water flow/drainage during future rain events and coastal storm events. We request that the EIS include an analysis of how these structures will impact the effectiveness of a particular treatment technology, and whether there will be a different erosion rate to consider.

b. Dune System

The best examples of "natural" coastal dune systems on Staten Island are at Crooke's Point and Miller Field. Construction of a buried sea wall on the existing sand dunes at Miller Field will replace this natural resource feature. This will also have additional adverse impacts on other specific natural resources, as described in the subheadings below. For this reason we believe that a thorough analysis of natural resource impacts and appropriate mitigation should be included in the EIS.

Mitigation proposed should offset the disruption of beach-dune ecosystem functions, especially where they interface with coastal maritime plant communities, such as those existing at Crooke's Point. Ecosystem restoration (removal of invasive exotic vegetation with restoration of native vegetational communities) at Crooke's Point would be one recommendation for such an offset. Construction of a sustainable saltmarsh/beach-dune complex at the erosional zone of Great Kills may be another viable mitigative measure to replace coastal maritime habitats lost along the shoreline affected by the buried sea wall. We are happy to work with your office to identify the appropriate mitigation strategy.

USACE Response: The draft EIS will cite the NPS Gateway General Management Plan to

present additional detail as well as impacts (for each sub-alternative, landward seaward or through the Hanger) to the existing dune at Miller Field. The dune at Miller Field has been actively managed by NPS, including re-contouring the slopes to minimize sand moving onto the adjacent parking lot the additions of plantings (most recently Ammophila breviligulata) to attempt to stabilize the sand). USACE's NED plan includes covering the slopes of the line of protection (LOP) with the excavated material (sand) and via coordination with the USFWS, the plan will also include planting native dune grass on the slopes. Existing dune habitat at Miller Field will be disturbed if the LOP seaward of the hanger sub-alternative is constructed; however this habitat will reestablish after construction is complete. In addition, USACE will be constructing a continuous line of dune habitat along the entire line of protection, a total of approximately 21 acres of dune habitat creation.

i. Natural Processes

The identified placement of the buried seawall through the existing dune is generally inconsistent with NPS policies for managing natural systems because it transforms a dynamic feature that is formed and morphed by coastal processes into a static engineered feature. Current management provides for future management altematives, such as strategic retreat, to allow for dune migration. Constmction of an engineered seawall through the current dune alignment is essentially an management decision that artificially fixes the location of the dune and berm system. The EIS does not adequately consider natural resource impacts of replacing a dynamic shoreline with a fixed engineered structure within the context of a national park.

USACE Response: The draft EIS will cite the NPS Gateway General Management Plan to present any additional detail as well as impacts (for each sub-alternative) to the existing dune at Miller Field. The LOP is a fixed engineered structure, however, the existing dune at Miller Field is manmade and has been managed by NPS, including the addition of plantings.

ii. Vegetation

- This alignment of the buried seawall will eliminate a sand dune plant community that colonized the site more than half a century ago. The NPS has undertaken substantial ecological restoration efforts on the dunes (removal of tens of thousands of non-native plants) since 2011, as well as post-Sandy reconstruction that includes about 30,000 grass stems and nearly 2,000 shrubs and trees.

- The new construction will replace compacted and root-stabilized sand. The existing sand dune crest at Miller Field beach is approximately I0.0 to 12.5 feet NAVD (compared with the NYC berms of 14 feet NAVD on either side of Miller Field). The multi-use path on the inland side of the dunes has an elevation of about 8.0 feet NAVD. These NPS dunes cover an area of approximately 1785 feet by 170 feet, or 7 acres.

- We request that the EIS include mitigation for these impacts in the form of planting efforts on the buried seawall with an intense and species-rich revegetation plan in order to rapidly re-establish native maritime plant and animal communities.

USACE Response: See response above in Section 2 regarding mitigation. USACE will include native planning efforts on the buried seawall and is in coordination with USFWS regarding the species. USACE would also welcome NPS input on planting efforts, including species list.

- If the promenade is located on top of the dune rather than alongside it, this will constitute an additional loss of available habitat. This should be factored into the impacts analysis.

USACE Response: The EIS will add detail regarding the potential impacts of disturbing the existing dune for the sub-alternatives in which the LOP is constructed seaward of the hanger and/or the multi-use path at Miller field is on top of the seawall. In this scenario, a boardwalk (replacement of multi-use path) will be located at the top of the line of protection and habitat in this location will not be reestablished after construction is complete. However, USACE will be constructing a continuous line of dune habitat along the entire LOP, a total of approximately 21 acres of dune habitat creation. This habitat creation is greater than the amount that will be impacted because of the boardwalk on top of the LOP.

- Long-term disruption to sediment transport and the resulting increased erosion could also lead to the loss of the oceanside saltmarsh at Great Kills. Again, we request that this be evaluated in the impacts analysis.

USACE Response: Text will be added to the Feasibility Study as well as to the EIS to address any potential erosional impacts along the shoreline.

iii. Fauna

We request that the EIS analyze potential impacts to fauna, including a projection and timeline for the reestablishment of habitat and the wildlife it supports. Such impacts may include:

- how the loss of the Miller Field dune system may deprive this area of habitat for native pollinators and migratory passerines during construction and re-vegetation as the new system gets established

USACE Response: The EIS will add detail to consider the impacts of temporary habitat loss as the dune at Miller Field is disturbed during construction. This habitat will reestablish and USACE will be constructing a continuous line of dune habitat along the

entire LOP, a total of approximately 21 acres of dune habitat creation.

- the cumulative impacts of erosion of the remaining beach over time on nesting habitat for Horseshoe Crabs, feeding and resting habitat for shorebirds, and habitat needed for feeding and resting by migratory passerines and raptors.

USACE Response: Text will be added to the Feasibility Study as well as to the EIS to address any potential erosional impacts along the shoreline.

3. Cultural Resources

We request a more thorough analysis of impacts to cultural resources be included in the EIS (such as on pages 2-34 and 4-41). Please note that compliance with Section 106 does not fulfill compliance with the analytic requirements of NEPA, which also includes cultural resources.

USACE Response: Additional analysis will be added to the EIS.

Regardless of the alignment of the buried seawall, the project will have an unavoidable major adverse impact on the historic district at Miller Field. We are ready to assist if requested in describing the impacts, such as severing Hangar 38 from its seaplane context, driving sheet piling near the Hangar and Elm Tree Light, etc. We believe this will constitute a major adverse impact under NEPA and an adverse effect under Section 106. We are happy to work with your office and the SHPO to identify the appropriate mitigation strategy.

USACE Response: USACE, as stated in the EIS, concurs with NPS that there will be impacts to the Miller Field Historic District. We will continue to coordinate with NPS and SHPO to develop mitigation strategies.

More specific textual comments are included below.

a. 1.5 Project Area Description

The extent of the project area within the legislated boundaries of Gateway NRA and their National Register (NR) status should be clearly identified. For example, Lines 22 - 27 read as follows:

> "The shoreline in the Project area consists entirely of city-owned beaches and lands of the Gateway National Recreation Area (NRA), owned by the Federal government and administered by the former military installation, currently a historic site) at the no11heast end of the Project area, Miller Field (a former Army airfield, currently a park with athletic fields) in the New Dorp Beach area, and Great Kills Park (an undeveloped natural area) southwest of Oakwood Beach."

It should be noted that the project begins adjacent to the National Register Fort Wadsworth Historic District, runs through the Miller Field Historic District and to Great Kills, all units of Gateway NRA, a national park.

Figure 1.3 should clearly identify NPS property. All three units are identified, but only F011Wadsworth is indicated to be part of Gateway NRA. The reference to Fort Wadsworth lists it as a former military site, suggesting the history of the site; we request that this history and/or the impacts to Fm1Wadsworth be discussed in the EIS.

Maps throughout the document should clearly identify Gateway NRA sites. The references to the sites should be consistent as well.

USACE Response: The draft FS and EIS will update figures to clearly identify Gateway NRA sites.

b. 3.1 Affected Environment

The description of the South Beach area should clearly indicate that this begins at Fort Wadsworth and describe the topography at this location.

USACE Response: The draft EIS will update the description of the South Beach area per the comment above

c. 3.7 **Cultural Resources**

The first 46 lines of this section appear to discuss archaeological sites but it is not identified as such. The paragraph noted below begins with a discussion about historic structures but continues with the archaeology discussion, so should be clarified. Page 3-39 lines:

> "The only historic structures noted in the APE are at Miller Field. Although the Phase I study did not identify any Native American resources along the proposed alignment, the shoreline was determined sensitive for deeply buried sites (Panamerican 2005). The potential for deeply buried sites was corroborated by a geomorphological study conducted for the District's New York and New Jersey Harbor Navigation Project (Geoarchaeological Research Associates 2014). While this study's APE was offshore, it suggested that the south shore of Staten Island is moderately sensitive for now inundated or deeply buried shoreline sites."

USACE Response: Will edit.

Page 40 - lines 24-43 discuss Miller Field. The hangar is identified as is the concrete fire tower. There is little information on the history or significance of Miller Field; Elm Tree Light and the apron are not identified at all. All are part of the historic district.

The history of Miller Field should be included in the text, and all historic resources should be clearly identified.

USACE Response: The EIS will include additional details on the history and significance of Miller Field, the Elm Tree Light and the apron. The apron is mentioned already in the EIS on line 27. In reference to the apron, the USACE is not clear on the location and extent of it as the NRHP nomination form is vague about it, the GMP does not mention the apron at all and the GMP Figure 3-12, which outlines the historic district, depicts what is assumed to be the apron to the south of Hangar 38. It seems to make more sense that apron is to the north of the hangar.

In this section there is no discussion about Fort Wadsworth and its historic structures, although Fort Wadsworth is discussed under many other headings in the text. Given that Fort Wadsworth is discussed and identified, a description of the site should be included and the impact if any should be discussed in 4.0. There is also no discussion about Great Kills, and although this is not a historic district, there are archaeology sites. These sites are outside of the APE, but the fact that they exist and are outside of the APE should be noted.

USACE Response: A discussion of Fort Wadsworth will be included in the EIS. The archaeological sites at Great Kills will be noted.

We suggest that a map of each Gateway NRA area should be included and each area should be clearly described. A subheading titled "Gateway NRA" or a subheading for each site might be helpful.

d. Consultation

"In accordance with the NHPA, implementing regulations, and New York State laws, the District has been in consultation with the New York SHPO and has prepared a Programmatic Agreement (Appendix F), which describes the roles and responsibilities of all parties in complying with cultural resource requirements."

Please add the NPS to this consultation. We will submit comments on the Programmatic Agreement separately.

USACE Response: This section will be removed as Consultation was included in Chapter 4 under "Section 106 Coordination" where coordination with NPS is already included. The comments on the Programmatic Agreement were received by email. Thank you.

e. 4.7 Cultural Resources Environmental Consequences

We concur with the process and impacts identified in the following statement:

"The District would continue to work with the NPS to minimize and/or mitigate for impacts to the Miller Army Airfield Historic District. The District would also

evaluate the NRHP-eligibility of the 1943 fire control tower. The proposed Project would sever the connection of Hangar No. 38, a seaplane hangar, from the sea, thereby impacting the setting of this historic district. Construction of the proposed alignment would require that the fire tower be demolished."

Additionally we request that the analysis incorporate the visual impact as well as direct impacts on Miller Field's historic resources, including the hangar, Elm Tree Light and the apron. Given the proposed alignment within feet of the Hangar and virtually wrapping around the Elm Tree Light, we anticipate a major adverse impact.

USACE Response: The USACE will incorporate an analysis of the visual impact to the district as well potential for direct impacts. Renderings are being prepared for Miller Field.

We also request that an analysis of the impacts on Fort Wadsworth and Great Kills be included in the text, particularly in regards to the viewsheds.

USACE Response: The USACE will provide an analysis of impacts to the Fort Wadsworth Historic District and Great Kills and their viewsheds. Please see enclosed views from Fort Wadsworth (Attachment 1).

f. Section 106 coordination

As discussed during a recent call, NPS consults with 3 federally recognized tribes. Please add the Stockbridge Munsee tribe to this list.

USACE Response: USACE has since the phone call initiated consultation with the Stockbridge-Munsee.

g. Tribal Consultation

We would like to confirm whether USACE has initiated tribal consultation, and if so, whether this has been limited to submission of the draft Programmatic Agreement or has the USACE submitted (or will it submit) the draft EIS and/or archeological reports to the tribes for review. We request to be kept informed regarding the extent of tribal consultation the USACE has completed and plans to complete.

USACE Response: As per Section 4.7 of the EIS, the USACE has initiated tribal consultation. As per correspondence in the EIS, the USACE provided the tribes with the Draft Programmatic Agreement and a CD with the Phase I cultural resources report. As per the correspondence in the EIS, the Delaware Tribe concurred with the Phase I recommendations for deep testing. The Delaware Nation indicated that the USACE should continue with the project as planned. The tribes will be provided copies of the Draft EIS. The USACE will keep NPS informed of all future tribal consultation.

h. 4.10 Aesthetics and Scenic Resources

This section does not include any discussion of the impact on NPS resources. Impacts should include a discussion of the view sheds at Great Kills, Fort Wadsworth and Miller Field.

USACE Response: The draft EIS will be updated to include a discussion of impacts to NPS resources, including viewsheds at Great Kills, Fort Wadsworth and Miller Field. Images from Fort Wadsworth are enclosed (Enclosure 2). Renderings are being prepared for Miller Field.

i. Chart 4.5 Table 4-5. Summary Comparison of the No-Action Alternative a 1 and the NED Plan

This chart indicates that the NED plan will have no additional impacts to cultural resources. As proposed, the construction of the wall will have an adverse impact at Miller Field, and may have visual impacts at Great Kills and F011Wadsworth, pending analysis of these viewsheds as noted above.

4. Recreational Resources

As a National Recreation Area, these resources are fundamental to our mission. If the buried seawall is located landward of Hangar 38 at Miller Field, there will be a loss of the recreational fields currently occupying that area. This should be considered as an adverse impact to the park. Mitigation measures should be specified an included as a pmt of the EIS analysis.

USACE Response: See response above in Section 2 regarding mitigation. The draft EIS will add analysis of impacts to portions of the recreational fields if the landward of the hanger sub-alternative is constructed.

The buried seawall will also impede public access to the shoreline. We request that the EIS specifically state that public access to the waterfront will be provided, and include the impacts from the change in access in the analysis, including potential mitigation.

USACE Response: See response above in Section 2 regarding mitigation. USACE NED Plan will replace the amount of access to the shore that is currently in place. On a recent field visit, USACE staff observed rope lined access points through the dune. If the seaward of the hanger sub-alternative is constructed, the same number of access points would be constructed over the buried seawall for access to the shoreline. Language will be added to the draft EIS to clarify this.

