Draft
RESTORATION PLAN AND ENVIRONMENTAL ASSESSMENT
WOODBRIDGE CREEK WETLAND RESTORATION PROJECT
WOODBRIDGE, NJ

Prepared by:

National Oceanic and Atmospheric Administration (NOAA)
U.S. Fish and Wildlife Service (USFWS) of the U.S. Department of the Interior
New Jersey Department of Environmental Protection

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EXECUTIVE SUMMARY

In this document, the National Oceanic and Atmospheric Administration (NOAA), the U.S. Fish and Wildlife Service, (USFWS) of the U.S. Department of the Interior, and the New Jersey Department of Environmental Protection (NJDEP), collectively referred to as the NY/NJ Harbor Oil Spill Trustees or "the trustees", present their preferred restoration alternative, the Woodbridge Creek Wetland Restoration Project, to partially compensate the public for natural resource damages resulting from the Exxon Bayway Oil Spill that occurred on January 2, 1990.

Each of the agencies listed above is a designated natural resource trustee under the National Contingency Plan, 40 CFR Section 300.600, for natural resources damaged by the Exxon Bayway Oil Spill. As a designated trustee, each agency is authorized to act on behalf of the public to assess and recover natural resource damages, and to plan and implement actions to restore natural resources and resource services injured or lost as a result of a discharge of oil.

The agencies listed above, commonly referred to as the NY/NJ Harbor Oil Spill Trustees or "the trustees", are authorized to spend Exxon Bayway settlement funds to restore degraded natural resources in the NY/NJ Harbor area that were injured by the spill. Under the terms of a consent decree with Exxon, the Trustees are authorized to use funds recovered from Exxon to: (1) acquire land including tidal wetlands within the New York/New Jersey Harbor; (2) restore and protect lands including tidal wetlands within the New York/New Jersey Harbor; and (3) perform necessary studies in the harbor region. Pursuant to these criteria, the trustees have selected the Woodbridge Creek Wetland Restoration Project for implementation.

This Draft Restoration Plan and Environmental Assessment (Draft RP/EA) sets forth the Trustees' decision making process, considerations and responsibilities as they evaluated four restoration alternatives and selected the Woodbridge Creek Restoration Project as the preferred alternative. Alternative 1, the no-action alternative, would rely on natural recovery. Alternative 2 involves a partial removal of earthen berms to allow tidal exchange. Alternative 3 requires full excavation including removal of all dike walls and the top surface of the degraded marshland, and subsequent planting. Alternative 4 likewise involves full excavation, including removal of all dike walls and the top surface of the degraded marshland, but also includes clean (sand) capping of the marsh surface, prior to planting.

The trustees determined that alternatives 2, 3 and 4, are feasible, ecologically sound alternatives that would achieve the desired restoration goals and are preferable to the no action alternative. The trustees then compared the three excavation and enhancement alternatives, considering the environmental impacts, benefits, costs, feasibility and likelihood of success, and selected Alternative 3, the Woodbridge Creek Restoration Project, as the preferred alternative.

The Woodbridge Creek Wetland Restoration site is located in the Township of Woodbridge, New Jersey on a tributary of the Arthur Kill. The proposed restoration site is both proximal, and similar, to natural resources injured by the Exxon Bayway Oil Spill. The Creek and the adjacent restoration site are exhibiting signs of degradation associated with commercial and residential development, alterations to hydrologic flows and intrusion of opportunistic species. The Woodbridge Creek Wetland Restoration Project will restore natural resources injured by the Exxon Bayway oil spill including tidal wetlands, marine fisheries and benthic invertebrates.

The Woodbridge Creek Restoration Project will result in the restoration and enhancement of approximately 17.15 acres of intertidal marsh. The proposed project involves: excavating approximately 23,104 cubic yards of fill material, excavating and removing a series of earthen berms that reduce tidal influence; and, excavating the interior marsh plain. A series of six "islands" of desirable high marsh vegetative species currently existing on site, and comprising 4.5 acres, will be protected during construction and remain intact. The marsh surface will be replanted and seeded with suitable low marsh and high marsh vegetative species. This project will occur in two phases in order to work expeditiously.

The proposed project will require the construction of a 1.9 acre area for upland disposal of the wet excavated material. Therefore, a containment pit will be constructed by excavating approximately 5,189 cubic yards of dry earth from the area. The excavated dry earth from the containment pit, totaling approximately 5,189 cubic yards, will be temporarily stock piled and subsequently used for capping. Part of the 1.9 acre disposal site does contain contaminates exceeding NJ DEP Disposal Criteria standards. The contaminated portion of the 5,189 cubic yards of dry earth will be isolated and stockpiled until the completion of the containment pit – and then filled back into the containment pit and later capped.

To facilitate construction and reduce the release of sediment into the water column, construction within the marsh plain will occur following the installation of temporary tide gates to de-water the site. Construction will occur between July and November during periods of low water. Construction in water will be curtailed during the essential fish habitat windows between April and June. All construction activities shall utilize "Best Management Practices" to reduce negative impacts on and adjacent to the project site.

The Trustees have determined that, under the National Environmental Policy Act (NEPA), an Environmental Assessment is sufficient for this project because there are insufficient impacts to warrant a full environmental impact statement and the impacts are localized within the project area. Therefore an environmental impact statement will not be prepared for this project, unless future information and/or comments counsel otherwise.

WOODBRIDGE CREEK WETLAND RESTORATION

1.0 INTRODUCTION: PURPOSE AND NEED FOR RESTORATION
1.1 Purpose and Need …….5
1.2 Authority and Legal Requirements……6
1.2.1 CWA……....6
1.2.2 NEPA Compliance……...7
1.2.3 Public Participation…….…7
1.3 Administrative Record…….…...7

2.0 AFFECTED ENVIRONMENT
2.1 Geographic Location…….…..7
2.2 Site Description…….…..8
2.3 Physical and Biological Environment…….……9
2.3.1 Threatened and Endangered Species……..……...9
2.3.2 Fish and Wildlife Habitat……..9
2.3.3 Essential Fish Habitat (EFH)……..…….10
2.3.4 Historic and Cultural Resources……..……....11
2.3.5 Sediment Quality…….11

3.0 DESCRIPTION OF ALTERNATIVES
3.1 Restoration Goals……..……...…14
3.2 Alternatives Considered……...14
3.2.1 ALTERNATIVE 1: No Action …….14
3.2.1.1 Description of Environmental Impacts ……15
3.2.1.2 Socioeconomic and Cumulative Impacts……..16
3.2.2 ALTERNATIVE 2: Wetland Enhancement (Dike Breaching) ……..16
3.2.2.1 Description of Environmental Impacts ……17
3.2.2.2 Socioeconomic and Cumulative Impacts …….17
3.2.3 ALTERNATIVE 3: Wetland Enhancement (Dike Removal) – Preferred …….17
3.2.3.1 Description of Environmental Impacts…….19
3.2.3.2 Socioeconomic Impacts……..……..23
3.2.3.3 Threatened/Endangered Species and Critical Habitat Impacts ……24
3.2.3.4 Fish and Wildlife Impacts…….24
3.2.3.5 Essential Fish Habitat (EFH) Impacts……..…24
3.2.3.6 Historical and Cultural Impacts ……...25
3.2.3.7 Cumulative Impacts……..25
3.2.4 ALTERNATIVE 4: Wetland Enhancement (Dike Removal. Clean capping)…26
3.2.4.1 Description of Environmental Impacts…….27
3.2.4.2 Socioeconomic Impacts……30
3.2.4.3 Threatened/Endangered Species and Critical Habitat Impacts…….31
3.2.4.4 Fish and Wildlife Impacts…….31
3.2.4.5 Essential Fish Habitat (EFH) Impacts……...31
3.2.4.6 Historic and Cultural Impacts……...32
3.2.4.7 Cumulative Impacts……..32

4.0 SELECTION OF THE PREFERRED ALTERNATIVE
4.1 No Action…….34
4.2 Wetland Enhancement (Dike Breaching)…….34
4.3 Wetland Enhancement (Dike removal)…….…….…34
4.4 Wetland Enhancement (Dike removal, clean capping)…….…34

5.0 PREPARERS, AGENCIES AND PERSONS CONSULTED

5.1 Agencies and Persons Consulted……..……..……35
5.2 Compliance with Environmental Statutes……..……35

6.0 REFERENCES AND LIST OF DOCUMENTS INCORPORATED BY REFERENCE……..…39

7.0 SUMMARY OF PUBLIC COMMENTS

To Be Completed at end of Public Comment Period.

APPENDIX A: USACE PERMIT LETTER……..……

APPENDIX B: ESA/EFH INFORMAL CONSULTATIONS……..

APPENDIX C: Maps and Figures 1-5 ……..…….

APPENDIX D: Sediment Test Results Tables 1-2… …… ……..……

APPENDIX E: Cultural and Historic Resources Evaluation……

APPENDIX F: PLANS AND SPECIFICATIONS …….. …

ENVIRONMENTAL ASSESSMENT OF THE WOODBRIDGE CREEK WETLAND RESTORATION

1.0 INTRODUCTION

1.1 Purpose and Need

On January 2, 1990 an uncontrolled release of #2 fuel oil occurred originating from the Exxon Bayway facility's underwater pipeline located in Linden, New Jersey. Approximately 567,000 gallons of oil were released into the Arthur Kill, a saltwater channel between New Jersey and Staten Island, NY causing the oiling of more than 100 acres of tidal salt marsh on Staten Island and in New Jersey. Approximately 700 shorebirds were killed as a direct result of the release and in some wetlands located closest to the release (i.e. Morses Creek) the dominant vegetation, salt marsh cordgrass (*Spartina alterniflora*), experienced a large-scale die-off. The oiling impacted fish and wildlife habitats including wetlands in the immediate area of the spill. Representatives of the City and State of New York, State of New Jersey, National Oceanic and Atmospheric Administration (NOAA), and the U.S. Fish and Wildlife Service (USF&WS), collectively referred to as the NY/NJ Harbor Oil Spill Trustees or "the trustees", responded to the incident in order to assess and quantify the impacts to natural resources.

Under authority of the Clean Water Act (CWA), the natural resources trustees conducted a damage assessment and filed a claim for damages to natural resources against Exxon. Exxon, the owner and operator of the Bayway Linden facility, settled with the trustees and paid over $11.5 million in natural resource damages to be used for natural resource restoration.

In response to the Exxon Bayway oil spill the local, state and federal natural resource trustees formed the New York/New Jersey Harbor Oil Spill Restoration Committee (referred commonly and throughout this document as the Trustees). This body is charged with developing primary and compensatory restoration projects in New York and New Jersey. Since 1991, the Trustees have administered funds received from the Exxon settlement to restore tidal wetlands in and around the areas impacted by oil.

The purpose of the proposed Woodbridge Creek Wetland Restoration Project is to compensate the public for injuries to natural resources caused by the Exxon Bayway oil spill. To achieve this goal, the proposed project will restore the historic tidal hydrologic connection between the restoration site and Woodbridge Creek, to increase the percent cover of *Spartina alterniflora*, to improve the aesthetic viewshed associated with the site and to enhance fisheries and wildlife breeding, nursery, forage and refuge habitat.

[1]The participating State and Federal agencies have been designated as natural resource trustees pursuant to these statutes and the National Contingency Plan, 40 CFR part 300.

Woodbridge Creek, a tributary of the Arthur Kill, represents a highly developed watershed and has been suffering from multiple anthropogenic and cumulative impacts for decades from a variety of sources. Oiling during the Bayway release directly impacted the lower reaches of Woodbridge Creek and the Arthur Kill, and the site does not currently provide optimal function for the biota living within its proximity. Restoration of the Woodbridge Creek site is consistent with the mandate of the trustees to compensate for resources lost as a result of the oiling of tidal marshes in the Arthur Kill.

1.2 Authority and Legal Requirements

This draft environmental assessment has been prepared jointly by NOAA, the U.S. Fish and Wildlife Service, and the New Jersey Department of Environmental Protection. Each of these agencies is a designated natural resource Trustee under the National Contingency Plan, 40 CFR Section 300.600, for natural resources damaged by the Exxon Bayway Oil Spill. As a designated trustee, each agency is authorized to act on behalf of the public to assess and recover natural resource damages, and to plan and implement actions to restore natural resources and resource services injured or lost as a result of a discharge of oil.

1.2.1. Clean Water Act (CWA) Compliance

Section 111 of the Clean Water Act (Federal Water Pollution Control Act 33 U.S.C. 1251 et seq.) and the natural resource damage assessment regulations (43 CFR Part 11) published pursuant to the Comprehensive Environmental Response, Compensation and Liability Act of 1980 authorize the trustees to act on behalf of the public to assess and claim damages (compensation) for injuries to natural resources from discharges of oil or releases of hazardous substances, and to use the recovered damages to restore, replace, or acquire the equivalent of the injured resources. This proposed restoration project was developed to fulfill the trustees' requirements under these authorities.

1.2.2 NEPA Compliance

Any restoration of natural resources under the Clean Water Act must comply with the National Environmental Policy Act (NEPA), as amended (42USC 4321 et seq.), and its implementing regulations (40 C.F.R. § 1500-1508). In compliance with NEPA and its regulations, this draft environmental assessment summarizes the current environmental setting, describes the purpose and need for action, identifies alternative actions, assesses their applicability and environmental consequences, and summarizes opportunities for public participation in the decision-making process.

1.2.3 Public Participation

The public has been involved in all aspects of the Woodbridge Creek Wetland Restoration Project planning and development. Initial public interaction was with former Middlesex County Assemblyman Ernie Oros, also the chairman of the Woodbridge River Watch, a non-profit community-based conservation organization dedicated to the protection of the Woodbridge Creek. During the reconnaissance phase for restoration following the spills, Mr. Oros provided great assistance to the Trustees on the condition, history and significance of the Woodbridge Creek wetland parcels. Subsequent public interaction has been through the Woodbridge River Watch; representatives of the State of New Jersey and the NOAA Restoration Center have met with representatives of the group to seek input into the design and implementation of the project. The project has been the subject of public televised discussion at one Woodbridge River Watch meeting in spring of 2002, and a public meeting at the Woodbridge Hungarian-Americans Club in winter of 2002. When the scope of the project was changed in 2005 another public meeting was held in October 2005 at Woodbridge Town Hall, again locally televised.

