# FINAL ENVIRONMENTAL IMPACT STATEMENT APPENDIXES

## CRANEY ISLAND EXPANSION

## NORFOLK HARBOR AND CHANNELS, VIRGINIA

**U.S. Army Corps of Engineers**
**Norfolk District**
**803 Front Street**
**Norfolk, Virginia 23510-1096**

**April 2006**

# APPENDIXES

| | |
|---|---|
| APPENDIX A | U.S. FISH & WILDLIFE SERVICE PLANNING AND REPORT |
| APPENDIX B | MITIGATION ANALYSIS |
| APPENDIX C | CUMULATIVE IMPACTS ASSESSMENT |
| APPENDIX D | HEA REPORTS (PETERSON, RUDDY BUCHMAN) |
| APPENDIX E | VIMS BENTHIC STUDY (SEITZ AND LIPCIUS) |
| APPENDIX F | NATIONAL ENVIRONMENTAL POLICY ACT COORDINATION TABLE |
| APPENDIX G | PERTINENT CORRESPONDENCE |
| APPENDIX H | SECTION 404 (b) (1) EVALUATION |
| APPENDIX I | U.S. FISH & WILDLIFE SERVICE COORDINATION ACT REPORT |

# APPENDIXES
(Cont'd)

| | |
|---|---|
| **APPENDIX J** | **U.S. HOUSE OF REPRESENTATIVES DOCUMENT NO. 563, 79TH CONGRESS, 2D SESSION, MAY 6, 1946** |
| **APPENDIX K** | **COMMENTS AND RESPONSES FROM THE DRAFT ENVIRONMENTAL IMPACT STATEMENT COORDINATION** |
| **APPENDIX L** | **COMMENTS AND RESPONSES FROM THE FINAL ENVIRONMENTAL IMPACT STATEMENT COORDINATION** |

# APPENDIX A

# U.S. FISH & WILDLIFE SERVICE PLANNING AND REPORT

# United States Department of the Interior

FISH AND WILDLIFE SERVICE
Chesapeake Bay Field Office
177 Admiral Cochrane Drive
Annapolis, MD 21401


December 4, 2002

Colonel David L. Hansen
District Engineer
Norfolk District, Corps of Engineers
Fort Norfolk, 803 Front Street
Norfolk, VA 23510-1096

Attn: Craig Seltzer

*Re: Craney Island Expansion Study*

Dear Colonel Hansen:

Enclosed is a planning aid report for the subject study. In accordance with the Scope of Work, it contains information on the baseline biological conditions, environmental impacts, and mitigation needs. The primary impact of the eastward expansion alternative would be the loss of an estimated 580 acres of estuarine open water habitat. While developing a plan to mitigate a loss of this magnitude will be difficult, the Service is participating in an ongoing effort by the Study's Mitigation Subcommittee considering a range of mitigation options that could form the basis for a conceptual mitigation plan. If there are any questions, please contact George Ruddy at (410) 573-4528 or george_ruddy@fws.gov.

Sincerely,

for John P. Wolflin
Supervisor

Enclosure

cc: Virginia Field Office

# Craney Island Expansion Feasibility Study

## Planning Aid Report:
## Baseline Biological Conditions and Impacts of the Eastward Expansion

Prepared for:
U.S. Army Corps of Engineers
Norfolk District

Prepared by:
George Ruddy
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Under supervision of:
John P. Wolflin, Supervisor
Chesapeake Bay Field Office
U.S. Fish and Wildlife Service

October 2002

ABSTRACT

Craney Island Expansion Feasibility Study

Baseline Biological Conditions and Impacts of the Eastward Expansion

October 2002

This report provides planning aid information to assist the Norfolk District, U.S. Army Corps of Engineers in their feasibility study of lateral expansion of the Craney Island Dredged Material Disposal Area. The main purposes for the expansion are to provide additional dredged material disposal capacity and to provide land for development of additional port facilities. The report provides information on the baseline biological conditions in the Elizabeth River and Hampton Roads area. It also provides information on the potential impacts and mitigation needs for the eastward expansion alternative. The primary impact of the eastward expansion would be the loss of approximately 580 acres of open water estuarine habitat. Developing a plan to mitigate such a large loss will be major challenge.

Key Words: Craney Island, dredged material disposal, Port of Hampton Roads, Elizabeth River, Norfolk Harbor

# INTRODUCTION

The Norfolk District, U.S. Army Corps of Engineers, is conducting the feasibility phase of the Craney Island Expansion Study, Hampton Roads, Virginia. The study is primarily focused on a lateral expansion on the east side that would enlarge the existing disposal site by approximately 580 acres. The main purposes for this expansion would be to provide additional dredged material disposal capacity, and to provide land for development of additional port facilities adjacent to the Norfolk Harbor Channel. This report provides information on the baseline environmental conditions, project impacts, and mitigation needs. It is submitted in accordance with provisions of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 *et seq.*) and Section 7 of the Endangered Species Act (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*).

# BASELINE BIOLOGICAL CONDITIONS

## Tidal Estuarine Environment

The Craney Island Disposal Area is situated at the junction of the Elizabeth River and the lower portion of the James River known as Hampton Roads. Based on measurements at Newport News this estuarine area has a mean tidal range of 2.6 feet and a spring tidal range of 3.1 feet (U.S. Department of Commerce 1989). The typical salinity range based on monthly averages observed in Hampton Roads off Craney Island is 16 to 22 parts per thousand (ppt) on the surface and 18-23 ppt at the bottom (Bradshaw and Kuo 1987). The monthly average difference between the surface and bottom salinity can be as much as 6 ppt during periods of high freshwater discharge when water column stratification is enhanced.

Hampton Roads has two noteworthy water quality concerns. It is included within a contaminant advisory covering the James River and all tributaries from the fall line at Richmond to the Hampton Roads-Norfolk Bridge Tunnel (Virginia Department of Environmental Quality 2000). This advisory is a legacy from Kepone contamination that occurred between 1966 and 1975. A fishing ban was instituted in 1975, but was rescinded in 1988 when the levels of contamination decreased sufficiently. A public advisory remains in effect as a precautionary measure; however, it does not recommend any specific limits on fish consumption. The second water quality concern is a restriction on the harvesting of shellfish from the waters of Hampton Roads around Craney Island (Appendix A). With a permit from the Marine Resources Commission, shellfish may be harvested from this area in the summer, provided that they are relayed to a clean area for a period of depuration. This restriction is based mainly on the potential for bacterial contamination.

The Elizabeth River is the site of a major deep water port supporting commerce, military activities, and industry. It has a long history of extensive dredging and shoreline alteration. Over the years man's aquatic filling activities have reduced the river's surface area by 27% (Nichols and Howard-Strobel 1986). The area is highly urbanized with some of the most severe

pollution problems in the Chesapeake Bay watershed. Because of its toxic contamination problems, the Chesapeake Bay Program has identified it as one of three Regions of Concern in the Bay. The other two are Baltimore Harbor and the Anacostia River. Significant contaminants include polycyclic aromatic hydrocarbons, various metals, tributyltin, and polychlorinated biphenyls (Chesapeake Bay Program 1994, Virginia Department of Environmental Quality 1998). The problem tends to be more severe in the branches, particularly in the Southern Branch. Shellfish harvesting is prohibited in the Elizabeth River due to the presence of chemical and bacterial contamination. While the Elizabeth River drains an area of over 300 square miles, the basin is rather flat and the freshwater input to the estuary is relatively low. In the summer dissolved oxygen in the bottom water is known to periodically drop below 4.0 mg/l, which is considered the minimum for general estuarine aquatic life (Sharp 1995). The Southern Branch appears to have the lowest dissolved oxygen, with levels sometimes nearing 1.0 mg/l.

In recent years a concerted effort was initiated to reduce the contaminant problems and enhance habitat. This effort was lead by the Elizabeth River Project, a private organization that developed a partnership of citizens, industry, governments, military, and recreational interests. A Watershed Action Plan that was produced in 1996 is expected to lead to significant improvements in the area.

Zooplankton in the Hampton Roads area are known to display a bimodal pattern of abundance with peaks in Spring (March-April) and summer (July-August) (Sharp 1995). Copepods are the dominant group with cladocerans comprising a minor fraction. Also present are the larvae of invertebrates such as barnacles, polychaete worms, molluscs, and crabs, and the eggs and larvae of resident estuarine fishes such as bay anchovy, hogchoker, goby, pipefish, blenny, and skillet fish. Zooplankton abundance is conspicuously reduced in the Elizabeth River and the species composition varies with the salinity gradient proceeding upriver (Sharp 1995, Birdsong 1993, Buchanan 1991). High concentrations of dissolved copper and zinc in the Elizabeth River have been shown to reduce survival of the copepod *Acartia tonsa,* and are believed to be at least partially responsible for the unusual low abundance of zooplankton there (Sunda et al. 1990).

Benthic macroinvertebrates comprise an important prey base for many fishes and crabs. Several studies have been conducted on the benthic macroinvertebrates inhabiting Hampton Roads and the Elizabeth River (Seitz and Lipcius 2002, Daurer 2001, Dauer 2000, Dauer et al. 1989a, Dauer et al. 1989b, Dauer and Ewing 1986, Hawthorne and Dauer 1983, Boesch 1973, Boesch 1972). Polychaetes, mollusks, and arthropods are the main groups. Diversity and abundance vary with the type of substrate, time of year, and location. Sand habitats tend to be more diverse, because of the presence of shell and other hard substrates that allow epifaunal colonizers.

The studies of Dauer and Ewing (1986), Dauer (2000), Seitz and Lipcius (2002) are particularly pertinent since they included stations adjacent to Craney Island within the proposed expansion area. Dauer and Ewing (1986) found that a silty sand bottom was located within 50 yards of the Craney Island shoreline. Further offshore the sediment contained a higher silt/clay content. No major differences in benthic invertebrate composition were detected between the nearshore silty,

sand bottom and the offshore higher slit/clay content bottom. Both areas were dominated by widely distributed species, many of which are classified as euryhaline opportunists. Polychaete worms were the most abundant group. Table 1 lists the top 14 numerically dominant species. Sometime after this study was conducted, 3-5 million cubic yards of sediment from the deepening of the channel to Newport News was deposited around Craney Island to increase dike stability (U.S. Army Corps of Engineers 1987). This alteration of the benthic environment would have affected the invertebrate community, but the long-term change may not be significant, since the community was dominated by widely distributed opportunistic species that were not restricted to particular bottom sediment conditions.

Dauer (2000) used a benthic index of biotic integrity (B-IBI) to characterize the benthic community condition of the Elizabeth River mainstem and its main tributaries (Eastern Branch, Western Branch, Southern Branch, and Lafayette River). The B-IBI is an index that incorporates several metrics representing species diversity, biomass, abundance, and certain community composition characteristics. Interpretation of the index is based on comparison with reference sites grouped according to salinity and substrate type. The Chesapeake Bay Program has used this index for several years to monitor the condition of the benthic community. Dauer sampled 25 stations in each of the Elizabeth River segments. The mainstem had a higher mean B-IBI value (better condition) than the tributaries. However, only 48% of the mainstem stations met the good condition level (B-IBI > 3) compared to 70% for the Virginia average for that year (1999). The conditions within the immediate vicinity of the eastern expansion project appear to be generally similar to the mainstem, and 3 of the7 stations (43%) showed a good condition level. Low species diversity and the presence of relatively large numbers of organisms from pollution tolerant taxa are the main reasons why many of the mainstem stations failed to attain the good condition level. The community was numerically dominated by polychaete and oligochaete worms, while arthropods and mollusks were notably uncommon. The 15 most abundant species are shown in Table 2. Seven of these were also numerically dominant species in the earlier study by Dauer and Ewing (1986).

Seitz and Lipcius (2002) sampled bivalves within the proposed Craney Island eastern expansion area (41 sites), and at 40 deep and 40 shallow (< 4feet) sites within the Elizabeth River entrance/Lafayette River area. They used a box core at sites deeper than 4 feet and a suction apparatus at shallower sites. These sampling methods were chosen to ensure that any deep dwelling bivalves would be collected. The sampling at the Craney Island site only found four species: *Tagelus plebeius, Aligena elevata, Macoma tenta, and Gemma gemma.* The number of species was relatively low in comparison to the other deep sites (7 species) and the shallow sites (8 species) sampled in the Elizabeth River mouth/Lafayette River area. The total bivalve density in the Craney Island area was also relatively low ($7.8/m^2$) in comparison to the other deep ($10.8/m^2$) and shallow ($71/m^2$) sites. This study is in the process of completing biomass measurements, but early observations indicated that all of the bivalves collected in the Craney Island sample area were small. Because of the relatively low bivalve abundance, the investigators concluded that the proposed fill area on the east side of Craney Island is not likely to be an important feeding area for blue crabs or demersal fish.

Table 1. Numerically dominant benthic invertebrate species collected adjacent to Craney Island by Dauer and Ewing (1986).

| Species | Abundance Rank |
|---|---|
| *Acteocina canaliculata* (G) | 1 |
| *Paraprionospio pinnata* (P) | 2 |
| *Mediomastus ambiseta* (P) | 3 |
| *Glycinde solitaria* (P) | 4 |
| *Phoronis psammophila*(Ph) | 5 |
| *Loimia medusa* (P) | 6 |
| *Nereis succinea* (P) | 7 |
| *Sigambra tentaculata* (P) | 8 |
| *Leitoscoloplos fragilis* (P) | 9 |
| *Sabellaria vulgaris* (P) | 10 |
| *Ampelisca abdita* (A) | 11 |
| *Leucon americanus* (C) | 12 |
| *Streblospio benedicti* (P) | 13 |
| *Spiochaetopterus oculatus* (P) | 14 |

(P) Polychaete
(Ph) Phoronid
(G) Gastropod
(A) Amphipod
(C) Cumacean

Table 2. Dominant benthic invertebrate taxa by abundance for the 25 stations in the mainstem Elizabeth River sampled by Dauer (2000). Taxa codes: G - gastropod, H - hemichordate, O - oligochaete, P - polychaete, Ph - phoronid, R - rhynchocoel

| Taxa | Number per $m^2$ |
|---|---|
| *Mediomastus ambiseta* (P) | 1020 |
| *Paraprionospio* (P) | 431 |
| Hemichordata spp. (H) | 406 |
| *Nereis succinea* (P) | 240 |
| *Glycinde solitaria* (P) | 163 |
| Tubificoides spp. Group I (O) | 151 |
| *Streblospio benedicti* (P) | 129 |
| *Loimia medusa* (P) | 119 |
| *Acteocina canaliculata* (G) | 96 |
| *Tubificoides wasselli* (O) | 73 |
| *Heteromastus filiformis* (P) | 68 |
| Nemertea spp. (R) | 68 |
| *Polydora ligni* (P) | 68 |
| *Phoronis psammophila* (Ph) | 64 |
| *Caulleriella killariensis* (P) | 59 |

The blue crab (*Callinectes sapidus*), hard clam (*Mercenaria mercenaria*), and Eastern oyster (*Crassostrea virginia*) are particularly important species, because of their commercial and recreational value. The blue crab is widely distributed and highly sought after by commercial and recreational fisherman. This swimming crab occurs around Craney Island, and watermen often set crab pots off the eastern perimeter during the warm months of the year.