We request that the EIS assess other potential impacts to the visitor experience, which may include:

- the seawall may block sea breezes, creating a hotter and drier microclimate inland

- the loss of the visitors' sense of connection with the sea and the natural environment, especially in the context that this is one of the few areas on Staten Island where a visitor can currently experience a natural dune system.

USACE Response: The draft EIS will add language stating that there could be minimal impact to sea breezes or the microclimate. Regarding visitor's sense of connection, CEQ states that NEPA does not require that an EIS speculate with respect to the potential impacts associated with feelings and personal perceptions.

Seawall construction will destroy the recently constructed Multi-Use Path, but will replace it with a promenade. The location of the promenade on top of or behind the seawall will have differing impacts. A seawall topped with a heavily-trafficked promenade through the middle of the vegetated dune community may create an enforcement issue for NPS. Alternatively, the visitor experience behind the dune will be substantially different than what visitors currently experience, or will experience on lands adjacent to NPS lands under this scenario. We ask that these and any other tradeoffs be addressed and analyzed in the EIS alternatives.

USACE Response: Correct, if the seaward of the hanger sub-alternative is constructed, the Multi-Use Path would be impacted and USACE's project would provide a functional equivalent pathway in the form of a promenade on top of the buried sea wall or a promenade at ground level behind the buried seawall (sub-alternatives), based on input from NPS. If NPS selects the on top of the buried seawall sub-alternative, the promenade would be on the crest of the seawall and the vegetated dune would be on the slopes of the seawall, therefore traffic on the promenade would be over and not through the vegetated dune. Many beaches have wooden platforms located above planted communities to allow pedestrian traffic (over) but not impact the plantings. If NPS is concerned about promenade users stepping off the path and into the dune, the project includes a fixed railing on either side of the promenade for safety. It's a federal requirement if you have a drop of 3 feet or more adjacent to the walkway. This could help with NPS's enforcement concern by discouraging people from walking off of promenade and into the vegetated dune on the slopes of the seawall.

Long-term, the disruption of sediment transport and resulting erosional impacts could lead to the eradication of recreational opportunities along the shoreline, such as access to the beaches. Of pa1iicular concem is any acceleration of erosion near the narrow area at Great Kills leading to the marina. If this area is breached, it would mean a loss of the road that is the only land access to the marina and Crooke's Point. We request that these potentiallong-te1m impacts be analyzed in the EIS and appropriate mitigation measures be evaluated.

USACE Response: Text will be added to the Feasibility Study as well as to the EIS to address any potential erosional impacts along the shoreline

5. **Great Kills Park CERCLA site**

The USACE proposed plan for Reach 1 calls for a vertical flood wall around the Oakwood Waste Water Treatment Facility and then an earthen levee extending up to Hylan Blvd. The construction footprint of these storm protection structures will likely overlap with the eastern boundary of the Great Kills Park CERCLA project (the Site). Based on current information on the Site, the radioactive contamination was brought to the Site with the waste fill material. The extent of the waste fill material along the park's southeastern boundary has not yet been fully delineated. The first phase of the Remedial Investigation (planned to start in 2015) will include further investigation of the footprint of the former landfill area.

The current steps for the GKP CERCLA project are:

- Remedial Investigation 2015-2017
- Feasibility Study 2018
- Proposed Plan
- Record of Decision
- Remedial Design/Remedial Action

To the extent practicable, NPS will consider prioritizing the investigation and clean up along the eastern boundary. However, the CERCLA process will still take several years to complete. We will work with you to factor this into the planning and construction of the project, both in terms of design as well as schedule.

USACE Response: Noted, thank you for the schedule and potential prioritization of the eastern boundary information. USACE will continue to coordinate closely with NPS on the cleanup at Great Kills Park.

6. **Permitting**

NPS is working to determine the legal authority and instrumentation under which the project will take place on NPS lands. It may not be the permanent easement mentioned in the EIS and we ask that you take this out of the draft EIS. We will continue to work with your office on this.

USACE Response: Reference to the permanent easement in the EIS will be replaced with a note saying that NPS is working with USACE to determine the legal authority and instrumentation under which the project will take place on NPS lands. Thank you.

A few more textual errors and housekeeping issues:

- Need to ensure accurate differentiation throughout the EIS between the NYC's Great Kills Park, and that of Gateway NRA

USACE Response: The draft EIS will be updated to ensure the language is clear when referring to NYC's Great Kills Park and that of Gateway NRA.

- Page 3-52: There seems to be some misclassification and misstatements about Gateway throughout this page. (e.g. Fort Wadsworth is a national park, Miller Field is an "abandoned" airfield, etc.). Please correct these inaccuracies in the draft EIS. We will be glad to help with this.

USACE Response: The draft EIS will be corrected per the comment above.

- Missing words in the paragraph about Gateway on p. 1-10 that sta11s "Tenain..."

USACE Response: The draft EIS will be corrected per the comment above.

- 1.6 **Planning Objectives**

  Please add the following objective:

  Where project activities are proposed for NPS lands, project will consider consistency with NPS policies (2006 NPS Management Policies) and Gateway National Recreation Area General Management Plan (2014).

USACE Response: The draft EIS (and FS) will add language per the comment above, to the extent practicable.

- 1.8 **Permits, Approvals, and Regulatory Requirements**

  Please include in Table 1-1:

  NPS
  - 2006 NPS Management Policies
  - Gateway National Recreation Area General Management Plan (2014)
  - Authorization, through a yet to be determined instrument, to conduct work on NPS land

USACE Response: The draft EIS (and FS) will add language per the comment above, to the extent practicable.

Attachment 1

Fort Wadsworth: Locations of Views 1, 2, and 3. Source GoogleEarth 2015.

Fort Wadsworth: View 1, looking SSW from USS Connecticut (or Constitution) Court to beach. Red arrow points to end of boardwalk, tie in to high ground would extend from boardwalk to the right of photo. Photographer L. Rakos, April 2015.

Fort Wadsworth: View 2, looking SSW from USS North Carolina /Ayers Road to beach. Red arrow points to end of boardwalk, tie in to high ground would extend from boardwalk to edge of parking lot. Photographer L. Rakos, April 2015.

Fort Wadsworth: View 3, looking SSW from Battery Ayres towards the beach. Red arrow points to end of boardwalk.
Photographer L. Rakos, April 2015.

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS
26 FEDERAL PLAZA
NEW YORK, NY 10278

CENAN-PL

30 October 2015

MEMORANDUM FOR Commander, North Atlantic Division, (CENAD-PD-N)
ATTN: Mr. Joseph Forcina (CENAD-PD-CS)

SUBJECT: South Shore of Staten island, New York, Coastal Storm Risk Management, Draft Feasibility Study and Environmental Impact Statement for Fort Wadsworth to Oakwood Beach

1. Reference CENAD-PDS-P Memorandum, dated 6 August 2015, subject: South Shore of Staten Island Draft Feasibility Report & Draft Environmental Impact Statement (DEIS), Policy Review Comments.

2. This memorandum transmits the District's final responses to the MSC policy review comments received on the draft report package submittal. These final responses have been pre-coordinated with appropriate MSC team members.

3. The District has scheduled the required IPR with NAD/HQ for 12 November 2015 to obtain higher authority final approval of these responses. That approval will allow for the ADM Milestone (CW263) to occur in December 2015. The Final Report is currently scheduled for submission (CW 160) in January 2016.

4. As a reminder, the District received formal Cost Certification on 13 October 2015 and officially received ATR Certification (CW 151) on 22 October 2015. IEPR is expected to be finalized by early November. There are no unresolved issues. Additionally, there are no significant public/agency comments.

5. As there are no major policy concerns, the District will begin preparation of the Final Feasibility Report and Environmental Impact Statement based on these responses, concurrent with the IPR and ADM meetings.

6. Please contact the Project Planner, Ms. Karen Ashton, P.E., with any questions at (917) 790-8607.

Encl

Frank Santomauro, P.E.
Chief, Planning Division
New York District

South Shore of Staten Island, New York
Fort Wadsworth to Oakwood Beach
Coastal Storm Risk Management Draft Feasibility Report
&
Environmental Impact Statement
CENAN responses to MSC Planning & Policy Review

1. Please refer to the following CENAN responses to CENAD-PDS-P comments:

a. Planning Constraints: Feasibility Report, Table 13 and EIS, Table 2-1: The term, "constraints" has specific meaning and criteria within USACE. The column named constraints does not identify constraints as the issues raised do not meet USACE criteria. Recommend renaming, perhaps, "considerations." In addition, decreased tax base is a local sponsor concern, and not a Federal government constraint. Please remove this constraint.

DISTRICT RESPONSE 3A: The District concurs and the constraint/consideration "decreased tax base" has been deleted from report text completely. Further, the Final Feasibility Report and EIS has been revised to state "considerations" instead of "Constraints".

b. Future With Project Conditions: The entire environmental future with project conditions section is lacking. District has chosen not to submit an integrated Feasibility Study/Draft EIS. In the case of two distinct documents the decision document (Feasibility Study) must still include the basic information and rely for additional detail on the EIS. District is advised to refer to the Planning Guidance notebook, Appendices C, Section (3) and G for specific requirements. These include:

DISTRICT RESPONSE 3B: A summary discussion has been added to the final Feasibility report. Text from the EIS Executive Summary has been used in the Feasibility Report to describe environmental impacts. Construction activities would temporarily disturb several resources, information from the table below excerpted from EIS Section 4.17 and used in the Feasibility Report to describe measures that will be put in place to avoid, lessen, mitigate or compensate for environmental impacts:

Resource	Environmental Impact	Measures to avoid, lessen, mitigate or compensate for environmental impact
Water Resources	Temporary, short term increase in suspended sediments and turbidity in surface waters adjacent to project	Any discharge of dewatered effluents would be subject to the requirements of the SPDES discharge permit.
Vegetation (Uplands and Wetlands)	Impact up to 51 acres vegetation along LOP, approx. 128.5 acres of vegetation within interior drainage areas and 20.1 acres of vegetation within the Tidal Wetland (Mosaic of Habitat) project feature. Minor tree clearing and site grading.	Project was formulated as a system and includes tidal wetland construction, invasive species removal, native vegetation seeding and planting and tree replacement.
Wildlife	Temporary, short term disturbance	Implement BMPs during construction to avoid impacts to wildlife. Have a process in-place for rescue of wildlife if necessary.
Cultural	Three sub-alternatives Miller Field (seaward, landward, or through Hangar 38), would have varying adverse effects on the NRHP-listed Miller Army Airfield Historic District, including the potential demolition of the WWII fire tower and alteration to the setting of Hangar 38.	Define and implement required mitigation measures in coordination with NPS.
Recreation	Short-term direct impacts during Project construction activities, as well as long term, direct impacts (ex: required relocation of buildings or portions of fields).	To the extent practicable, access to the beaches would be maintained throughout construction. Specific impacts to facilities will be identified during the refined design of the Project, and in collaboration with NYCDPR. These impacts would be essentially mobile, moving along the LOP as each activity is completed.
Aesthetics and Scenic Resources	Short-term direct adverse impacts	These impacts would be essentially mobile, moving along the LOP as each activity is completed.
Transportation	Short-term minor adverse effects	Contractors would route and schedule construction vehicles to minimize conflicts with other traffic, and strategically locate

		staging areas to minimize traffic impacts. Equipment would not be fixed in one location for long durations, but would progress along the construction right-of way.
Noise	Short-term moderate effects due to heavy construction activities such as pile driving and use of construction equipment during revetment activities	Construction activities limited to weekdays between the hours of 7:00 a.m. and 6:00p.m. without a special permit. A noise mitigation plan would include such restrictions as specifying sites for noise generating equipment and avoiding unnecessary late night and weekend construction activities, and would be developed to address nearby schools, hospitals, and houses of worship.

i) a description of environmental impacts, and description of measures to avoid, lessen, mitigate or compensate for environmental impacts in the decision document. (The Executive Summary of the EIS would provide a sufficiently detailed description of impacts, additional information would need to be developed dealing with measures).

ii) Determination of the significance of ecological resources likely to be affected by alternative plans, and the significance of these effects;

DISTRICT RESPONSE: Response – A summary discussion has been added to the Feasibility report. EIS Section 4.17 provides a summary of construction impacts of the NED Plan. Section 4.17 is based on more detailed information contained in Sections 4.1 through 4.16 of the EIS and includes the level of significance for each resource.

c. Oakwood Beach City Restoration Plans and Federal project: District is asked to clarify the relationship between the NED plan, which includes functional enhancement of wetlands and Oakwood Beach and the City's ecosystem restoration plans. Questions to be addressed include: Is this captured in the FWOPC? Does the NED plan complement other restoration plans in the area?

DISTRICT RESPONSE 3C: As discussed in Section 2.2 of the Draft EIS, the FWOPC includes locally funded actions. Some are explicitly identified (such as the Bluebelt Program), while others are generically identified (such as, "the acquisition of local property for the preservation of wetlands and introduction of new natural storage areas..."). Consequently, the FWOPC includes the City's functional enhancement of wetlands adjacent to the Oakwood Beach Wastewater Treatment Plant and ecosystem restoration plans. USACE also has ongoing feasibility study

(Hudson-Raritan Ecosystem Restoration Study) that is identifying restoration opportunities throughout the NY/NJ Harbor Estuary. One of the potential opportunities identified is the Oakwood Beach/Great Kills site, which would complement this project's effort.