1.3 Administrative Record

There is an administrative record, including project permits, planning documents, project expenditures to date, committee resolutions, legal determinations and consent decrees, and outreach material for the Exxon Bayway case. The NOAA Office of General Counsel's Northeast Region maintains this record for the NOAA Restoration Center's Sandy Hook Field Office. These references are available to the public and may be viewed at:

NOAA General Counsel Northeast Region
One Blackburn Dr.
Gloucester, MA 01930
Contact: Gwendolyn McCarthy (978) 281-9211

2.0 AFFECTED ENVIRONMENT

2.1 Geographic Location

The Arthur Kill Complex is located in New Jersey's Watershed Management Area 7, and is a tidal strait connecting the Kill van Kull and Newark Bay to Raritan Bay and the Raritan River (Figure 1). As a highly industrialized waterway, it is dredged to an average channel depth of 30 feet, with much of the shoreline hardened or fortified. Waterside and adjacent land uses of the Arthur Kill watershed are heavily developed, especially for port facilities and petroleum and chemical industries. Upland areas of the watershed are dominated by residential and commercial land uses, and in New Jersey, have an average population density greater than 5,000 people per square mile, 75 times the national average (USF&WS 1997). Past and present land uses resulted in filling most of the salt marshes that were once extensive in the Arthur Kill drainage and developing most of the upland and inland wetland areas.

The Woodbridge Creek watershed drainage area is ~6,400 acres. The lower portion of the Woodbridge Creek's watershed is deep and many of the adjacent marshes have been filled, drained, diked or otherwise anthropogenically degraded. These downstream marsh systems are flooded twice daily by saline and brackish waters; however, they receive a significant amount of freshwater runoff from adjacent commercial facilities and development. These marshes are somewhat stressed and degraded and are comprised of mostly large stands of *Phragmites australis* (the common reed), in place of what once were *Spartina alterniflora* (salt marsh cordgrass) marshes (Normandeau Associates, 1999). The Woodbridge Creek's upper watershed is comprised of some upland hardwood forest, forested wetlands, tidal marshes, high marshes, and successional fields ringed by industrial, commercial, and residential land uses. A mature pin oak (*Quercus palustris*) wooded wetland parcel is located near the headwaters (Figures 2, 3, and 7).

Wetlands along the Woodbridge Creek (in the Arthur Kill Complex) have declined in functionality and extent since the 1800s. Filling and diking wetlands and tidal channels, combined with the impacts of development and industrialization, have altered acreage, extent and functions of tidal wetlands in the Complex. However, the persistence of some tidal wetland parcels despite these impairments in the Arthur Kill indicates conditions amenable to restoration (Bergen et al. 2000; Vitaliano et al. 2002; Duffy-Anderson, J.T., Manderson J.P. and K.W. Able 2003).

2.2 Site Description

The Woodbridge Creek Wetland Restoration project site is located in the Township of Woodbridge, Middlesex County in New Jersey (Figures 1 and 2). The Township-owned parcels are located north of Port Reading Avenue, bounded by Woodbridge Creek to the west, residences to the east and Saint's Boulevard to the north. The restoration project is focusing on approximately 19.5 acres (Figures 1-4). Of those 19.5 acres, 17.5 acres will be enhanced or restored through excavation and re-contouring. 2.0 acres are reserved for placement of excavated materials.

The perimeter of the restoration site was historically diked and filled, presumably to establish a dewatering pit for dredged sediments. The center marsh plain was never directly filled, but the reduction of the tidal influence elevated sediment deposition, reduced tidal draining and increased stored freshwater on the site, cumulatively altering the tidal wetland hydrology and function. *Phragmites australis* (the common reed) has become the dominant species on the site, and the depth to historic salt marsh peat varies from between six inches to two feet deep on the marsh plain, deeper in the diked areas (Sturdevant and Craft, 2002).

The restoration site also includes some remnant high marsh meadows dominated by *Distichlis spicata* (spike grass) and *Spartina patens* (salt hay), and is bordered to the north, south and east by three reference marshes (Figure 3). The reference marshes are dominated by *Phragmites australis, Spartina alterniflora* (salt marsh cordgrass), *Spartina*

patens, and *Iva frutescens* (marsh elder). The *S. alterniflora* site occurs at the lowest elevation, adjacent to the creek (and receives the highest tidal inundation). *The S. patens*/*I. Frutescens* site occurs upstream and is dominated by *S. patens*, *I. Frutescens*, *D. spicata*, and *Solidago* sp. (goldenrod). This site receives a lower amount of tidal inundation. The *P. australis* site occurs farther upstream and is dominated by monotypic stands of *P. australis* (Sturdevant and Craft 2002). The high marsh species such as *S. patens* occur at elevations ~0' MHW – 2.8'; other species such as *P. australis* occur within arrange of 3-5' in elevation (Normandeau Associates, 1999).

2.3 Physical and Biological Environment

The natural resources located within the project boundary include upland habitats, transitional upland-wetland habitats, tidal wetland habitats, and open water habitats. Characterization of the resources has been on going since 1999 and has been undertaken as a component of pre-restoration monitoring (baseline monitoring) (Sturdevant and Craft 2002) which is designed to represent current conditions.

2.3.1 Threatened and Endangered Species

There are no federally listed species of flora or fauna known to inhabit or be dependent upon the project site or immediately adjacent area. The NJDEP does not have any record of state-listed rare plants, animals or natural communities known to exist in the project area. However, the state-listed northern harrier (*Circus cyaneus*) has been observed near the project site. There are no recent records of the state-listed northern harrier breeding within the project site (See informal ESA consultation: Appendix B).

2.3.2 Fish and Wildlife Species

Historic placement of fill and the expansion of nuisance and invasive vegetation have considerably disturbed the Arthur Kill watershed and the specific project area, though the types of habitat are suitable to support a diverse group of resident and migratory wildlife including fish, birds, shellfish and mammals. The habitats utilized may include *Phragmites australis* stands, salt marsh, upland herbaceous, forest scrub-shrub, open water or disturbed communities. Finfish species found in the Arthur Kill and Woodbridge Creek are consistent with that expected in a tidal creek and marsh system in coastal New Jersey (USACE 1998, USFWS 1997). Fish species likely to be found in and around the project site are composed of freshwater, marine and diadromous species. Species include alewife (*Alosa pseudoharengus*), American eel (*Anguilla rostrata*), Atlantic menhaden (*Brevoortia tyrannus*), Atlantic needlefish (*Strongylura marina*), bay anchovy (*Anchoa mitchilli*), bluefish (*Pomatomus saltatrix*), blueback herring (*Alosa aestivalis*), catfish (*Ameirus nebulosus* and *A. catus*), mummichog (*Fundulus heteroclitus*), pumpkinseed

(*Lepomis gibbosus*), striped bass (*Morone saxatilis*), striped killifish (*Fundulus majalis*), summer flounder (*Paralichthys dentatus*), weakfish (*Cynoscion regalis*), white perch (*Morone americana*), and winter flounder (*Pseudopleuronectes americana*).

Shellfish species found in and around the project site include Blue crabs (*Callinectes sapidus*), fiddler crabs (Uca spp.), grass shrimp (*Palaemonetes pugio*), ribbed mussels (*Geukensia demissa*), and mud crab (*Rhithropanoepus harrisii*).

Reptiles and amphibians likely to occur in or around the project site include common garter snake (*Thamnophis sirtalis*), common snapping turtle (*Chelydra serpentina*), diamondback terrapin (*Malaclemys terrapin*), eastern garter snake (*Thamnophis sirtalis*), eastern box turtle (*Terrapene carolina*), and red-eared slider (*Trachemys scripta*).

Avian species potentially present or using habitats on or near the site include Canada goose (*Branta canadesis*), American black duck (*Anas rupripes*), American crow (*Corvus brachyrhynchos*), American goldfinch (*Carduelis tristis*), barn swallow (*Hirundo rustica*), belted kingfisher (*Ceryle alcyon*), black-crowned night heron (*Nycticorax nycticorax*), common grackle (*Quiscalus quiscula*), starling (*Sturnus vulgaris*), gadwall (*Anas strepera*), herring gull (*Larus argentatus*), mallard (*Anas platyrhynchos*), marsh wren (*Cistothorus palustris*), northern harrier (*Circus cyaneus*), red tailed hawk (*Buteo jamaicensis*), red winged blackbird (*Agelaius phoeniceus*), and song sparrow (*Melospiza melodia*). Mammal species at the site include house mouse (*Mus musculus*), muskrat (*Ondatra zibethicus*), Norway rat (*Rattus norvegicus*), raccoon (*Procyon lotor*), and southern red-backed vole (*Clethrionomys gapperi*).

2.3.3 Essential Fish Habitat

The Hudson-Raritan Estuary does provide Essential Fish Habitat as defined under the Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. 1801 et seq.) for a number of marine species, including red hake (*Urophycis chuss*), winter flounder (*Pseudopleuronectes americanus*), windowpane (*Scopthalmus aquosus*), Atlantic sea herring (*Clupea harengus*), bluefish (*Pomatomus saltatrix*), Atlantic butterfish (*Peprilus tricanthus*), Atlantic mackerel (*Scomber scombrus*), summer flounder (*Paralicthyes dentatus*), scup (*Stenotomus chrysops*), king mackerel (*Scomberomorus cavalla*), Spanish mackerel (*scomberomorus maculatus*), cobia (*Rachycentron canadum*), sandbar shark (*Carcharhinus plumbeus*), and black sea bass (*Centropristis striata*).

This project will not adversely affect any essential fish habitat (EFH) or federally managed species.

2.3.4 Historic and Cultural Resources

There are no historical or cultural resources listed within the proposed restoration site area. A study was conducted in 2005 by the Army Corp of Engineers with consultation from the State of New Jersey SHPO for the purpose of determining historic and cultural

impacts of the ACOE/PA wetland mitigation project adjacent to the NOAA/DEP site (Rakos 2005) APPENDIX E. The study encompassed the NOAA/DEP site and the surrounding wetland and areas of upland adjacent to the Port Reading Avenue road.

The study determined that a water-powered mill was located at Woodbridge Creek in the vicinity of Port Reading Avenue and constructed in colonial times and operated until the 19th century. Its exact location is not known but remnants are believed to exist below ground – possibly contained below the Port Reading road bed or adjacent within the right-of-way of the road. No other historic properties or artifacts were determined to have existed in the marsh project footprint. To date no artifacts have been uncovered or are suspected to exist within the marsh.

2.3.5 Sediment Quality

NJDEP Soil Cleanup Criteria.
Soils that exceed either the Residential or non-Residential Direct Contact Soil Cleanup Criteria are subject to the review and directive of the State of New Jersey Office of Dredging and Sediment Technology (ODST). Excavation, carting and disposal are carried out in a manner directed by ODST. Under an alternative that includes excavation of contaminated soils, the Trustees Project Manager will be directed by ODST to confine the excavated soils in a manner that protects the public from exposure. Final inspection must meet the approval of ODST.

Sediment sampling was conducted to characterize contaminants, grain size and percent moisture. Results were compared to NJDEP Soil Cleanup Criteria (See Appendix D Table 1). None of the samples analyzed exceeded NJDEP Impact to Groundwater Soil Cleanup Criteria (IGWSCC) for the compounds or elementals tested: Metals, Volatile and Semi-Organics, Pesticides, Herbicides and PCB's (See Appendix D Table 1). However, some samples did contain detectable levels of metals (inorganics) slightly exceeding both the Residential Direct Contact Soil Cleanup Criteria (RDSCC) and the Non-Residential Direct Contact Soil Cleanup Criteria (NRDSCC) (Table 2). Sample Locations were segregated into two categories. Nine samples taken at surface 6" in the proposed Preservation Area and nine samples were taken at proposed depth of excavation in the Restoration Area. The Restoration Area contains the soils proposed for excavation and so the test results are particularly important to the determination of disposal options.

Within the Preservation Area surface sediments the following metals slightly exceeded NJDEP Soil Criteria standards in at least one sample: Arsenic (RDSCC = 20.0 mg/kg, sample results (9) 17.8-119 mg/kg, mean = 45.9 mg/kg); Beryllium (RDSCC = 1.0 mg/kg, sample results (9) 0.5-1.5 mg/kg, mean = 1.0 mg/kg); Cadmium (RDSCC = 1.0, sample results (9)(*6ND) 0.93-1.1 mg/kg, mean=1.0 mg/kg); Copper (RDSCC = 600 mg/kg, sample results (9) 170.0-1880, mg/kg, mean = 643.6 mg/kg); Lead (RDSCC = 400 mg/kg, sample results (9) 126.0-490, mg/kg, mean = 262.6 mg/kg); Nickel (RDSCC = 250 mg/kg, sample results (9) 84.6-408.0, mg/kg, mean = 184.1 mg/kg); Thallium (RDSCC = 2.0 mg/kg, sample results (9)(*8ND) 10.1, mg/kg, mean = 10.1 mg/kg)

Arsenic, Beryllium, Cadmium, and Copper were the only metals slightly exceeding NJDEP soil criteria standards when assessed using means, with Cadmium going non-detected in six of the nine samples. With the exception of these four inorganic metals, all samples analyzed met or were below New Jersey Department of Environmental Protection Soil Disposal Criteria standards in the Preservation Area.

Within the Restoration Area surface sediments the following metals slightly exceeded NJDEP Soil Criteria standards in at least one sample: Arsenic (RDSCC = 20.0 mg/kg, sample results (9) 6.7.-74.1 mg/kg, mean = 41.3 mg/kg); Beryllium (RDSCC = 1.0 mg/kg, sample results (9) 0.61-1.6 mg/kg, mean = 0.9 mg/kg); and Cadmium (RDSCC = 1.0, sample results (9)(*7ND) 3.2-3.9 mg/kg, mean=1.0 mg/kg).

Arsenic and Cadmium were the only metals slightly exceeding NJDEP soil criteria standards when assessed using means with Cadmium going non-detected in seven of the nine samples. With the exception of these two inorganic metals, all samples analyzed met or were below New Jersey Department of Environmental Protection Soil Disposal Criteria standards in the Restoration Area.