The hard clam is distributed throughout the Hampton Roads area. Commercially harvestable densities are found just west of Newport News Point, on Hampton Flats between Newport News Point and Old Point Comfort, and on the Newport News Middle Ground (Roegner and Mann 1990, Byrne et al. 1987, Haven et al. 1981). The clam fishery in Hampton Roads and lower Chesapeake Bay is managed on a rotational basis with certain areas being opened and closed at various times of the year to limit the harvest in any one region (Mann 2002). In addition, the regulations allow clams from regions closed for direct harvest because of elevated coliform levels to be relayed to appropriate clean areas for depuration and subsequent harvest. A survey around Craney Island by Dauer and Ewing (1986) using a commercial dredge showed that hard clams were present in generally low numbers. The highest densities were found on the north side (7-14 clams per 5-minute dredge tow), while the east side yielded 1-2 clams per 5-minute tow. The Virginia Institute of Marine Science and the Virginia Marine Resources Commission initiated a hard clam survey for Hampton Roads and the Elizabeth River in 2001 (Mann 2002). Sampling was accomplished using modified hydraulic patent tongs with a coverage of one square meter. Figure 1 shows the sampling areas, and Table 3 shows the results for 39 of the 43 sampling areas. The areas around Craney Island had low densities of clams especially on the east side where only one clam was obtained in 28 tong grabs.

Baylor Grounds (designated public oyster grounds) are located off the east, west and north sides of Craney Island (Figure 2). The Baylor Grounds were originally naturally productive oyster areas that were surveyed on a state wide basis and set aside for public use in 1894 (Haven and Whitcomb 1983). The grounds in the vicinity of Craney Island and Hampton Roads have not been productive for many years. One reason for the decline in oyster productivity in this area is the introduction of two oyster pathogens, MSX (*Halosporidium nelsoni*) and dermo (*Perkinsus marinus*) beginning in the late 1950s. The oysters could have also been affected by anthropogenic disturbances including the construction of Craney Island and pollution. However, some oysters still set in this area and surveys around Craney Island have revealed a patchy, low density distribution (Dauer and Ewing 1986). Baylor Grounds retain protection under state law and any permanent destruction would require legislative approval (Gerry Showalter, Virginia Marine Resources Commission, pers. com.).

Even though the abundance of adult oysters in the Hampton Roads area is relatively low, this area is thought to play a critical role in the retention of oyster larvae in the James River. The James, particularly the region from the Route 17 bridge upstream to Mulberry Point is the primary area for producing seed oysters in Chesapeake Bay. Seed oysters are young oysters that are harvested and transplanted to other areas for growing to harvestable size. What makes the James River so important is the extremely high oyster set and survival. An unusual intersection

Table 3. Results of the 2001 VIMS/VMRC hard clam survey for Hampton Roads and the Elizabeth River (Mann 2002). The sampling area locations are shown in Figure 1. Areas around Craney Island are shown in bold.

| Area | Acreage | Number of Tong Grabs | Number of Clams Collected | Density (No./$m^2$) |
|---|---|---|---|---|
| 1 | 894.5 | 113 | 14 | 0.12 |
| 2 | 924.5 | 116 | 21 | 0.18 |
| 3 | 790.2 | 50 | 0 | 0.00 |
| 4 | 1159.4 | 145 | 54 | 0.37 |
| 5 | 1200.5 | 150 | 229 | 1.53 |
| 6 | 1926.8 | 242 | 76 | 0.31 |
| 7 | 1098.9 | 69 | 0 | 0.00 |
| 8 | 749.5 | 47 | 4 | 0.09 |
| 9 | 632.8 | 79 | 71 | 0.90 |
| 10 | 805.5 | 50 | 8 | 0.16 |
| 11 | 644.2 | 80 | 74 | 0.93 |
| 12 | 844.3 | 53 | 35 | 0.66 |
| 13 | 895.8 | 112 | 58 | 0.52 |
| 14 | 725.6 | 91 | 45 | 0.49 |
| 15 | 597.2 | 74 | 13 | 0.18 |
| 16 | 1126.4 | 141 | 149 | 1.06 |
| 17 | 102.7 | 13 | 15 | 1.15 |
| 18 | 1248.7 | 78 | 0 | 0.00 |
| 19 | 681.8 | 85 | 712 | 8.38 |
| 20 | 902.7 | 57 | 17 | 0.30 |
| **21** | **1118.9** | **70** | **20** | **0.29** |
| 22 | 731.3 | 92 | 241 | 2.62 |
| 23 | 986.5 | 123 | 358 | 2.91 |
| 24 | 722.6 | 45 | 70 | 1.56 |
| 25 | 1253.4 | 157 | 469 | 2.99 |
| 26 | 741.5 | 47 | 46 | 0.98 |
| 27 | 1567.5 | 196 | 442 | 2.26 |
| 28 | 711.7 | 45 | 27 | 0.60 |
| **29** | **544** | **34** | **9** | **0.26** |
| **30** | **452.3** | **28** | **1** | **0.04** |
| 31 | 649.5 | 46 | 29 | 0.63 |
| 32 | 1209.7 | 41 | 0 | 0.00 |
| 33 | 466.4 | 58 | 33 | 0.57 |
| 34 | 645.2 | 81 | 39 | 0.48 |
| 39 | 112.2 | 16 | 12 | 0.75 |
| 40 | 75.0 | 9 | 17 | 1.89 |
| 41 | 673.0 | 40 | 21 | 0.53 |
| 42 | 362.7 | 41 | 14 | 0.34 |
| 43 | 367.7 | 38 | 9 | 0.24 |
| 44 | 38.1 | 7 | 1 | 0.14 |
| Total | 31382.1 | 3059 | 3453 | |
| Mean | | | | 0.93 |

of currents at Hampton Roads tends to prevent the oyster larvae from being carried out of the river and facilitates their transport back upstream to the setting area (Mann 1988, Byrne et al. 1987). This is believed to be the main reason for the unusually high set in the James River.

Fish surveys of the lower James River and Elizabeth River have revealed a diverse assemblage of species. A list of the fish species collected from 7 surveys that were conducted in the area is given in Appendix B. The fish fauna is quite dynamic, with the relative distribution and abundance changing markedly over time (Birdsong et al. 1984). A majority of the species are marine migrants that enter the area at various times and life stages. This group includes many species with commercial or recreational value. They may enter the area as adults, but more often as juveniles. Some of the more important marine species include: Atlantic croaker, spot, Atlantic menhaden, weakfish, bluefish, and summer flounder. Anadromous species such as alewife, blueback herring, American shad, and striped bass pass through the area as adults on their way to and from freshwater spawning areas. The use of the Elizabeth River for anadromous fish spawning appears to be negligible. However, juveniles spend variable amounts of time in the area before eventually returning to the sea.

Some species are permanent residents of Chesapeake Bay. These would include bay anchovy, Atlantic silverside, killifish, blennies, skilletfish, gobies, pipefish, lined seahorse, oyster toadfish, blackcheek tonguefish, hogchoker, windowpane, white perch, yellow perch, and silver perch. These species also often display movements into and out of the area, as well as within the area, in response to changes in water temperature, other water quality conditions, and food availability. A few species are visitors from freshwater areas.

Fish diversity reaches a maximum in late summer and early fall (Murdy et al. 1997). As fall progresses many species migrate out to the ocean and southward. A few cold-water adapted species such as the spotted and red hakes enter the area during the colder months, but leave before the summer.

Birdsong (1984) made monthly trawl collections between January 1982 and January 1984 at 8 stations distributed within the lower Chesapeake Bay, lower James River, and Elizabeth River. He found that the two "Elizabeth River mainstem stations were among the most prolific producers of fishes." Species with relatively high abundance included: bay anchovy, Atlantic croaker, spotted hake, weakfish, blueback herring, Atlantic silverside, silver perch, and spot.

Table 4 shows a list of 11 species, for which "essential fish habitat" (EFH) has been designated in the Hampton Roads area. EFH is a designation that applies to species, which are managed under a Federal fishery management plan. It was established under the 1996 amendments of the Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. 1801 et seq.), and it is defined as "those waters and substrate necessary to fish for spawning, breeding, or growth to maturity." The Act requires federal agencies to consult with the National Marine Fisheries Service (NMFS) on proposed actions, funded, permitted or undertaken by the agency, that may

Table 4. Species which have Essential Fish Habitat designated in the Hampton Roads area. HAPC denotes "habitat areas of particular concern." Source: National Marine Fisheries Service 1999.

| Species | Life Stage | | | |
|---|---|---|---|---|
| | Egg | Larva | Juvenile | Adult |
| windowpane flounder (*Scophthalmus aquosus*) | | | | X |
| summer flounder (*Paralichthys dentatus*) | | X | X | X |
| black sea bass (*Centropristis striata*) | | | X | X |
| bluefish (*Pomatomus saltatrix*) | | | X | X |
| Atlantic butterfish (*Peprilus triacanthus*) | X | X | X | X |
| king mackerel (*Scomberomorus cavalla*) | X | X | X | X |
| Spanish mackerel (*Scomberomorus maculatus*) | X | X | X | X |
| cobia (*Rachycentron canadum*) | X | X | X | X |
| red drum (*Sciaenops occelatus*) | X | X | X | X |
| dusky shark (*Carcharinus obscurus*) | | X | | |
| sandbar shark (*Carcharhinus plumbeus*) | | X | X | X |
| sandbar shark (*Carcharhinus plumbeus*) | | HAPC | HAPC | HAPC |

adversely affect EFH. To determine the specific consultation procedures, which will be required, we suggest that you contact Tim Goodger of the NMFS Oxford, MD office at (410) 226-5771.

The lower James River is included within an area of the lower Chesapeake Bay that is designated as a "habitat area of particular concern" (HAPC) for the sandbar shark. This designation denotes EFH that is particularly important to the long-term productivity of the species and/or is particularly vulnerable to degradation. The intent of the designation is to focus greater attention on conservation efforts. The sandbar shark is a primarily bottom dwelling species that attains a maximum size of about 7.5 feet for females and 6 feet for males (Murdy el al. 1997). It has a wide distribution and has been reported from coastal areas of all tropical and warm-temperate oceans and seas. In the western Atlantic, it ranges from Massachusetts to southern Brazil. It has been one of the most important commercial shark species along the east coast of the United States since the 1940s. It is caught by long-lines, gill nets, and by anglers using rod and reel. Overfishing is believed to have reduced its numbers by about 80%.

The lower Chesapeake Bay is an important nursery area for sandbar sharks. Females move into the lower bay during the summer (Springer 1960). They typically bear 8 to 12 young and depart the bay shortly thereafter apparently without feeding. The young average approximately 24 inches at birth. They feed on a variety of fish and crustaceans, but blue crabs are a particularly important food item (Medved and Marshall 1981). They remain in the bay until the onset of winter, when they migrate to warmer waters off the coast and/or southward. They may return to estuary mouths and coastal bays in the mid-Atlantic region the next year in late spring.

The lower James River has low to moderate numbers of wintering waterfowl. Table 5 shows species counts based on 5-year averages from 1981 to 2000. The more numerous species include: canvasback, Canada goose, bufflehead, ruddy duck, mallard, American widgeon, ring-neck duck, northern shoveler, black duck, and mergansers. Waterfowl appear to be relatively more common on the western side of Craney Island along the shoreline up to the Nansemond River. Some wintering waterfowl also use the shallow water areas within the Craney Island disposal site. During the warmer months, various gulls, terns, cormorants, shorebirds, and wading birds are common in and around Craney Island.

## Craney Island Disposal Area

The Craney Island Disposal Area currently encompasses approximately 2,500 acres. The disposal operations and dike maintenance create a spatially and temporally variable disturbance regime. Large shallow water zones are created during large disposal operations. Gradual drying and vegetative colonization (typically by *Phragmites*) occurs between dredging cycles. The amount of dredged material, which is deposited, can vary significantly from year to year. The three interior cells are used in rotation to facilitate drying and material consolidation. The large open expanse of the area and its relative isolation help to make Craney Island an attractive area for birds that use shallow water, beaches, or open flats. Large numbers of waterfowl and shorebirds often occur, especially during migration. The site is also used by a variety of other

Table 5. Mid-winter waterfowl survey results (5-year averages) for the lower James River including the Elizabeth and Nansemond Rivers (Zone 4, Segment 1).

| Species/Group | 1981-1985 | 1986-1990 | 1991-1995 | 1996-2000 |
|---|---|---|---|---|
| mallard (*Anas platyrhyncos*) | 349 | 182 | 368 | 124 |
| black duck (*Anas rubripes*) | 170 | 49 | 92 | 28 |
| gadwall (*Anas streptera*) | 6 | 5 | 6 | 87 |
| widgeon (*Anas americana*) | 247 | 42 | 42 | 91 |
| green-winged teal (*Anas crecca*) | 0 | 2 | 12 | 40 |
| northern shoveler (*Anas clypeata*) | 80 | 0 | 60 | 208 |
| northern pintail (*Anas acuta*) | 140 | 0 | 0 | 50 |
| redhead (*Aythya americana*) | 20 | 7 | 0 | 4 |
| canvasback (*Aythya valisineria*) | 1720 | 451 | 990 | 1271 |
| scaup (*Aythya marila & A. affinis*) | 75 | 102 | 21 | 12 |
| ring-neck duck (*Aythya collaris*) | 166 | 105 | 79 | 58 |
| common goldeneye (*Bucephala clamgula*) | 56 | 14 | 18 | 12 |
| bufflehead (*Bucephala albeola*) | 193 | 71 | 183 | 370 |
| ruddy duck (*Oxyura jamaicensis*) | 45 | 1 | 136 | 916 |
| scoters (*Melanitta* spp.) | 66 | 11 | 15 | 12 |
| oldsquaw (*Clangula hyemalis*) | 127 | 5 | 12 | 2 |
| mergansers (*Mergus* spp.) | 279 | 22 | 76 | 56 |
| Atlantic brant (*Branta bernicla*) | 200 | 0 | 25 | 0 |
| snow goose (*Chen caerulescens*) | 40 | 0 | 0 | 0 |
| Canada goose (*Branta canadensis*) | 662 | 1160 | 557 | 554 |
| tundra swan (*Cygnus columbianus*) | 0 | 2 | 1 | 0 |
| Grand Total | 4641 | 2231 | 2693 | 3895 |

types of water-oriented birds including terns, gulls, wading birds, and osprey. The open habitat and large concentrations of birds make the area attractive to peregrine falcons (Davis 1988). This avian predator was removed from the Federal list of endangered species in 1999. Many thousands of birding enthusiasts come to Craney Island each year to observe the birds (Beck 1998).

Several species of ground nesting birds are known to nest at Craney Island. Examples include: least tern, killdeer, willet, piping plover, blackneck stilt, avocet, horned lark, and night hawk. Least tern is the most numerous nesting species. Ruth Beck, an ornithologist with the College of William and Mary, has been advising the Corps, since the 1980s, on ways to protect and enhance threatened and colonial nesting bird species at Craney Island. In the latter 1980s, specific habitat management measures were implemented to attract beach nesting birds. Fine sand and shell material was deposited and graded to provide nesting habitat. Wood decoys also, were set out to attract birds to the new habitat. Mammalian predators, such as red fox, were removed. Least terns responded positively to this effort and reached a peak of 300 pairs in 1989, although 60 to100 pairs was more typical during this period. The number of nesting pairs declined during the 1990s, and only 30 to 45 pairs nested during the last 3 years. A number of factors were responsible for the decline. The previous habitat management activities were not continued, and the quality of the nesting habitat declined. Mammalian predators, including red fox, feral cats, and feral dogs, increased. There was an increase in the amount of human activity, including a major operation to install wick drains along the perimeter dike.