As a further note: The cumulative impact analysis includes a discussion of New York City's Forest Restoration and Fire Management in Oakwood Beach-Great Kills Park. The New York City Department of Parks and Recreation (NYCDPR) is the lead agency for the review of this project, which consists of forest restoration and fire management pilot project for a 2-acre open space in Great Kills Park. The project involves the restoration of a wetland and adjacent forest area to enhance ecosystem value and lower fuel vegetation structure. The NYCDPR determined that this project would not have a significant impact on the environment (NYCDPR 2015). This project does not overlap the two proposed ponds in Drainage Area B.

d. Evaluation of Alternatives: The relationship between alternatives and basis for screening out alternatives is unclear. Specific examples that require clarification include why FM4 and FMI were not retained (as these have higher BCRs than the retained FO I), and the relationship between F03 and FM3, and between F03A and F03B. District is advised to clarify the relationships between alternatives and the reasons for screening out those with positive BCRs. In addition, it is not evident that it is appropriate to perform the screening (Table 16) using cost estimates that are 12 years old. In the 12 years that have elapsed, the prices of fuel and stone, important inputs to this project, have changed dramatically – and not in the same direction. District is asked to include an explanation as to why indexing 2003 costs is appropriate

DISTRICT RESPONSE 3D: Response – The project formulation that took place in between 2002 and 2005 considered alternatives for both the entire Fort Wadsworth to Oakwood Beach reach ("FO" alternatives), as well as for the Fort Wadsworth to Miller Field ("FM" alternatives portion of the overall reach. While alternatives FM1 and FM4 were economically justified, they did not address the Miller Field to Oakwood Beach portion of the project that experienced significant damages and loss of life during Hurricane Sandy. The outcome of the screening process was the identification of the four alternatives shown on Table 16 of the draft Main Report. Alternative 4, which provided the most net benefits and greatest BCR, was identified as the Tentative Selected Line of Protection Plan in 2005. During the last phase of the study, which took place prior to Hurricane Sandy, Alternative 4 was evaluated at four different still water design levels to establish the optimized NED Plan. Subsequent to Hurricane Sandy, the optimization process incorporated post-Hurricane Sandy analyses and design changes. Indices were utilized only to update the costs and benefits of the four Alternative plans identified on Table 16. This was considered appropriate since Alternative 4 had significantly lower annual costs than the other 3 alternatives. During the optimization process, current price levels were utilized. However, the District updated the costs regardless to ensure that NAD's concerns are addressed. Further, the final SSSI Report will be revised and updated with the attached price level updates for the alternatives in Table 16. Current unit

prices were used to update the costs and they reflect current interest rates. Alternative 4 still maximizes the annual net benefits. The results are:

FORT WADSWORTH TO OAKWOOD BEACH - SELECTED ALTERNATIVES BOROUGH SOUTH SHORE OF STATEN ISLAND FEASIBILITY STUDY SUMMARY OF PLAN ECONOMICS (2015 PRICE LEVEL, 3.375% DISCOUNT RATE, 50 YEAR PERIOD OF ANALYSIS)				
LINE OF PROTECTION	Alternative #1 Beach Fill	Alternative #2 Road Raising (Full)	Alternative #3 Road Raising (Partial)	**Alternative #4 Buried Seawall/ Armored Levee**
Annual Benefits	$12,557,096	$12,908,429	$12,908,429	**$12,908,429**
Annual Costs	$7,148,000	$5,946,000	$7,132,000	**$5,460,000**
Net Benefits	$5,409,096	$6,962,429	$5,776,429	**$7,448,429**
BCR	1.8	2.2	1.8	**2.4**

e. Benefits: It is not evident why the BCR of the Recommended Plan changed so drastically between the alternatives analysis (2.8) and the refinement of the plan. In the ES, First Costs are reported to be $528.4M and Average Annual Costs are $24M. In the Alternatives Analysis (page 6-29), the First Costs are $90.3M and the Average Annual Costs are $4.2M. It is understandable that refinements and optimization of design raised costs; however, this cost increase beyond what would have been expected. District is asked to explains the cost increase and verify that Alternative 4 is still the Recommended Plan. Lastly, the net benefits numbers in Table 20 do not make sense. District is asked to clarify how they were calculated.

DISTRICT RESPONSE 3E: The decrease in the BCR of the Recommended Plan from 2.8 in the alternatives analysis to 1.3 in the final plan is due to a number of factors. The current project cost reflects post-Sandy required design changes, such as utilizing updated FEMA stage frequency curves, changes in plan alignment and design section types based on post-Sandy conditions, and also updates in technical guidance related to I-type floodwall design. It includes the cost of interior drainage features ($86 million – which applies to all plans equally) that was not included in the Alternatives analysis.

The decrease also reflects the significantly higher estimates for mob/demob, disposal of excavated material, and for concrete and steel in the 2015 estimate as compared to the 2003 Alternatives analysis. The decrease also reflects significantly higher contingency rates associated with the CSRA requirement for cost certification (39.3 % vs. 15%) and E&D (20% vs. 7%). Since these significant cost increases would affect the other 3 alternatives, Alternative 4 remains the Recommended Plan.

The decrease also reflects the level of alternative analysis. The 2.8 BCR was based on an alternative analysis comparison at a 1% probability of exceedance. The final optimized plan includes a decrease associated with the 0.03% probability (300-yr) of annual exceedance.

Regarding Table 20, the Annual Benefits shown are the incremental benefits gained by implementing the identified alternative (x), and the Annual Cost of Measures in the Tentatively Selective Plan is the difference in cost (y) between that plan and the minimum facility. The net benefits are therefore computed by deducting y from x. The Total Annual Cost in Table 20 is presented for reference since it contributes to the analysis of the overall plan but it is not considered in the evaluation of interior drainage alternatives.

Since no cost-effective plans to improve on the minimum facility were identified for Areas A, B, and E, there are no net benefits for these areas in the right-hand column of Table 20 and the interior drainage plan remains the minimum facility for these areas.

The following from Paragraph 129 of the Interior Drainage Appendix will be added to Table 20 as a footnote: "The Minimum Facility is intended to ensure that the <u>existing</u> drainage system performs the same with and without the project put in place as to avoid induced flood damages. This is the starting point from which all additional interior drainage alternatives can be evaluated. Additional interior drainage facilities may be designed to further reduce interior water levels beyond the minimum facilities. These additional interior facilities must be incrementally justified, i.e. their incremental costs must be less than the incremental benefits."

f. There is no description of the economic analysis in the Main Report. At a minimum, paragraphs 45 and 46 of the Benefits Appendix should be included. As presented, a reader would have no idea of how the work was done and what HEC-FDA does.

DISTRICT RESPONSE 3F: Paragraphs 45 and 46 from the Benefits Appendix will be added to the Final Version of the Main Report.

g. The Benefits Appendix limits benefits to damages to structures and their contents. District is asked to clarify whether consideration was given to quantifying Emergency Costs avoided, and if that would change the Recommended Plan.

DISTRICT RESPONSE 3G: Response – Efforts were made to obtain "emergency costs avoided", which generally represent 2-5 % of the total annual benefits. Unfortunately, the available data was an aggregate for the entire City of New York. Despite repeated attempts and requests, the City of NY was not able to provide the "emergency cost data avoided" for the specific project area. Since the benefits associated with "emergency costs avoided" would be similar for any of the

alternatives, including these benefits would not change the Recommended Plan.

h. Price levels: The rep01i is inconsistent in its use of price levels. Paragraph 24 uses FY 14 and the O&M section uses May 2015. While project costs and benefits can be compared to one another using a price level that is not current, the Executive Summary and all discussion of the Recommended Plan should consistently use current price levels and discount rates. It may be that this document will be revised to coincide with FY16. If this is the case, the ES and RP need to reflect FYI 6 PLs and discount rates.

DISTRICT RESPONSE 3H: Response - The cost estimates were at Jul 2014 price level. Final report will show all cost estimates at Oct 2015 price levels

i. Interior Drainage: The Main Report needs to flesh out the discussion of how the interior drainage was formulated and how benefits were calculated and justified. As presented, evident that going above the minimum facility in areas C and E are f01mulated to be beyond what would be justified as the NED plan. If they are beyond what the Federal project would justify, then incremental costs would be borne by the non-Federal Sponsor and cost-sharing would change. (See PGL 37, Cost Sharing of lnterior Drainage Facilities, Section 5.a.)

DISTRICT RESPONSE 3I: Response – Para 237 of the Main Report states that the "Minimum Facility Plan was the starting point from which all other Alternatives were measured". Para 5a of PGL 37 specifies that "All costs of minimum facilities as described herein, as well as incrementally justified facilities to solve residual flooding are part of the total project cost". As summarized in Table 19, potential alternatives were evaluated against the Minimum Facility in each of the Drainage areas to determine whether any of the alternatives were incrementally justified. Table 20 identifies the Optimum Plans for each of the Drainage Area. Minimum facilities were recommended for drainage Areas A, B and D since there was no alternative that provided excess net benefits. For drainage areas C and E, the optimum plans provided $3.1 million and $1.2 million in net benefits, respectively as compared to the Minimum facilities identified for those drainage areas

j. No net loss of Wetland Acreage or Function: While District notes a loss of 10.9 acres of tidal wetlands versus creation of over 46 acres of freshwater emergent acres there is no discussion of functional values. The EIS contains the statement, "Taken as a whole, the construction of 46 acres of tidal wetlands versus the loss of 10.9 acres of freshwater wetlands would produce a net significant positive impact on wetland habitats and quality of wetlands in the project area." There must be, minimally, a qualitative basis for this statement in the EIS. Additionally, it is USACE Policy to have no net loss in acreage or function. Therefore, District is advised to include a discussion of overall project gain or loss in function as well as acreage in the Future With Project section of the Feasibility Rep01i as well as Section 4.3.2 of the EIS. The inclusion of figures that demonstrate the relationship between interior drainage ponds and wetland created is strongly recommended.

DISTRICT RESPONSE 3J: The EIS Section 4.3.2 has been updated to clarify wetland impacts from the construction of the LOP, the interior drainage and the Tidal Wetland (Mosaic of Habitat) features. This includes the loss of 10.89 acres from construction of the LOP and the improvement of 117.25 acres of wetland for the combined interior drainage features and of the improvement of 16.5 acres associated with the Tidal Wetland Feature (consisting of a Mosaic of Habitats) from removal of invasive species, seeding/planting of native species post excavation. The conversion of 11.3 acres of upland to wetland associated with the interior drainage project features (specifically areas B, C & E where excavation will take place) is also noted.

Existing conditions for the 46-acre area of proposed tidal wetland (mosaic of habitat) consists of estuarine emergent wetlands with a tidal channel (16.5 ac), sandy beach (15.6 ac), littoral zone (7.7 ac), upland shrub/scrub areas (3.6 ac), and upland developed area (2.6 ac). The predominant species within the impacted emergent wetland community is common reed, and in many areas of the wetlands this species grows in monotypic stands.

The projects Tidal Wetland feature will include construction of 46 acres of a mosaic of habitats (12.9 acres low marsh, 6 acres high marsh, 6.9 acres shrub, 3.2 acres maritime forest and 17 acres of dune grass). The 18.9 acres of wetland that are part of this constructed project feature (12.9 acres low marsh + 6 acres high marsh) is greater than the existing 16.5 acres of wetlands.

Figures demonstrating the relationship between interior drainage ponds and the Tidal Wetland (Mosaic of Habitat) and wetland improvement are being developed and will be included in EIS Section 4.3.2. The following table will be included in EIS Section 4.3.2 to assist in this clarification.

	Acres of Wetland Impact (excavation or fill in wetlands)	**Acres of Upland Impact**
Interior Drainage		
Area B (39.31 acres excavated)	38.73	0.68
Area C (54.79 acres excavated)	46.03	8.77
Area E (34.34 acres excavated)	32.49	1.85
Interior Drainage subtotal	117.25	11.3

Line of Protection (LOP)	10.89	40.20
Tidal Wetland (46 Mosaic of Habitat)	16.5	3.6 (upland shrub/scrub)
Total Impact	144.64	55. 1

The following qualitative discussion of overall project gain or loss in function as well as acreage will be provided in the Future With Project section of the Feasibility Report as well as Section 4.3.2 of the EIS:

"The SSSI project will impact 144.64 acres of existing *Phragmites* monoculture low quality wetland habitat. Of this acreage, the impact of 10.89 acres is related to the fill associated with the Line of Protection (LOP) project feature resulting in a permanent loss of the existing wetlands. There are 117.25 acres of impact is associated with the interior drainage project feature (within drainage areas B, C & E) being created for surface water detention as well as 16.5 acres of impact associated with the construction of the Tidal Wetland (Mosiac of Habitats) feature. The interior drainage and Tidal Wetland (Mosiac of Habitat) work will include the excavation, removal of existing *Phragmites*, re-grading and seeding/planting of native vegetation to create emergent wetlands (in the interior drainage area), and low marsh and high marsh (in the Tidal weltand [Moasiac of Habitats] area), result in a functional improvement over the existing conditions in both cases. In addition, excavation for the interior drainage features will impact an additional 11.3 acres of existing upland habitat. This excavation, re-grading and seeding/planting of native vegetation (and removal of the existing *Phragmites* monoculture) will provide emergent wetland habitat in these areas where wetland did not previously exist.

As part of the integrated approach for the Oakwood Beach area, the USACE considered increasing human and ecosystem community resilience as part of the overall solution to manage risk. To inhibit erosion, attenuate wave energy that can cause scour to the Project area, and to reduce sedimentation through the creek and tide gate into the freshwater wetland, the NED Plan has been designed to preserve the functional effectiveness of tidal exchange. This would facilitate wetland drainage and enable the tidal wetlands seaward of the LOP to help filter sediments so they are not brought into the freshwater wetlands.

As supported by coordination with USFWS, the functions of the existing wetlands (low quality *Phragmites* monoculture) do not support replacement of their function with anything greater than equal acres of project mitigation features. The creation of 11.34 acres of native seeded/planted emergent wetland where upland previously existed (via the interior drainage project feature), more than compensates for the loss of 10.98 acres of low quality *Phragmites* monoculture lost as a result of the fill for the LOP. Provided the wetland enhancements function as designed/intended, the

proposed action would result in no net loss of wetland acreage and in a net increase in wetland functional values. As such, USFWS concurred with the USACE and concluded, provided the FWCAR recommended measures are implemented, that the proposed action will not have significant adverse impacts on fish and wildlife resources in the project area."

k. There are several cost engineering and interior drainage ATR comments that remain open due to the lack of back check. District is advised to address these comments before finalization of the report.

DISTRICT RESPONSE 3K: Response- All ATR comments have been addressed and comments closed. ATR Certification (22 Oct 2015), including cost certification (13 Oct 2015) is included as part of the Final report package as part of the Quality Control package submission.

k . Datum: While the completion strategy for feasibility, approved by Tab Brown, is to use NGVD29, the collect datum, NAVD88 should be used in the Executive Summary. NAVD88 will be used in the PED phase.

DISTRICT RESPONSE 3L: Response – NAVD88 is utilized in the Executive Summary in the final report and will be fully utilized in PED.

2. The following edits are recommended for the Environmental Assessment:

a. Drainage Area E: Section 3.3.2 states that the wetland in Drainage Area E is a designated Class I wetland and resident habitat for State listed threatened or endangered animal species. District is asked to add a discussion to the EIS, Section 3.3.2 on anticipated impacts to this habitat from creation of ponds within Drainage Area, or measures to avoid and minimize these impacts.

DISTRICT RESPONSE 4A: Response – USACE has updated the EIS as requested.