*indicates number of samples with concentrations below the low detection limit (ND= no detect).

<u>The Sediment Quality Guideline (biological affects criteria)</u>.
Results were compared to the sediment quality guideline ERL (Effects Range Low) (Long and Morgan, 1990). Long and Morgan originally defined an ERL as the upper end of a range of concentrations where toxicity effects rarely would be observed. Later, Long et al. (1995) refined the definition to "concentrations below the ERL value represent a minimal-effects range…..in which effects would be rarely observed. Concentrations equal to and above the ERL, but below the ERM (Effects Range Median) represent a possible-effects range..." The mathematic definitions of ERLs and ERMs do not convey any predictive value. They are particular percentiles over a range of concentrations found to co-occur with toxicity but there is an overlapping concentration range without co-occurring effects. While it has been done, there is no basis for assuming that multiple concentrations above an ERL increase the probability of toxicity. It is important to clarify that an ERL is not a threshold. Rather, an ERL is simply a low point on a continuum of bulk chemical concentrations in sediment that roughly relate to sediment toxicity (O'Connor 2004). Although the ERL Sediment Quality Guideline is a useful tool in determining possible or probable sediment effects, it is not at this time, a regulatory requirement posed by any State, Federal or local agency.

A total of eighteen discreet sediment samples were taken at depths related to the restoration work proposed and tested for concentrations of Metals, Volatile and Semi-Organics, Pesticides, Herbicides and PCB's (See Appendix D Table 1). Sample Locations were segregated into two categories. Nine samples taken at surface (at surface 0'-0.5') in proposed Preservation Area and nine samples were taken at proposed depth of excavation in the Restoration Area (1.25'-2.0' below surface). The Restoration Area is where the excavation will take place and therefore it is important to determine if the action (exposing

a new sediment layer to the surface) will have possible, probable or unlikely effects on sediment dwelling organisms.

The results of the comparison show that concentrations of seven metals (Arsenic, Cadmium, Copper, Lead, Mercury, Nickel, and Zinc) enter the ERL in one or more samples across categories. Six of those metals, (Cadmium excluded) enter the ERM in one or more samples across categories. In general, the concentrations were higher in the surface of the Preservation Area than in the proposed depth of excavation in the Restoration Area.

All samples were pooled using means. Mean sediment concentration was obtained for the preservation area and also for the samples from the Restoration Area. Within the Preservation Area (area of no proposed work), there were two metals that produced means within the ERL and four metals appear in mean concentrations higher than the ERL (within the ERM). Results for the Preservation Area: Arsenic (ERL = 8.2-70 mg/kg, sampling mean = (9) 45.9 mg/kg); Copper (ERM = >270 mg/kg, sampling mean = (9) 643.6 mg/kg); Lead (ERM = > 218 mg/kg, sampling mean = (9) 262.6 mg/kg); Mercury (ERM = > 0.71 mg/kg, sampling mean = (9) 0.709 mg/kg); Nickel (ERM = > 52 mg/kg, sampling mean = (9) 184.1 mg/kg); and Zinc (ERL =150-410 mg/kg, sampling mean = (9) 345.1 mg/kg). Cadmium, fell below the effects range entirely (ERL =1.2-9.6 mg/kg, sampling mean = (9) (*6ND) 1.0 mg/kg).

Within the proposed Restoration Area, six metals fell within the ERL when using means. Only one metal, Nickel appears in mean concentration higher than the ERL (within the ERM). Results for the Restoration Area: Arsenic (ERL = 8.2-70 mg/kg, sampling mean = (9) 41.3 mg/kg); Cadmium (ERL =1.2-9.6 mg/kg, sampling mean = (9)(*7ND) 3.6 mg/kg); Copper (ERL = 34-270 mg/kg, sampling mean = (9)104.2 mg/kg); Lead (ERL = 47-218 mg/kg, sampling mean = (9)93.3 mg/kg); Mercury (ERL = 0.15-0.71 mg/kg, sampling mean = (9)(*1ND)0.2 mg/kg); Nickel (ERM = 21-52 mg/kg, sampling mean = 64.7 mg/kg); and Zinc (ERL = 150-410 mg/kg, sampling mean = (9)197.8 mg/kg).

The results appear to indicate that concentrations of metals are, in general, smaller at lower depth and greater at the surface, owing to prolonged exposure and sedimentation from creek sedimentation (water column) sources. It is clear that excavation to the proposed depth will not uncover concentrations higher than currently found at the surface. One metal, Nickel, greatly exceeds the lower ERM value in both the preservation and excavation area. This gives some evidence to reports of an historic metal pickling (plating) industry that occurred up creek only a short distance from the site. Nickel was widely used for plating at the time that the facility was said to operate in the 19th century and early 20th century. Concentrations at the surface are more than double those at the proposed depth.

*indicates number of samples with concentrations below the low detection limit (ND= no detect).

3.0 DESCRIPTION OF ALTERNATIVES

3.1 Restoration Goals

The Woodbridge Creek Wetland Restoration site has experienced a loss of multiple services and functionality. The Trustees analyzed the condition of the Woodbridge Creek Wetland Restoration Site and determined that it exhibits signs of degradation and would benefit from restoration.

To compensate for the loss of natural resources caused by the Exxon Bayway oil spill, the trustees have determined that it is necessary to create improved water quality, additional fisheries nursery and foraging habitat, increased shorebird habitat and improved public access to the New York and New Jersey shorelines. Woodbridge Creek was selected by the Trustees for this purpose because of the underlying disturbance that greatly impairs marine life function; and because the technology exists to repair the marsh to full function.

Losses of service and function within the project area include: restricted tidal hydrology flushing, loss of percent cover of *Spartina alterniflora* marsh grasses, loss of the aesthetic viewshed within the project site, and loss of fisheries, wildlife and shorebird breeding, nursery and forage habitat. Historic aerial photography revealed changes to the marsh system through several decades beginning with photos taken in the 1940's. The photographs demonstrate that a major change occurred sometime after 1970 and before 1975. For reasons that are not known, the creek was dredged and the spoils were side cast to the marsh surface, creating a berm that still today rings the site. This berm changed the way the tides interfaced with the marsh surface. Regular flow was all but restricted. This change of surface elevation and tidal restriction led to a change in the vegetation community. Common Reed Grass, *Phragmites australis,* is a tall grass known to Eurasia and is now colonized throughout much of the temperate regions of the globe. Phragmites is known to colonize areas of disturbance. The berm formed by the side cast dredging created the opportunity for Phragmites to occupy the area of disturbance. The berm created a barrier for fish to utilize the marsh and the introduction and rapid spread of Phragmites further limited its use by fish and other wildlife.

In the next three decades Phragmites grew dense and out-competed the native grasses which formerly supported salt marsh life. As the Phragmites grew dense it also expanded its range. Wherever it expanded its range it also generated a thick mat of dead stems which were slow to decay. In time, the stem mat and sediment helped to increase the elevation of the marsh, further restricting the tides from flowing into the interior of the patch. Recognizing that the underlying catalyst for the marsh loss was the creation of the berm and that Phragmites dominance was an indicator of the underlying problem, we moved to address the underlying problem that is the tidal restriction. In this effort it is important to note that Phragmites growth can be restricted or eliminated by the re-introduction of regular tides and the increased salinity that comes with it.

The CERCLA natural resource damage assessment regulations (43 CFR Part 11 Section 11.82) require that Trustees develop a reasonable range of alternatives to restore, replace, or acquire the equivalent of the injured natural resources and then identify the preferred alternatives based on the ten criteria listed in the regulations. The Trustees identified and evaluated four possible restoration alternatives, including the no action alternative.

To comply with the requirements of NEPA, the Trustees analyzed the effects of each alternative on the quality of the human environment. The National Environmental Policy Act's implementing regulations direct federal agencies to evaluate the potential significance of proposed actions by considering both context and intensity. For the actions proposed in this Draft EA, the appropriate context for considering potential significance of the actions is local, as opposed to national or worldwide.

In the following sections the preferred and non-preferred restoration alternatives for the affected natural resources and natural resource services are presented and discussed.

3.2 **Alternatives Considered** and Evaluation Criteria

Each of the four alternatives was considered based on functional services provided, technical feasibility, regulatory consistency and cost effectiveness. Key physical factors must be met, in particular, tidal hydrology and salinity in order to achieve functional services. The Oil Spill Trustees secured the services of Najarian Associates to characterize the tide and salinity regimes of the Woodbridge Creek as it affects the project site, and to estimate the change of these regimes as a result of the proposed physical alterations to the site (Najarian Associates 2001). To achieve these goals salinity and tide data were collected on and around the site and analyzed. These data were used to calibrate and verify a mathematical model for the Creek system. The type of model was selected for the project to satisfy the desired study objectives. The model was capable of simulating relevant hydrodynamic and salt transport processes, was well documented and validated in previous model studies and capable of simulating complex creek channel morphology. Based on these criteria the Trustees selected the use of the RMA-2/RMA-4 mathematical models. The RMA-2 is a two-dimensional, time-varying, finite-element, hydrodynamic model. The RMA-4 is a companion, two-dimensional, finite-element water quality model. The results of the field monitoring for salinity and tide fluctuations were computed in the models and were validated and calibrated for the Woodbridge Creek restoration site. These final models were then run to determine the potential impacts of three alternatives (Alternative 4 presents no hydrological difference from Alternative 3), including the No Action alternative (Najarian Associates 2001).

3.2.1 ALTERNATIVE 1: No Action

NEPA requires the Trustees to evaluate the "no-action" alternative. Under Alternative 1, No Action, the Trustees would not take any direct action to restore habitats for fish and

wildlife or to address lost habitats in the Arthur Kill watershed associated with the oiling incidents. No habitat restoration activities would occur on-site and no long-term monitoring would be performed using Harbor Oil Spill Trustee funds. The no-action alternative is essentially the same as an alternative to allow natural recovery to occur services to full function over time.

The Trustees have determined that natural recovery is appropriate as primary restoration but the no action alternative is rejected for compensatory restoration. Losses were, and continue to be, suffered during the period of recovery from this spill. Bergen, et al 2000 determined that natural time of recovery of tidal grasses (marsh structure) in the spill zone greatly exceeded the time required under human intervention and that in seven years post-spill the marshes had yet to exhibit any significant signs of natural recovery or signs of return of lost function. Restored vegetation either met or exceeded parameters of growth of natural "pristine" vegetation within one season of growth. Further, the NYC Natural Resources Group Restoration Team reports the return of fish and avian habitat function, primarily foraging, within one year of restoration of the vegetation (Bergen, et al 2000). Technically feasible and cost-effective alternatives exist to compensate for losses.

3.2.1.1 Description of Environmental Impacts

The No Action Alternative provides no significant positive benefits to the Woodbridge Creek restoration site, to the Woodbridge Creek system as a whole, and does not adequately address the goals and purpose of the restoration project as identified. Without manipulation of the site through direct restoration practices, time-lapse aerial photography of the site indicates that a particular species of grass, *Phragmites australis* considered a nuisance species for its ability to form a basil thatch thus raising marsh elevation and limiting fish access and foraging opportunity, will continue to expand, potentially reducing viable fisheries and wildlife habitat. The No Action alternative would not provide any significant ecological benefits to fish and wildlife within the project area, and would not contribute to improved ecological conditions in the adjacent Woodbridge Creek and Arthur Kill complex. Alternative 1 would not require the use of disposal area and so no disruption of the existing upland or its vegetation would occur. However, the contaminants found in both the salt marsh and the upland would remain in place and in contact with the surface, rather than contained and capped. The area would remain subject to infrequent tidal flushing, thus maintaining the slow pace of contaminant cycling and return. Storage of contaminants is greater in Phragmites than in tidal marsh plant species. Phragmites provides long term storage and uptake of nutrient and contaminants within plant root and rhizome and above ground leaf (Windham, L., J.S. Weis, and P.Weis 2003). Not only does Phragmites return contaminants slower to the system but also nutrients as well. Marine organisms would continue to have minimal contact with the degraded area. Organisms with limited contact with plant communities seek the fringes of the tidal creeks for services, e.g. for protection, foraging and breeding. Of a minor positive consequence, the minimal contact with the interior by marine organisms also provides limited access to the contaminated soils with concentrations in the low effects range.

3.2.1.2 Socioeconomic and Cumulative Impacts

There would be no significant socioeconomic or cumulative impacts under the No Action Alternative. Without restoration, however, additional view sheds will not be enhanced, the nuisance mosquito populations will not be reduced and no additional recreational opportunities through bird watching, environmental education or improved fishing would occur. No significant cumulative or socioeconomic impacts would result from this alternative.

3.2.2 ALTERNATIVE 2: Tidal Wetland Enhancement (Dike Breaching)

The model assessed two of the three construction design alternatives (the fourth alternative is essentially the same as Alternative 3 in terms of hydrology). The first scenario involves breaching the dike in selected locations, but leaving the majority of the dikes in place on-site, creating a central channel, and re-grading all existing *Phragmites* covered areas (elevations of between 3'-5' NAVD 88) down to low marsh elevations (2'-2.8' (NAVD 88). Construction is expected to be completed within three months from the initial start date. A temporary construction storage area, and an access and haul road will be constructed at the north and south of the project site to accommodate trucks and excavators. Prior to excavation, NOAA Restoration Center and NJDEP staff will stake out "areas to be preserved", and identify the limits of grading. Silt fencing will be trenched in to reduce impacts to water quality due to sediment erosion, and will be removed following the completion of planting.

3.2.2.1 Description of Environmental Impacts

Alternative 2 does offer habitat for fish and birds and would likely attract increased activity. Limited tidal exchange would occur in the high marsh, however access time to marsh vegetation by fish would be limited to the highest tidal periods. The impacts of this Alternative would result in greater open water habitat via the central channel, less low marsh habitat, a greater amount of high marsh habitat giving greater opportunity for re-invasion by *Phragmites* and higher base elevations for low marsh vegetative plantings. The storage of tidal water on-site during a natural flushing action is less than that of Alternative 3, but more than Alternative 1. The footprint of the disposal area would be reduced from alternative 3 and the mound created would be less high and less steeply sloped. Erosion would be decreased over Alternative 3. The footprint of the disposal area would decrease from 1.9 acres, required for Alternative 3, down to <1.5 acres and no taking of existing wetland would be required for the disposal mound. By leaving behind a large portion of the berms, the potential for re-colonization of *Phragmites* into the restored site remains a threat to project success.