Piping plover, a Federally listed threatened species, nested at Craney Island from 1989 to 1997. The number of nesting pairs during this period ranged from 1 to 5. They were responding to the same favorable nesting habitat conditions that benefitted the least terns. Unlike least terns piping plover produce precocial young that leave the nest shortly after hatching to travel to moist sand or mud flats for foraging. Since the young cannot fly, the foraging areas need to be located reasonably close to the nesting areas. The failure of piping plover to nest at the site since 1997 reflects the same decline in habitat conditions experienced by the least tern. In addition, some of the chick foraging areas on the outside of the perimeter dike and within the interior became unsuitable or inaccessible. It appears that piping plover would not be likely to use the site in the future, unless an active habitat management effort was implemented.

## Endangered Species

Immature loggerhead (*Caretta caretta*) and Kemp's ridley (*Lepidochelys kempii*) sea turtles regularly inhabit the lower Chesapeake Bay including the Hampton Roads area during the summer months (Mitchell 1994; Musick et al. 1984; Musick 1979). The loggerhead is Federally-listed as a threatened species and the ridley is listed as endangered. The endangered green (*Chelonia mydas*) and endangered leatherback (*Dermochelys coriacea*) sea turtles could also occur in the area, but only as rare transients. Sea turtles typically arrive in late May and depart in the fall as the water temperature drops below 20EC. Loggerhead and Kemp's ridley sea turtles spend a considerable amount of time feeding on the bottom. They have been known to be killed

by entrainment by hopper dredges. Since these species are under the jurisdiction of the National Marine Fisheries Service, we recommend that you contact Tim Goodger of their Oxford, MD office at (410) 226-5771 to determine the need for consultation under Section 7 of the Endangered Species Act.

An active bald eagle (*Haliaeetus leucocephalus*) nest is located approximately 0.5 miles west of Craney Island. The bald eagle is Federally-listed as a threatened species. Based on our current understanding of the project alternatives, there should be no effect on the bald eagle.

Piping plover (*Charadrius melodus*), which is Federally-listed as a threatened species, nested at Craney Island from 1989 to 1997. The habitat conditions currently appear marginal for this species, and an active management program would probably be needed to attract these birds to the site in the future.

### Future Without the Project

The future, without the project, would see the existing Craney Island disposal facility filled to capacity, but the disposition of the land and its potential habitat value would be uncertain. A third crossing of the lower James River is being planned as a bridge-tunnel with a segment that runs along the east side of Craney Island. There would be deepening of the Norfolk Harbor Channel. The existing 45-foot inbound lane would be deepened to 50 feet to match the existing 50-foot outbound lane. Subsequent further deepening to 55 feet is planned also. Maersk Maritime Services is planning to construct a new shipping terminal at a site on the Elizabeth River, just south of Craney Island. Ongoing restoration efforts by the Elizabeth River Project and others should lead to a reduction in sediment contaminants and improvement in wetland and related habitats in the Elizabeth River.

## PROJECT IMPACTS AND MITIGATION NEEDS

The most obvious and significant impact is the loss of approximately 580 acres of estuarine, open-water habitat. Since the habitat is of medium value and relatively abundant in Chesapeake Bay, we have classified it as Resource Category 3 under the Service's mitigation policy. The mitigation goal for this category is "no net loss of habitat value while minimizing loss of in-kind habitat value." Thus, to the extent that in-kind habitat losses cannot be avoided or minimized after appropriate mitigation planning efforts, substitute habitats should be created or enhanced (out-of-kind replacement) to compensate for the project habitat losses. The Service, currently, is participating in the Corps' project mitigation process, which is seeking to develop a conceptual plan to compensate for the habitat loss caused by the eastward expansion. Potential compensatory actions, which are being considered, include: restoring oyster grounds, restoring beds of submerged aquatic vegetation, restoring wetlands, decontaminating toxic hot spots in the Elizabeth River, preserving/enhancing riparian lands, stabilizing eroding shoreline habitats, creating/managing a hard clam broodstock sanctuary, removing blockages to potential anadromous fish spawning areas, improving bird habitat on Craney Island or elsewhere,

installing measures to improve the quality of urban stormwater runoff, and creating artificial fish reefs.

Besides the direct loss of estuarine habitat caused by the eastern expansion, there may be other impacts to adjacent habitats. The potential effect on the circulation of the lower James River (Hampton Roads) and the Elizabeth River was evaluated in a three-dimensional hydrodynamic modeling study by Wang et al. (2001). The study investigated potential effects on water surface elevation, current magnitude, surface and bottom salinity, bottom sedimentation potential, and Elizabeth River flushing. It found that the eastward expansion caused no significant effects on the circulation of the lower James River or Elizabeth River. The hydrodynamic model was verified and appeared capable of detecting any substantive effects. In fact, it did detect some important effects with the northward expansion and some lesser effects with the westward expansion alternatives. The lack of any notable effects on the Elizabeth River circulation with the eastward expansion appears to be due to the assumed dredging for the new port berthing area. This dredging would increase the river's cross sectional area to a degree that it would offset and slightly exceed the decrease caused by the filling.

The habitat in the dredged area will be modified. The water depth will be significantly increased from 3-4 m to approximately 16 m. This may alter the fish use of the area by potentially favoring pelagic adults in lieu of smaller juveniles. Crab harvesting activities would be precluded. The resident benthic invertebrate community in the dredged area will be eliminated for a time until a new assemblage repopulates. The repopulation typically, would occur over a time frame extending from a few months to a year or so. However, the character of the new benthic habitat may be altered. One potential concern is that sediment scouring and deposition associated with ship propeller wash could reduce the habitat suitability. If there will be a need for maintenance dredging, this could result in additional periodic impacts to the benthic community.

The operation of a new port facility on the expanded filled area could affect the use of birds on the existing Craney Island. The port could foster the presence of potential predators such as rats, raccoons, and gulls. Ground nesting birds such as the least tern would be particularly vulnerable to these predators. The lights, noise, and associated human activity from the port could also have some effect, although birds may be able to acclimate to these potential disturbances.

The adequate consideration of alternatives is a fundamental way to assure that unnecessary impacts are not incurred. This report has focused on the eastward expansion since it is the most probable alternative under consideration. The need to provide an area for port expansion appears to be the driving factor for this alternative. It also appears that much of the material capacity of the eastward expansion will be used up to accommodate the dredging for the new port berthing area. If the need for this port expansion proves not to be compelling, then other alternatives to provide dredged material disposal capacity, should receive closer scrutiny. These would include raising the existing dikes, ocean disposal, and beneficial uses such as habitat development.

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# APPENDIX B

**List of fishes collected by trawl and beach seine surveys in the lower James River and Elizabeth River near Craney Island.**

Freshwater eels - Anguillidae
- American eel - *Anguilla rostrata* (3, 5, 6)

Conger eels - Congridae
- conger eel - *Conger* sp. (6)

Anchovies - Engraulidae
- bay anchovy - *Anchoa mitchilli* (1, 2, 3, 4, 5, 6, 7)
- striped anchovy - *Anchoa hepsetus* (1, 2, 5)
- misc. anchovy - *Anchoa* sp. (7)

Herrings - Clupeidae
- Atlantic thread herring - *Opisthonema oglinum* (2)
- threadfin shad - *Dorosoma petenense* (2, 6)
- gizzard shad - *Dorosoma cepedianum* (2, 3, 5, 6, 7)
- Atlantic menhaden - *Brevoortia tyrannus* (1, 3, 5, 6, 7)
- American shad - *Alosa sapidissima* (3, 5, 6)
- blueback herring - *Alosa aestivalis* (2, 3, 4, 5, 6)
- alewife - *Alosa pseudoharengus* (3, 5, 6)

Lizardfishes - Synodontidae
- inshore lizardfish - *Synodus foetens* (1, 3, 5, 6, 7)

Carps and minnows - Cyprinidae
- common carp - *Cyprinus carpio* (1, 2)

Toadfishes - Batrachoididae
- oyster toadfish - *Opsanus tau* (3, 4, 5, 6)

Clingfishes - Gobiesocidae
- skilletfish - *Gobiesox strumosus* (3, 4, 5, 6)

Cods - Gadidae
- red hake - *Urophycis chuss* (3, 5, 6)
- spotted hake - *Urophycis regia* (3, 4, 5, 6)

Cusk-eels - Ophidiidae
striped cusk-eel - *Ophidion marginatum* (3, 5, 6)
Needlefishes - Belonidae
Atlantic needlefish - *Strongylura marina* (2)

Halfbeaks - Hemiramphidae
American halfbeak - *Hyporhamphus meeki* (7)

Killifishes - Cyprinodontidae
mummichog - *Fundulus heteroclitus* (2, 6)
striped killifish - *Fundulus majalis* (2, 3, 5, 7)
banded killifish - *Fundulus diaphanus* (5)

Silversides - Atherinidae
Atlantic silverside - *Menidia menidia* (2, 3, 5, 6, 7)
inland silverside - *Menidia beryllina* (6)

Pipefishes and seahorses - Syngnathidae
northern pipefish - *Syngnathus fuscus* (1, 3, 4, 5, 6, 7)
dusky pipefish - *Syngnathus floridae* (3)
lined seahorse - *Hippocampus erectus* (4)

Searobins - Triglidae
northern searobin - *Prionotus carolinus* (1, 3, 4, 5, 6)
striped searobin - *Prionotus evolans* (3, 5, 7)

Butterfishes - Stromateidae
harvestfish - *Peprilus alepidotus* (1, 2, 3)
butterfish - *Peprilus triacanthus* (1,3, 5)

Snake mackerels - Trichiuridae
cutlassfish - *Trichiurus lepturus* (3)

Jacks - Carangidae
crevalle jack - *Caranx hippos* (2, 3)
lookdown - *Selene vomer* (1)
Atlantic moonfish - *Selene setapinnis* (3)
permit - *Trachinotus falcatus* (2)

Cobia - Rachycentridae
cobia - *Rachycentron canadum* (1, 2)

Mackerels - Scombridae

Spanish mackerel - *Scomberomorus maculatus* (2)

Mullets - Mugulidae
white mullet - *Mugil curema* (2, 5, 7)
striped mullet - *Mugil cephalus* (2, 6)

Stargazers - Uranoscopidae
northern stargazer - *Asroscopus guttatus* (3, 4)

Drums - Sciaenidae
Atlantic croaker - *Micropogonias undulatus* (1, 2, 4, 5, 6, 7)
weakfish - *Cynoscion regalis* (1, 3, 4, 5, 6)
spotted seatrout - *Cynoscion nebulosus* (2, 6)
spot - *Leiostomus xanthurus* (1, 2, 3, 4, 5, 6, 7)
southern kingfish - *Menticirrhus americanus* (2)
silver perch - *Bairdiella chysoura* (2, 3, 6, 7)
banded drum - *Larimus fasciatus* (3)
red drum - *Sciaeops occellata* (3, 7)

Spadefishes - Ephippidae
Atlantic spadefish - *Chaetodipterus faber* (3, 6)

Bluefishes - Pomatomidae
bluefish - *Pomatomus saltatrix* (1, 2, 3, 4)

Gobies - Gobiidae
naked goby - *Gobiosoma bosc* (3, 4, 5, 6, 7)
seaboard goby - *Gobiosoma ginsburgi* (3, 4)
green goby - *Microgobius thalassinus* (3, 4, 6)

Striped basses - Moronidae
striped bass - *Morone saxatilis* (2, 3, 5, 6)
white perch - *Morone americana* (5, 6)

Perches - Percidae
Yellow perch - *Perca flavescens* (5)

Combtooth blennies - Blenniidae
striped blenny - *Chasmodes bosquianus* (1, 3, 5)
feather blenny - *Hypsoblennius hentzi* (3, 4, 5, 6)

Mojarras - Gerreidae
silver jenny - *Eucinostomus gula* (6)

Porgies - Sparidae

scup - *Stenotomus chrysops* (3)

pinfish - *Lagodon rhomboides* (7)

Grunts - Haemulidae
pigfish - *Orthopristis chrysoptera* (7)

Sunfishes - Centrarchidae
bluegill - *Lepomis macrochirus* (2)

Wrasses - Labridae
tautog - *Tautoga onitis* (5)

Sea basses and groupers - Serranidae
black sea bass - *Centropristis striata* (1, 3, 5)

Puffers - Tetraodontidae
northern puffer - *Sphoeroides maculatus* (3, 6, 7)

Tonguefishes - Cynoglossidae
blackcheek tonguefish - *Symphurus plagiusa* (2, 3, 4, 5, 6)

American soles - Achiridae
hogchoker - *Trinectes maculatus* (1, 3, 4, 5, 6)

Righteye flounders - Pleuronectidae
winter flounder - *Pleuronectes americanus* (5)

Paralichthyid flounders - Paralichthyidae
summer flounder - *Paralichthys dentatus* (1, 2, 3, 4, 5, 6, 7)
smallmouth flounder - *Etropus microstomus* (3, 5, 6)
windowpane - *Scopthalmus aquosus* (3, 5)

1. Species recorded from a survey by the Virginia Institute of Marine Science consisting of a total of 26 trawls taken near Craney Island and 57 trawls taken near Ragged Island during three summers between 1976 and 1978. A 16-foot otter trawl with a 1.5-inch stretch mesh and a 0.5-inch cod end liner was towed for 5 minutes at approximately 2.5 knots.

2. Species recorded from a VIMS survey consisting of a total of 15 seine hauls taken near Ragged Island during three summers between 1989 and 1991. A 100 by 4 feet flat minnow seine with 0.25-inch bar mesh was set perpendicular to the shore and swept in a quarter circle back to the shore.

3. Species reported by Birdsong et al. (1984) at 3 trawl stations: one at the mouth of the Elizabeth River, just east of Craney Island and west of the ship channel; another in the main stem of the Elizabeth River off Lamberts Point; and the third about 1 nautical mile up the Southern

Branch of the Elizabeth River from its confluence with the Eastern Branch. Each station was sampled monthly from January 1982 through January 1984, excluding February 1982 and December 1983. Three 10-minute tows were made at each station on each sample date with a 16-foot wide, semiballoon otter trawl with a 0.25 inch cod end liner.

4. Species reported by Dauer et al. (1989a) based on a trawl survey at the mouth of the Elizabeth River near the Norfolk International Terminals. Six 10-minute tows were made in April and again in July 1989 with a 3-meter otter trawl.

5. Species reported by Hedgepeth et al. (1981) based on numerous trawls in the lower James River and Elizabeth River conducted during the winter and summer of 1978 and 1979.

6. Species recorded from VIMS trawl surveys at numerous stations within the Elizabeth River in 1985 (20 tows), 1999 (13 tows), and 2000 (28 tows).