The proposed actions in all drainage areas, including Drainage Area E, would result in the removal of invasive non-native vegetation, the seeding and planting of native wetland vegetation, and the creation of emergent wetland in the excavated wetlands. In Drainage Area E, of the proposed 32.47 acres of pond excavation is currently wetland. The NYSDEC Freshwater Wetland "Class 1" designation for this wetland is due to its important habitats and flood control features in an otherwise urban setting. As part of the project's Interior Drainage feature, the wetland will be made deeper to create enhanced flood storage capacity, invasive non-native species removed, and native species seeded and planted. This will result in beneficial impact to this Class 1 wetland function. The net result would be to improve the ecological value of those habitats. The USFWS agrees with this conclusion. USACE has consulted with NYSDEC Division of Fish, Wildlife & Marine Resources Natural Heritage Program related to state-protected animal species, and will develop measures to avoid and minimize impacts to state-protected species as a result of this Project. The Natural Heritage Program's December 2014 letter did not list any state

endangered or threatened animal species, although did list two species (Barn Owl and Needhmam's Skimmer) that are of conservation concern to the state. Their letter did list two species of plants (Green Milkweed and Globose Flatsedge) that are listed as Endangered or Threatened by New York State. This information will be added to the discussion in EIS section 3.3.2.

b. ESA Coordination: The FWSPAL, dated 27 March 2015, notes the need for Section 7 Consultation on Red Knot, specifically noting the need for a Corps ESA determination and assessment. The ESA determination and assessment is lacking. District is advised that this determination and assessment should be included in the Draft EIS, and Service findings, closing out Section 7 consultation, included in the Final EIS.

DISTRICT RESPONSE 4B: Response – USACE has updated the EIS as requested.

NYD has been in coordination with USFWS, a draft ESA determination and assessment was sent to USFWS for their review in July 2015. USFWS provided comments on this draft in August 2015. A letter transmitting NYD's final determination and assessment was sent to USFWS on 8 September 2015. The Service Findings, when received, will be included in the Final EIS.

c. 404(b)(1) Inconsistencies: The 404(b0(1) analysis section 4(b) wetlands describes the creation of 46 acres of wetland, but then goes on to state that the interior drainage would not affect wetland acreage. This appears to be a contradiction. District is advised to revise for consistency within the 404(b)(1) analysis and within the larger EIS and decision document.

DISTRICT RESPONSE 4C: Response – USACE has updated the EIS, and specifically the 404(b)(1) analysis, for consistency as requested.

The potential impacts to wetlands have been clarified in both the Final EIS and in the 404(b)(1) analysis. The 404(b)(1) is now consistent with the Final EIS.

d. Clean Air Act Compliance: Given the scale of the preferred alternative District is requested to include a discussion on how a RONA is appropriate. If the duration of construction, or seasonality of construction plays a role in the non-applicability, District is advised to make that clear.

DISTRICT RESPONSE 4D: Response – USACE has updated the EIS as requested.

Section 4.1.5 has been updated to clarify that the RONA determination is not based upon the scale of the preferred alternative; it is based upon which Federal Actions emissions are regulated under the CAA. The preferred alternative will be accomplished utilizing mostly land-based diesel equipment. That equipment is already accommodated in the affected states State Implementation Plan (SIP), therefore, the justification for the Record of Non-Applicability.

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS
26 FEDERAL PLAZA
NEW YORK, NY 10278

CENAN-PL

30 October 2015

MEMORANDUM FOR Commander, North Atlantic Division, (CENAD-PD-N)
ATTN: Mr. Joseph Forcina (CENAD-PD-)

SUBJECT: South Shore Staten Island Draft Feasibility Report & Draft Environmental Impact Statement (DEIS), Policy Review Response to CECW-PC Comments

1. Reference is made to the CECW-PC Memorandum, dated 28 September 2015, subject: South Shore of Staten Island Draft Feasibility Report & Draft Environmental Impact Statement (DEIS), Policy Review Comments.

2. This memorandum transmits the District's final responses to the HQUSACE policy review comments received on the draft report package submittal. These final responses have been pre-coordinated with appropriate HQ team members.

3. The District has scheduled the required IPR with NAD/HQ for 12 November 2015 to obtain higher authority final approval of these responses. That approval will allow for the ADM Milestone (CW263) to occur in December 2015. The Final Report is currently scheduled for submission (CW 160) in January 2016.

4. As a reminder, the District received formal Cost Certification on 13 October 2015 and officially received ATR Certification (CW 151) on 22 October 2015. IEPR is expected to be finalized by early November. There are no unresolved issues. Additionally, there are no significant public/agency comments.

5. As there are no major policy concerns, the District will begin preparation of the Final Feasibility Report and Environmental Impact Statement based on these responses, concurrent with the IPR and ADM meetings.

6. Please contact the Project Planner, Ms. Karen Ashton, P.E., with any questions at (917) 790-8607.

Encl

Frank Santomauro, P.E.
Chief, Planning Division
New York District

South Shore of Staten Island, New York

Fort Wadsworth to Oakwood Beach

Coastal Storm Risk Management Draft Feasibility Report

&

Environmental Impact Statement

CENAN responses to HQUSACE Policy Review

Plan Formulation:

1. Formulation - Plan Optimization. The concern is that the Alternatives analysis used incomplete engineering requirements in developing the costs to conduct the economic optimization that could impact the selection of the NED plan. As noted in the issue paper on the NED plan, "(T)he District conducted an optimization using a linear extrapolation of the increase in costs per increase in design level for different "Stillwater Design Estimates" that resulted in a 15.8' NED plan"... Then the appropriate engineering design requirements were added onto the NED plan resulting in a substantially larger plan at approx 20'. The linear cost extrapolation may have distorted the selection because the costs are not linear and the design requirements resulted in substantially larger engineered features.

Note that this issue was originally in the issue paper prior to the TSP. At that time, the VT did not know there was such a significant difference in elevation when the engineering requirements were added onto the selected plan that was formulated using stillwater elevations.

RESPONSE PL-F #1: The Issue Paper does indeed state that the District would conduct a linear extrapolation of the increase in costs per increase in design level for different "Stillwater design estimates" for optimization purposes. Please note that design costs were already fully developed for stillwater design elevations 13.3 ft NGVD, 14.3 ft NGVD, and 15.6 ft NGVD. In the Issue Tracker, the District had proposed to extrapolate the design cost relative to the 16.6 ft NGVD stillwater design elevation. However, during optimization to identify the NED Plan, the District decided to develop feasibility level costs for each stillwater design elevation rather than conduct a linear extrapolation of ANY costs, including the 16.6 ft NGVD cost.

As noted on Page 39 of the E&D Appendix (June 2015) feasibility level design, quantities, costs, and economic benefits were calculated for the four plans to determine the optimal (NED) plan. The sections below provides an overview for the review of the design criteria used to refine the plans including design considerations to clarify how the crest elevation for the NED plan was calculated for the stillwater elevations.

As described above, optimization alternatives were designed based on stillwater elevations of 13.3, 14.3, 15.6, and 16.6 ft NGVD 1929. These stillwater elevations are roughly equivalent to a future condition of 100, 150, 300, and 500 year storm event based on the frequency of occurrence relationships for the project area and a historic sea level rise allowance of 0.7 ft.

In addition, the alternative plans were designed to withstand wave forces, wave overtopping, local scour, and coastal erosion. The following Table 4-6 from the E&D Appendix (June 2015) shows the Feasibility level design costs for all stillwater level design elevations that equate to the crest elevation design height that encompasses the additional height of the seawall required for wave forces, wave overtopping, local scour, and coastal erosion. For the Buried Seawall/Armored Levee reach, the structure crest elevations and costs correspond to the aforementioned stillwater design levels of 16.0 feet, 18.0 feet, 20.5 feet and 22 feet NGVD 1929 respectively. The structure crest elevations are greater than the stillwater design levels to meet the desired wave overtopping design limits.

Table 4-6: Line of Protection Cost Estimate

Item Description	13.3' SWL	14.3' SWL	15.6' SWL	16.6' SWL
Mob/Demob.	$6,219,000	$7,033,000	$8,526,000	$9,705,000
Clearing/Grubbing &Stripping of Topsoil	$1,268,000	$1,268,000	$1,268,000	$1,268,000
Demolition of Timber Boardwalk & Asphalt Walkway	$4,480,000	$4,480,000	$4,480,000	$4,480,000
Tidal Wetlands Mitigation	$5,598,000	$5,598,000	$5,598,000	$5,598,000
Cultural Mitigation	$3,000,000	$3,000,000	$3,000,000	$3,000,000
A-1 Levee	$3,042,000	$3,294,000	$3,541,000	$3,612,000
A-2 Levee	$589,000	$655,000	$700,000	$750,000
A-3 Vertical Floodwall	$10,720,000	$11,955,000	$13,281,000	$15,133,000
A-4 Buried Seawall	$126,788,000	$145,577,000	$181,290,000	$208,834,000
Subtotal	$161,704,000	$182,860,000	$221,684,000	$252,382,000
Contingency (30%)	$42,043,000	$54,858,000	$66,505,000	$75,714,000
Subtotal	$210,215,000	$237,718,000	$288,187,000	$328,096,000
Engineering and Design, and S&A (20%)	$42,043,000	$47,544,000	$57,637,000	$65,619,000
Total Project Cost	$252,258,000	$285,262,000	$345,824,000	$393,715,000
IDC (3.375%, 48 months)	$17,415,000	$19,694,000	$23,875,000	$27,181,000
Total Investment Cost	**$269,673,000**	**$304,956,000**	**$369,699,000**	**$420,895,000**
Annualized Investment Cost (3.375%, 50 years)	$11,239,000	$12,710,000	$15,408,000	$17,542,000
O&M Cost	$178,000	$178,000	$178,000	$178,000
Total Annual Cost	**$11,417,000**	**$12,888,000**	**$15,586,000**	**$17,720,000**

However, the District concurs that Table 4-6 doesn't clearly communicate that the costs developed for the alternatives, include the costs that equate to the crest elevation design height that encompasses the additional height of the seawall required for wave forces, wave overtopping, local scour, and coastal erosion. Therefore, the main report will be revised to more clearly note that total costs are inclusive of these calculated design costs for which annual costs are derived (note: annual benefits are determined from the stillwater design elevation not the crest height elevation). An example Table to be submitted before the cost breakdown table shown above and explanation such as this response to comment may include:

Stillwater Design Elevation	**13.3 ft NGVD 1929**	**14.3 ft NGVD 1929**	**15.6 ft NGVD 1929**	**16.6 ft NGVD 1929**
Equivalent Storm Event	**100 year**	**150 year**	**300 year**	**500 year**
Seawall Height Req'd as a result of Overtopping Analysis	**2.7 feet**	**3.7 feet**	**4.9 feet**	**5.4 feet**
Crest Elevation of Seawall	**16 ft NGVD 1929**	**18 ft NGVD 1929**	**20.5 ft NGVD 1929**	**22 ft NGVD 1929**
Total Investment Cost	**$269,673,000**	**$304,956,000**	**$369,699,000**	**$420,895,000**

It should be noted that design alternatives for wave overtopping increasing height to the armored seawall. The armored seawall is already armored with 3-ton stone. Therefore, unlike an earthen levee that may fail during low frequency storm events so additional armoring on the landward side of the levee to account for wave overtopping levee failure, does not apply for an armored seawall such as the recommended plan. The subject seawall is already armored with 3 ton stone. The seawall will not fail like a levee; it can only be overtopped by a significant storm event.

Environmental/NEPA:

1.The DEIS documents 140 acres of temporary impacts to Phragmites dominated (low quality)habitat to excavate and convert these coastal ponds into better quality habitat and interior drainage features for the recommended plan. For obvious reasons these are significant and the document should better disclose and document the time lag or temporary nature of these impacts vs. the permanent loss for the wall element to approx 11 acres.. It is important to ensure that everyone understands why the agency has decided that this is an acceptable impact which does not warrants habitat mitigation. The team also needs to also ensure that these interior drainage features are not converting jurisdictional waters of the US into non jurisdictional storm water ponds. The 404(b) 1 should also adequately cover all of these impacts both permanent and temporary.

RESPONSE:
The EIS Section 4.3.2, as well as the 404(b) 1 analysis, has been updated to clarify wetland impacts from the construction of the LOP, the interior drainage and the Tidal Wetland (Mosaic of Habitat) features. This includes the loss of 10.89 acres from construction of the LOP and the improvement of 117.25 acres of wetland for the combined interior drainage features and of the improvement of 16.5 acres associated with the Tidal Wetland Feature (Mosaic of Habitat) from temporary construction impacts related to the (removal of invasive species, seeding/planting of native species post excavation). The conversion of 11.3 acres of upland to wetland associated with the interior drainage project features is also noted.

Existing conditions for the 46-acre area of proposed tidal wetland (mosaic of habitat) consists of estuarine emergent wetlands with a tidal channel (16.5 ac), sandy beach (15.6 ac), littoral zone (7.7 ac), upland shrub/scrub areas (3.6 ac), and upland developed area (2.6 ac). The predominant species within the impacted emergent wetland community is common reed, and in many areas of the wetlands this species grows in monotypic stands.

The projects Tidal Wetland feature (Mosaic of Habitat) will include construction of 46 acres of a mosaic of habitats (12.9 acres low marsh, 6 acres high marsh, 6.9 acres shrub, 3.2 acres maritime forest and 17 acres of dune grass). The 18.9 acres of wetland that are part of this constructed project feature (12.9 acres low marsh + 6 acres high marsh) is greater than the existing 16.5 acres of wetlands.

Figures demonstrating the relationship between interior drainage ponds and the Tidal Wetland (Mosaic of Habitat) and wetland improvement are being developed and will be included in EIS Section 4.3.2. The following table will be included in EIS Section 4.3.2 to assist in this clarification.

	Acres of Wetland Impact (excavation or fill in wetlands)	**Acres of Upland Impact**
Interior Drainage		
Area B (39.31 acres excavated)	38.73	0.68
Area C (54.79 acres excavated)	46.03	8.77
Area E (34.34 acres excavated)	32.49	1.85
Interior Drainage subtotal	117.25	11.3
Line of Protection (LOP)	10.89	40.20
Tidal Wetland (46 Mosaic of Habitat)	16.5	3.6 (upland shrub/scrub)
Total Impact	144.64	55.1

The following qualitative discussion of overall project gain or loss in function as well as acreage will be provided in Section 4.3.2 of the EIS:

"The SSSI project will impact 144.64 acres of existing *Phragmites* monoculture low quality wetland habitat. Of this acreage, the impact of 10.89 acres is related to the fill associated with the Line of Protection (LOP) project feature resulting in a permanent loss of the existing wetlands. There are 117.25 acres of impact is associated with the interior drainage project feature (within drainage areas B, C & E) being created for surface water detention as well as 16.5 acres of impact associated with the construction of the Tidal Wetland (Mosaic of Habitat) feature. The interior drainage and Tidal Wetland (Mosaic of Habitat) work will include the excavation, removal of existing *Phragmites*, re-grading and seeding/planting of native vegetation to create emergent wetlands (in the interior drainage area), and low marsh and high marsh (in the Tidal wetland [Mosaic of Habitat] area), result in a functional improvement over the existing conditions. In addition, excavation for the interior drainage features will impact an additional 11.3 acres of existing upland habitat. This excavation, re-grading and seeding/planting of native vegetation (and removal of the existing *Phragmites* monoculture) will provide emergent wetland habitat in these areas where wetland did not previously exist.