3.2.2.2 Socioeconomic and Cumulative Impacts

This Alternative would provide benefits to the view sheds associated with this project, although the longevity of the view could not be guaranteed due to the high potential of re-colonization by *Phragmites*. The potential for use of the site for environmental education and the increased wildlife and fisheries benefits would also be elevated from that of the status quo, but would not be guaranteed for the same reasons.

3.2.3 ALTERNATIVE 3: Tidal Wetland Enhancement (Dike Removal) – Preferred

This scenario was modeled to show the full and complete removal of the dikes, and reduction of the majority of the marsh surface to low marsh elevations of between 1.5' and 2.5' NAVD. Approximately 23,104 cubic yards of organic and inorganic sediment material will be excavated and disposed of on-site in accordance with NJ Department of Environmental Protection Office of Dredging and Sediment Technology decision to require a confined disposal facility for placement of materials. Construction is expected to be completed within three months from the initial start date. The Materials Placement Containment is an area of 1.9 acres and the Marsh Restoration is 17.5 acres including the preservation area (Figure 4 – General Plan). A temporary construction storage area, and an access and haul road will be constructed at the north descending from the Materials Placement Area into the Marsh Restoration Area in order to accommodate trucks and excavators. Prior to excavation, NOAA Restoration Center and NJDEP staff will stake out "areas to be preserved", and identify the limits of grading. Silt fencing will be trenched in to reduce impacts to water quality due to sediment erosion, and will be removed following the completion of planting.

The construction area will be de-watered and the five identified outlets through existing berms into the Woodbridge Creek on the west and Cove Creek on the east will be temporarily filled. A temporary drainage system, consisting of corrugated PVC pipe with a tide gate will be installed to allow positive drainage from the marsh surface out to the creeks. The purpose of this drainage is to enable construction to occur within the marsh plain without the influence of daily tidal inundation to better facilitate restoration operations, and to reduce the likelihood of sediment discharges into the streams. These drainage systems will be removed following the completion of excavation and the removal of the berms.

Planting shall occur following the completion of construction. Jute mats and netting will be used to stabilize plantings and seeding, and to reduce the effects of erosion from loose sediments. Planting shall include *Spartina alterniflora, Scirpus maritima, Scirpus americana* plugs applied at low elevations (0.8.-2.0 5' NAVD). *Juncus gerardii, Spartina patens*, and *Spartina cynosuroides* plugs will be planted in the high marsh elevation (2.0'-3. 5' NAVD 88). Planting shall occur between April 1 and June 31, and will include the installation of a goose deterrence fencing system.

The excavated materials; soil, roots and leaf litter along with other miscellaneous debris

that may be found, will be hauled to the northern end of the site below the Saints Field Parking lot where the Materials Placement Containment Area will be constructed to contain the excavated materials. The earthen constructed berm is not a temporary placement facility for de-watering but rather a permanent resting location for the materials. The facility is to be constructed according to guidelines set forth by the State of New Jersey, Department of Environmental Protection Office of Dredging and Sediment Technology NJAC 7:26E Technical Requirements for Site Remediation. Under the guidelines set forth in the regulations, the Trustees will provide a clean fill cap over the material, smooth grade the mounds and plant with a variety of native plant material for a safe as well as aesthetically appealing final presentation. The area to be used for confinement also contains some instances metal contamination exceeding Residential levels. The Project Manager has been instructed to isolate the contaminated soils within a containment wall constructed of clean earthen materials. Upon completion of excavation and dewatering, the materials will be capped with 2.0 feet of clean fill. The Project Plans and Specifications direct the contractor to prepare this disposal site, fill it with the wet soil excavate and cap.

The removal of the dikes coupled with the lower elevation reduces the likelihood for *Phragmites* re-colonization and increases low marsh acreage. The environmental impacts associated with this Alternative include the direct increase of fish and wildlife habitat, improved view sheds in the project area, and a reduction in nuisance mosquito habitat (fresh water ponds and pockets).

The viewshed associated with the project site will be enhanced, nuisance mosquito populations will be reduced and additional recreational opportunities through bird watching, environmental education or improved fishing would occur.

3.2.3.1 Description of Environmental Impacts

Air Quality Impacts

Minor amounts of carbon monoxide or other pollutants associated with heavy machinery may be temporarily associated with the proposed activities on-site during the construction phase. Construction activities should have no long-term air quality impacts on the site or surrounding environment.

Water Quality

A temporary increase in turbidity is expected during construction, and will be timed (through best management practices and a time-of-year restriction) to occur during periods of reduced or non-critical usage by fisheries resources. Excavation of the marsh surface will create a temporary increase in suspended solids and turbidity, resulting in a reduction of water quality and decrease in dissolved oxygen and light penetration of the Woodbridge Creek during construction. This project is anticipated to have no long-term negative water quality impacts. Mitigation to prevent water-quality impacts will include the use of best

management practices and sediment erosion control to minimize or prevent sediments from entering the water column. The Trustees also coordinated with the Freehold Soil and Water Conservation District staff to secure advisement on erosion control and subsequent regulatory approval.

Water Carrying Impacts (Hydrology)

Hydrology & Hydrodynamics modeling was conducted by the ACOE. The model performed a test of two major scenarios; one with the inclusion of both the Trustees and the adjacent ACOE/PA project to final constructed elevation; and another with only the ACOE project completed to final constructed elevation.

The tidal datum information was used to develop the design elevations for the low marsh and high marsh planting zones. The hydrodynamic analyses presented were then used to design and evaluate the effectiveness of the restoration design in terms of inundation and draining efficiency. Model simulations predicted the magnitude of the velocities n the proposed conditions determined by the model were not much higher than the existing conditions.

The hydrodynamic analysis, performed using the RMA-2 model, showed that the marsh plain and channel network design allows for proper inundation and drainage of the site as the tide floods and ebbs. That is the inundation criteria have been met for the site.

The simulations also showed that the current opening at Port Reading Avenue (at the bridge) does not significantly constrict the flow (both for flooding or ebbing). Furthermore, there was no back up water with proper flow attenuation throughout the model area (Louis Berger Group, 2005).

Sediment Quality Impacts

Existing sediment characteristics on the project site include coarse, granular material, silty clays and historic peat providing some benefit to multiple low marsh plant species. Following excavation to the specified depth, peat material and sands, which promote healthy low marsh species, should be exposed to tidal flushing.

This alternative proposes to reduce sediment quality impacts through the implementation of a Sediment Control System, a Confined Materials Placement System and a Toxicological/Chemical Monitoring Plan and Adaptive Management Plan.

<u>Sediment Control System</u>
Sediment transport will be minimized during construction so as not have an adverse impact on the environment and the surrounding ecosystem. All construction activities will be implemented using Best Management Practices (BMP's), turbidity curtains, and silt fences to prevent any adverse impacts. Further impacts will be mitigated by the planting of marsh vegetation. The specified planting of a suite of marsh vegetation including *Spartina alterniflora* is a preferred biological means of sediment stabilization. Marsh grasses

vegetation can grow to full height and density within a single growing season. Planting is scheduled to occur during the early spring in order to facilitate peak growth in a single season.

Confined Materials Placement System

Existing sediment quality meets or is below Impact to Groundwater Soil Cleanup Criteria (IGWSCC) standards. Arsenic and Cadmium were the only metals slightly exceeding NJDEP Residential Direct Contact Soil Cleanup Criteria (RDCSCC) and the Non-Residential Direct Contact Soil Cleanup Criteria (NRDCSCC) standards when assessed using means. Cadmium only exceeded the standard in two samples, while the remaining seven had concentrations lower than the detection limit and below the Residential criteria. Arsenic concentrations pose the greatest re-exposure risk if sediment is allowed to be placed in direct contact with human populations therefore the materials placement area shall be constructed in accordance with guidelines set forth by NJDEP. With the exception of these inorganic metals, all samples analyzed met or were below New Jersey Department of Environmental Protection (NJDEP) soil criteria standards.

The Materials Placement Facility will require the use of a 1.9 acre footprint in an upland area adjacent to the Saints Field Parking Lot. This footprint will be prepared by stripping and clearing of all existing vegetation, excavating a pit (some of the excavated clean soils will temporarily be set to the side for later use as capping material, with some of the material used as side walls for the disposal area. The clean cap material shall be placed at a depth of no less than 2.0ft thickness.

The site is currently classified as Emergent Woodland (where trees form clusters) and or Shrub/Scrub (where trees are small and less dense and vegetation is primarily shrubby or weedy). This area contains a variety of field plants, early succession trees and also non-native garden and lawn escapees. Its value is somewhat limited by the obvious disturbances that have occurred in the past. It itself is a fill earth waste site of unknown origin. To mitigate for the loss of this urban green island, the project team will vegetate the entire footprint with a selection of native warm season grasses and shrubs dominated by Panic grass, Groundsel Bush and Gray Birch so that ultimately the site will retain its function as a green upland island and visual screen between the recreational fields and adjacent uses. The immediate effects will be the loss of the greenery, shade, wildlife value during construction followed by a few years of limited growth culminating in the reformation of the green island after a predicted five to ten year period.

Removal of the wet sediment to the approved upland location and the re-establishing of the native low marsh condition will result in an overall beneficial impact to fisheries and wildlife habitats and to the surrounding ecosystem. The Confined Placement Facility is designed to remove potentially harmful sediment from contact with humans and wildlife. Migration or transport of those sediments will be mitigated by the construction of the clean cap over the entire surface. The Placement area will contain slopes of 5:1 up to 3:1. Slopes increase the likelihood of sediment erosion and migration from the clean cap, but in an amount unlikely to render the cap ineffective. Planting of native species of grasses, shrubs and trees on the cap surface and slopes will mitigate potential sediment transport

down slope. Some transport of clean cap material is anticipated to fan into the marsh below, especially in the interim period from establishment of the placement area until maturity of the vegetation. Final cover will consist of clean sands/sandy loam and therefore contaminant transport is not a concern. To mitigate against that impact, the silt curtain shall remain in place until which time the seeded and planted vegetation provides mature vegetative cover.

Toxicological/Chemical Monitoring Plan and Adaptive Management Plan

Possible adverse effects could result from the exposure of any contaminant that occurs in concentrations known to have possible or probable toxicological effects in sediment dwelling organisms. The project team has determined to minimize human contact with excavated materials with the use of a Confined Materials Placement Site. In order to minimize possible adverse affects posed to wildlife caused by residual contaminants in the Restoration Area the team first determined to quantify those residual concentrations and determine their effects level. Sediment sample results were compared to the sediment quality guideline ERL (Effects Range Low)/ERM Effects Range Median developed by Long and Morgan, National Oceanic Atmospheric Administration, published in 1990 and revised in 1995.

The Restoration Area is where the excavation will take place and therefore it is important to determine if the action (exposing a new sediment layer to the surface) will have possible, probable or unlikely effects on sediment dwelling organisms.

The results of the comparison (Presented in Section 2.3.5) show that mean concentrations of seven metals (Arsenic, Cadmium, Copper, Lead, Mercury, Nickel, and Zinc) are within the Effects Range Low in samples taken from the proposed restoration surface (1.25’-2.0 below existing surface). Concentrations in this range are associated with possible adverse effects on sediment dwelling organisms.

The results appear to indicate that concentrations of metals are, in general, smaller at lower depth and greater at the surface, owing to prolonged exposure and sedimentation from creek sedimentation (water column) sources. It is clear that excavation to the proposed depth will not uncover concentrations higher than currently found at the surface. In other words, the background levels exceed those of the proposed marsh.

Adverse effects in the low range are considered “possible” as opposed to “probable” or “highly likely”. Total avoidance of risk is presented in Alternative 4. For this alternative and for Alternative 4 we assumed the risk to be low as demonstrated by the ERL/ERM comparison. For Alternative 3 however, we propose not to eliminate the risk altogether but rather to monitor the actual effects of residual metals in the post restoration condition. Biological effects monitoring is more complex and costly than the standard project success monitoring that is used to determine satisfactory attainment of the State of New Jersey structural success criteria standard (vegetated cover of 85% or greater). In order to determine adverse/non-adverse effects on sediment dwelling and sediment feeding organisms both a monitoring plan and a success criteria need to be developed prior to the project construction. This will allow time to collect pre-restoration baseline condition data.

The project team has determined that the Toxicological/Chemical Monitoring Plan will provide the essential tools to examine and determine quantitatively and qualitatively whether adverse affects do occur. The study results of the Monitoring Plan at the completion of a five-year post- restoration monitoring period will determine whether further action is required to mitigate for any adverse effects that do occur. Should the results show that the residual sediment concentrations have significant adverse effects; the project team is prepared to initiate the completion of an Adaptive Management Plan in order to solve for those adverse effects (Weinstein, et al 1997). The Adaptive Management Plan will follow a process that will determine what additional courses of action are available and will select a chosen alternative from those available actions.

A financial approach/mechanism has been determined for implementing these commitments. The Trustees will fund the proposed Toxicological/Chemical Monitoring Study and any physical alterations required by the Adaptive Management Plan with settlement funds; and will fund corrective actions as necessary based on the results.

Vegetation Impacts

The project will have no adverse impacts on low marsh or transitional high marsh vegetation. It is expected that excavation of this site will increase the duration and frequency of tidal inundation and develop more favorable conditions for the spread of typical low marsh species (*Spartina alterniflora*, etc) and that this transformation will produce benefits to the vegetative community as well as to wildlife. The establishment of low marsh will radically alter the species dominance but will not significantly affect the diversity of species. The project creates a condition in the low marsh that is favorable to *Spartina* species over *Phragmites australis; which* will be reduced significantly but not entirely eradicated. Sufficient cover of *Phragmites* at the edges of the project transition zones will provide nesting opportunity for passerine birds which favor it for nesting and cover. This brief list is known to include Marsh wren, Red-winged Blackbird and Swamp Sparrow, of which the former two are known to currently use the site for nesting. Positive impacts of the *Spartina alterniflora* dominated wetland include increased fisheries productivity and benefits to resident estuarine fish such as Mummichog and Striped Killifish. Positive impacts will be made to avian species and guilds which are fisheries dependent such as wading birds, gulls, terns and ospreys. Increased production of small resident fish will have positive off site impacts towards larger fish such as Bluefish and Striped Bass which are dependent on small prey.