7. Species recorded during a survey at the east side of Craney Island by Walter Priest (VIMS) and Randy Owen (VMRC) on September 4, 2002. The survey consisted of two hauls of a 100-foot seine at the beach just north of the rehandling basin, and two 5-minute tows with a 6-foot beam trawl just off the shore.

# APPENDIX B

# MITIGATION ANALYSIS

MITIGATION APPENDIX

TABLE OF CONTENTS


| Item | Page |
|---|---|
| EXECUTIVE SUMMARY | B-1 |
| 1 INTRODUCTION | B-4 |
| 2 ACTION REQUIRING COMPENSATORY MITIGATION | B-6 |
| 3 PROJECT-RELATED ADVERSE IMPACTS | B-7 |
| 3.1 HABITAT EQUIVALENCY ANALYSIS (HEA) METHOD | B-8 |
| 3.2 INJURY REQUIRING COMPENSATORY MITIGATION | B-9 |
| 4 MITIGATION MEASURES | B-11 |
| 4.1 PRELIMINARY SCREENING OF POTENTIAL MITIGATION MEASURES | B-13 |
| 4.2 APPROPRIATENESS OF SELECTED MITIGATION MEASURES | B-25 |
| 4.3 COMPENSATORY QUANTIFICATION OF MITIGATION MEASURES | B-29 |
| 5 ALTERNATIVE MITIGATION PLAN FORMULATION – MITIGATION SUBCOMMITTEE RECOMMENDATIONS | B-30 |
| 5.1 MITIGATION SUBCOMMITTEE PLAN RECOMMENDATIONS | B-31 |
| 6 ALTERNATIVE MITIGATION PLAN FORMULATION – DETAILED ANALYSIS | B-34 |
| 6.1 HABITAT EVALUATION METHOD DEVELOPMENT | B-35 |
| 6.2 PRODUCTIVITY ADJUSTMENTS | B-36 |

TABLE OF CONTENTS
(Cont'd)


| Item | Page |
|---|---|
| 6.3 QUALITATIVE PRODUCT SCORE | B-41 |
| 6.4 HABITAT UNITS | B-48 |
| 7 PLAN SELECTION | B-48 |
| 7.1 ALTERNATIVE PLAN DEVELOPMENT | B-48 |
| 7.2 COST EFFECTIVENESS AND INCREMENTAL COST ANALYSIS (CE/ICA) | B-49 |
| 7.3 MITIGATION PLAN SELECTION | B-55 |
| 8 SELECTED MITIGATION PLAN DESCRIPTION | B-60 |
| 8.1 SEDIMENT MITIGATION SITE DESCRIPTIONS | B-62 |
| 8.2 WETLAND MITIGATION SITE DESCRIPTIONS | B-66 |
| 8.3 OYSTER REEF SITE DESCRIPTIONS | B-72 |
| 8.4 OTHER MITIGATION SITES | B-75 |
| 9 RELATIONSHIP OF MITIGATION PLAN TO THE USACE ENVIRONMENTAL OPERATING PRINCIPLES | B-77 |
| 10 CONCLUSIONS AND RECOMMENDATIONS | B-80 |
| 11 REFERENCES | B-82 |


LIST OF TABLES


| No. | Title | Page |
|---|---|---|
| 1 | HEA PRODUCTION LOST | B-10 |
| 2 | CONSTRAINTS FACED IN DEVELOPING THE MITIGATION PLAN | B-12 |

LIST OF TABLES
(Cont'd)


| No. | Title | Page |
|---|---|---|
| 3 | PRELIMINARY SCREENING FACTORS USED TO EVALUATE PROPOSED COMPENSATORY MITIGATION PROJECTS | B-16 |
| 4 | MITIGATION PLAN SITE ALTERNATIVES | B-18 |
| 5 | MITIGATION OPTION WEIGHTING FACTOR EVALUATION | B-23 |
| 6 | FUNCTIONS LOST/FUNCTIONS REPLACED | B-29 |
| 7 | HEA PRODUCTION GAINED | B-30 |
| 8 | QUALITATIVE PRODUCT SCORES | B-47 |
| 9 | COST-EFFECTIVE PLANS | B-51 |
| 10 | RESULTS OF COST-EFFECTIVENESS ANALYSIS | B-52 |
| 11 | RESULTS OF INCREMENTAL COST ANALYSIS | B-54 |
| 12 | MITIGATION PLAN FOR CRANEY ISLAND EXPANSION | B-61 |
| 13 | RECOMMENDED MITIGATION PLAN (PRODUCTION/COST) | B-62 |
| 14 | POTENTIAL SEDIMENT REMEDIATION ALTERNATIVES | B-65 |
| 15 | CRANEY EXPANSION WETLAND MITIGATION SITES | B-69 |
| 16 | MITIGATION PLAN CONSISTENCY WITH USACE ENVIRONMENTAL OPERATING PRINCIPLES | B-79 |

## LIST OF FIGURES


| No. | Title |
|---|---|
| 1 | PROJECT RECOMMENDED PLAN CRANEY ISLAND EAST EXPANSION |
| 2 | MITIGATION SUBCOMMITTEE EVALUATIONS |
| 3 | CANDIDATE MITIGATION SITES/OPPORTUNITIES EVALUATED DURING SECOND PHASE OF SCREENING |
| 3A | CANDIDATE MITIGATION SITES/OPPORTUNITIES EVALUATED DURING SECOND PHASE OF SCREENING (cont'd) |
| 3B | CANDIDATE MITIGATION SITES/OPPORTUNITIES EVALUATED DURING SECOND PHASE OF SCREENING (cont'd) |
| 4 | MITIGATION BENEFITS CALCULATIONS |
| 5 | COST-EFFECTIVE PLANS |
| 6 | BEST BUY PLANS |
| 7 | WYCOFF SEDIMENT SITE |
| 8 | REPUBLIC SEDIMENT SITE |
| 9 | MONEY POINT SEDIMENT SITE |
| 10 | PARADISE CREEK SEDIMENT SITE |
| 11 | SCUFFLETOWN SEDIMENT SITE |
| 12 | LAMBERTS POINT/ODU WETLAND SITE |
| 13 | FORMER EXXON WETLAND SITE |
| 14 | PARADISE CREEK PARK WETLAND SITE |
| 15 | ELIZABETH RIVER TERMINALS WETLAND SITE |
| 16 | JONES AND GILLIGAN'S CREEK WETLAND SITE |

LIST OF FIGURES
(Cont'd)


| No. | Title |
|---|---|
| 17 | ST. JULIANS ANNEX WETLAND SITE |
| 18 | CRANEY ISLAND CONSENSUS MITIGATION PLAN CONNECTIVITY WITH EXISTING RESTORATION AREAS |
| 19 | RAGGED ISLAND WILDLIFE MANAGEMENT AREA |
| 20 | CRANEY ISLAND CONSENSUS MITIGATION PLAN SOUTHERN BRANCH, ELIZABETH RIVER |
| 21 | CRANEY ISLAND CONSENSUS MITIGATION PLAN HOFFLER CREEK OYSTER REEF CREATION SITE AND CRANEY ISLAND BIRD MANAGEMENT PLANNING AREA |
| 22 | CRANEY ISLAND CONSENSUS MITIGATION PLAN LAMBERTS POINT WETLANDS RESTORATION AREA AND CRANEY ISLAND BIRD MANAGEMENT PLANNING AREA |
| 23 | CRANEY ISLAND CONSENSUS MITIGATION PLAN RAGGED ISLAND WETLANDS AREA, OYSTER REEF CREATION AND CLAM BED RESTORATION |

# MITIGATION ANALYSIS
# APPENDIX

## EXECUTIVE SUMMARY

The Recommended Plan includes the construction of a 580-acre dredged material placement cell to the east of the existing CIDMMA with the expanded cell used for port development. In accordance with the Council on Environmental Quality (CEQ) Regulations for Implementing the National Environmental Policy Act (NEPA), and with ER 1105-2-100, "Policy and Planning Guidance for Conducting Civil Works Planning Studies (Planning Guidance Notebook)," the project-related adverse environmental impacts (i.e., impacts to fish and wildlife resources) have been avoided or minimized to the extent practicable, and a mitigation plan has been developed to compensate for remaining unavoidable significant adverse impacts. A Cost Effectiveness/Incremental Cost Analysis (CE/ICA) has been performed to identify the most cost-effective plan(s).

The compensatory mitigation plan was developed with input from a Mitigation Subcommittee consisting of representatives from 12 Federal and State agencies and 3 local interest groups. The committee convened on 15 occasions between June 2002 and May 2005. The CE/ICA resulted in a total of 22 plans that were determined to be cost-effective, including three Best Buy Plans. The selected mitigation plan is one of the Best Buy Plans.

Using data from existing studies and those performed specifically for this Feasibility investigation, the Mitigation Subcommittee was tasked with assessing the degree of habitat impact associated with the 580-acre fill, formulating mitigation ratios to replace or to increase the ecological function and productivity of the area lost, and developing a conceptual mitigation plan comprised of various tidal and sub-tidal habitats. A "landscape approach" was used to establish physical connectivity between various mitigation sites and to establish ecological synergy. Application of this approach also maximizes productivity and ensures long-term viability of each of the sites. Habitat

Equivalency Analysis (HEA) methodology was used to quantify the loss in habitat productivity from the proposed CIDMMA expansion and to provide a scale for a mitigation project that would compensate for the estimated loss in ecosystem services and production at the appropriate trophic levels. This information was used to conduct the CE/ICA.

The U.S. Army Corps of Engineers (USACE) and the Virginia Port Authority (VPA) used this information and the committee's input to develop and present a "Draft Conceptual Mitigation Plan" at subcommittee meetings in February 2005. The plan considered in-kind relatedness, proximity to impact site, publicly recognized value of the habitat type, risk/long-term viability, ability to restore lost ecological functions, and the habitat productivity lost and productivity supplied by each mitigation option to replace the loss. Subsequent meetings in May 2005 resulted in modifications to the conceptual plan and the development of a "Draft Consensus Mitigation Plan." This consensus plan, also known as the Locally Preferred Plan (LPP), consists of approximately 20 acres of oyster reef restoration, 56 acres of wetland restoration, and and 67 acres of bottom sediment clean-up that will result in 411 acres of bottom restoration. This mitigation plan amounts to an approximate equivalent amount of production than is estimated to be lost from project construction, and functional benefits are enhanced synergistically by implementation of the three major mitigation measures across the landscape.

While the geographic scope of the mitigation search area covered the Elizabeth River, the lower James River, and vicinity, the committee placed a high priority on developing mitigation projects within the Elizabeth River system. The proposed expansion is located in the mouth of the Elizabeth River and 580 acres of the river's bottom, and overlying water column will be lost as a result of construction of the expansion. For this reason, a significant portion of the mitigation effort is focused in the Elizabeth River system. In addition, by targeting the Southern Branch of the river, the combined projects of wetlands restoration, sediment cleanup, and oyster restoration are able to establish physical connectivity and ecological synergy. Application of this

approach also maximizes productivity and provides maximum opportunity for long-term sustainability of each of the sites.

Sediment remediation is not a typically used mitigation alternative; however, when judged by a committee of subject matter experts, including Federal and state regulators typically involved in developing mitigation recommendations, sediment remediation was given an "in-kind relatedness" score of 9.3 (out of a possible 10), the highest of 13 other mitigation options evaluated in this study. "In-kind relatedness" was defined by the Mitigation Subcommittee as "similarity of the mitigation option to the disturbed/impacted habitat type." The overall mitigation benefit for sediment clean-up was adjusted upward in order to take into account several aspects of this particular mitigation measure and its potential for positive regional impacts, even if done as a stand-alone activity. This appendix describes how the benefit was enhanced for this particular mitigation measure.

By remediating 67 acres of the worst "hot spots" within a 3-mile segment of the river, a large portion of the river (411 acres) will realize increases in general overall ecological improvement to water quality, fisheries, and diversity; abundance; and productivity of bottom dwelling organisms. It is well known that persistent environmental contamination can have long-term and wide-spread effects that impact a considerable area around the site of the contamination, especially in the aquatic environment. The additional production credited to this particular type of mitigation, therefore, is justified.

Of the three Best Buy Plans identified in the CE/ICA, the LPP was selected as the recommended and fully-justified mitigation plan. The recommended mitigation plan is acceptable, efficient (cost-effective), complete, and supported by the non-Federal local sponsor (VPA); by other state and Federal agencies, such as the U.S. Environmental Protection Agency (USEPA), U.S. Fish & Wildlife Service (USFWS), National Oceanic and Atmospheric Administration (NOAA), and Virginia Institute of Marine Science (VIMS); and non-profit organizations such as the Elizabeth River Project (ERP).

In conclusion, the Mitigation Subcommittee, along with the USACE and VPA, has identified specific feasible mitigation options. The USACE has used CE/ICA to evaluate the options and has identified a Best Buy Plan that fully compensates for the unavoidable environmental impacts of the project. During plan development, every effort was made to accommodate the diverse input of the stakeholders involved in this process. The recommended "Draft Consensus Mitigation Plan," which is based on three years of stakeholder involvement, scientific study, and thorough analysis of all data and information collected, proposes 487 acres of compensatory mitigation in the form of large scale ecosystem restoration at a total cost of approximately $50 million. Upon successful completion, the Mitigation Plan will replace important ecological functions in the lower James and Elizabeth River estuaries and will provide compensation for the water column and benthic productivity lost from the proposed expansion of CIDMMA.

# 1 INTRODUCTION

In accordance with Council on Environmental Quality (CEQ) Regulations for Implementing NEPA (40 CFR 1500-1508), and with Appendix C, paragraph C-3 of ER 1105-2-100, "Policy and Planning Guidance for Conducting Civil Works Planning Studies (Planning Guidance Notebook)" (USACE, 2000), the planning of USACE-sponsored and other Federal projects must ensure that project-related adverse environmental impacts (i.e., impacts to fish and wildlife resources) have been avoided or minimized to the extent practicable, and that remaining unavoidable significant adverse impacts are compensated to the extent justified. USACE regulations stipulate that the Recommended Plan must contain sufficient mitigation measures to ensure that the plan selected will have no more than negligible net adverse impacts on fish and wildlife resources, including impacts of the mitigation measures themselves. Furthermore, a CE/ICA must be performed to identify the most cost-effective mitigation plan.

Mitigation, which includes avoidance, minimization, and compensation, has been addressed in the Environmental Impact Statement (EIS). Critical to developing the EIS is the identification of a recommended mitigation plan so that the scope of mitigation can be clearly assessed and presented. Avoidance and minimization was pursued as mitigation

wherever that course of action presented itself as a feasible option. Avoidance and minimization included choosing the expansion alternative (east) that had the least amount of hydrodynamic impact as predicted by VIMS hydrodynamic model studies, physically designing the east expansion to minimize effects, avoidance of critical and sensitive habitats, cultural and historical resources, commercially valuable fishery resources, threatened and endangered species, and many other specific and less obvious decisions integral to the project design. The remaining adverse impacts to ecological resources were addressed by compensatory mitigation, as presented in this document.