As part of the integrated approach for the Oakwood Beach area, the USACE is considering human and ecosystem community resilience as part of the overall solution to manage risk. To minimize erosion, attenuate wave energy that can cause scour to the Project area, and to reduce sedimentation through the creek and tide gate into the freshwater wetland, the NED Plan has been designed to preserve the functional effectiveness of tidal exchange. This would facilitate wetland drainage and enable the tidal wetlands seaward of the LOP to help filter sediments so they are not brought into the freshwater wetlands. This Tidal Wetland

project feature will construct 46 acres of a mosaic of habitats (12.9 acres low marsh, 6 acres high marsh, 6.9 acres shrub, 3.2 acres maritime forest and 17 acres of dune grass).

As supported by coordination with USFWS, the functions of the existing wetlands (low quality *Phragmites* monoculture) do not support replacement of their function with anything greater than equal acres of project mitigation features. The creation of 11.34 acres of native seeded/planted emergent wetland where upland previously existed (via the interior drainage project feature), more than compensates for the loss of 10.98 acres of low quality *Phragmites* monoculture lost as a result of the fill for the LOP. Provided the wetland enhancements function as designed/intended, the proposed action would result in no net loss of wetland acreage and in a net increase in wetland functional values. As such, USFWS concurred with the USACE and concluded, provided the FWCAR recommended measures are implemented, that the proposed action will not have significant adverse impacts on fish and wildlife resources in the project area."

2. Environmental/NEPA: The project includes both habitat mitigation as a feature as well as a feature which is over 40 acres of coastal wetlands in front of or in addition to the wall/storm barrier. The team should explain more clearly if these are to be sacrificed and not rebuilt after a storm event might damage them or if these are to be a permanent feature on the project.

RESPONSE:
Habitat mitigation is not associated with the proposed project (see response to comment 1 above). The proposed project's Tidal Wetland is a project feature and will include construction of 46 acres of a mosaic of habitats (12.9 acres low marsh, 6 acres high marsh, 6.9 acres shrub, 3.2 acres maritime forest and 17 acres of dune grass). The FS and EIS will be updated to note that the tidal wetland project feature would be subject to emergency management activities, such as repair after a storm event, under PL 84-99, Flood Control and Coastal Emergencies (FCCE).

3. General characterization of environmental consequences. In general, the EIS does not describe the significance of the anticipated adverse impacts. The basis of this concern is 40 CFR 1502.16. The significance of this concern is medium because it affects the completeness of the EIS. Recommend the District revise the EIS to identify the significance of the anticipated adverse and beneficial impacts to each significant resource.

RESPONSE:
EIS Section 4.17 provides a summary of construction impacts of the NED Plan. Section 4.17 is based on more detailed information contained in Sections 4.1 through 4.16 of the EIS and includes the level of significance for each resource.

Economics:

1. Alternative Screening: Table 13 of the Main Report shows the initial tier screening of alternatives. Alternative FM1 is screened from further consideration using the rationale, "Lower net benefits compared to the Alternative covering full project reach (FO1): Screened out." This seems to conflict with later in the same Table because alternative FO1 has a significantly lower Preliminary BCR than Alternative FM1; 1.8 BCR for FO1 vs. 2.4 BCR for FM1. Please provide further explanation of this discrepancy and the validity for the screening decision.

   The comparisons between the FM1 (Fort Wadsworth to Miller Field Alternative 1) and the FO1 (Fort Wadsworth to Oakwood Beach Alternative 1) were performed to determine if the project were incrementally justified to include both the South Beach and Midland Beach communities that are within the FM1 area and communities such as Oakwood Beach and New Dorp that are added by the FO1 Alternative. The analysis revealed that there is very high risk for storm damages in the Oakwood Beach and New Dorp Areas and that the larger project area was incrementally cost justified. Further, the residual risk for FM1 is far greater than FO1 and the net benefits for FO1 exceeded those of FM1.

2. Base Year: Section 4.4 on Page 4-2 of the Main Report identifies the Base Year as 2019. However, the Interest During Construction (IDC) is based on a 17 month design and a 3.5 year construction schedule, which does not seem to support the 2019 designation. Further, Section 10.2 Implementation Schedule depicts construction going into at least 2021. The base year is important aspect of the Without Project (see ER 1105-2-100 Section 2-4.b.(1)). This conflict should be addressed and, if necessary, revise the report accordingly.

   The Report will be revised to reflect the project base year that conforms to the updated construction schedule.

3. Cost Share: The cost share in the Executive Summary (ref. Table ES-1) and the main report (ref. Section 10.3) are based on the Total Project Cost (escalated to the midpoint of construction). While the Total Project Cost is used for financial purposes in the Project Partnership Agreement, the feasibility report and Chief's Report should be based on the Project First Cost (constant dollar at Current Prices); please reference the DCW Memorandum Subject: Corps of Engineers Civil Works Cost Definitions and Applicability dated 25 August 2015. The cost share presented in the report should be revised based on the Project First Cost instead of the Total Project Cost.

   Concur, Report will be revised.

4. Depth-Damage Relationships: The depth-damage relationships used in the economic analysis were based on numerous sources, including those developed for the Passaic River Basin for non-residential structures. However, no discussion of the applicability to the

South Shore Staten Island study area is included. ER 1105-2-100 Paragraph E-19.q.(2) states that, "For feasibility studies, depth-damage relationships should be developed based on site-specific data or from comparable floodplain data. In areas where depth-damage relationships are based on comparable floodplain data, at a minimum, qualitative rationale will be provided to demonstrate the reasonableness of use of the depth damage relationship in the study area." Please revise the economic appendix to describe the rationale of why the depth-damage relationships are appropriate for this study (e.g. type of flooding (saltwater/freshwater) and duration of flooding).

- **A qualitative discussion describing that the Passaic River Basin non-residential damage functions were considered appropriate for the SSSI and will be added to the report. The discussion will identify that the relatively limited non-residential development in the study area did not warrant the development of project specific damage functions and that the Passaic River Basin functions were considered applicable because the study areas are nearby (25 to 30 miles apart). Additionally, the basins have similar building stock and both locations are subject to a mix of salt water and fresh water flooding.**

5. Economic Damage Verification: Section 5.5 of the economic (benefit) appendix shows a very good description of model calibration based on the December 1992 storm and equivalent event in the HEC-FDA model. The conclusion is based on average annual damages per structure of $7,869 and $8,140, adjusted to 1992 dollars. While this is reasonable per structure, the total number of structures damaged in 1992 was about 229 and the HEC-FDA model shows approximately 3,425. Understanding that significant development has probably happened in the 20 years between the 1992 storm and the inventory year, this still appears to be a big difference. Please provide a little more detail on why this does validate the model results.

- **The relevant section in the Benefits Appendix states that 229 property owners were known to have been paid for claims made under the NFIP for the 1992 storm, not that 229 structures were known to have been damaged. As mentioned in the third paragraph in that section, not all affected property owners maintain flood insurance and the level of coverage will vary greatly among those that do. In the absence of more detailed data for NFIP coverage in the study area, a comparison of the damages and claims per structure is the only appropriate means to attempt to verify the modeled damages. The text of the Appendix will be revised to clarify that the calibration was based on average damage for the structures for which insurance claims data was available. Additional calibration comparing the extent of flooding during Sandy to the location of structures estimated to suffer damage using the HEC-FDA model will be performed and will be incorporated into the Appendix if the results can be displayed in an appropriate scale and format.**

6. OMRR&R: Operation, Maintenance, Repair, Rehabilitation, and Replacement are an important aspect of a project. It is considered in economics and in the responsibility of the non-federal sponsor. The executive summary and main report identify annual O&M

as $550,000 in the text; however Table 24 on Page 6-46 also has a separate line item for 'Major Rehab'. Why are these costs presented separately and not added together as OMRR&R? Also, why does major rehab decrease with the various alternatives?

> **The Major Rehab item reflects the potential damage that the project would suffer in large or extreme storm events. The major rehab decreases for the larger plans because they are designed to withstand larger storm (larger armor stone and higher crest elevations) and are subject to less damage in future events.**

7. Price Level and Discount Rate: The economic analysis correctly uses Fiscal Year 15 prices and discount rate. Since future submittals will cross FYs, please note that those submittals will need to be based on the FY price level and discount rate at the time of the submittal. This is a proactive comment for awareness that does not need to be addressed at this time.

> **Acknowledged. The Final Report will be based on the FY16 price level and discount rate at the time of the submittal.**

Real Estate/RE Counsel

1. Requirements for use of Gateway National Recreation Area lands under the jurisdiction of NPS.

a. Although the Real Estate Plan indicates that the National Park Service will issue a special use permit to USACE to construct the Project on Gateway National Recreation Area lands under the NPS' jurisdiction, section 4.8 of the EIS states that the legal authority and instrument that will be used for actions on NPS lands have yet to be determined. Further, neither the Real Estate Plan nor the main report nor the EIS discuss whether the non-Federal sponsor will be required to obtain a permit or real property interest from NPS for operation and maintenance activities related to the Project. The basis of the concern is ER 405-1-12, paragraph 12-16c(6), which requires Real Estate Plans to document the view of the local representative of the managing Federal agency as to use for the project and the acquisition plan for acquiring the required real property interests. The significance of the concern is medium/high because it has the potential to affect plan formulation but insufficient information is provided to make a determination. Recommend the District describe the status of coordination with NPS and, if possible, the legal authority for NPS to permit use of its lands for the Project, the appropriate instrument for permitting use by both the Corps and the non-Federal sponsor, and any major terms and conditions of use in the response to this comment. Paragraph 7 of the Real Estate Plan, and appropriate sections of the EIS (e.g., section 4.8) and main report (e.g., section 7.3), must be updated to include this information prior to finalizing the feasibility report and EIS.

RESPONSE: Paragraph 7a, b of the REP discusses a Special Use Permit as being required on Federally-owned lands for the construction, operation, and maintenance for the life of the project. Additionally, the Real Estate Plan indicates the use of a Memorandum of Understanding between the NPS and the City of New York which both parties have agreed and support the project.

b. The maps accompanying the Real Estate Plan, as well as section 4.9 of the EIS, suggest that recreational facilities within Miller Field will be impacted by the Project. However, neither the Real Estate Plan nor the Main Report nor the EIS specify whether facilities owned by the National Park Service will require relocation and/or replacement. The basis of the concern is that the interdepartmental waiver doctrine generally prohibits a Federal agency from using its funds to repair damage to another Federal agency's property without specific statutory authority. While 10 U.S.C. 2691 provides some limited authority to restore NPS lands temporarily impacted by the Project if required by the terms of a NPS permit, relocation and/or replacement of NPS facilities that are adversely impacted by Project are outside the scope of the statute. The necessary statutory authority could be provided through congressional authorization of the Project based on a Chief's Report that specifically recommends relocation or replacement of NPS facilities at Project expense; however, it is unclear whether P.L. 113-2 provides the necessary medium/high because it has the potential to affect plan formulation but insufficient information is provided to make a determination. Recommend the District identify in the response to this comment whether the recommended plan includes relocation, restoration, or replacement of any facilities owned by NPS at Corps project expense so that Office of Counsel may determine

whether the authority of PL 113-2 is sufficient to allow relocation or replacement of NPS facilities at Project expense.

<u>RESPONSE</u>: The real estate plan (REP) will be revised to specify that there are no requirements to relocate, replace, modify, or restore any NPS facility at Miller Field. See paragraph 7a of the REP.

c. The non-Federal sponsor capability assessment accompanying the Real Estate Plan states that there are no lands/interests in land required for the project that the non-Federal sponsor cannot condemn. The concern is that this statement is incorrect. The basis of the concern is that the non-Federal sponsor cannot condemn land under the jurisdiction of the NPS. The significance of this concern is low because it affects the understanding or accuracy of the project as described in the report, but will not affect the recommendation or justification of the project. Recommend the District revise the non-Federal sponsor capability assessment accordingly.

<u>RESPONSE</u>: The Non-Federal Sponsor Capability Assessment Checklist will be corrected accordingly.

2. Requirements for use of municipal parklands: The May 26, 2015 City of New York Memorandum in Appendix G indicates that state legislation is required to alienate municipal parkland required for the Project. The concern is that the requirement for state legislation to authorize use of municipal lands for the Project is not documented in the Main Report or Real Estate Plan. The bases of the concern are NEPA, which requires identification of conflicts between the proposed action and the objectives of Federal, state, and local land use plans, and ER 405-1-12, paragraph 12-16c(3) and (13), which require consideration of unique aspects of state or local law and how they impact the non-Federal sponsor's capability to provide the required real estate interests for the Project. The significance of this concern is medium/high because it has the potential to affect plan formulation but insufficient information is provided to make a determination. Recommend the District coordinate with the non-Federal sponsor and provide a determination in the response to this comment as to whether state legislation will be required to utilize any of the lands required for the Project. Paragraph 3(c) of the Real Estate Plan, the non-Federal sponsor capability assessment, and appropriate sections of the EIS (e.g., Section 4.8) and main report (e.g., section 7.3, 10.4, 10.5) must be updated to include the necessary information prior to finalizing the feasibility report and EIS.

<u>RESPONSE</u>: District is coordinating with the non-Federal sponsor. State legislation will be drafted in order to utilize the subject lands. Paragraph 3(c) of the Real Estate Plan, the non-Federal sponsor capability assessment, and appropriate sections of the EIS (e.g., Section 4.8) and main report (e.g., section 7.3, 10.4, 10.5) will be updated accordingly, including the necessary information prior to finalizing the feasibility report and EIS.

3. Road raisings required for the Project.

a. Driveway modifications: Section 4.13 of the EIS indicates that driveways will have to be replaced due to road raisings. The report specifies a grade of between 10 to 15 percent. The

concern is that the report does not identify whether the proposed grades are compatible with local building codes. The significance of the concern is medium/high because it has the potential to affect plan formulation and justification but there is insufficient information to make a determination. If driveways cannot be modified by owners as proposed, the properties may have to be bought out entirely and the occupants relocated. This could significantly impact project costs. Recommend the District investigate whether the proposed driveway grades are compliant with local building codes and determine whether risks associated with potential noncompliance have been accounted for in the real estate cost estimates for the Project.

RESPONSE: Driveways design will be determined in PED as will the compatibility to local building codes. With the proposed acquisition of most of the properties surrounding the proposed road raisings, the impact of these to structures and associated driveways is limited if not negligible.

Specifically, for the proposed road raising at *Mill Road and Kissam Avenue* and at *Seaview Avenue and Father Capodanno,* no private properties are expected to be impacted by the raising of these roads because of the NYS property acquisitions (See updated RE maps with NYS buyout properties shown).