3.2.3.2 Description of Socioeconomic Impacts

Aesthetics Impacts

Short-term adverse impacts to the aesthetic and scenic resources within the Project area will be minor. Aesthetic values will be reduced temporarily during the construction phase

due to the presence of construction equipment and vehicles as well as due to the construction process. Positive impacts on aesthetics will result from the implementation of the preferred alternative. Unobstructed views of the Woodbridge Creek, Wedgewood Brook and Cove Creek will be available following the removal of dense stands of *Phragmites australis*, which currently reduce visibility to the center of project site. In addition, native plantings in the project area would increase the aesthetics and scenic values of the site.

Noise Impacts

There would be a minor increase in noise levels associated with construction in the immediate project area due to the increase in vehicular and machinery traffic. These impacts are anticipated to be minimal, short-term and limited to active periods of construction between sunrise and sunset. There are no long-term noise impacts associated with this project as proposed.

Recreational Impacts

Current recreational use of the site is limited to the exterior perimeter due to the dense monotypic stands of *Phragmites australis*. Therefore, during construction there will be no loss of recreational opportunities. Following construction, the project area and Woodbridge Creek may provide additional benefits of passive recreational uses; however, the current plan implies no additional recreational access as a component of the proposed project.

Transportation Impacts

Temporary minor impacts to land based transportation in the project area is expected during the construction phase. A staging area has been designated in the Saint's Field Parking lot. These impacts are expected to be minimal, short-term and limited to the periods of active construction, between sunrise and sunset. On-site movement of excavated material from the restoration area to the de-watering and staging areas will be accomplished through heavy machinery. Any temporary filling required to stabilize the pathway for equipment movement on-site will provide minor temporary impacts and will be remedied following construction. All services are contained on-site. Trucks and excavators will transport and haul loads entirely within the site. Vehicles will not require use of the service roads except in instances of carting containers of debris and tires wherever they are encountered. These will be sent to waste receiving stations. Vehicles leaving or returning to the job site will do so only for reasons of routine maintenance and servicing, transport to other facilities (home office) not directly related to this job. These are considered minor or no impact.

3.2.3.3 Threatened/Endangered Species and Critical Habitat Impacts

No Federally listed rare, threatened or endangered species are known to occur within the proposed project area. However, the state endangered northern harrier (*Circus cyaneus*) has been sighted in the vicinity of the project area. While no historic breeding activity is

confirmed at the site, a timing restriction of April 1 through June 30 on excavation in wetlands has been imposed by the Fish & Wildlife Coordination Act consultation in order to minimize any possible disturbance.

3.2.3.4 Fish and Wildlife Habitat Impacts

Finfish species found in the Arthur Kill and Woodbridge Creek are consistent with that expected in a tidal creek and marsh system in coastal New Jersey (USACE 1998, USFWS 1997). Fish populations found in and around the project site are composed of freshwater, marine and diadromous species. Species include alewife (*Alosa pseudoharengus*), American eel (*Anguilla rostrata*), atlantic menhaden (*Brevoortia tyrannus*), atlantic needlefish (*Strongylura marina*), bay anchovy (*Anchoa mitchilli*), bluefish (*Pomatomus saltatrix*), blueback herring (*Alosa aestivalis*), catfish (*Ameirus nebulosus* and *A. catus*), mummichog (*Fundulus heteroclitus*), pumpkinseed (*Lepomis gibbosus*), striped bass (*Morone saxatilis*), striped killifish (*Fundulus majalis*), summer flounder (*Paralichthys dentatus*), weakfish (*Cynoscion regalis*), white perch (*Morone americana*), and winter flounder (*Pseudopleuronectes americana*).

Shellfish species found in and around the project site include Blue crabs (*Callinectes sapidus*), fiddler crabs (Uca spp.), grass shrimp (*Palaemonetes pugio*), ribbed mussels (*Geukensia demissa*), and mud crab (*Rhithropanoepus harrisii*).

Restoration activities associated with this project will not adversely impact or curtail any naturally occurring aquatic life movement; however the project will improve the capability of aquatic organism use within the system. No construction activities shall occur directly adjacent to the creek during potential periods of migratory fish usage. In order to comply with NMFS recommendations, no activity resulting in discharges will occur in or directly adjacent to the creek-side of the creek bank during the period of potential fish migration or spawning, including the period from April 1 through June 30.

3.2.3.5 Essential Fish Habitat (EFH) Impacts

This proposed restoration is occurring in areas that are designated as Essential Fish Habitat (EFH), as determined by the National Marine Fisheries Service.

The Trustees conclude, based on informal consultation with the NOAA Habitat Conservation Officer, that the Hudson-Raritan Estuary does provide Essential Fish Habitat (EFH) as defined under the Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. 1801 et seq.) for a number of marine species including red hake (*Urophycis chuss*), winter flounder (*Pseudopleuronectes americanus*), windowpane (*Scopthalmus aquosus*), Atlantic sea herring (*Clupea harengus*), bluefish (*Pomatomus saltatrix*), Atlantic butterfish (*Peprilus tricanthus*), Atlantic mackerel (*Scomber scombrus*), Summer flounder (*Paralicthyes dentatus*), scup (*Stenotomus chrysops*), king mackerel (*Scomberomorus cavalla*), Spanish mackerel (*scomberomorus maculatus*), cobia (*Rachycentron canadum*), sandbar shark (*Carcharhinus plumbeus*), and black sea bass

(*Centropristis striata*). However, due to environmental and specific habitat requirements, the following species are excluded from Essential Fish Habitat consultation for this project: Atlantic sea herring (*Clupea harengus*), Atlantic butterfish (*Peprilus tricanthus*), Atlantic mackerel (*Scomber scombrus*), Summer flounder (*Paralicthyes dentatus*), scup (*Stenotomus chrysops*), king mackerel (*Scomberomorus cavalla*), Spanish mackerel (*scomberomorus maculatus*), cobia (*Rachycentron canadum*), sandbar shark (*Carcharhinus plumbeus*), black sea bass (*Centropristis striata*), and bluefish (*Pomatomus saltatrix*).

Impacts to red hake (*Urophycis chuss*), winter flounder (*Pseudopleuronectes americanus*), and windowpane (*Scopthalmus aquosus*) will be avoided/mitigated by the use of Best Management Practices (BMP's). The use of BMP's shall include installation of erosion mats, turbidity curtains, and the implementation of time-frame construction avoidance windows. Voluntarily, no construction activities shall occur directly adjacent to the creek during potential periods of anadromous fish usage. NMFS recommendations regarding Essential Fish Habitat do not restrict activity, however no activity resulting in discharges will occur in or directly adjacent to the creek-side of the creek bank during the period of potential fish migration or spawning, including the period from April 1 through June 30. Any foreseeable disturbance would be temporary in nature and will be limited by implementation of BMP's onsite.

While there may be some temporary, short-term impacts to EFH, there will not be any long-term adverse effects on Essential Fish Habitat. The Trustees believe that the restoration as proposed will not adversely impact, but should enhance the quality of the EFH in this area in the long-term (See informal EFH consultation: Appendix B).

3.2.3.6. Historic and Cultural Impacts

This project will not adversely impact any known historical or cultural resources. The ACOE led study and the NJSHPO consultation determined that any historic artifacts of the 19th century mill, if they still exist, are well outside the boundaries or impacts of this project. We conclude that the project will cause no disturbance to the area within the Port Reading right-of-way that may contain relics and remains of the former mill.

3.2.3.7 Cumulative Impacts

The comprehensive restoration of the Woodbridge Creek is a priority of the Trustees, the Harbor Estuary Program, the Woodbridge Town Administration, and of citizens groups at large. The completion of this project would be invaluable to the creek system, and should assist in promoting similar projects within the watershed.

The Army Corps of Engineers is also planning a wetland restoration project just northwest of the proposed Woodbridge Creek Wetland Restoration Site. The ACOE project aims to restore a small parcel of degraded, *Phragmites*-dominated marsh to low Spartina salt-

marsh, similar to the proposed project. These two projects will greatly and collectively help to accomplish the comprehensive restoration of the Woodbridge Creek system.

The intertidal habitat as proposed in this project should have a positive impact on the adjacent marshland and creek system. The project should promote the abundance and diversity of fish and wildlife species in and around the project site, increased water quality, enhance the viewshed, provide additional environmental education opportunities and reduce nuisance mosquito populations in the area. No work related to this project is anticipated to have negative impacts on adjacent lands or natural resources. Short-term impacts during construction will be temporary and non-invasive. Positive impacts associated with the proposed restoration include the reduction in nuisance mosquito populations, an enhanced viewshed, improvements to local surface water quality, and an increase in the abundance and diversity of fish and wildlife.

The Hydrology & Hydrodynamics modeling that was conducted by the ACOE concluded with no significant negative impacts to flooding would occur due to this project. There was no finding of adverse flooding conditions resulting from the project. The study concluded that no additional flooding hazard would be encouraged by the project.

The hydrodynamic analyses presented were used to design and evaluate the effectiveness of the restoration design in terms of inundation and draining efficiency. Model simulations predicted the magnitude of the velocities in the proposed conditions determined by the model were not much higher than the existing conditions.

The hydrodynamic analysis, performed using the RMA-2 model, showed that the marsh plain and channel network design allows for proper inundation and drainage of the site as the tide floods and ebbs. That is, the inundation criteria have been met for the site.

The simulations also showed that the current opening at Port Reading Avenue (at the bridge) does not significantly constrict the flow (both for flooding or ebbing). Furthermore, there was no back up water with proper flow attenuation throughout the model area (Louis Berger Group, 2005).

3.2.4 ALTERNATIVE 4: Tidal Wetland Enhancement (Dike Removal. Clean Capping) – non-preferred.

This scenario was modeled to show the full and complete removal of the dikes, and reduction of the majority of the marsh surface to elevations between 1.5’ and 2.5’ NAVD followed by planting as described in Alternative 3. Alternative 4 differs from Alternative 3 in one regard; this alternative seeks to eliminate risk of possible biological effects posed by residual sediment contaminants. To do so the entire marsh surface within the Restoration Area will be over excavated to a depth of 0.5’ below the proposed final grade. The over excavated materials shall be placed within the Confined Materials Placement Area and the marsh surface is to be returned to grade via a 0.5’ clean sand cap before planting. An additional volume of 10,500 cubic yards will be added to the approximately

23,104 cubic yards of organic and inorganic sediment material that was already planned for excavation in Alternative 3. The material will be excavated and disposed of on-site in accordance with NJ Department of Environmental Protection Office of Dredging and Sediment Technology decision to require a confined disposal facility for placement of materials. The original 1.9 acre footprint will be supplemented by an additional Confined Materials Placement Facility to the South of Port Reading Avenue on newly acquired Township Lands (the former NJ Turnpike parcel). Construction is expected to be completed within five months from the initial start date (two additional months beyond Alternative 3 are required for placement and settling of clean fill). The site is divided into the two Materials Placement Containment Areas and the Marsh Restoration (Figure 5). As with Alternative 3, a temporary construction storage area, and an access and haul road will be constructed at the north descending from the Materials Placement Area into the Marsh Restoration Area in order to accommodate trucks and excavators. Prior to excavation, NOAA Restoration Center and NJDEP staff will stake out "areas to be preserved", and identify the limits of grading. Silt fencing will be trenched in to reduce impacts to water quality due to sediment erosion, and will be removed following the completion of planting.

All parameters of construction remain similar to those of Alternative 3 with the exception of those services that are associated with the over-excavation and clean-fill operations. All restoration services remain the same as Alternative 3 unless otherwise noted.

- Temporary Drainage Systems (systems enhanced to accommodate increased depth of excavation)
- Sediment Control Systems (systems enhanced to accommodate increased depth of excavation)
- Excavation of Berms and Marsh Surface (0.5' additional elevation of removal)
- Removal of Materials to Confined Disposal Areas (addition of one new facility)
- Clean-capping of Marsh surfaces (10,500 cubic yards of clean sand are required to be trucked and placed)
- Planting (plantings at 2.0" greater depth in loose materials)

All benefits will remain similar to Alternative 3 with the one major exception being the reduction in risk associated with exposed residual contaminants.

- Enhanced viewshed
- Nuisance mosquito control
- Fish and bird habitat improvements
- Recreational Benefits (bird watching, environmental education or improved fishing would occur)

3.2.4.1 Description of Environmental Impacts

Air Quality Impacts

Minor increases in the amounts of carbon monoxide or other pollutants associated with

heavy machinery over Alternative 3 may be temporarily associated with the proposed activities on-site during the construction phase. The clean cap will require increased trucking activity to and from the site. Activities will take place over an additional two months beyond that proposed in Alternative 3. Construction activities should have no long-term air quality impacts on the site or surrounding environment.

Water Quality

As per Alternative 3, a temporary increase in turbidity is expected during construction, and will be timed (through best management practices and a time-of-year restriction) to occur during periods of reduced or non-critical usage by fisheries resources. This project is anticipated to have no long-term negative water quality impacts. Mitigation to prevent water-quality impacts will include the use of best management practices and sediment erosion control to minimize or prevent sediments from entering the water column. The Trustees also coordinated with the Freehold Soil and Water Conservation District staff on erosion control and subsequent regulatory approval.

Water Carrying Impacts (Hydrology)

Over-excavation creates a very temporary condition whereby the basin of the marsh is deeper and can receive additional water volume until the clean cap can be placed. Once the cap is in place, the marsh will equal the physical parameters of Alternative 3. At this point the tidal hydrology will be equivalent of the Alternative 3 scenario described in the ACOE commissioned Hydrology & Hydrodynamics study.

Model simulations predicted the magnitude of the velocities in the proposed conditions determined by the model were not much higher than the existing conditions.
The hydrodynamic analysis, performed using the RMA-2 model, showed that the marsh plain and channel network design allows for proper inundation and drainage of the site as the tide floods and ebbs. That is, the inundation criteria have been met for the site.