The NEPA Committee and the Mitigation Subcommittee, consisting of representatives from 13 Federal and state agencies and 3 local interest groups, guided development of the Mitigation Plan. The agencies and interest groups included: the USEPA, USFWS, NOAA, USACE, U.S. Navy, VIMS, Virginia Department of Environmental Quality (VDEQ), Virginia Marine Resources Commission (VMRC), Virginia Department of Conservation and Recreation, Virginia Department of Game and Inland Fisheries (VDGIF), VPA, Old Dominion University (ODU), College of William & Mary, ERP, James River Association, and Wetlands Watch. These committees had direct and continuous involvement in:

- Identification and preliminary screening of potential mitigation measures;
- quantification of project-related injury and compensation;
- development of mitigation plan alternatives; and
- mitigation plan selection.

These committees identified alternative mitigation measures at 15 specific geographical locations as compensatory mitigation to offset the loss of 580 acres of river bottom and overlying open water habitat. Alternative compensatory mitigation measures were scaled in order to compensate for the injury. Accordingly, the gains in resources and/or services provided by the alternative compensatory plans are equivalent to the resources and/or services lost as a result of the injury. Mitigation plan selection and economic justification was then accomplished through CE/ICA.

This mitigation analysis has been conducted as part of the Craney Island Eastward Expansion (CIEE) Feasibility Study. This appendix documents the process of mitigation plan formulation over the course of more than 3 years. The recommended mitigation plan demonstrates a rational and justifiable relationship to the project-related injuries. There are several main components to evaluating the relationship: 1) Similarity in attributes to the injured habitat, 2) Proximity to the affected area, 3) Appropriate scale, and 4) Cost effectiveness, and 5) Structural feasibility. Each of these factors has been addressed during mitigation plan formulation and selection, as presented in this report.

This report is organized as follows. This introduction is followed by Section 2, which presents the action requiring mitigation i.e., the east expansion plan recommended by the CIEE Feasibility Study. Section 3 presents the project-related impacts including a quantitative assessment of the injury requiring compensation. Section 4 presents the identification and selection of potential mitigation measures, which was conducted in close coordination with the Mitigation Subcommittee. Formulation of potential elements (measure/site combinations) of the Mitigation Plan, which was also guided by subcommittee input, is presented in Section 5. Section 6 describes the detailed plan formulation conducted by the Norfolk District, including benefit estimation and cost assessments. Mitigation plan selection is described in Section 7, which includes details from the Institute for Water Resources (IWR) Plan supported CE/ICA. Section 8 provides detailed descriptions of the individual mitigation plan components. Section 9 briefly presents the conclusions and recommendations. Section 10 lists the reference materials used in the report.

## 2 ACTION REQUIRING COMPENSATORY MITIGATION

The Recommended Plan includes the construction of a 580-acre dredged material placement cell to the east of the existing Craney Island Dredged Material Management Area (CIDMMA) with the area atop the expanded cell to be used for port development. The eastward expansion of the CIDMMA involves the filling of 580 acres of an estuarine area near the mouth of the Elizabeth River, eliminating now functioning habitats from the

estuarine ecosystem in the Elizabeth River, lower James River, and vicinity. Figure 1 displays the Recommended Plan and its surroundings. Construction of the plan recommended in the CIEE Feasibility Study will affect two biological habitats:

- The estuarine sea floor; and
- The overlying water column, which has an average depth of 10 feet.

## 3 PROJECT-RELATED ADVERSE IMPACTS

A number of existing studies and studies conducted specifically for this project were evaluated by the Mitigation Subcommittee for background information and impacts evaluation (Figure 2). The benthic area that would be impacted is currently an area of open, muddy bottom that has a low species diversity and abundance. For example, a study done on bivalve abundance and diversity (Lipcius and Seitz, 2002) found seven bivalve species in deep water areas in the Elizabeth river system outside the proposed project area, eight species in shallow waters of the Elizabeth River system, but only four species in the proposed project area. The density of bivalves was also lowest in the proposed project area when compared to shallow water sites in the Elizabeth River system and other deep water areas in the Elizabeth River system. Other than bivalves, those species of invertebrates present are mostly smaller, pollution-indicative species. Species of commercial importance, such as hard clams, *Mercenaria mercenaria,* were almost totally non-existent. Biomass per unit area of open bottom in the proposed project impact area is low.

The impacted area was formerly populated with oyster reefs of various sizes, though the original extent of these reefs is lost to history and cannot be fully documented. The Baylor survey (Baylor, 1894) did document extensive (historical) oyster reefs in the east expansion footprint and the area is displayed on Baylor survey maps as Public Ground No.1, Norfolk County. The water column above the bottom supports a diverse assemblage of phyto- and zoo-plankton, as well as a variety of finfish and other mobile aquatic organisms, such as cnidarians (hydras, jellyfish, etc.). Due to the low numbers of filter feeders, both in the benthos and water column, much of the primary productivity in

the form of phytoplankton is not consumed and eventually dies and settles to the bottom, where it contributes to hypoxic conditions. Overall, and compared to other areas in the lower Chesapeake Bay and the Elizabeth River, the area is of relatively low overall productivity and low ecological value.

From 2002 through 2004, the Mitigation Subcommittee reviewed benthic biomass, abundance, and diversity surveys of the Elizabeth and Lower James Rivers in order to characterize the affected area and to quantify project-related injury. A cumulative impacts assessment commissioned by USEPA and a baseline biological condition assessment conducted by USFWS were also evaluated. The USFWS Planning Aid Report (Ruddy, 2002) classified the habitat at the east expansion site "...of medium value and relatively abundant in Chesapeake Bay, we have classified it as Resource Category 3 under the Service's mitigation policy. The mitigation goal for this category is no net loss of habitat value while minimizing loss of in-kind habitat value." Seitz and Lipcius (2003) concluded that the habitat within the impact footprint is limited in function and biomass productivity. Clam populations and biomass are extremely low when compared to similar habitats in the River system. As a result, they concluded that "...the area is not a significant feeding ground for blue crabs or finfish" (Lipcius and Seitz, 2003). In addition, no threatened or endangered species are present, and the area is classified by VIMS as a submerged aquatic vegetation (SAV) "exclusion zone" where SAV growth is not viable.

## 3.1 HABITAT EQUIVALENCY ANALYSIS (HEA) METHOD

HEA is a method developed by NOAA to determine compensation for natural resources damaged as a result of discharges of oil, releases of hazardous substances, or physical injury resulting from vessel groundings. The basic concept of the HEA method is that "....the public can be compensated for past losses of habitat resources through habitat replacement projects providing additional resources of the same type" (Damage Assessment and Restoration Program at www.darp.noaa.gov).

The HEA method has been used to evaluate impacts from vessel groundings, spills, and hazardous waste sites to many habitat types, including seagrass, coral reef, tidal wetland, salmon stream, and estuarine soft-bottom sediment. This methodology was applied to an oil spill which occurred in the Patuxent River (a tributary to the Chesapeake Bay) in 1999. Use of the HEA method was recommended by the USEPA and NOAA to the Mitigation Subcommittee as a way to quantify the impact of the proposed expansion and to determine the scale of compensatory mitigation.

## 3.2 INJURY REQUIRING COMPENSATORY MITIGATION

Two complementary HEA's were conducted in support of mitigation plan development (Figure 2). The initial HEA was conducted by Dr. Charles Peterson (University of North Carolina), a benthic ecologist and noted expert in the field of coastal community ecology with previous experience in conducting HEA in the Chesapeake Bay. A supplementary HEA was conducted by George Ruddy of the USFWS. While not as comprehensive as the first two complementary studies, an additional HEA model was also run by NOAA to determine the compensatory effect of sediment remediation (Buchman, 2003).

The initial HEA report prepared by Peterson (see EIS, Appendix D) was peer reviewed by a panel of 13 scientists and went through various revisions based upon comments and input received. Using data from the ODU and VIMS abundance and biomass surveys, the Peterson HEA model quantified the loss in habitat productivity from the proposed CIDMMA expansion and provided a scale for a restoration project that would compensate for the estimated loss in ecosystem services and production at the appropriate trophic levels. Secondary species productivity in both the benthic water column habitats was estimated. A supplemental analysis conducted by Ruddy modified Peterson's initial HEA results. These changes were accepted by consensus of the Mitigation Subcommittee as the quantified resource injury and as the basis for compensatory mitigation.

It was determined that productivity, in terms of kilograms per year (kg/yr), would be one facet of the Mitigation Plan development and would be an appropriate metric for quantifying ecosystem gains and losses. Productivity incorporates many aspects of the ecosystem and is typically used by scientists as an accurate measure of the biological output of an ecosystem. It allows integration of the abundance of organisms, their overall size, or biomass, as well as can be a composite of several types of biological material (i.e., benthic organisms plus water column organisms). It is a much better metric than simpler metrics, such as surface area or volume of area lost (Seitz, 2005).

The following table summarizes the conclusions of Peterson's initial HEA analysis and Ruddy's modifications, as accepted by the Mitigation Subcommittee. The estimated annual losses in benthic macrofauna and meiofauna and zooplankton water column productivity resulting from the proposed of the eastward expansion of CIDMMA are presented as kilograms of biomass production (Peterson and Associates, 2003; Ruddy, 2005). Estimated annual productivity loss increased from 109,367 kg to 124,423 kg based on the supplementary analysis by Ruddy.

Table 1. HEA PRODUCTION LOST

| Resource | Peterson productivity loss (kg/yr) | Ruddy productivity loss (kg/yr) |
|---|---|---|
| Benthic invertebrates | 13,112-33,652 | 71,518 |
| Water column (1) (zooplankton) | 16,976-75,715 | 52,905 |
| Total | 30,088-109,367 | 124,423 |

(1) These computations assume a worst-case scenario of complete loss of water column habitat volume equal to the volume of fill. Access channel dredging will create a water column volume equal to the fill, thereby retaining water column volume constant, but with less in the photic zone.

# 4 MITIGATION MEASURES

Many of the NEPA Technical Committee and its associated Mitigation Subcommittee meetings have focused on evaluating mitigation measures that could be used for the loss of nearshore, shallow, and open water habitat. Some potential mitigation measures evaluated include, but were not limited to, oyster bed restoration, SAV restoration, sediment clean-up in the Elizabeth River, wetland restoration/ conservation, and riparian buffers. The Mitigation Subcommittee focused on mitigating the direct effects associated with the loss of about 580 acres of bottom area and open water habitat located just to the east of the CIDMMA.

An early decision made by the Subcommittee was that "...on-site, in-kind mitigation (i.e., grading back waterfront property near CIDMMA to create benthic habitat) is not practical, economical, or technically feasible. Off-site, out-of-kind mitigation is, therefore, the focus of this mitigation plan. The geographic region of consideration agreed upon by consensus is the Elizabeth River, Hampton Roads Harbor, and lower James River systems" (Mitigation Subcommittee Meeting Minutes, June 21, 2002).

While the geographic scope of the mitigation search area covered the Elizabeth River, the lower James River, and vicinity, the committee placed a high priority on developing mitigation projects within the Elizabeth River system. This approach seemed justified since the proposed expansion is located in the mouth of the Elizabeth River and 580 acres of the river's bottom, and overlying water column will be lost as a result of construction of the expansion. Therefore, where mitigation options were available in the Elizabeth River, these options were given a higher priority. Several other constraints were faced in evaluating the mitigation options and, ultimately, in arriving at the recommended mitigation plan. Several of these constraints are highlighted in the following table.

Table 2. CONSTRAINTS FACED IN DEVELOPING THE MITIGATION PLAN

| Subject | Constraint | Effect on Plan |
|---|---|---|
| COST | Highly urbanized watershed | - Higher real estate cost<br>- Higher site logistics cost<br>- Fewer mitigation sites and few "cheap" mitigation options available<br>- Anthropogenic influences costly to deal with |
| VDEQ WATERSHED ACTION PLAN (1996, 2002) | Identifies No.1 and No. 2 highest priorities to restore river: sediment cleanup and wetlands restoration | Significant impact to river must consider highest priorities to restore river where "in-kind relatedness" of the priority to the impact has been identified. |
| PUBLIC INTEREST GROUP | 2,000-member Elizabeth River Project:<br>"...our preferred alternative is bottom restoration elsewhere in the river to compensate for the loss of healthy bottom (at CIDMMA expansion). We are unaware of any other alternative that would achieve the win-win goal of a net gain for the river. Recognizing that the USACE and VPA could offer several different plans and types of compensatory mitigation, we feel strongly that any plan **MUST** include a substantial effort to restore polluted bottom to replace the good bottom lost to the expansion." | Sediment remediation is included in evaluation of alternatives in response to Environmental Operating Principle guidance to: "Respect the views of individuals and groups interested in Corps activities, listen to them actively, and learn from their perspective in the search to find innovative win-win solutions to the nation's problems that also protect and enhance the environment." |
| PRIOR USACE STUDIES AND APPROVALS | The USACE "Elizabeth River Basin, VA - Environmental Restoration Feasibility Study (2001)" identifies sediment clean-up and wetlands restoration as National Ecosystem Restoration Plan. Section 312 Project approved by Assistant Secretary of the Army (Civil Works). | Significant impact to river must consider prior USACE recommendations/approvals to restore river where "in-kind relatedness" of the approved restoration to the impact has been identified. |
| STAKEHOLDER GROUPS | Needs and requirements of a diverse group of stakeholders must be addressed. | No one mitigation alternative alone can satisfy concerns. |

## 4.1 PRELIMINARY SCREENING OF POTENTIAL MITIGATION MEASURES

The advantages and limitations of various mitigation measures were discussed at subcommittee meetings. The following are some brief key points that were made regarding various measures identified by the Subcommittee:

(1) Oyster Bed Restoration -- improves benthic diversity and habitat; provides water column benefits; replaces benthic components lost -- although they may be a different species composition; risk from disease pressure;

(2) SAV Restoration -- improves benthic habitat and diversity; provides nursery areas for finfish and shellfish; limited opportunities/locations in the lower James and Elizabeth Rivers for large successful long-term growth and function;

(3) Wetland Restoration -- provides fisheries habitat and invertebrates habitat; are losing fish habitat with expansion; different than what is lost; good juvenile fish and invertebrate use;

(4) Sediment restoration – provides restored bottom areas (fisheries habitat and invertebrates habitat) in the river and improves water quality; close to "in-kind" compensation for lost bottom area;

(5) Upland Conservation Areas -- it was generally agreed that it is not in-kind related; mostly water quality benefits and habitat for wildlife;

(6) Shore-Stabilization -- some in-kind relatedness; habitat components (wetlands, SAV's, etc.) can be designed into these projects;

(7) Fish Habitat Enhancement through Dam Removal or Fish Ladders -- limited number of species benefit from this option; proposed locations are miles from impact site;

(8) Clam Management Sanctuary -- enhances bottom habitat and benthos;

(9) Bird Management Plan (BMP) at CIDMMA -- minimal in-kind relatedness, but provides indirect benefits to avian species;

(10) Storm Water Retrofit -- a water quality issue -- not a habitat; there is minimal in-kind relatedness;

(11) Nesting Islands for avian species -- building islands results in loss of bottom; there is minimal in-kind relatedness; and

(12) Artificial Reefs -- fish habitat; epifaunal organisms attach to reef structure; enhances benthic productivity; does not address water column effects.