For the proposed road raising on Seaview Avenue there may be grading down elevations to the homes located on the west side of the road between Quincy Avenue and Oceanside Avenue. This is why additional survey would be needed for the design in the design phase. The eastside should have no issues with grading. The roadway transition onto Quincy and Oceanside Avenues may impact only a few structures on the north side of the road. The impact of which to cost would be negligible.

b. Cost apportionment: The Main Report and Real Estate Plan appear to allocate the entire cost of the road raisings to the 02 Relocations account. The concern is that a portion of the cost of the road raising should be cost-shared as construction because the roads, once raised, will function as project features and provide positive flood control. The significance of the concern is medium because it affects the completeness of the report but appears unlikely to affect plan formulation or justification. Recommend the District revise the project cost estimate to apportion the costs of the road raisings appropriately between the levees and floodwalls and relocations feature codes.

RESPONSE: The cost of the road raisings is incorporated in the Relocation Cost Code Account 02. The road raising at Kissam Ave is intended to ensure continued access to the line of protection, sewer lines and other infrastructure. The intent of the road raisings at Mill Road and Sea View Avenue are to ensure that overland runoff is directed toward a specific interior area and that ponded interior runoff does not flow into lower, more vulnerable areas. While a portion of the fill cost at Mill Road and Sea View Avenue could be allocated to a flood control purpose, the vast majority of the road raising costs are simply relocations. Because the allocation of road raising costs to

the 02 Account does not impact the results of the cost apportionment and that final road raising designs will vary based on updated surveys, the Feasibility Study has not sought to disaggregate this minor cost item.

c. Operation and Maintenance: It is unclear whether O&M costs include the costs associated with maintaining the raised roads as levees. The concern is that that these costs are project costs that should be borne by the non-Federal sponsor. The significance of the concern is medium because it affects the completeness of the report but appears unlikely to affect plan formulation or justification. Recommend the District and non-Federal sponsor coordinate with the NYC DOT or other agency responsible for the roads in question to develop mutually acceptable O&M requirements and to determine O&M performance responsibilities and costs.

RESPONSE: Paragraph 381 states that USACE will coordinate with NYSDEC and NYC during the PED phase in the development of the O&M manual for the project including the operation and maintenance of the three (3) proposed roadways that will be raised. O&M is a 100% non-Federal responsibility as is also stated in the report. NYCDOT has specific operation and maintenance requirements that will be incorporated into the project O&M manual, accordingly.

For so long as the project remains functioning, the non-federal sponsor will operate, maintain, repair, replace, and rehabilitate the roads which is a functional portion of the project, at no cost to the Government, in a manner compatible with the project's authorized purposes and in accordance with applicable Federal and State laws and any specific directions prescribed by the Government in the Operations, Maintenance, Replacement, Repair and Rehabilitation (OMRR&R) manual and any subsequent amendments thereto.

4. Facility and utility relocations: A number of facility and utility relocations appear to be required for the project that are not documented in the Real Estate Plan. The basis of the concern is ER 405-1-12, paragraph 12-16c(16). The significance of the concern is medium because it affects the completeness of the report and apportionment of costs between construction and LERRD but should not affect the overall project cost or justification (assuming costs are already accounted for in the overall project cost estimate). Recommend the District describe measures falling into the categories below in paragraph 17 of the Real Estate Plan and include the associated costs in the 02 account.

a. Relocation of existing drainage infrastructure: As described in paragraphs 281-283 of the Main Report, the Project appears to require modifications to existing sewer interceptors and access thereto. Existing stormwater/sanitary collection systems consisting of pipes are utilities, and alterations of such systems are part of LERRDs. See ER 1105-2-100, paragraph E-21c(11).

RESPONSE: ER 405-1-12 chapter, 12-8c discusses five criteria that must be satisfied before the replacement, alteration or other modification to a facility can properly be categorized as a relocation. Criteria 5 states: "The fair market

value of the interest that must be acquired due to project impact is too difficult to obtain; or payment of fair market value instead of providing a substitute facility would result in manifest injustice to the owner or to the public." Since a fair market value could reasonably be determined for the interests obtained in the acquisition of lands and existing drainage infrastructures therein, the modification of existing drainage infrastructure is not considered as a 01-account relocation expense. The construction cost to modify existing drainage infrastructures is captured in the project's 02-account.

Further, a utility survey will be conducted in PED. Costs associated with utility relocation are included in the cost estimate under cost code acct 02 and include contingencies associated with unknown or undocumented utility relocations. The costs were certified by the cost MDX on 13 October 2015. Additional facilities that may require relocation are incidental to construction and may only be identified once a comprehensive professional land survey has been completed during PED. Costs associated with the replacement of these facilities has also been accounted for in the cost estimate and associated contingencies and certified by the cost MDX on 13 October 2015.

b. Utility relocations associated with road raisings: It appears likely that there are utility relocations associated with the road raisings.

RESPONSE: The extent of any potential utility relocation that may be required due to road raisings will be known upon completion of surveys conducted during PED. If utilities are identified for relocation and are to be accounted for as part of the 01-Lands & Damages account, the REP will be updated accordingly. The REP will be revised to provide more clarity on the matter. Project costs include contingencies to account for these utility relocations.

c. Relocation of recreation facilities: The maps accompanying the Real Estate Plan, as well as section 4.9 of the EIS, suggest that existing recreation facilities in addition to the boardwalk will be impacted by the project. However, only the boardwalk is listed as facility relocation.

RESPONSE: Recreation facilities impacted by the project are incidental to project construction and will be replaced in-kind. These costs to remove and replace recreation facilities are captured as project construction costs.

d. Relocation of existing public access: The Project appears to require the relocation of existing perpendicular public access to the shoreline.

RESPONSE: The project requires modification to the existing boardwalk, which has been identified as a relocation expense as a "functional equivalent" in the 01-account (see Paragraph 17.b. of the REP). Costs to relocate/modify public

access points along the boardwalk are part of the overall costs to "relocate" the boardwalk.

5. Identification of the interest and estate required for ponding areas: Paragraph 326 of the Main Report and paragraph 10 of the Real Estate Plan identify flowage easements and restrictive easements as the required estates for the natural storage areas and excavated ponds included in the Project. The first concern is that the standard flowage easement proposed for the excavated ponds does not include the affirmative rights necessary to permit excavation and alteration of the land. The second concern is that the restrictive easement proposed for natural storage areas to be preserved as open space may not comply with relevant state statutes authorizing conservation and open space easements or restrictive covenants. The significance of these concerns is medium because they affect the completeness of the report but appear unlikely to impact plan formulation or justification. Recommend the District reevaluate the interests and estates required for the excavated ponds and natural storage areas and identify more appropriate standard or non-standard estates. A physical takings analysis or induced flooding analysis is not required to justify the acquisition of real property interests in areas to be excavated or preserved for natural storage if the interior drainage analysis identified the features as minimum facilities or as incrementally justified improvements to reduce residual risk.

RESPONSE:

a) **Flowage Easements- The District recently drafted a proposed new standard estate for ponding areas and forwarded to HQUSACE for review and approval. The proposed "Ponding Easement" provides language for the natural overflow, flooding, or submerging of land, as well as for excavation when required, for ponding areas. If approved, the "Ponding Easement" will be used in lieu of a flowage easement for the excavated ponds. The real estate plan will be updated to discuss the request for the new standard estate. It will also be updated if the Ponding Easement is approved by HQUSACE and replaces the Flowage easement as a required real estate interest.**

b) **Restrictive Easements- The District has not identified any state statute that would prohibit the use of a restrictive easement. However, the District is coordinating with the non-Federal Sponsor to confirm.**

6. Real estate costs included in total project costs and eligible for credit.

a. Application of PL 113-2 rule: Because USACE plans to construct this project under the authority of, and using funds provided by, PL 113-2, the non-Federal sponsor is eligible for credit for costs it incurs after January 29, 2013 to acquire privately owned lands for the project. All lands held by the non-Federal sponsor prior to that date are not eligible for credit. The concern is the Real Estate Plan and baseline cost estimate for real estate do not reflect application of this rule. The significance of this concern is medium because it affects the completeness of the report but appears unlikely to affect plan formulation or justification. Recommend the District coordinate with the non-Federal sponsor to determine what real estate interests required for the Project should be included in total project costs and credited toward the non-Federal sponsor's share.

<u>RESPONSE</u>: All costs to acquire the real estate interests required for the project have been accounted for in the total project costs. The District is currently working with the non-federal sponsor to identify which properties have already been acquired to determine the crediting of real estate eligibility, accordingly.

b. Real estate costs funded using other Federal agency funds: It appears that the City of New York and the non-Federal sponsor have been using HUD Community Development Block Grants and USDA Emergency Watershed Protection Program grants to purchase real estate interests required for the Corps Project. The concern is that the value of these interests should only be included as a cost to the Corps project if the Federal agencies providing the funds determine in writing that the funds are authorized to be used to carry out the Corps project. The significance of this concern is medium because it affects the completeness of the report but appears unlikely to affect plan formulation or justification. Recommend the District coordinate with the non-Federal sponsor and the Federal agencies involved to complete the required determinations prior to finalizing the feasibility report and EIS.

<u>RESPONSE</u>: The State of New York is currently executing the NY Rising Buyout and Acquisition Program ("NYS buyout properties") for property owners whose homes were substantially damaged by Hurricane Sandy or by other designated storms (See updated RE maps with NYS buyout properties shown). These properties are being acquired with the aid of Federal funding. The non-Federal Sponsor will not be credited for any real estate acquisition expenses associated with the acquisition of these lands (See Paragraph 4 of the REP). There are no other lands required for the project that are owned by a public entity and are known to have been acquired with Federal funds.

7. Compatibility of Project with requirements of state and federal grant programs being used for required real estate acquisitions: As stated in the preceding comment, it appears that the City of New York and the non-Federal sponsor have been using HUD Community Development Block Grants and USDA Emergency Watershed Protection Program grants to purchase real estate interests required for the Corps Project. The concern is that these grant programs may have requirements that are incompatible with the Corps Project. For example, most grant programs authorizing buyouts of flood damaged or flood prone properties require buyouts to be on a voluntary basis. For acquisitions using federal financial assistance to be voluntary, they must not be part of an intended, planned, or designed project area where all or substantially all of the property within the area is to be acquired within specific time limits. 49 CFR 24.101(b)(1)(ii). Relocation assistance is generally not authorized as part of these grant programs. However, properties required for the Corps Project are part of an intended, planned, or designated project area where all or substantially all of the property within the area is to be acquired within specific time limits, and acquisitions specifically for the Corps Project will be under the threat of eminent domain. The Corps must verify that the non-Federal sponsor has provided relocation assistance to displaced persons in accordance with section 207 of PL 91-646 prior to carrying out the Corps project on those lands. With acquisitions under the various grant programs overlapping with the planning and implementation of the Corps Project, it is unclear how the requirements of the grant programs can be met at the same time as the requirements of the Corps Project. The significance of this concern is high because it may affect the Corps' and the non-Federal sponsor's ability to

carry out the project in accordance with legal requirements. Recommend the District coordinate with the non-Federal sponsor to determine whether acquisitions of lands required for the Corps project can be carried out using funds provided under the various grant programs without violating either the terms and conditions of those programs or Corps requirements under PL 91-646 and without resulting in disparate treatment of similarly situated landowners.

RESPONSE: Any property acquired by the non-Federal Sponsor or its local partner utilizing federal funds/grants will not be eligible for reimbursable expenses associated with the acquisition of those parcels. See response to comment 6b. Additionally, the non-Federal Sponsor is aware of the requirements to provide full PL 91-646 relocation benefits to displace persons when applicable. However, currently the project does not require the acquisition of properties that requires relocation benefits.

8. Borrow requirements: Neither the Main Report nor the Real Estate Plan appear to document the borrow requirements for the recommended road raisings or levees. The basis concern is that a source of borrow material must be identified in order to ensure the statement of the Project's environmental impacts is sufficient and in order to ensure that any real estate requirements associated with the provision of borrow material are documented in the Real Estate Plan in accordance with ER 405-1-12, paragraph 12-16c(2). The significance of this concern is medium because it affects the completeness of the report but is unlikely to affect the recommendation or justification of the project. Recommend the District identify the borrow requirements for the road raisings and levees in the response to this comment and update the relevant sections of the Main Report and Real Estate Plan with the information prior to finalizing the feasibility report and EIS.

RESPONSE: There are no borrow requirements for the project. Any earthen material required for the construction of the proposed road raises or line of protection will be obtain by the selected contractor from existing, approved commercial sources.

9. Formulation of and justification for tidal wetland restoration measures; required real estate interest: Paragraph 279 of the Main Report and section 4.3.2 of the EIS recommend the restoration of approximately 46 acres of tidal wetlands in the Oakwood Beach area. However, neither the main report nor the EIS describe the formulation or justification of this feature of the proposed Project. Further, the Real Estate Plan does not describe the real estate requirements necessary to support the tidal wetland restoration. The basis of this concern are the basic plan formulation policies of ER 1105-2-100 and ER 405-1-12 paragraph 12-16c(2). The significance of this concern is medium/high because it has the potential to affect plan formulation and justification but insufficient information is provided to make a determination. Recommend the District describe in the response to this comment how the tidal wetland restoration was formulated and justified in accordance with the guidance in ER 1105-2-100 and identify the interest and estate required to support the recommended restoration. The Main Report, EIS, and Real Estate Plan and costs must be updated to incorporate the necessary information prior to finalizing the report and EIS.

RESPONSE:

a. **The subject Tidal Wetlands are a project feature that was justified based on multiple counts, notwithstanding the requirement to reconfigure the tidal creek for tide gate relocation through the line of protection that would require the temporary disturbance due to construction on the seaward side of the line of protection. Currently the existing 46-acre area of the proposed tidal wetland area consists of estuarine emergent wetlands with a tidal channel (16.5 ac), sandy beach (15.6 ac), littoral zone (7.7 ac), upland shrub/scrub areas (3.6 ac), and upland developed area (2.6 ac). The predominant species within the emergent wetland community is common reed, and in many areas of the wetlands this species grows in monotypic stands (phragmites). The proposed measure along the seaward side of the Line of Protection at Oakwood Beach would construct approximately 46 acres of a mosaic of habitats, including 12.9 ac low marsh, 6 ac high marsh, 6.9 ac shrub, 3.2 maritime forest, and 17 ac of dune grass plantings.**

   It is understood that a project component cannot be justified on the restoration of construction impacts alone. Please note that if the subject area was to be restored after the impacts of construction, the tidal creek would still be relocated (widened and realigned) through the line of protection and the existing tide gate and Section 103 levee removed. Additionally, a new tide gate would be installed through which the aligned tidal creek would flow through the line of protection that is the source of a tidal wetland/freshwater wetland interchange for the interior drainage component of the project. Further, because the Phragmites are over 12 feet tall in the area of construction, they would have to be removed and then upon construction completion, native planting and seeding would have to occur. Regardless, this is the minimum that would be required by environmental agencies.