The simulations also showed that the current opening at Port Reading Avenue (at the bridge) does not significantly constrict the flow (both for flooding or ebbing). Furthermore, there was no back up water with proper flow attenuation throughout the model area (Louis Berger Group, 2005).

Sediment Quality Impacts

Existing sediment characteristics on the project site include coarse, granular material, silty clays and historic peat providing some benefit to multiple low marsh plant species. Following excavation to the specified over excavated depth, the marsh surface will be backfilled and fine graded with sand/sand loam which will promote healthy low marsh species.

This alternative proposes to reduce sediment quality impacts through the same implementation of a Sediment Control System and Confined Materials Placement System

as found in Alternative 3. With the addition of a clean fill cap, Alternative 4 prevents sediment surface contact with any residual contaminant. Therefore this alternative eliminates the need for the Toxicological/Chemical Monitoring Plan and Adaptive Management Plan to deal with ecological risk of residual sediment contamination.

Sediment Control System

As per the Sediment Control System described in Alternative 3; sediment transport will be minimized during construction so as not have an adverse impact on the environment and the surrounding ecosystem. All construction activities will be implemented using Best Management Practices (BMP's), turbidity curtains, and silt fences to prevent any adverse impacts. Further impacts will be mitigated by the planting of marsh vegetation. The specified planting of a suite of marsh vegetation including *Spartina alterniflora* is a preferred biological means of sediment stabilization. Marsh grasses vegetation can grow to full height and density within a single growing season. Planting is scheduled to occur during the early spring in order to facilitate peak growth in a single season.

Confined Materials Placement System

Alternative 4 offers the same system for confining the excavated materials as determined in Alternative 3. The Materials Placement Facility will require the use of a 1.9 acre footprint in an upland area adjacent to the Saints Field Parking Lot as described. An additional area of confinement is required under this scenario to contain an additional +10,000 cubic yards of material. The area known as the Turnpike Parcel will be required for the additional disposal and capping. An area of less than 1.0 acre is required for the material and an additional amount of clean capping materials of +2,000 cubic yards are required. The clean cap material shall be placed at a depth of no less than 2.0ft thickness. All requirements and restrictions set forth in Alternative 3 also transfer to Alternative 4. Arsenic concentrations pose the greatest re-exposure risk if sediment is allowed to be placed in direct contact with human populations therefore the materials placement area shall be constructed in accordance with guidelines set forth by NJDEP. With the exception of these inorganic metals, all samples analyzed met or were below New Jersey Department of Environmental Protection (NJDEP) soil criteria standards.

The Turnpike Parcel materials placement footprint is currently classified as post industrial landscape containing no natural habitat. There is no loss of the greenery, shade, or wildlife value as with the North Materials Placement Area. Some additional street traffic is associated with Alternative 4 and the use of the Turnpike Placement Area; which under Alternative 3 is not required.

Vegetation Impacts

The project will have no adverse impacts on low marsh or transitional high marsh vegetation. It is expected that excavation of this site will increase the duration and frequency of tidal inundation and develop more favorable conditions for the spread of typical low marsh species (*Spartina alterniflora*, etc) and that this transformation will

produce benefits to the vegetative community as well as to wildlife.

As with Alternative 3, this alternative will establish low marsh as the dominant habitat and Spartina alterniflora as the dominant species. Over-excavation is anticipated to have a benefit to the success of the newly planted marsh. Over-excavation will remove a substantial layer of Phragmites root so as to make its rapid reintroduction less likely under this scenario. Once again, *Phragmites australis* will be reduced significantly but not entirely eradicated. Sufficient cover of *Phragmites* at the edges of the project transition zones will provide nesting opportunity for passerine birds which favor it for nesting and cover. All other benefits and impacts to wildlife that were discussed under Alternative 3 remain unchanged under Alternative 4.

The North Confined Placement Facility will remain unchanged from the description in Alternative 3. The additional Placement Facility at the Turnpike Parcel will not have an impact on any existing vegetative community. The Turnpike Parcel Confined Facility will be capped, graded and vegetated in the same manner proposed for the North Placement Facility.

3.2.4.2 Description of Socioeconomic Impacts

Aesthetics Impacts

No additional aesthetic and scenic resources will be impacted by this alternative. Aesthetic values will be reduced temporarily during the construction phase due to the presence of construction equipment and vehicles as well as due to the construction process. Positive impacts on aesthetics will result from the implementation of the preferred alternative. A vegetated green island will take the place of an un-vegetated post-industrial island now found at the Turnpike Parcel.

Noise Impacts

Some additional noise on street transport corridors is anticipated with this alternative. There would be a minor increase in noise levels associated with construction in the immediate project area due to the increase in vehicular and machinery traffic. These impacts are anticipated to be minimal, short-term and limited to active periods of construction between sunrise and sunset. There are no long-term noise impacts associated with this project as proposed. The additional impact will be derived from the additional number of hauling vehicles necessary to transport 10,000 cubic yards plus 2,000 cubic yards clean cap material to the Turnpike Disposal facility. This placement area itself is far removed from residential areas and will not create an additional residential noise impact there.

Recreational Impacts

Current recreational use of the site is limited to the exterior perimeter due to the dense monotypic stands of *Phragmites australis*. Therefore, during construction there will be no

loss of recreational opportunities. Following construction, the project area and Woodbridge Creek may provide additional benefits of passive recreational uses; however, the current plan implies no additional recreational access as a component of the proposed project.

Transportation Impacts

Some additional minor impacts to land based transportation in the project area is expected during the construction phase. Trucks will transport and haul loads to the Turnpike Disposal Area. This will create an additional demand o the residential surface roads leading from the North Area to the South Area.

3.2.4.3 Threatened/Endangered Species and Critical Habitat Impacts

No Federally listed rare, threatened or endangered species are known to occur within the proposed project area; or will be disturbed by the additional actions necessary to carry out Alternative 4.

3.2.4.4 Fish and Wildlife Habitat Impacts

No additional impacts or disturbances to Finfish species will result from the additional actions necessary to carry out Alternative 4.

Restoration activities associated with this project will not adversely impact or curtail any naturally occurring aquatic life movement; however the project will improve the capability of aquatic organism use within the system. No construction activities shall occur directly adjacent to the creek during potential periods of migratory fish usage. In order to comply with NMFS recommendations, no activity resulting in discharges will occur in or directly adjacent to the creek-side of the creek bank during the period of potential fish migration or spawning, including the period from April 1 through June 30.

One certain benefit to wildlife are the reduction of ecological risks. The risks associated with prolonged exposure to residual contaminants by fish and wildlife through ingesting sediment or food resources are reduced almost entirely in this scenario.

3.2.4.5 Essential Fish Habitat (EFH) Impacts

This proposed restoration is occurring in areas that are designated as Essential Fish Habitat (EFH), as determined by the National Marine Fisheries Service.

The Trustees conclude based on informal consultation with the NOAA Habitat Conservation Officer that the Hudson-Raritan Estuary does provide Essential Fish Habitat (EFH) as defined under the Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. 1801 et seq.) for a number of marine species.

This alternative does not propose to create any additional impacts to Essential Fish Habitat. While there may be some temporary, short-term impacts to EFH, there will not be any long-term adverse effects on Essential Fish Habitat. The Trustees believe that the restoration as proposed will not adversely impact, but should enhance the quality of the EFH in this area in the long-term (See informal EFH consultation: Appendix B).

3.2.4.6. Historic and Cultural Impacts

There are no other historical or cultural resources to be impacted under this alternative. This project will not adversely impact any known historical or cultural resources. The ACOE led study and the NJSHPO consultation determined that the historic artifacts of the 19th century mill, if they still exist are well outside the boundaries or impacts of this project. We conclude that the project will cause no disturbance to the area within the Port Reading right-of-way that may contain relics and remains of the former mill.

3.2.4.7 Cumulative Impacts

The additional actions of Alternative 4 do not present an increase in long-term impacts to the environment. Additional impacts for this alternative are defined as short-term and occur only during the construction period. The comprehensive restoration of the Woodbridge Creek is a priority of the Township, the natural resource trustees and the community at large. The completion of this project would be invaluable to the system, and should assist in promoting similar projects within the watershed. The short-term impacts occur in the construction of an additional Confined Placement area and are defined as temporary air, noise and visual impacts due to increased volume of hauling vehicles on local roads.

The intertidal habitat as proposed in this project should have a positive impact on the adjacent Township property and greening of the Turnpike Parcel not found under the other alternatives. Chiefly, this alternative will eliminate ecological risk of adverse impacts through sediment contact. The project should promote the abundance and diversity of fish and wildlife species in and around the project site, increased water quality, enhance the viewshed, provide additional environmental education opportunities and reduce nuisance mosquito populations in the area.

There are no additional negative impacts to flooding would occur due to this project alternative.

4.0 SELECTION OF THE PREFERRED ALTERNATIVE

4.1 NO ACTION

Alternative 1, No Action, was not selected since it does not meet the project goal or purpose. The status quo design currently permits only limited finfish and wildlife forage, breeding, nursery and refuge habitat represented by a limited diversity of species found in baseline analysis. The No Action alternative does not promote an increase in fisheries and wildlife habitat and is therefore not conducive to replacing such habitat lost as a result of the 1990 oil spills. The Trustees believe that restoring the habitat to a mix of low marsh and emergent high marsh plant species communities, as well as removing historic fill material in order to enable natural hydrologic exchange is necessary to benefit the fish and wildlife species and the public. This alternative will not benefit fish and wildlife species; nor will it compensate the public or restore lost habitat function and has therefore not been further considered in this evaluation.

4.2 Wetland Enhancement (Dike Breaching)

Alternative 2, Tidal Wetland Enhancement (Dike Breaching) was evaluated against the purpose and goals stated for this project in section 1.1 of this document. The breaching of the dikes provided an increased tidal flushing potential but did not appear to significantly increase the physical conditions (i.e. salinity, tidal duration, etc.) or the appropriate hydrologic exchanges necessary to meet the project goals. The model analysis indicated that breaching may increase the likelihood of *Phragmites australis* spread and would not adequately ensure conditions ideal for the growth and propagation of desired low marsh species. A central goal of this project is to provide as much assurance as possible that the most appropriate low marsh conditions will be consistently created onsite. In order to achieve this goal, Alternative 2 was deemed to be less costly, but also potentially less effective, than alternatives 3 and 4.

4.3 Wetland Enhancement (Dike Removal)

Alternative 3, Tidal Wetland Enhancement (Dike Removal) was selected as the preferred alternative because it most effectively meets the stated goals of the project, namely: to compensate the public for injuries to natural resources caused by the Exxon Bayway oil spill by restoring the historic tidal hydrologic connection between the restoration site and Woodbridge Creek; by increasing the percent cover of *Spartina alterniflora; by* improving the aesthetic viewshed associated with the site; by enhancing fisheries and wildlife breeding, nursery, forage and refuge habitat; and by being a cost effective expenditure to restore marsh acreage and functionality in response to the Bayway oil spill.

4.4 Wetland Enhancement (Dike Removal) + Clean Capping of Sediment.

Alternative 4, Tidal Wetland Enhancement (Dike Removal) + Clean Capping, was not

selected as the preferred alternative. This alternative meets the stated goals of the project. However, since the ecological risk presented by sediment contaminant concentrations has been determined to be low, there is no reason to believe that clean fill capping will result in a significant reduction of risk, or that the additional cost incurred will have a measurable benefit, or that any of the stated goals will be compromised by choosing the lower cost Alternative #3. Alternative 3 will address any concerns of ecological risk via the Toxicological/Chemical Assessment of Effects and the Adaptive Management Plan, results in a proposal that meets all goals while at the same time maintains control of costs.

5.0 PREPARERS, AGENCIES AND PERSONS CONSULTED

5.1 Agencies and Persons Consulted

In the preparation of the Woodbridge Creek Wetland Restoration Project Environmental Assessment, the project managers have ensured that there is coordination with local, state and federal agencies where applicable. There are also a number of relevant laws, regulations and policies which must be considered during the design, construction and monitoring phases of this project, as well as several regulatory requirements associated with the state and federal permit process. During the planning phase, the Trustees coordinated with the following local, state and federal agencies:

- **National Marine Fisheries Service**
- **United States Fish and Wildlife Service**
- **United States Army Corps of Engineers**
- **New Jersey Department of Environmental Protection**
- **Freehold Soil and Water Conservation District**
- **Middlesex County**
- **Township of Woodbridge**
- **State Historic Preservation Office (NJDEP)**

5.2 Compliance with Environmental Statutes

1. Preservation of Historic and Archeological Data Act of 1974, as amended, 16 USC 469 et seq.

Compliance: Project was reviewed and completed in accordance with the State Historic Preservation Office (SHPO) as a component of the NJDEP permitting process. There are no permit requirements relating to SHPO.

2. Clean Air Act, as amended, 42 USC 7401 et seq.

Compliance: Public notice of the availability of this report to the Environmental Protection Agency is required for compliance pursuant to Sections 176C and 309 of the

Clean Air Act.

3. Clean Water Act of 1977 (Federal Water Pollution Control Act Amendments of 19720 33 U.S.C. 1251 et seq.

Compliance: 1.) A Section 404(b)(1) Evaluation and Compliance Review was undertaken by the Army Corps of Engineers. Coordination with the Army Corps has been completed pursuant to Section 401 of the Clean Water Act. 2.) A 401 Water Quality Certification Review was undertaken by the Army Corps of Engineers. Coordination with the Army Corps has been completed pursuant to Section 401 of the Clean Water Act.

4. Coastal Zone Management Act of 1982, as amended, 16 U.S.C. 1451 et seq.

Compliance: The necessary permits were applied for by the Office of Natural Resources Restoration (NJDEP) to the Office of Dredging and Sediment Technology for approval of a Waterfront Development /Water Quality Certificate Document Coastal Zone Management Consistency Permit and a Fresh Water Statewide General Permit #16 for habitat creation and enhancement activities. These permits were approved April 3rd 2006. This permit is authorized under and in compliance with the rules on Coastal Zone Management.

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

Compliance: Coordination with the U.S. Fish and Wildlife Service (FWS) and the National Marine Fisheries Service (NMFS) has been completed pursuant to Section 7 of the Endangered Species Act.