Each of the mitigation measures were evaluated to determine how each measure would contribute to compensation for project-related injuries to natural resources. Measures that came closest to restoring the same type of organisms, functions, and habitats as those impacted by the project were more likely to be retained by the preliminary screening process than those where the connection is not as close.

Likelihood of success and technical feasibility of each alternative were also evaluated during the preliminary screening to assess whether a mitigation measure could be successfully implemented in a reasonable amount of time given available technology and expertise. Generally, the likelihood of a measure's success was evaluated based on whether implementation of the measure:

- Is scientifically accepted;
- Has a high rate of success as documented in literature and independent studies;
- Is capable of being implemented in a cost-effective manner; and
- Provides measurable natural resource service gains.

The following table lists the factors used to evaluate the proposed compensatory mitigation projects.

Table 3. PRELIMINARY SCREENING FACTORS USED TO EVALUATE PROPOSED COMPENSATORY MITIGATION PROJECTS

| PRIMARY FACTORS |
|---|
| 1. Return Injured Natural Resources to Baseline and/or Compensate for Interim Losses. The alternative must demonstrate a rational relationship to the injuries giving rise to the claim for natural resource damages. |
| 2. Likelihood of Success and Technical Feasibility of Each Alternative – Evaluated based on whether the methods: (1) are proven; (2) have a high rate of success as documented in the literature; (3) are capable of being implemented in a cost-effective manner; and (4) characterize the natural resource service gains stemming from the project. |
| 3. Regulatory Considerations – Compliance with applicable Federal, state, and local laws and regulations. |
| 4. Cost to Carry Out the Mitigation Alternative (Cost Effectiveness) – Favored projects are those that provide the most benefit for the least cost expended. |
| 5. Proximity to Impact Site. The alternative should be within same river system or regional watershed as impact site. |
| SECONDARY FACTORS |
| 5. Consistency with Local, Regional, and National Mitigation Goals and Initiatives. |
| 6. Alternative Prevents Future Injury as a Result of the Incident and Avoids Collateral Injury as a Result of Implementing the Alternative (Avoids Additional Injury). |
| 7. Alternative Benefits More than One Natural Resource and/or Service (Multiple Benefits) – Provides incidental benefits to other resources whether injured or not. |
| 8. Longevity of the Mitigation Project – Expected lifespan of the project. |
| 9. Integration With Existing Management Programs/Duplication or Substitution for other Authorities. |
| 10. Adjacent or Nearby Affecting Land Uses. |
| 11. Site Ownership – Public or private? |
| 12. Logistical Considerations – Site accessibility; site constraints. |
| 13. Long-Term Operation and Maintenance - Operation and Maintenance requirements. |
| 14. Public Health, Safety, and Welfare – Would project negatively impact? |
| 15. Location relative to other habitat restoration or compensatory mitigation projects? |

Preliminary screening of potential mitigation measures included information on candidate locations where these mitigation measures could be implemented. The concept of proximity was used to assess whether the mitigation measure is located within the area impacted or is within a reasonable distance of the affected area (i.e., same watershed, ecosystem, and/or political boundary). This geographic area was identified as the Elizabeth River, the lower James River, and vicinity. The following table lists the 36

candidate locations considered and their proximity to the impact site. Sites located outside the defined geographic area were dropped during the first phase of screening. Thirty-one sites were carried forward for further evaluation. Figure 3 depicts the locations of the 31 remaining candidate sites relative to the proposed project. The numbered locations correspond with the site descriptions provided in the following table.

The Mitigation Subcommittee developed a list of criteria for evaluating prospective mitigation measures in the Elizabeth and Lower James Rivers. A hand-out was distributed among committee members presenting two matrices used to evaluate the proposed mitigation measures. The following table presents weighting factors and the numerical scores attributed to the various mitigation options by the committee. The weighting factors included:

| | |
|---|---|
| In-kind relatedness | Public Education Opportunities |
| Proximity to impact site | Publicly recognized value of the habitat type |
| Risk/Long-term viability | Ability to restore lost ecological functions |

Table 4. MITIGATION PLAN SITE ALTERNATIVES

| Site # | Mitigation site name | Mitigation type | Available acreage | Distance from CIDMMA (mi.) | Comments |
|---|---|---|---|---|---|
| **Elizabeth River Watershed Sites** | | | | | |
| 1 | Wyckoff Creosote and Pipe | Sediment Remediation | 6.7 | 8 | Restoration of this site is listed in Virginia State Watershed Action Plan for Elizabeth River. In-kind related. Adjacent to or connected to other sites in plan. Meets "Landscape Approach" objective. |
| 2 | Scuffletown Creek | Sediment Remediation | 6 | 8 | Restoration of this site is listed in Virginia State Watershed Action Plan for Elizabeth River. In-kind related. Adjacent to or connected to other sites in plan. Meets "Landscape Approach" objective. |
| 3 | Atlantic Wood | Sediment Remediation | 6 | 8 | Site dropped. Site is in USEPA Superfund program |
| 4 | Paradise Creek | Sediment Remediation | 10 | 8 | Restoration of this site is listed in Virginia State Watershed Action Plan for Elizabeth River. In-kind related. Adjacent to or connected to other sites in plan. Meets "Landscape Approach" objective. |
| 5 | Republic Creosote | Sediment Remediation | 27 | 8.5 | Restoration of this site is listed in Virginia State Watershed Action Plan for Elizabeth River. In-kind related. Adjacent to or connected to other sites in plan. Meets "Landscape Approach" objective. |
| 6 | Eppinger and Russell | Sediment Remediation | 17 | 9 | Site dropped. Remediation efforts under design. Private concern is remediating site as mitigation for impacts to subaqueous habitat. |

Table 4. MITIGATION PLAN SITE ALTERNATIVES
Cont'd

| Site # | Mitigation site name | Mitigation type | Available acreage | Distance from CIDMMA (mi.) | Comments |
|---|---|---|---|---|---|
| **Elizabeth River Watershed Sites** | | | | | |
| 7 | Money Point | Sediment Remediation | 17 | 9 | Restoration of this site is listed in Virginia State Watershed Action Plan for Elizabeth River. In-kind related. Adjacent to or connected to other sites in plan. Meets "Landscape Approach" objective. |
| 8 | Copper Slag/Breakwater Jetty | Sediment Remediation | 10 | 3 | Man-made erosion control structure. Concerns regarding hydrodynamic impact if removed and effect on down stream properties. |
| 9 | Scott's Creek | Sediment Remediation | 1 | 4.5 | Small site. No connectivity with other site in plan. Does not meet "Landscape Approach" objective |
| 10 | Jones and Gillian Creek (property between) | Wetlands Restoration | 10 | 8 | Adjacent to other sediment and wetland restoration sites. Meets "Landscape Approach Criteria" |
| 11 | Paradise Creek (Peck Property) | Wetlands Restoration | 5 | 8.5 | Allows for public access to restored waterway. Significant community interest in restoring wetlands at this site. Adjacent to other sediment and wetland restoration sites. Meets "Landscape Approach Criteria" |
| 12 | Chesapeake Deep Water Terminals (Paradise Creek) | Wetlands Restoration | 10 | 8.5 | Cost-prohibitive in terms of land acquisition. Higher elevation (25'+) than other available sites. Significant excavation required to create wetlands. |
| 13 | U.S. Navy St. Juliens Annex/Blows Creek | Wetlands Restoration | 30 | 8.5 | Meets U.S. Navy/ USEPA restoration goals for remediation of upland areas. Restoration of prior converted marshland. |

Table 4. MITIGATION PLAN SITE ALTERNATIVES
Cont'd

| Site # | Mitigation site name | Mitigation type | Available acreage | Distance from CIDMMA (mi.) | Comments |
|---|---|---|---|---|---|
| **Elizabeth River Watershed Sites** | | | | | |
| 14 | Former Exxon Terminal (Shotmeyer Property) | Wetlands Restoration | 1 | 8.5 | Adjacent to other sediment and wetland restoration sites. Meets "Landscape Approach Criteria" |
| 15 | St. Julians Creek | Wetlands Restoration | 1 | 11 | No connectivity with other restoration sites. Other sites close to impact area. Does not meet "Landscape Approach" objective |
| 16 | Newtown Creek | Upland Forest Conservation | 1 | 11 | Conservation of existing habitat. Little to no restoration opportunity. Other sites closer to impact area. No connectivity with other restoration sites. Does not meet "Landscape Approach" objective |
| 17 | Easement area along Hodges Creek - Upland Restoration | Wetlands Restoration | 1 | 11 | No connectivity with other restoration sites. Other sites close to impact area. Does not meet "Landscape Approach" objective |
| 18 | Barrow pit on Mains Creek - Upland and Wetland Restoration | Wetlands Restoration | 4 | 11 | No connectivity with other restoration sites. Other sites close to impact area. Does not meet "Landscape Approach" objective |
| 19 | Former Intercoastal Steel site - Wetland Restoration | Wetlands Restoration | 1 | 11 | Contaminated upland with no proposed remediation activity. Possibly a Superfund site. No connectivity with other restoration sites. Other sites close to impact area. Does not meet "Landscape Approach" objective |
| 20 | Falls Creek (Deep Creek) - Wetland Restoration | Wetlands Restoration | 10 | 11 | No connectivity with other restoration sites. Other sites close to impact area. Does not meet "Landscape Approach" objective |

Table 4. MITIGATION PLAN SITE ALTERNATIVES
Cont'd

| Site # | Mitigation site name | Mitigation type | Available acreage | Distance from CIDMMA (mi.) | Comments |
|---|---|---|---|---|---|
| **Elizabeth River Watershed Sites** | | | | | |
| 21 | Lambert's Point Wetland Site | Wetlands Restoration | 0.6 | 2 | Closest to impact area. Land acquired. Wetland design already underway. |
| 22 | Lake Kingman | Wetlands/Subaqueous Habitat Conservation | 35 | 3 | Property no longer for sale. |
| 23 | Oyster Reefs - Historic Baylor grounds - Elizabeth River | Oyster Restoration | 15 | 8.5 | Adjacent to other sediment and wetland restoration sites. Meets "Landscape Approach Criteria" |
| **James River Watershed Sites** | | | | | |
| 24 | Oyster Reef - Hoffler Creek Wildlife Preserve | Oyster Restoration | 1 | 3 | Preserve is located in residential area adjacent to CIDMMA. Oyster reef construction is in preserves Master Plan. |
| 25 | Oyster Reefs - Candidate restoration site on historic Baylor grounds - Lower James River | Oyster Restoration | 15 | 8 | Sites previously identified by USACE. Meets "Landscape Approach in connection with Hoffler Creek and Ragged Island Sites |
| 26 | Hoffler Creek Wildlife Preserve | Upland Forest/Wetland Conservation | 142 | 3 | |
| 27 | WC2. Ragged Island Wildlife Management Area | Wetland/Oyster Restoration | 8 | 9 | Significant erosion and loss of marshland at this location. Adjacent to State Clam Broodstock Sanctuary. Significant economies of scale in restoring lost wetland acreages. |
| 28 | WC3. Carter Property | Upland Forest/Wetland Conservation | 45 | 10 | No longer for sale. Conservation of existing habitat. Little opportunity for restoration |
| 29 | WC4. Curles Neck Farm - Henrico County | Upland Forest/Wetland Conservation | 7200 | 90 | Significant distance from impact area. Land acquisition. Cost prohibitive |

Table 4. MITIGATION PLAN SITE ALTERNATIVES
Cont'd

| Site # | Mitigation site name | Mitigation type | Available acreage | Distance from CIDMMA (mi.) | Comments |
|---|---|---|---|---|---|
| **James River Watershed Sites** | | | | | |
| 30 | Rice Center - Wetland Restoration/Dam Breech - Charles City county | Wetland Restoration | 342 | 77.5 | Significant distance from impact area. |
| 31 | DVR1. Barge graveyard on WBR Elizabeth River, near Rt. 164/W. Freeway bridge | Derelict Vessel Removal | 2.8 | 4 | Not considered in-kind restoration by the committee. No connectivity with other sites. Sunken vessels may be serving as breakwater/erosion control structure/fish habitat |
| 32 | BMP 1. Bird Management Plan at Craney Island DMMA | Avian Habitat Management | N/A | 0 | On-site, significant habitat for threatened and rare species of birds |
| 33 | BMP 2. Bird Management Plan at Hermitage (Norfolk) | Avian Habitat Management | N/A | 2 | In Lafayette River-small site |
| 34 | Fish Ladders - Woolen Mills Dam on Rivanna River (privately owned) - approx. 10 ft high, 1/2 mile impoundment | Anadromous Fish Habitat Restoration | unknown | 198 | Significant distance from impact area |
| 35 | Fish Ladders - Scott's Mill Dam - 1st dam at Lynchburg | Anadromous Fish Habitat Restoration | 72 | 252 | Significant distance from impact area |
| 36 | Harvell Dam - Appomattox River, head of tide at Petersburg, next dam upstream is already breached | Anadromous Fish Habitat Restoration | unknown | 84 | Significant distance from impact area |

Table 5. MITIGATION OPTION WEIGHTING FACTOR EVALUATION

| **Weighting Factors** | Oyster Restoration | SAV Restoration | Wetland Restoration | Sediment Clean-up | Riparian Buffers | Shoreline Stabilization | Fish Habitat Enhancement (dam removal) | Clam Broodstock Sanctuary | Bird Mgmt. Plan - Craney Island | Stormwater | Artificial Fish Reefs | Bird Nesting Islands | Conservation/ Preservation Areas |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **1.1 Weighting Score[1]** | | | | | | | | | | | | |
| In-kind relatedness | 7 | 6.8 | 6.1 | 9.3 | 5.5 | 2.2 | 4.4 | 8.3 | 3.6 | 5.1 | 5.9 | 2.3 | 4.6 |
| Large-scale ecosystem benefits | 7.8 | 8.0 | 7.5 | 4.9 | 8.5 | 4.2 | 5.1 | 6.0 | 5.2 | 6.2 | 4.9 | 5.5 | 7.7 |
| 2 **Publicly Recognized Value** | 8.3 | 8.3 | 8.4 | 8.0 | 8.3 | 5.9 | 6.3 | 5.2 | 4.5 | 7.3 | 5.2 | 3.2 | 7.6 |
| 3 **Risk/Success** | 5.3 | 4.5 | 8.7 | 6.1 | 8.3 | 7.8 | 8.4 | 6.7 | 6.6 | 5.5 | 6.8 | 5.8 | 8.5 |
| 4 Weighting Factor Score (From Part 2) | **28.4** | **27.6** | **30.7** | **28.3** | **30.6** | **20.1** | **24.2** | **26.2** | **19.9** | **24.1** | **22.8** | **16.8** | **28.4** |
| 5 Total Environmental Benefit Score (From Part 1) | Not Conducted | | | | | | | | | | | | |
| 6 Total Restoration Option Score (EBF * WFS) | Not Conducted/Not Available | | | | | | | | | | | | |

(1) Weighting scores are scaled from 1-10, 10 giving the highest weight (and preference for the option).

In addition, the committee assessed the functional attributes of the existing open-water habitat and determined that the following mitigation measures had the highest likelihood of success in replacing the ecological functions of existing open-water habitat over the long-term:

- Salt marsh creation/restoration;
- Oyster reef creation/restoration; and
- Sediment remediation.