   However, in addition to the required tidal creek realignment and associated activities, the study erosion analysis has indicated that the Oakwood Beach section of the Line of Protection presents an erosion rate of 5,700 cy/yr (Figure 2-4 of the E&D Appendix). Additionally, the area also has a higher organic content and the soil is poor and therefore susceptible to significant erosion during the higher frequency storm events. Over the 50-year period of analysis the District has determined through coastal modeling that the beach widths for the project to "function" is 75 – 150 feet. However, it is acknowledged that the long-term beach erosion rate may be affected by climate variability, including increasing sea level rise and frequency/duration of coastal storm events. If the long-term beach erosion accelerated such that the minimum beach width of 75 feet was reached, beach maintenance/restoration activities would have to be evaluated.

   Therefore, the proposed tidal wetland planting and grading of the area seaward of the line of protection would help attenuate wave energy that can cause scour during high frequency events and diminish the erosive forces in the area. The proposed measure along the seaward side of the Line of Protection at Oakwood

Beach has also been designed to preserve the functional effectiveness of tidal exchange which would facilitate wetland drainage and enable the tidal wetlands seaward of the LOP to help filter sediments so they are not brought into the freshwater wetlands.

Comprehensive coastal restoration provides the greatest return on investment while considering habitats most vulnerable to climate change and human development. Multiple habitats would provide environmental and public benefits to the Oakwood Beach area. Creating this mosaic of habitats would not only result in a net gain in wetland functional values (biological productivity/ecological value and flood storage) but would also support a diverse set of species. This suite of habitats will also support the ecosystem's overall ability to adapt and to be resilient in response to disturbances such as storm events.

As per the USACE Climate Change Adaptation Plan dated June 2014 (which stated to manage climate risks in the near term and build short and long term resilience into USACE projects) and as part of the post Hurricane Sandy update, the project was modified by moving the line of protection (LOP) landward at Oakwood Beach and incorporating the tidal wetland. The landward relocation avoided impacts to the intertidal habitat, and well as potential Essential Fish Habitat (EFH) mitigation from the National Marine Fisheries Service (NMFS). NMFS supports the USACE's efforts to develop a comprehensive coastal storm risk management plan for Staten Island and in October 13 2015 coordination they stated:

"The proposed wetland enhancement by restoring and improving tidal exchange will outweigh the impacts created by the tide gates and slide gates, provided that the gates are operated in a manner that does not preclude tidal exchange and fish access. It will also restore and enhance essential fish habitat (EFH) for a number of federally managed species including summer flounder *(Paraichthys dentatus)*, bluefish *(Pomatomus saltatrix)* and their prey species. As a result, EFH conservation recommendations are not needed to minimize adverse effects to EFH."

b. Further, the Real Estate Plan will be updated to describe the real estate requirements necessary to support the tidal wetland restoration and identify the interest and estate required to support the recommended restoration. Please note that the Main Report/EIS, and Real Estate Plan and costs will be updated to incorporate the necessary information prior to finalizing the report, accordingly.

The significance of this concern is minimal because it will not affect plan formulation and justification. All stillwater design elevation alternatives would include the same 46 acre tidal wetland cost and therefore, plan selection remains constant. Further, because real estate interests are almost solely already owned

by New York City Department of Parks of Recreation, the real estate costs for acquisition and easements are also minimal. The cost of real estate interests has been identified to be less than $1M. Standard Easements required for this project element include "Bank Stabilization" for the line of protection and "Channel Stabilization" for the Tidal Creek realignment.

10. Requirements associated with deauthorization of the existing Oakwood Beach Section 103 Project: The Main Report does not describe what actions if any must be taken to deauthorize the existing Oakwood Beach Section 103 Project, nor does it document the views of the section 103 project sponsor. The significance of this concern is medium because it affects the completeness of the report but appears unlikely to affect plan formulation or justification. Recommend the District develop a path forward for affecting the deauthorization of the Section 103 CAP Project and solicit the views of the 103 project's non-Federal sponsor.

RESPONSE: USACE constructed a project in 1999 as part of the Section 103 Continued Authorities Program (CAP) to manage risk in the Oakwood Beach area from Bay flooding. The project provides risk management against a 15-year coastal storm (6.7% chance of occurring in any given year). An overview map of the project area shows that the existing Section 103 project is obsolete in the current area for the proposed project and for the recommended design protection at the probability of exceedance for the optimized design elevation. Further, the current Section 103 project is locate in the area of the proposed tidal creek realignment that also requires relocation of the tide creek to the recommended Line of Protection. Therefore, all aspects and components of the existing Section 103 project must be removed. Costs associated with its removal are included in the proposed project's cost estimate.

The proposed project and the existing project non-Federal sponsor is the New York State Department of Environmental Conservation (NYSDEC). The NYSDEC fully supports the proposed project that includes the deactivation and removal of the Section 103 project.

Because the Section 103 project is authorized under the Continuing Authorities Program, a Programmatic Authority, it cannot be deauthorized. Rather, the project will be physically removed and deactivated from the Program. Additionally, a deactivation notice will be provided to the NYSDEC notifying them when OMRR&R requirements will cease and any project close-out requirements in accordance with the executed Project Partnership Agreement.

The Final Feasibility Report will also be revised to incorporate the above information to discuss the deactivation process for the Section 103 project.

Counsel

1. Feas. Rpt., Para. 1 at page 1-1. Use of term "local partner" is confusing. Are there two sponsors? Does NYC have any legal obligation in connection with the project? If not, use a different term (e.g. stakeholder). See also para. 10.

RESPONSE: The EIS and FS will be updated to clarify that New York State Department of Environmental Conservation (NYSDEC) is the non-federal sponsor and that New York City is the State's local partner. This relationship will also be documented in the agreement between the State and City. The legal obligation is between USACE and NYSDEC. NYSDEC will have a subsequent legal agreement unto which the USACE is not a part.

2. Feas. Rpt., Para. 74 at p. 3-13 and para. 59 at p. 3-6. Shoreline ownership description is confusing. Para. 74 is confusing as the two sentences seem to contradict each other. Also, para. 74 seems to contradict the more robust explanation of shoreline ownership in para. 59. The first sentence of the second subparagraph in para. 59 is also confusing to read.

RESPONSE: The FS will be revised to clarify the shoreline ownership description on both page 59 and page 74. The study shoreline consists entirely of city beaches and the Gateway National Recreation Area (that is operated by the National Parks Service at Miller Field, Fort Wadsworth and Great Kills).

3. Feas. Rpt., Para. 259 at p. 6-42. Section 905 of WRDA 1986 specifically requires the formulation of non-structural alternative plan, and the Planning Guidance Notebook identifies that non-structural measures can be considered independently or in conjunction with structural measures. (ER 1105-2-100, page 3-10). The intent of the law and guidance is to ensure that non- structural measures are considered. The alternatives provided in the feasibility, while technically evaluating non-structural plans, do not explicitly consider whether there were feasible alternatives that would have included a combination of non-structural and structural measures. Suggest either re-evaluating the possibility of combined non-structural and structural plans or clarifying and explaining that inclusion of non-structural measures in the existing structural alternatives is not feasible.

RESPONSE: Nonstructural solutions were considered in the Interior Drainage analysis as an alternative for Interior Drainage areas A, B, C, D and E. It was determined that either Minimum Facility or Excavation was the selected plan for each Interior Drainage area as non-structural alternatives within each drainage area did not prove to be economically justified.

4. Feas. Rpt., Section 10.1 – items of local cooperation:

a. In para. 375, subpara. 1, delete "1. In coordination with Federal Government, who shall provide 65% of the initial project cost," and subparas. a. and b.; Subparas. c-e should be numbered as separate subparagraphs like the remaining subparagraphs in this paragraph.

<u>RESPONSE:</u> SECTION 10.1 WILL BE REVISED, ACCORDINGLY.

b. Be consistent in use of term for non-Federal sponsor. Some ILCs use the term "sponsor," while some use the term "partner." This is particularly confusing since NYC is identified as the local "partner" earlier in the report. (See comment # 1 above). Revise all relevant ILCs to read consistently as "non-Federal sponsor."

<u>RESPONSE</u>: The EIS and FS will be updated to clarify that New York State Department of Environmental Conservation (NYSDEC) is the non-federal sponsor and that New York City is the State's local partner. This relationship will also be documented in the agreement between the State and City.

c. Insert as the first ILC:

"a. Provide a minimum of 35 percent of initial project costs assigned to coastal and storm damage reduction, plus 100 percent of initial project costs assigned to protecting undeveloped private lands and other private shores which do not provide public benefits, and 50 percent of periodic nourishment costs assigned to coastal and storm damage reduction, plus 100 percent of periodic nourishment costs assigned to protecting undeveloped private lands and other private shores which do provide public benefits, and as further defined below:

(1) Provide, during design, 35 percent of design costs allocated to coastal and storm damage reduction in accordance with the terms of a design agreement entered into prior to commencement of design work for the project;

(2) Provide all lands, easements, rights-of-way, including suitable borrow areas, and perform or assure performance of all relocations, including utility relocations, as determined by the Federal government to be necessary for the initial construction, periodic nourishment or operation and maintenance of the project;

(3) Provide, during construction, any additional amounts necessary to make its total contribution equal to 35 percent of initial project costs assigned to coastal and storm damage reduction plus 100 percent of initial project costs assigned to protecting undeveloped private lands and other private shores which do not provide public benefits;"

<u>RESPONSE</u>: SECTION WILL BE REVISED, ACCORDINGLY.

d. Delete second sentence beginning "However, for lands that" in #1.c.

<u>RESPONSE</u>: SECTION WILL BE REVISED, ACCORDINGLY.

e. Delete "For so long as the project remains functioning" from #2.

<u>RESPONSE:</u> SECTION WILL BE REVISED, ACCORDINGLY.

f. Add "Inform affected interests, at least annually, of the extent of protection afforded by the structural flood damage reduction features."

<u>RESPONSE:</u> SECTION WILL BE REVISED, ACCORDINGLY.

g. Add "Assume, as between the Federal government and the non-Federal sponsor, complete financial responsibility for all necessary cleanup and response costs of any hazardous substances regulated under CERCLA that are located in, on, or under lands, easements, or rights- of-way required for construction, operation, maintenance, repair, rehabilitation, or replacement of the project;"

RESPONSE: SECTION WILL BE REVISED, ACCORDINGLY.

h. Add "Not use funds from other Federal programs, including any non-federal contribution required as a matching share therefore, to meet any of the non-Federal sponsor's obligations for the project unless the Federal agency providing the funds verifies in writing that such funds are authorized to be used to carry out the project."

<u>RESPONSE</u>: SECTION WILL BE REVISED, ACCORDINGLY.

5. Should include section toward end of Feas. Rpt. summarizing status of compliance with or non-relevance of all applicable Federal environmental laws, regulations, policies, and executive orders. Should address each law, regulation, policy, E.O. separately.

<u>RESPONSE</u>: SECTION WILL BE REVISED, ACCORDINGLY.

6. EIS, 1. p. 2-1, lines 30 and 33: The term "non-Federal partner" is confusing. Use "non- Federal sponsor" where appropriate and another term for interested stakeholders.

<u>RESPONSE</u>: The EIS and FS will be updated to clarify that New York State Department of Environmental Conservation (NYSDEC) is the non-federal sponsor and that New York City is the State's local partner. This relationship will also be documented in the agreement between the State and City.

7. EIS, Need to include a statement regarding whether or not there is any significant public controversy. If not, then simply state that. If so, describe the nature of the controversy.

<u>RESPONSE</u>: The public comment period closed on 9 September 2015. Concur, the Final EIS will include a statement noting that there is not significant public controversy related to the project features.

8. EIS, Need to include summary of public views and comments. Public view and

comments section states only the procedural compliance with NEPA public review. Need brief description summarizing general substantive comments.

RESPONSE: Concur, a table has been compiled to document public comments received during the 75 day Public Comment period (19 June 2015 – 9 September 2015) and USACE responses. This table and a brief statement summarizing substantive comments will be included in the Final EIS.

9. EIS, Need a "List of Preparers" section. 40 CFR 1502.17.

RESPONSE: Concur, a List of Preparers has been added to the EIS.

10. EIS, Need to include a list of persons, agencies, and interested stakeholders to whom a copy of the EIS will be sent.

RESPONSE:EIS Appendix E provided the EIS Distribution List. The District will provided access to an electronic copy of the Final EIS to Federal, state, and local elected and appointed government officials and agencies; interested organizations; and any individuals who requested the document. The District will also post the Final EIS on the Internet at http://www.nan.usace.army.mil/. Hard copy printed copies of the EIS will not be provided to agencies, interested organizations and individuals in keeping with Executive Order 13514, "Planning for Federal Sustainability in the Next Decade" which calls for government agencies to reduce paper usage.

MINOR and
EDITORIAL

1. Why is conversion from NGVD 1929 to NAVD88 being deferred to post feasibility?

RESPONSE: PL 113-2 and NAD policy requires the use of existing data/models to expedite the completion of Hurricane Sandy studies. At the time of Hurricane Sandy, the TSP had been identified and optimized to identify the NED plan. Post-Sandy, the PDT re-optimized the TSP based on updated FEMA stage-frequency curves, updated (post-Sandy) structure inventory, etc so that we could update the project costs/benefits. As noted in the study Risk Register (and approved through vertical coordination) the study schedule and funding does not allow for the time to convert the raw data for the study to NAVD88. However, all the Pertinent Data presented in the report were converted to NAVD88. Please note that ALL datums will be converted/presented in NAVD88 during the PED phase.

2. Economic (Benefit) Appendix Page 23 Paragraph 70 States, "EM 1110-2-1619 suggests that in lieu of better site-specific information, content-to-structure value ratios based on large samples of Flood Insurance Administration (FIA) claims records can be used (Table 6-4 presented in EM 1110-2-1619). An approximate average standard deviation of 25% was utilized for structure value uncertainty." Is this for non-residential only or for residential also? If it is being applied to residential, why is uncertainty not based on the EGMs?

<u>Response:</u> In the HEC-FDA models the uncertainty associated with content-to-structure value ratio is a standard deviation of 25% for all structures both residential and non-residential, which is in accordance with the referenced table. The uncertainty associated with just structure value in HEC-FDA is 10% standard deviation, which has been based on recent accepted reports rather than a direct recommendation in the referenced EGM. We will revise this section of text to clarify.

Nonstructural solutions did not meet the Planning objectives and were screened out early in the Planning process. Nonstructural solutions were determined to not manage enough risk to the majority of the population at risk to be economically justified. Nonstructural solutions were evaluated within the 25 yr floodplain and the BCR ranged between 0.1 and 0.2. Further, incorporating any nonstructural solution behind a continuous line of protection would be redundant and is not cost effective.