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

Compliance: Coordination with the FWS, NMFS, and the State fish and wildlife agencies signifies compliance with the Fish and Wildlife Coordination Act.

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

Compliance: Coordination with the State Historic Preservation Office was completed and signified compliance.

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

Compliance: Preparation of an Environmental Assessment signifies partial compliance with NEPA. Full compliance is expected at the time that a Finding of No Significant Impact is issued.

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

Compliance: The project has applied for and received Clean Water Act (Section 404) and

Rivers and Harbors Act of 1899 permits.

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

Compliance: Floodplain impacts have been considered prior to selection of final project plans.

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

Compliance: Coordination with the National Marine Fisheries Service and preparation of an Essential Fish Habitat (EFH) Assessment signifies compliance with the EFH provisions of the Magnuson-Stevens Act.

12. Information Quality Guidelines issued Pursuant to Public Law 106-554.

Compliance: Information disseminated by Federal agencies to the public after October 1, 2002, is subject to information quality guidelines developed by each agency pursuant to Section 515 of Public Law 106-554 that are intended to ensure and maximize the quality of such information (i.e., the objectivity, utility and integrity of such information). This Environmental Assessment is an information product covered by the information quality guidelines established by NOAA and DOI for this purpose. The information collected herein complies with applicable guidelines.

Executive Orders

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

Compliance: Coordination with the State Historic Officer will signify compliance.

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

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

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

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

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

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

Executive Order 12898, Environmental Justice, 11 February 1994.

Compliance: Not applicable, the project is not expected to have a significant impact on minority or low income population, or any other population in the United States.
Executive Order 13007, Accommodation of Sacred Sites, 24 May 1996

Compliance: Not applicable unless on Federal lands, then agencies must accommodate access to and ceremonial use of Indian sacred sites by Indian religious practitioners, and avoid adversely affecting the physical integrity of such sacred sites.

Executive Order 13045, Protection of Children from Environmental Health Risks and Safety Risks. 21 April, 1997.
Compliance: Not applicable, the project would not create a disproportionate environmental health or safety risk for children.

Executive Memorandum

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

Compliance: Not applicable if the project does not involve or impact agricultural lands.

6.0 REFERENCES AND LIST OF DOCUMENTS INCORPORATED

Date:	Author(s):	Document:
1990	ER Long, LG Morgan	The Potential for Biological effects of sediment-sorbed contaminants Tested in the National Status and Trends Program. In NOAA Technical Memorandum. NOSOMA. 52, 8.
1995	ER Long, DD MacDonald, S.L. Smith, and F.D. Calder	Incidence of adverse biological effects within ranges of chemical concentrations in marine and estuarine sediments. Environm. Mgmt. 19: 81-97
1997	United States Fish and Wildlife Service (USFWS)	Significant Habitats and Habitat Complexes of the New York Bight Watershed
1997	MP Weinstein, JH Balletto, JM Teal, DF Ludwig	Success Criteria and Adaptive Management for a Large-scale Wetland Restoration Project. Wetlands Ecology and Management. Vol 4 no 2. 111-127
1999	Normandeau Associates	Application for Coastal Zone Management (Waterfront Development) Review Woodbridge River Restoration Project
2000	A Bergen, C Alderson, R Bergfors, C Aquila and MA Matsil	Restoration of a *Spartina alterniflora* salt marsh following a fuel oil spill, New York City, NY Wetlands Ecol. & Mngmnt. 185-195.
2001	Najarian Associates	Tide and Salinity Intrusion Model for the Woodbridge Creek Marsh Restoration Project
2002	JJ Vitaliano, RN Reid, AB Frame, DB Packer, L Arlen, and JN Sacco	Comparison of benthic invertebrate assemblages at Spartina alterniflora marshes reestablished after an oil Spill and existing marshes in the Arthur Kill (NY/NJ)

2002	A Sturdevant and CB Craft	Baseline Ecological Characterization of an Estuarine Marsh Restoration Site and Reference Marshes along Woodbridge Creek, NJ
2003	JT Duffy-Anderson, JP Manderson, and KW Able	A Characterization of Juvenile Fish Assemblages Around Man-Made Structures in the New York-New Jersey Harbor Estuary, U.S.
2003	Windham, L., J.S. Weis, P. Weis	Uptake and distribution of metals in two dominant salt marsh macrophytes, Spartina alterniflora (cordgrass) and Phragmites australis (common reed). Estuarine and Coastal Shelf Science. 56: 63-72.
2004	TP O'Connor	The Sediment Quality Guideline, ERL, is not a Chemical Concentration at the Threshold of Sediment Toxicity. NOAA N/SCI1 National Centers for Coastal Ocean Science.
2005	L Rakos	A Cultural Resource Evaluation of the Woodbridge Creek Wetland Mitigation Site Woodbridge Township, Middlesex County, New Jersey. Conducted in Connection with the NY and NJ Harbor Navigation Project – DRAFT Doc. Planning Division NY District US Army Corp of Engineers.
2005	U.S. Fish & Wildlife Service	Planning Aid Report: Hackensack Meadowlands Ecosystem Restoration Project Bergen and Hudson Counties, New Jersey: Environmental Contaminants Issues for Restoration. USFWS: Ecological Services, Region 5 NJ Office
2005	Louis Berger Group.	Woodbridge Creek Restoration Area A – Harbor Deepening Mitigation Woodbridge, NJ: Design Documentation Report. Prepared for NY District Army Corp of Engineers.

7.0 SUMMARY OF PUBLIC COMMENTS

To Be Completed at end of Public Comment Period.

Appendix A: USACE Permit Letter
State of New Jersey Water Quality Certificate
Middlesex County Soil and Water Board Certification

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

APR 10 2006

REPLY TO
ATTENTION OF:
Eastern Permits Section

SUBJECT: Permit Application Number 2002-00188-J1
by NOAA Fisheries Restoration Center Sandy Hook Field Office

Carl Alderson
Coastal Restoration Specialist
NOAA Fisheries Restoration Center Sandy Hook Field Office
74 Magruder Road
Highlands, New Jersey 07732

Dear Mr. Alderson:

On March 24, 2006, the New York District Corps of Engineers received a request for Department of the Army authorization to excavate approximately 23,104 cubic yards of material to restore approximately 17.15 acres of intertidal salt marsh. Twelve acres will be excavated to a target elevation of 1.9 feet and sloping to 1.5 feet. Six areas of high marsh vegetative species totalling 4.5 acres will be preserved and protected during construction. Temporary dewatering during construction will be accomplished through the installation of a temporary drainage system, consisting of corrugated PVC pipe and a tide gate. The temporary drainage system will be removed following the completion of excavation. After construction, plantings will be done. Jute mats and netting will be used to stabilize the plantings. At low elevations between 0.8 feet and 2.0 feet, plantings will include Spartina alterniflora, Scirpus maritima, and Scirpus american. At high marsh elevations between 2.0 feet and 3.5 feet, plantings will include Juncus gerardii, Spartina patens, and Spartina cynosuroides.

All excavated material will be placed at the northern end of the site, in an 1.75 acre upland location, except for 0.25 acres of wetland to be filled adjacent to the upland placement site. The wetland area to be filled measures approximately 380 feet by 60 feet and the volume of material to be placed is 1,200 cubic yards. The placement of the excavated material in the upland location would occur beyond the jurisdiction of the Department of the Army.

The site is located adjacent to Woodbridge Creek, Arthur Kill, Raritan Bay, in the Town of Woodbridge, Middlesex County, New Jersey.

Based on the information submitted to this office, and accomplishment of notification in accordance with the applicable

federal requirements, our review of the project indicates that an individual permit is not required. It appears that the activities within the jurisdiction of this office could be accomplished under Department of the Army Nationwide General Permit Numbers 27 and 33. The nationwide permits are prescribed as an Issuance of Nationwide Permits in the Federal Register dated January 15, 2002 (67 FR 2020). The work may be performed without further authorization from this office provided the activity complies with the permit conditions listed in Section B, Nos. 27 and 33, Section C, any applicable New York District regional conditions, the following special condition, and any applicable regional conditions added by the State of New Jersey, copies enclosed.

Special Condition

(A) The permittee understands and agrees that, if future operations by the United States require the removal, relocation, or other alteration, of the structure or work herein authorized, or if, in the opinion of the Secretary of the Army or his authorized representative, said structure or work shall cause unreasonable obstruction to the free navigation of the navigable waters, the permittee will be required, upon due notice from the Corps of Engineers, to remove, relocate, or alter the structural work or obstructions caused thereby, without expense to the United States. No claim shall be made against the United States on account of any such removal or alteration.

This determination covers only the work described in the submitted material. Any major changes in the project may require additional authorizations from the New York District.

Care should be taken so that construction materials, including debris, do not enter any waterway to become drift or pollution hazards. You are to contact the appropriate state and local government officials to ensure that the subject work is performed in compliance with their requirements.

This verification is valid for a period of two years from the date of this letter, unless the nationwide permit is modified, suspended or revoked. This verification will remain valid for two years from the date of this letter if the activity complies with the terms of any subsequent modifications of the nationwide permit authorization. If the nationwide permits are suspended, revoked, or modified in such a way that the activity would no longer comply with the terms and conditions of a nationwide permit, and the proposed activity has commenced, or is under contract to commence, the permittee shall have 12 months from the date of such action to complete the activity.

Within 30 days of the completion of the activity authorized by this permit and any mitigation required by this permit, you

2

are to sign and submit the attached compliance certification form to this office.

If any questions should arise concerning this matter, please contact Naomi J. Handell, of my staff, at (917) 790-8523.

Sincerely,

Michael G. Vissichelli
Chief, Eastern Permits Section

Enclosures

cf: NJDEP

3

State of New Jersey
DEPARTMENT OF ENVIRONMENTAL PROTECTION

JON S. CORZINE
Governor

LISA P. JACKSON
Commissioner

Site Remediation and Waste Management Program
Office of Dredging and Sediment Technology
P.O. Box 028
Trenton, NJ 08625
(609) 292-1250
FAX (609) 777-1914

Mr. David Bean
New Jersey Department of Environmental Protection
Office of Natural Resource Restoration
501 East State Street
Trenton, NJ 08625-0404

April 3, 2006

RE: Waterfront Development Permit/Water Quality Certificate/
Freshwater Wetlands Statewide General Permit #16 - Habitat Creation and Enhancement Activities
File No.: 1225-02-0007.2 WFD 060001 (IP-In Water) / FWW 060001
Applicant(s): New Jersey Department of Environmental Protection, Office of Natural Resource/
National Oceanic and Atmospheric Administration
Project: Woodbridge River Restoration
Block: 605, Lots 1 and Block 606, Lots 10,11,12,13,14 and 15
Woodbridge Twp., Middlesex County

Dear Mr. Bean:

Enclosed, please find the approved Waterfront Development Permit/Water Quality Certificate/CAFRA Statewide General Permit #16 - Habitat Creation and Enhancement Activities for the above referenced project. Please review this permit and note any conditions which may have been imposed, and have the applicant promptly complete and return the enclosed "Acceptance of Revocable Construction Permit/s" form to the Department at the above address.

This approval is valid for five years from the original effective date of the permit and all terms and conditions of the permit/s are detailed therein. Please note that the permittee must give notice of initiation of construction using the enclosed "Construction Report" form. Notice must be given at least 14 days prior to initiation of construction. Upon completion of construction, the "Completion Report" form must also be completed and submitted to the above address.

Any person who considers himself and herself aggrieved by this permit decision may request a hearing by addressing a written request for such hearing to the following address: Office of Legal Affairs, Department of Environmental Protection, P.O. Box 402, Trenton, New Jersey 08625-0402, Attention Adjudicatory Hearing Requests. This written request must include a completed copy of the attached Administrative Hearing Request Checklist and all information identified in Section III of that list.

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In order to promote inter-governmental cooperation in the management of our natural resources, a copy of this decision shall be shared with appropriate local and federal agencies. Should you have any questions in this regard, please do not hesitate to contact me at (609) 292-8838.

Sincerely,

Suzanne U. Dietrick, Chief
Office of Dredging and Sediment Technology
Site Remediation Program

Enclosures

C: Steve Dorrler, Port Authority of New York and New Jersey
Scott Nicholson, NY District ACOE, Harbor Program Branch

Mr. Carl Andersen
National Oceanic and Atmospheric Administration
NOAA Fisheries Restoration Center
74 Magruder Road
Highlands, NJ 07732

Mr. Scott Thompson
Municipal Engineer
Woodbridge Township
One Main Street
Woodbridge, NJ 07095

Municipal Clerk - Woodbridge Twp.
1 Main Street
Woodbridge, NJ 07095

New Jersey Natural Resources Conservation Program

FREEHOLD SOIL CONSERVATION DISTRICT
(Serving Middlesex and Monmouth Counties)
4000 Kozloski Road, P.O. Box 5033
Freehold, New Jersey 07728-5033
Tel: (732) 683-8500
Fax: (732) 683-9140
E-mail: info@freeholdscd.org
Website: www.freeholdscd.org

RECEIVED
APR -7 2006
TOWNSHIP OF WOODBRIDGE
DIVISION OF ENGINEERING
4/5/06

TWP. OF WOODBRIDGE
ONE MAIN STREET
WOODBRIDGE NJ 07095

Ref.#: 2006-0185
Proj.: CREEK RESTORATION AREA A
Twp. : Woodbridge
Block: CLEARING
Lots : CLEARING

*** CERTIFICATION LETTER ***

Pursuant to the New Jersey Soil Erosion and Sediment Control Act; N.J.S.A. 4:24-39 et. seq., Chapter 251, P.L. 1975 and as amended by C. 264, P.L. 77 and C. 459, P.L. 79, the Freehold Soil Conservation District hereby grants certification of the soil erosion and sediment control plan for the above referenced project, subject to the following:

1. That the applicant carries out all land disturbance activities in accordance with the Standards for Soil Erosion and Sediment Control in New Jersey, promulgated by the State Soil Conservation Committee.

2. The owner/applicant must obtain a District issued Report of Compliance prior to the issuance of any Certificates of Occupancy by the municipality.

3. Changes in the certified plan relating to, or that will affect land disturbance on the site, must be submitted to the District office for certification.