Riparian buffer creation/restoration and wetlands conservation were also highly regarded as potential mitigation measures. However, they were not selected for individual detailed analysis but were rather incorporated as a potential component of salt marsh restoration.

The three major mitigation measures presented above provide ample opportunity to fully compensate for project-related injuries. Sediment remediation was considered by many subcommittee members to be the highest environmental restoration priority in the Commonwealth as presented in VDEQ's Elizabeth River Watershed Action Plan (ERP 1996, 2002).

In addition, based on recommendations from VIMS, the committee agreed on a "landscape approach," which considers the spatial relationship of different ecological communities that interact synergistically. For example, marsh restoration is expected to result in increased subtidal benthic production adjacent to the marsh. If also conducted in the vicinity of oyster reefs, an alternative prey base will be developed for predators that might otherwise feed on the oyster reef. If successful, this approach should maximize productivity and ensure the long-term viability of each of the habitats created. Therefore, proposed wetland, oyster reef, and sediment remediation measures that were contiguous or allowed the construction of multiple habitat types were strongly endorsed by the Mitigation Subcommittee.

## 4.2 APPROPRIATENESS OF SELECTED MITIGATION MEASURES

Sediment remediation is not a typically used mitigation alternative; however, as mentioned previously, when judged by a committee of subject matter experts, including Federal and state regulators typically involved in developing mitigation recommendations, sediment remediation was given an "in-kind relatedness" score of 9.3 (out of a possible 10), the highest of 13 other mitigation options evaluated in this study. "In-kind relatedness" was defined by the Mitigation Subcommittee as "similarity of the mitigation option to the disturbed/impacted habitat type." The proposed expansion results in the loss of 580 acres of benthic habitat and associated water column, where ecological function and productivity will be completely lost to the estuary. Sediment remediation will result in increased ecological productivity, diversity, and health in both the restored areas and the overlying water column. While still considered "out-of-kind" mitigation, the committee, therefore, judged that sediment remediation is a relatively equal trade-off for what is being lost.

Bottom habitat deterioration related to sediment contamination is the result of a long history of regional industrial, commercial, and residential development in the Elizabeth River watershed. Industrial use of the Elizabeth River started in the early 1600's with the construction of the first shipyard. Since that time, the river has been extensively developed by numerous industries. A map of a 3-mile segment of the Southern Branch depicting types of industries, both past and present, which surrounds the Atlantic Wood superfund site, was developed by reviewing USACE harbor maps dating back to the late 1800's along with other historical documents. Types of pollutants associated with industries found along the river and documented by researchers to be present in sediments throughout the river include: heavy metals (i.e., cadmium, chromium, copper, lead, mercury, nickel, and zinc) and organic compounds, such as polynuclear aromatic hydrocarbons (PAH's), phthalates, PCB's, and tributyl tin (TBT).

Many of the industries found along the river have been present since the early 1900's. Historic waste management practices, spills, and direct discharge of wastes to the Elizabeth River were commonplace and have led to widespread and extensive

contamination of sediments. In addition to Atlantic Wood Industries, there have been three other creosote wood preserving facilities and one creosote bulk terminal located on the shores of the Southern Branch (Figure 10). Both the Wycoff Pipe and Creosote Company (immediately north of Atlantic Wood Industries) and the Eppinger and Russell Co. (1.5 miles upstream) were operating prior to 1900. Besides the historic waste disposal and discharge practices, the Eppinger and Russell site had a major fire in the 1960's that ruptured a tank, resulting in a massive spill of creosote into the river.

Chemical pollutants, both organic and inorganic, from these sources have collected in the sediments and reached harmful levels. Health problems in fish including fin rot, tumors, cataracts, and other abnormalities have all been linked to high levels of pollutants. The pollutants of primary concern are heavy metals and PAH's. The sources of heavy metals include shipyards and stormwater runoff. The primary sources of PAH's include petroleum products, coal, as well as the incomplete combustion of fossil fuels, creosote, and stormwater runoff (Alden, 1995).

Within the Chesapeake Bay watershed, high levels of sediment contamination are found in the Elizabeth River, Baltimore Harbor area, and the Anacostia River. Each of these areas has several contaminants at concentrations above the Probable Effects Levels, posing a significant risk to aquatic organisms. The Chesapeake Bay Program designated these three areas as "Regions of Concern."

Examination of benthic communities in the Elizabeth River suggests that contaminated sediments have adverse effects. Uptake of organic compounds in fish has been observed by assaying bile from exposed fish. Bioaccumulation of PAH's in commercially-fished, resident crabs has also been documented. In addition, the frequency and intensity of neoplasms, cataracts, enzyme induction, fin rot, and other lesions observed in fish populations (mainly *Leiostomus xanthurus*, spot) have been correlated with the extent of sediment contamination (Van Veld et al., 1990). Laboratory studies have been conducted to elucidate whether the sediments were responsible for the observed effects (Van Veld et al., 1990). Fish maintained in the laboratory in contact

with sediments taken from the Elizabeth River exhibited several of the symptoms observed among fish populations in the field. Additional laboratory studies have implicated contaminants from sediments as causal agents for other effects, such as immune system dysfunction.

The USACE, in the process of conducting the Elizabeth River Ecosystem Restoration Feasibility Study, and in consultation with VPA, the ERP, and other members of the Mitigation Subcommittee, has previously identified approximately 67 acres of sediment remediation in various "hot spot" areas of the Southern Branch of the Elizabeth River. Successful "hot spot" removal/remediation in these locations would help minimize the potential for more widespread and continual recontamination of the river bottom. Over time, natural sediment transport and sedimentation processes should be sufficient to maintain sediment quality at acceptable levels throughout the entire system.

Construction of functional oyster reef habitat and the restoration of salt marsh habitat have a history of viability in the Chesapeake Bay and other East Coast estuaries, thereby serving as a guide to efficient and effective restoration in the Virginia portion of the lower bay (Thayer et al., 1992; Lenihan and Peterson, 1998; Luckenbach et al., 1998; O'Beirn et al., 1999; Mann, 2000). Both oyster reef and salt marsh restoration projects were recently included in the mix of compensatory actions following the Chalk Point oil spill in the Patuxent River in the Maryland portion of the bay.

Salt marsh and oyster reef restoration has been the focus of intense advocacy by scientists, managers, and the public in the Chesapeake Bay region and throughout the East Coast of the U.S. (Burreson et al., 1999; Mann, 2000; Jackson et al., 2001). This move toward extensive oyster reef and salt marsh restoration is motivated by the steep documented decline of these habitats and by the growing recognition of the importance of the ecosystem services they provide.

Oyster reefs indeed provide several services to the ecosystem. Their filtration removes suspended inorganic and organic particles, thereby reducing turbidity. This filtration represents a type of biomanipulation that helps counter the negative impacts of eutrophication (Lenihan and Peterson, 1998; Jackson et al., 2001). With reduction in turbidity, the consequent enhanced light penetration can allow SAV habitat to expand in depth range and in aerial cover because these rooted aquatic grasses are limited by light penetration. Such SAV expansion provides additional nursery habitat for fishes and crabs in the bay. Through their local production and deposition of feces and pseudofeces, oysters promote denitrification, thereby transforming nitrogen from a nutrient into an inert gas (Newell et al., 2002). Oyster reefs also serve as important habitat for crabs and demersal fishes, both through provision of structural refuges and also by promoting production of associated invertebrate prey organisms (Zimmerman et al., 1989; O'Beirn et al., 1999; Lenihan et al., 2001; Peterson et al., 2003).

Wetlands provide many ecological benefits, such as fish and wildlife habitats, natural water quality improvement, flood storage, shoreline erosion protection, opportunities for recreation, and aesthetic appreciation. Wetlands are among the most productive ecosystems in the world, comparable to rain forests and coral reefs. They also are a source of substantial biodiversity in supporting numerous species from all of the major groups of organisms, from microbes to mammals. Physical and chemical features, such as climate, topography (landscape shape), geology, nutrients, and hydrology (the quantity and movement of water), help to determine the plants and animals that inhabit various wetlands.

The mitigation planning objective is to replace lost habitat function and value to the extent practicable. The following table further explains the appropriateness of the selected mitigation plan to replace the values and functions lost at the impact site.

Table 6. FUNCTIONS LOST/FUNCTIONS REPLACED

| Functions lost at impact site | Mitigation Plan components | Functions gained/improved at mitigation site(s) |
|---|---|---|
| Primary production by benthic microalgae; Secondary production by infauna (benthic invertebrates); Water column plankton production; Feeding, nursery, and predation habitat for post-larval fishes and invertebrates; Feeding habitat for birds | Sediment Remediation | Improved benthic (primary and secondary) productivity, diversity, abundance; Reduced toxicity throughout food chain; Improved fisheries habitat and food sources |
| | Wetlands Restoration | Fish spawning, nursery, and feeding habitat; Predation refuge for fishes and invertebrates; Natural water quality improvement; Shoreline erosion protection; Biodiversity; Bird resting, feeding, and nesting areas |
| | Oyster Restoration | Increased benthic productivity, diversity, and abundance; Increased biofiltration; Habitat and predation refuge for fish and decapods; Phytoplankton productivity; Nutrient cycling; Fisheries feeding areas |
| *Note*: Using the three mitigation components (i.e., the "landscape" approach) will provide synergistic benefits across the watershed and will improve overall ecological function and sustainability of the plan. | | |

## 4.3 COMPENSATORY QUANTIFICATION OF MITIGATION MEASURES

Both of the HEA models developed by Peterson and Ruddy estimated annual secondary biomass production per acre for restoration of oyster reefs and salt marsh in the study area (see the following table). Information from the supplemental analysis by Ruddy was used to calculate potential levels of compensation provided by these two measures. Based on the results of the supplemental HEA model, specific acreages of oyster reef or salt marsh restoration (or combinations thereof) were calculated as compensation for the existing benthic and zooplankton productivity that would be lost due to implementation of the Recommended Plan. Preliminary compensatory mitigation results were calculated by mixing these two mitigation measures at a spatial scale that provided expected benefits to match the loss.

Table 7. HEA PRODUCTION GAINED

| Parameter | Peterson HEA | Ruddy HEA |
|---|---|---|
| Annual production credit per acre restored oyster reef | 5,995 | 781 |
| Annual compensation credit per acre restored salt march | 449.7 | 450 |
| Acres Oysters Required | 5.02-18.24 | 161 |
| Acres Wetlands Required | 66.9-243.2 | 276 |

Base on the quantified project-related injury presented in the previous table (124,423 kg/yr), the mitigation acreage required by each measure to fully compensate for the project-related injury would be:

- Salt marsh acreage required to compensate for 580 acres of impact
  - 124,423 / 450 = 276 acres
- Oyster Reef acreage required to compensate for 580 acres of impact
  - 124,423 / 781 = 161 acres

An additional model was run by NOAA to determine the compensatory effect of sediment remediation (Buchman, 2003). The results concluded that 1 acre of sediment remediation would compensate for 0.89 acre of lost habitat, which indicates that 661 acres of sediment remediation would be needed to fully compensate for 580 acres of impact. While not peer reviewed, these results were simply a demonstration of the capability of the HEA approach to determine the potential value of sediment remediation as mitigation for habitat loss in the expansion area. The draft document by Buchman appears in the EIS, Appendix D.

## 5 ALTERNATIVE MITIGATION PLAN FORMULATION – MITIGATION SUBCOMMITTEE RECOMMENDATIONS

Using the results of both the Peterson and Ruddy HEA Analysis and the Buchman sediment model, the Mitigation Subcommittee conducted evaluations of alternative

mitigation plan elements (site/measure combinations), and ultimately recommended a consensus combination of elements as mitigation for the project-related injuries. The committee used a "modified" Delphi Technique, a well known strategic planning and public policy tool, to prioritize the prospective sites. The subcommittee's initial recommended consensus plan is identified as the "Draft Conceptual Mitigation Plan, February 2005" (Figure 2). Upon further deliberation and incorporation of additional information, including supplemental HEA information provided by Ruddy, the Mitigation Subcommittee recommended plan is identified as the "Consensus Mitigation Plan, May 2005" (Figure 2). This plan was included as an alternative plan in the CE/ICA subsequently conducted by the Norfolk District. The following sub-section briefly describes the Subcommittee's deliberation process.

## 5.1 MITIGATION SUBCOMMITTEE PLAN RECOMMENDATIONS

On the basis of the preliminary screening of potential measures, the Subcommittee identified eight wetland restoration/conservation and oyster restoration sites as potential elements of the Mitigation Plan. These measure/site combinations were advanced for more thorough evaluation in terms of costs and benefits. Multiple sediment "hot spots" totaling 56 acres were also identified for more detailed analysis. Additional due diligence was conducted on each of the proposed elements. One wetland site (WR 5, Chesapeake Deep Water Terminals) on the Southern Branch of the Elizabeth was dropped from consideration because physical site constraints and alternative land uses deemed wetland construction structurally and economically impractical. All other potential elements remained for consideration for inclusion in the plan.

In May 2005, the Subcommittee determined that the USFWS supplemental HEA results (Ruddy, 2005) should be factored into the quantitative description of the project-related injury, which caused a change in the targeted output of the compensatory mitigation plan and a change in the compensatory value of oyster reef restoration. The revised injury and compensatory estimates resulted in the need for additional oyster reef and wetlands creation to accommodate for the productivity loss from project impacts, as presented previously in Section 4.2.

The revised annual productivity loss of 124,423 kg would be fully compensated for, if either 161 acres of oyster reefs or 276 acres of salt marsh were actually constructed.

However, a majority of subcommittee agreed that:

- The plan should include all of the three measures that were selected in the preliminary screening (wetlands, oysters, and sediment restoration); and
- Factors other than productivity (including habitat diversity, connectivity, and functional benefits) should be used to ultimately select the sites and mix of mitigation measures that would make up the final plan (see discussion on habitat unit development in Section 6 below).

In collaboration with USFWS, USACE used the revised HEA results to derive a preliminary venture cost estimate for the Mitigation Plan, in order to identify the potential economic scope of the mitigation efforts being recommended by the Subcommittee. Specifically, a preliminary venture cost estimate of $46.5 million was derived by calculating the cost of constructing 50 percent of the required acre of oyster reef (80 acres) and 50 percent of the required acre of salt marsh (138 acres). For the purpose of developing a venture level cost estimate, a cost of $250,000 per acre was assigned to wetland restoration and a cost of $150,000 per acre was assigned to oyster restoration. These cost estimates were derived from similar USACE projects as presented later in this appendix.

The venture cost estimate was presented to the committee at their May 26, 2005 meeting. The committee was asked to use the $46.5 million as the venture level project budget and to prioritize sites based on the established criteria to create the elements of a mitigation plan. The committee proceeded to select sites from a previously compiled list of priority locations derived earlier using the modified Delphi method.

Based on the relative importance of sediment restoration in the project area, the group agreed that sediment restoration elements totaling approximately $30 million should be included in the Mitigation Plan. This budgetary priority for sediment restoration is consistent with local environmental restoration priorities as presented in ERP's and VDEQ's Elizabeth River Watershed Action Plan (ERP, 2002). The Mitigation Subcommittee also recommended salt marsh and oyster reef restoration elements totaling $16.5 million. The salt marsh and oyster reef restoration elements were selected so as to compliment sediment remediation efforts and meet the "landscape approach" criteria. An additional $2 million was identified as a contingency for cost uncertainties concerning sediment remediation. This allocation of venture costs provided the Subcommittee with an economic perspective on the relative cost and importance of potential restoration measures.