3. Economic (Benefit) Appendix Page 25 Paragraph 73 – The paragraph refers to 7,407 structures but Table 6 earlier in the appendix on page 16 describes 7,367 structures. Please revise for consistency.

<u>Response:</u> The Final Feasibility Report will be revised to indicate the accurate number of structures, accordingly. The paragraph text is in error and will be revised to be consistent with the tables.

4. Economic (Benefit) Appendix – Double check the formatting of some of the tables.

<u>Response:</u> The Final Feasibility Report will be revised to indicate to ensure the adequate formatting of the tables, accordingly.

5. Economic (Benefit) Appendix – Consider adding an example depth damage function for non- residential, and also for the WWTP.

<u>Response:</u> The appendix will be revised to include a plotted example of a depth-damage function for non-residential structures. The Appendix will illustrate the function PRB-SG1-SD7-SG3 (used for food stores and similar), since that's the most frequently assigned depth-damage function for non-residential structures in the inventory. Text about the development of the custom damage function for the WWTP using historic damage from Hurricane Sandy and estimates developed for the NYC waste water resilience plan will be added.

6. Economic (Benefit) Appendix – Consider adding a little more narrative to describe the WWTP damages and damages reduced. This is a critical piece of infrastructure.

<u>Response:</u> Text will be added to the economic appendix to expand on the analyses. The text will note that while the plan will manage risks to the plant from storm surge, review of the plant hydraulics indicate that there are limitations in plant discharge capacity during high storm surge which may cause treated effluent to overflow into the plant facilities resulting in low levels of damage. Since the plant continued to operate during the mush flood levels experienced during Hurricane Sandy, no interruption of plant operations ins anticipated due to these hydraulic limitations.

7. Draft EIS Page 2-2 line 35 – 37 states, "The Section 103 project is being deactivated and the tide gate will be removed and replaced as part of the National Economic Development (NED) Plan." This sentence seems out of place since this is in the No Action Section.

<u>Response:</u> Concur. The sentence will be deleted.

8. Draft EIS Page 2-4 lines 1 and 2 state, "…the equivalent annual damages for the No-Action Alternative would be $23,254,000 (USACE 2015)." This value for future without project damages is not consistent with The Main Report and Economic Appendix. Please revise for consistency.

<u>RESPONSE:</u> Concur. Table 21 of the draft Feasibility Report presents the accurate equivalent annual damages as $34,790,960. The final EIS will be revised to state the correct equivalent annual damages, accordingly.

9. Draft EIS Page 2-8 lines 17 – 18 state, "Among the alternatives, one of the variables considered was the level of protection provided, based on 10-, 25-, or 100-year floodplains/storm protection level (USACE 2015)." This language is not consistent with current USACE risk communication standards and should be replaced with 'annual chance exceedance probability' and equivalent terminology, such as that in the main report.

<u>RESPONSE:</u> Concur. The term "10-, 25-, and 100-year floodplains/storm protection level" will be deleted and replaced with "annual chance exceedance probability language.

10. Draft Report – The EO 11988 Section hits the six steps, but there could be some more 'good news' things missing. For example, other text appeared to indicate there are several hospitals in the study area and other critical infrastructure that is being afforded risk reduction. Also, the ponding areas for the interior drainage provide some floodplain function over the future without project, as the Executive Summary states, "The Plan also provides for overall environmental enhancement through the removal of Phragmites in interior ponds in order to provide the needed storage capacity, and planting of native freshwater wetland plants with greater wildlife habitat value." Some things to consider to 'beef up' this section.

<u>RESPONSE:</u> Concur. The PDT is currently working on updating the report to indicate as such. The PDT concurs that this project is more than just a line of protection that provides coastal storm risk management at 0.3% annual chance exceedance. This project is wholly accepted by the environmental agencies as environmentally beneficial, which for a project that recommends a structural solution, says a lot.

11. Feas. Rpt., need to review for grammar and spelling thoroughly. The following are just some grammatical/spelling issues identified:

a. Para. ES16. Change "effect" to "effective" and restructure run-on sentence.
b. Para. 254. Change "unity" to "one"?
c. Para. 277. Change "minimized" to "minimize."
d. Para. 264. 1st sentence is a run-on sentence.
e. Para. 357. End of subparagraph 5 has two periods.
f. Page 9-3. Heading at 9.2 needs a space between "9.2" and heading title.
g. Para. 376. Replace "," at end of third sentence with ".".

<u>CONCUR:</u> The report will be revised to correct any grammatical and/or spelling errors, including those noted above.

Appendix J

Ecological Monitoring Plan

MONITORING PLAN

SOUTH SHORE OF STATEN ISLAND

COASTAL STORM RISK MANAGEMENT PROJECT

STATEN ISLAND, NEW YORK

September 2016

Prepared by:

U. S. Army Corps of Engineers

New York District

New York, New York 10278

NATURAL PROTECTIVE AND INTERIOR DRAINAGE FEATURES MONITORING

Natural Protective and Interior Drainage Features Monitoring Report Requirements: All natural protective and interior drainage features will be monitored starting with the first full growing season after the construction/planting of the feature is completed and will be monitored five full growing seasons. The District will be responsible for the monitoring. Monitoring information must be collected twice a year in the early spring and the fall. Hydrological monitoring will be conducted once a month from April to October. Site vegetation and hydrology will be monitored for five years, and photo documentation of the site's progress will be incorporated into each annual monitoring report. The report will also include a concise description of the monitoring program, including the methodology, results, and conclusions.

The monitoring report will include a recommendation section consisting of professional observations and judgments. This will allow for the identification of natural elements that are successful and those elements that are not achieving the desired result. Observations of wildlife utilization of the site will be made, including a list of observed species. Observations on herbivory pressures and effectiveness of anti-herbivory measures will be made. Recommendations for maintenance and corrective measures will be included. Monitoring reports will be prepared no later than December 31st of each monitoring year.

If problems and/or inadequacies are identified during monitoring, supplemental plans may be developed to ensure the successful establishment of the wetlands and the intended biotic communities. These plans may include additional grading, soil amendments, or manipulation of hydrology, as necessary in selected areas.

All Monitoring Reports require the following information:

a. A USGS quad map, and a county road map showing the location of the site, including the block and lot of the site. A copy of an aerial photograph of the site should also be included;

b. A brief description of the features being monitored;

c. Photographs of the site with a location map indicating where they were taken on the site;

d. A grid-sampling pattern must be set-up across the site and be indicated on a map that will accompany each report. The location from where the samples were collected must be provided to confirm the findings;

e. Data sheets from sampling points, which describe the vegetation present, the percent coverage of the vegetation, soil borings and location of the water table.

First Full Growing Season Monitoring Report Requirements:

1. As-built plans which depict final grade elevations at one-foot intervals will be provided by the USACE which will include a table listing the vegetative species and quantities of each species that were planted.

2. Show on the as-built plans that the boundaries of the natural protective and interior drainage areas have been visibly marked with 3 inch white PVC pipe extending 4 feet above the ground surface. The stakes must remain on the site for the entire monitoring period;

3. Photos of the constructed feature project keyed to a photo location map and provide the GPS waypoints in NY State plane coordinates NAD 1983;

4. Document that the constructed features area have been posted with several permanent signs, which identify the site as a natural area and that mowing, cutting, dumping and draining of the property is prohibited.

Years 2 -4 Monitoring Report Requirements:

1. Documentation based on field data, that the goals of the natural protective and interior drainage features, including any transition areas, are being satisfied. If the USACE is finding problems with the features and does not anticipate the site will be a success then recommendations on how to rectify the problems must be included in the report with a time frame in which they will be completed;

2. Documentation of the planted vegetation as well as the species that are naturally colonizing the site, including the location and percent coverage of each species. The data should document that the site is progressing towards 85 percent survival and 85 percent area coverage of plantings. If the proposed plant community is a scrub/shrub or forested wetland or wetland buffer the USACE must also demonstrate each year with data that the woody species are thriving, and increasing in stem density and height each year. If the field data shows that the natural protective features and interior drainage features are failing to meet the vegetation survival, coverage and health goals, the monitoring report should contain a discussion of steps that will be taken to rectify the problem, including a schedule of implementation;

3. Documentation of any invasive or noxious species colonizing the site and how they are being eliminated. Recommended actions may be accomplished via hand-pulling, application of a pesticide or other NYSDEC and NYCDEP approved methods.

Final (Year 5) Monitoring Report Requirements:

1. Documentation that demonstrates that the goals of the natural protective and interior drainage features including acreage have been successful. A field wetland delineation of the project features based on the Federal Manual for Identifying and Delineating

Jurisdictional Wetlands (1987) which shows the exact acreage of State open waters, emergent, scrub/shrub and/or forested wetlands will be completed.

2. Documentation that the site has an 85 percent survival and 85 percent area coverage of the project plantings are species native to the area. Documentation of all plant species are healthy and thriving and if the proposed plant community contains trees demonstrate that the trees are at least five feet in height.

3. Documentation that the site is less than 10 percent occupied by invasive or noxious species such as but not limited to *Phalaris arundinacea* (Reed canary grass), *Phragmites australis* (common reed grass), *Typha latifolia* (broad-leaved cattail), *Typha angustifolia* (narrow-leaved cattail), *Lythrum salicaria* (purple loosestrife), *Ailanthus altissima* (tree-of-heaven), *Berberis thunbergii* (Japanese barberry), *Berberis vulgaris* (common barberry*), Elaeagnus angustifolia* (Russian olive), *Elaeagnus umbellata* (Autumn olive), *Ligustrum obtusifolium* (Japanese privet), *Ligustrum vulgare* (common privet) and *Rosa multiflora* (multiflora rose).

4. Documentation that the site contains hydric soils or there is evidence of reduction occurring in the soil.

5. Potential corrective features may include:
    - Replanting vegetation in areas where plantings do not meet predetermined criteria
    - Enhancing survival of planted vegetation (by applying a fertilizer such as Osmocote)
    - Improving tidal flushing
    - Suppressing encroachment by *Phragmites* through mechanical landscaping techniques, physical removal and/or replanting of desirable species
    - Preventing herbivory (by installing fencing)
    - Adjusting channel morphology and hydrology, or stabilizing banks

Monitoring Methodology:

- *Vegetation Monitoring – Herbaceous Cover***:** Quadrat sampling will be used to monitor the development of herbaceous vegetative cover and dominance patterns within the created or enhanced forested, scrub shrub and emergent wetland habitats. Within each 1-meter square quadrat, an estimate of the total percent cover provided by native and invasive herbaceous plants will be generated. Percent cover of individual species will also be provided. A minimum of ten quadrats per cover type unit will be used. The location of each quadrat will be shown on the plans contained in the monitoring report.

  The location of the sampling points will be evenly spaced across each tidal and emergent wetland area to be sampled (2). The same start location will be used each year of the monitoring program. The distance of the first sampling point from the starting point along the perimeter of the emergent area will be decided by using a new random number each year. Each successive sample will be at equidistant intervals along the perimeter. The

distance will be determined by calculating the perimeter of each emergent wetland to be sampled from the as-built plans and divided it into a minimum of ten equal lengths.

At each sampling point along the perimeter of the tidal and emergent wetland, a marker will be blindly tossed into the site to select the quadrat location. One edge of the quadrat will be aligned with a North-South axis. Each successive sample will be located using the same method at equidistant intervals along the perimeter.

For scrub shrub and forested wetlands, the 1-meter square quadrats will be located within the 10-meter square permanent sampling plots. The sample location will be chosen by blindly tossing a marker into the sample plot and then follow the procedure described above.

- *Vegetation Monitoring – Woody Plant Densities*: Stem densities of woody plants will be generated using stem counts within permanent 10-meter square sample plots randomly located within forested and scrub shrub planting zones. Within each plot the number of trees and shrubs will be counted, by species, and recorded onto a data form. The height of each tree and shrub will also be recorded. The location of each sample plot will be shown on the plans contained in the monitoring report.

  The location of each sample plot will be determined prior to conducting field work by randomly by establishing a 10- meter square grid over the area to be monitored as shown on the As-Built plans, assigning each grid block a number, and generating a series of random numbers. The random numbers corresponding to the first ten grid blocks will be used to establish the sample locations. The four corners of each sampling plot will be marked in the field with a 6-feet long 2-inch PVC pipe driven into the ground a minimum of 12 inches and no more than 18 inches.

  Data collected from each quadrat will be used to demonstrate by the second growing season eighty- five percent survival and/or coverage by native plant species.

- Observations regarding invasive species encroachment will also be made and recommendations on strategies to manage these invasive species will be provided. *Hydrological Monitoring*: The hydrodynamics of the emergent wetlands will be monitored on a monthly schedule between April and October. This will be accomplished by visual observations of soil saturation and depth to groundwater.

- *Soil Monitoring:* For the first year of monitoring, a minimum of six soil pits will be dug and described to a depth of 20 inches within the wetland areas. The soil profiles will document the depth of topsoil placement as well as indicators of reduction. The location of each spoil pit will be located using GPS and plotted onto a map for inclusion in the monitoring report. The map will include the NY state plane coordinates for each pit in NAD 1983. Subsequent monitoring reports (Years 2 through 5) require documentation of the development of hydric soils within restored wetland areas. A minimum of two soil profiles will be examined and described within each wetland and the soil profile included within the monitoring report. The depth to saturated soil and free water will also be recorded for each soil profile.

- *Invasive Species Monitoring:* All the natural protective feature and interior drainage locations should be inspected for invasive species.
-

  Monitoring Requirements: A check sheet will be used to inspect for the presence of invasive species. Documentation that the restoration/creation areas is less than 10 percent occupied by invasive or noxious species is required during each of the monitoring years. Invasive or noxious species include, but are not limited to: *Phalaris arundinacea* (Reed canary grass), *Phragmites australis* (common reed grass), *Lythrum salicaria* (purple loosestrife), *Ailanthus altissima* (tree-of-heaven), *Berberis thunbergii* (Japanese barberry), *Berberis vulgaris* (common barberry*), Elaeagnus angustifolia* (Russian olive), *Elaeagnus umbellata* (Autumn olive), *Ligustrum obtusifolium* (Japanese privet), *Ligustrum vulgare* (common privet), *Rosa multiflora* (multiflora rose) and other invasive species.

  Monitoring Methodology: The presence and extent of invasive species will be documented through the herbaceous quadrat sampling program described under the above, and through visual observations conducted as part of wandering surveys. The wandering surveys will be conducted in May, July and September of each year of the monitoring program. The presence or absence of invasive species will be documented by walking transects through each segment of the site. The location and approximate size of each invasive plant population will be noted on the data form provided and located on a field map. If the plants encountered are small in number then hand-pulling to remove the plant and plant roots should be performed immediately and the action taken recorded. Larger populations should be documented and recommended actions recorded for subsequent action.

  Reporting: The presence of invasive species should be reported within each annual monitoring report.