A copy of the certified plan must be kept on the job site at all times.

This certification is valid for 3 ½ years, or for 2 years in the event the project is for mining, landfill, or storage and is limited to the controls specified in this plan. It is not authorization to engage in proposed land use unless the municipality or other controlling agency has previously approved such use. Failure to comply with the above conditions may result in the issuance of a **STOP CONSTRUCTION ORDER**.

Sincerely,

Ines Grimm

Ines M. Grimm
District Manager

DISTRIBUTION: **WHITE** - Applicant **CANARY** - District **WHITE** - Appl. Eng.
CANARY - Municipal Eng. **PINK** - Construction Official
GOLD - Plan. Board

STATE DEPARTMENT OF AGRICULTURE, STATE DEPARTMENT OF ENVIRONMENTAL PROTECTION, COOK COLLEGE OF RUTGERS UNIVERSITY AND UNITED STATES NATURAL RESOURCES CONSERVATION SERVICE, COOPERATING

Revised 07/04

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Appendix B: ESA/EFH Informal Consultations

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Habitat Conservation Division
James J. Howard Marine
Sciences Laboratory
74 Magruder Road
Highlands, New Jersey 07732

October 12, 2001

TO: Steven Kiernan
Habitat Conservation Division
James J. Howard Marine
Sciences Laboratory
74 Magruder Road
Highlands, New Jersey 07732

SUBJECT: Woodbridge Creek Restoration Project
Woodbridge, Middlesex Co., NJ

_____ Karen Greene
(Reviewing Biologist)

We have reviewed the information provided to us regarding the above subject project. We offer the following preliminary comments pursuant to the Endangered Species Act, the Fish and Wildlife Coordination Act and the Magnuson-Stevens Fishery Conservation and Management Act:

Endangered and Threatened Species

_X___ With the exception of occasional transients, there are no endangered or threatened species in the project area.

____ The following endangered or threatened species may be present in the project area:

____ shortnose sturgeon (*Acipenser brevirostrum*)
sea turtles: ____ loggerhead (*Caretta caretta*) ____ Kemp's ridley (*Lepidochelys kempii*)
____ green (*Chelonia mydas*) ____ leatherback (*Dermochelys coriacea*)

DEPENDING UPON PROJECT DETAILS, POSSIBLE RECOMMENDATIONS MAY INCLUDE:

Fish and Wildlife Coordination Act

__X__ The following may be present in the project area: Anadromous and resident fish, finfish and benthic species including alewife and blueback herring

DEPENDING UPON THE PROJECT DETAILS POSSIBLE RECOMMENDATIONS INCLUDE:

No in water work in Woodbridge Creek from April 1 to June 30, use best management practices to minimize turbidity.

Essential Fish Habitat

_____ No EFH presently designated in the project area.

__X____ The project area has been designated as Essential Fish Habitat (EFH) for one or more species. When details of the project are made available and permit applications have been made, conservation recommendations may be given. For a listing of EFH and further information, please go to our website at:

http://www.nero.nmfs.gov/ro/doc/newefh.html.
-If you wish to discuss this further, please call 732-872-3023-

INFORMAL NMFS CONSULTATION

Fwd: PCN 2002-00188-J1, NOAA Restoration Center]

Subject: [Fwd: PCN 2002-00188-J1, NOAA Restoration Center]
Date: Tue, 23 Mar 2004 13:38:41 -0500
From: Karen Greene <karen.greene@noaa.gov>
To: Craig Woolcott <Craig.Woolcott@noaa.gov>

FYI - This was our comment on the pcn from the ACOE. You should have some sort of letter of authorization from the ACOE in your files.

-------- Original Message --------
Subject: PCN 2002-00188-J1, NOAA Restoration Center
Date: Tue, 07 May 2002 10:32:53 -0400
From: Karen Greene <karen.greene@noaa.gov>
To: "Helman, Marc" <Marc.Helman@nan02.usace.army.mil>
CC: Jodi McDonald
<Jodi.M.McDonald@nan02.usace.army.mil>,koko.cronin@nan02.usace.army.mil

There are no ESA species in the project area. I've seen the project design and details and the impacts to EFH would be temporary and minimal with an increase in EFH once completed. We have no EFH CRs or FWCA recommendations to offer and no objections.

1 of 1 3/23/04 1:38 PM

APPENDIX C: MAPS AND FIGURES

Figure 1. Woodbridge Wetland Restoration Site Location Map

Figure 2. PROJECT LOCATION MAP

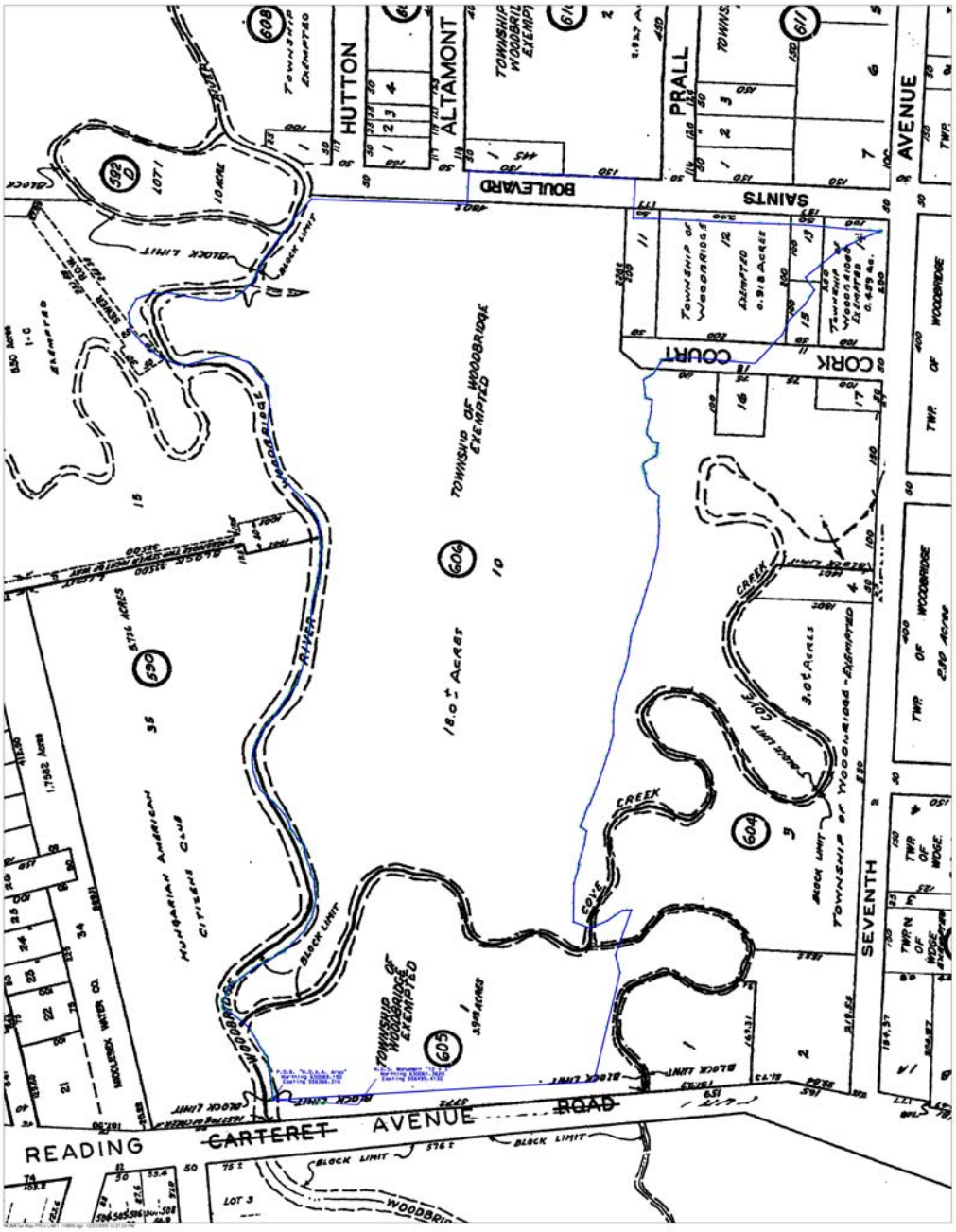

Figure 3. WOODBRIDGE WETLAND RESTORATION AERIAL PHOTOGRAPH

Figure 4. Restoration Plan Photographs

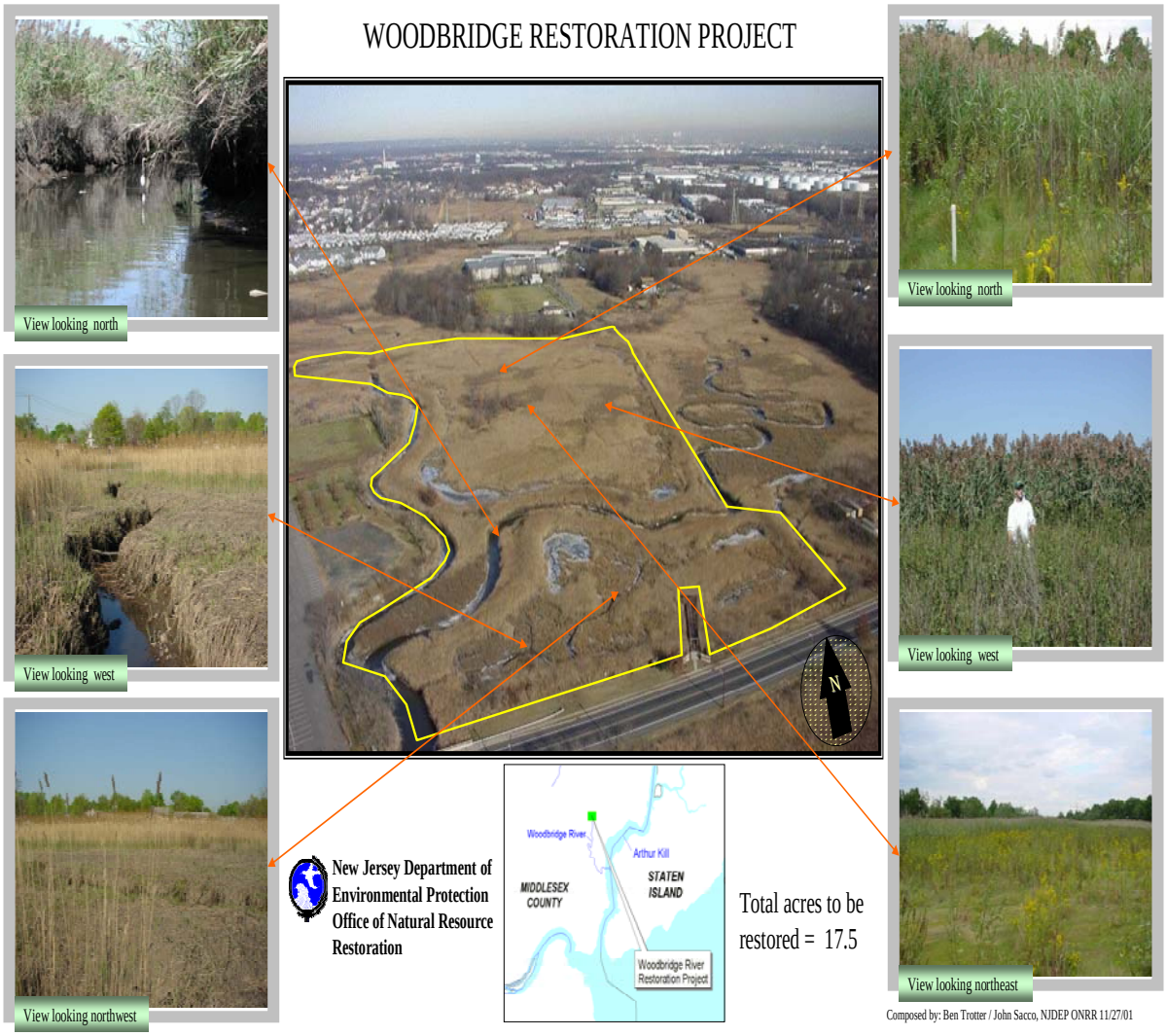

Figure 5.
PROPOSED TRANSPORTATION PLAN

APPENDIX D: Sediment Test Results Tables (Separate Electronic Documents)

APPENDIX E: Cultural and Historic Resources Evaluation (Not Available Electronically)

APPENDIX F: PLANS AND SPECIFICATIONS (Not Available Electronically)

Public Notice

National Oceanic and Atmospheric Administration,
U.S. Department of the Interior,
and New Jersey State Department of Environmental Protection.

Request for Public Comment on Draft Restoration Plan and Environmental Assessment titled, "Woodbridge Creek Wetland Restoration (Area B)".

The National Oceanic and Atmospheric Administration, the U.S. Fish and Wildlife Service, on behalf of the U.S. Department of the Interior, and the New Jersey State Department of Environmental Protection (collectively, "the natural resource trustees") invite the public to comment on a proposed plan to implement a fish habitat restoration project in the Township of Woodbridge, New Jersey with settlement funds obtained under a consent decree arising from the Exxon Bayway oil spill that occurred on or about January 1st to January 2nd 1990. The consent decree specifies that the public shall be compensated for fish and wildlife injuries caused by the Exxon Bayway oil spill. The natural resource trustees are authorized to administer the settlement funds on behalf of the public to restore, rehabilitate or acquire the equivalent of the natural resources injured by the Exxon Bayway oil spill.

The Draft Restoration Plan/Environmental Assessment proposes the restoration of 17.15 acres of tidal salt marsh on Woodbridge Creek adjacent and north of Port Reading Avenue in the Township of Woodbridge., New Jersey.

The public comment period on this plan ends May 26, 2006. The Draft Restoration Plan and Environmental Assessment is available on the following website: http://www.darp.noaa.gov; or at the Township of Woodbridge Public Library located at the Main Library, George Frederick Plaza, Woodbridge, NJ 07095, (732) 634-4450.

To submit your comments or to receive a hard copy of the Draft Environmental Assessment, please contact: Carl Alderson at (732) 872-3087, NOAA Restoration Center, 74 Magruder Road, Highlands, NJ 07732; or by email at Carl.Alderson@noaa.gov