The Mitigation Subcommittee, along with the USACE and VPA, identified specific feasible mitigation measures and mitigation plan elements (measure/site combinations) that were developed during the preliminary screen phase of mitigation plan formulation. A "Consensus Mitigation Plan," which was based on the outcome of the preliminary screening, was endorsed by consensus as developed by the Mitigation Subcommittee (May 26, 2005). The "Consensus Mitigation Plan, May 2005" was included by the Norfolk District as an alternative in the detailed incremental benefit and cost analysis conducted with the support of IWR Plan software.

Complementary to the deliberations of the Mitigation Subcommittee, the Norfolk District has developed a benefits assessment method that quantitatively supplements the HEA information for input into the CE/ICA. As described in the following section, the CE/ICA was used to conduct a more detailed evaluation of the mitigation options and to develop the final recommended mitigation plan for this project. The habitat assessment method and CE/ICA are presented later in this appendix.

The final Mitigation Plan will be subject to final review and approval by the USACE and Federal and state regulatory agencies. The USACE and VPA have made

every effort to accommodate the diverse input of the stakeholders involved in this process. The "Consensus Mitigation plan, May 2005" is based on 3 years of stakeholder involvement, scientific study, and a thorough analysis of all data and information collected. During the Preconstruction Engineering and Design (PED) Phase and the permitting phase, VDEQ and VMRC may request refinements to the proposed Mitigation Plan. The VPA and the USACE are committed to working with these agencies to make further revisions as required.

# 6 ALTERNATIVE MITIGATION PLAN FORMULATION – DETAILED ANALYSIS

The HEA analyses conducted by Peterson and Ruddy provided a viable method of assessing the impacts that were endorsed by a team of scientists and stakeholders. However, this approach does not consider any qualitative measure of either the ecological services lost by constructing the proposed project or the ecological services gained by any type of mitigation considered. It also does not value any ecological improvements other than biomass gained per unit area of mitigation restored.

If mitigation were to be conducted in kind, open water with bottom habitat consisting of soft mud and silt would be created. Creating more open water habitat where none was before (i.e., grading back wetlands or uplands) is not a reasonable option and could negatively impact the physical processes, biological resources, and habitat of the lower Chesapeake Bay. It would also likely result in the need for substantial takings of public or private waterfront property in order to create more aquatic habitat. The potential to successfully take 580 acres of waterfront property in the Elizabeth River and lower James River that make up the local project area is also highly unlikely. Since in-kind mitigation is impractical, other types of habitat creation have been considered. In order to create high quality habitats, some metric of habitat quality must be considered in addition to the productivity metric (kg/yr).

If only quantitative measures are considered, one runs the risk of creating habitats that have high biomass production but low ecological value. As an example, a currently

severely degraded wetland site could be restored sufficiently to allow colonization by low value wetland plants such as the common reed, *Phragmites australis.* A monoculture wetland consisting of this common reed would ultimately produce substantial biomass but would not be desirable from an ecological or habitat diversity standpoint. This type of mitigation also would not address the underlying environmental problems facing the Elizabeth River system, currently considered one of the most degraded sub-estuaries of the Chesapeake Bay due to filling of wetlands, sediment contamination, and the resultant loss of ecological connectivity.

Qualitative measures also must be considered in developing a mitigation plan in order to adequately conduct:

- An evaluation of different mitigation options for maximum positive ecological impact per dollar spent on mitigation; and
- A direct comparison of different mitigation options and scenarios by using broad-based and interconnected ecological benefits provided by different mitigation options (as opposed to comparing individual and specific species compositions, for example).

An evaluation approach that includes qualitative measures will also allow the USACE to consider the interconnectedness of the different mitigation options. The goal would be to create a plan consisting of a variety of different mitigation activities that act synergistically to provide greater benefits than any of these activities would as a stand alone activity at isolated sites. In terms of project losses or impacts, the qualitative aspect was not specifically applied because the intention is to use this tool to compare and contrast the relative merits of the different mitigation alternative plans, especially as the components work synergistically, not to quantify impacts.

## 6.1 HABITAT EVALUATION METHOD DEVELOPMENT

In order to conduct an economic evaluation of the proposed alternatives, the average annual benefits for each alternative were identified and evaluated. The environmental benefits, reported as habitat units, for each plan are derived from a

qualitative product score applied to the production output (kg) for each of the alternatives. This qualitative product score was estimated for each type of mitigation to capture the effects of qualitative impacts that are not reflected in the production output metric. Each alternative resulted in a different amount of habitat units for two reasons. First, the three types of mitigation provide varying amounts production output. Second, each type of mitigation was assigned different a qualitative product score.

## 6.2 PRODUCTIVITY ADJUSTMENTS

The HEA analysis determined the loss of benthic productivity as one of the primary ecological services lost. This productivity was defined as secondary production lost. As mentioned previously, the benthos in the project area consists of several species.

The other main determinant of production lost was defined as a loss in zooplankton production. Zooplankton is a very broad-based definition that includes small crustaceans that feed on phytoplankton, such as copepods, single-celled protists (tintinids and loricate ciliates being the most common members), larval stages of larger species of crustaceans that only spend a short time (typically several weeks) in the water column, larval stages of many sessile mollusk species, and cnidarians, ctenophores, and others (Nybakken, 1988).

The production output (kg/yr) was estimated for each alternative plan using the appropriate production per acre deemed acceptable by the mitigation committee. For all of the mitigation options considered, it was assumed that productivity would accrue fully beginning in Year 1 and remain level throughout the project life. This is atypical in environmental project scoring, which usually employs a logarithmic growth scale exhibiting low productivity at first as the living portion of the project accumulates in numbers, diversity, and size, and then at some point productivity begins to surpass the long-term average. Instead of developing a logarithmic growth curve, the constant average productivity used in this analysis implicitly assumes that there will be some reduced benefits at project inception which will be offset as the project reaches maturity. This will be particularly true with the application of a "landscape approach" where

projects will provide synergistic, and increasingly greater, benefits over time. Therefore, the average production was assumed to be equivalent for each of the 50 years in the period of analysis.

### 6.2.1 Sediment Clean-up Productivity Adjustment

The overall production level for sediment clean-up was adjusted upward in order to take into account several aspects of this particular mitigation measure and its potential for positive regional impacts, even if done as a stand-alone activity. The way the production score was enhanced for this measure is described as follows. Sediment restoration is conducted in the most contaminated areas in the lower Chesapeake Bay, also know as "hot spots." Many of these hot spots have been there for decades, and due to the type of contaminants, have been persistent and are likely to continue to adversely impact the entire Elizabeth River system for many years to come. So, in order to take this into account, an initial restoration of the worst sites that encompass approximately 67 acres would be credited as fully enhancing or restoring an area surrounding these sites that encompasses 411 acres as measured in productivity of the benthos. This is due to the severe negative impacts that these 67 aces or "hot spots" currently cause in the 411 acres area within this 3-mile stretch of the Southern Branch of the Elizabeth River. This contamination has resulted in low populations of mostly pollution tolerant organisms, many of which are sub-lethally impacted by the contamination that they contribute, in turn, higher in the food chain. In order to make the most beneficial impact with limited financial resources, targeting "hot spots" is common practice in sediment remediation projects. Hot spots typically provide a toxic source of contaminants that continually impacts water quality and aquatic organisms throughout the system via chemical, physical, and biological processes. Monitoring of hot spot removal projects almost always indicates ecological improvements not only in the immediate areas of the clean-up but also in surrounding aquatic habitat (Waukegan Harbor, Illinois; New Bedford, Massachusetts; Boston Harbor, Massachusetts; Eagle Harbor, Washington). Recognizing the ancillary benefits associated with hot spot removal, California's State Water Resources Control Board and the Regional Water Quality Control Boards are required to: (1) identify and characterize toxic hot spots, (2) plan for the cleanup or other

appropriate remedial or mitigating action at the sites, and (3) prevent the creation of new toxic hot spots and the further pollution of existing hot spots (Water Code Section 13392). All toxic hot spots have been identified in California's enclosed bays, estuaries, and coastal waters.

The sediment clean-up production level was further enhanced by taking into account the somewhat diminished regional effect that cleaning up these 67 acres would have on the rest of the Southern Branch of the Elizabeth River (approximately 1,200 acres). These contaminants have been slowly dispersed throughout the Elizabeth River over time. In addition, the movement and foraging of various benthic and pelagic organisms has spread these toxins throughout the system and into the Chesapeake Bay. The most pronounced effect, however, is concentrated in the Southern Branch of the Elizabeth River.

It is assumed that cleaning up these 67 acres of hot spots would result in varying levels of restoration of the populations of benthic organisms throughout the Southern Branch of the Elizabeth River. The level of adjustment selected if the entire 67 acres of sediments were restored was a 25 percent enhancement in benthic biomass throughout the Southern Branch of the Elizabeth River. This adjustment reflects the increase in general overall health improvement of organisms living in the Elizabeth River.

It is well known that exposure to toxins can reduce the fitness of a creature exposed to them, even if it survives. For example, oysters exposed to dilutions of water soluble fractions of sediments from the Elizabeth River increased the intensity of pre-existing Dermo oyster disease infections, and also increased the susceptibility of uninfected oysters to Dermo infection (Chu and Hale, 1994). Dermo is lethal to oysters, and prior to killing them, it reduces their overall condition, including their reproductive capacity. This effect is compounded by exposure to environmental toxins. Environmental toxins alone also produce this suppression of reproductive output (Berthou, 1987). Environmental toxins have similar pre-lethal exposure effects on other types of marine life, including fish (Hansen, 1975).

It was also assumed that benthic biomass improvements would increase if additional, though less contaminated, sediment areas were restored in addition to the 67 acres. Additional clean-up is assumed to enhance benthic biomass in the Southern Branch of the Elizabeth River in a logarithmically declining scale, with additional acreage providing progressively less additional biomass as additional acreage is added.

It would also be necessary to adjust the regional benefits downward if less than these 67 acres of "hot spots" were restored. Leaving any of the acreage unrestored may result in some recontamination of a portion of the Southern Branch over time. Because the clean-up strategy would involve targeting the most contaminated acreage as the first priority for clean-up, this recontamination would not result in levels even approaching the current level of degradation; however, it will likely be enough to reduce the regional increases in species health and biomass to somewhat less than the +25 percent expected if all 67 acres were restored.

These adjustments were made in order to properly assess the impact that cleaning up the most toxic "hot spots" in the entire lower Chesapeake Bay would have on the local ecosystem. The Mitigation Subcommittee strongly endorsed sediment clean-up as one of the primary objectives to be considered in the CIDMMA mitigation plan and is also a key component of a widely-endorsed Elizabeth River Watershed Action Plan. Sediment clean-up is also the closest to in-kind mitigation out of all the options considered. Finally, it is well known that persistent environmental contamination can have long-term and wide-spread effects that impact a considerable area around the site of the contamination, especially in the aquatic environment. The additional production credited to this particular type of mitigation, therefore, is justified.

### 6.2.2 Oyster Reef Production Adjustment

One other mitigation measure that had a regional adjustment applied to it was oyster reef restoration. The reason for this adjustment is that successfully restored oyster reefs will, when they reproduce, enhance oyster recruitment over a much wider area. Restored reefs would be stocked with disease-resistant oysters of various varieties. These

oysters will reproduce and their planktonic larvae will be dispersed throughout the Elizabeth River to varying degrees depending on local hydrodynamics and freshwater input. Oyster larvae can attach to any hard substrate in the water column and survive, as can be seen in the Elizabeth River, Lynnhaven River, and elsewhere in the lower bay, where some success has been achieved with restored oyster reefs. Young oysters can be seen colonizing rip-rap, wooden and concrete pilings, metal bulkheads, and other hard surfaces throughout these rivers. It is reasonable to assume that successfully restored oyster reefs will further enhance this colonization potential throughout the Elizabeth River significantly enough that additional population enhancement will occur.

Recent data from other areas of Chesapeake Bay indicate successful recruitment enhancement. Stocking with a selected strain of disease-resistant oysters (DEBY strain) in the Great Wicomico River resulted in a distinct recruitment signal from these oysters throughout the Great Wicomico River (fall 2004, unpublished data). Recruitment enhancement in regions that have set-aside sanctuaries has been documented extensively for a variety of species, including mollusks, such as scallops, hard clams, abalone, oysters, and Pacific giant clams, as well as more mobile invertebrates, such as sea urchins, and many finfish species. The reefs proposed in the Mitigation Plan would be permanent sanctuaries, free from fishing pressure, and the populations in what are effectively marine protected areas would function to enhance recruitment to surrounding areas (Allison, 1998; Oakley, 1996; Peterson, 1996; Quinn, 1993; and Tegner, 1993). The limiting factor for oysters in the Elizabeth River, other than diseases and predation common throughout the bay, will be the lack of available hard substrate for oyster larvae to attach to.

For this analysis, it was assumed that a certain amount of acreage constructed would result in a regional benefit to the entire Elizabeth River system. For oysters, the benefit was assumed to accrue to a wider area than that assumed for sediment clean-up. This is because it is known that oyster larvae have a planktonic stage that lasts for approximately three weeks during which they can potentially be dispersed many miles from their point of origin, depending on the circulation patterns of their waters. The

amount of regional benefit was assumed to be between 2.25 percent to 12 percent depending on the amount of oyster reef acreage restored. The increased benthic biomass is assumed to occur on 0.05 percent of the bottom of the Elizabeth River (this 0.05 percent is assumed to be the proportion of the existing bottom available for oysters to colonize (i.e., hard surface), since the great majority of the benthic habitat is currently not suitable).

## 6.3 QUALITATIVE PRODUCT SCORE

Because mitigation plan formulation considers a series of different alternatives that could restore lost biomass productivity, and there is a need to compare and contrast different scenarios with them, a broad-based qualitative metric was developed. The variables used to construct the qualitative metric were not used to increase the production values of any proposed mitigation activity. Instead, these variables were used to put the mitigation measures into a more equivalent footing and to allow direct comparison between the potential mitigation measures. Several of the variables used to develop the qualitative aspects of the Mitigation Plan were adapted from the estuarine benthic index of biotic integrity (B-IBI) for Chesapeake Bay (Weisberg et al., 1997).

A qualitative product score was estimated for each type of mitigation in two separate categories, assuming use of one or two habitats and assuming use of all three habitats (Figure 4). The qualitative variables considered in the qualitative product score include the following: species diversity, species abundance, water column bio-filtration, sediment and water column toxin reduction, food web stability, and food web complexity. These variables were rated on a scale of 0 to 1 with the higher ratings indicating a greater contribution to enhancing the ecological variable. A weight factor was also developed to capture the risk associated with each mitigation type. The weighting factor was also rated on a scale of 0 to 1, with 1 being the lowest amount of risk. The qualitative variables and risk factor are described in further detail below.

### 6.3.1 Species Diversity Variable

The first variable selected as a broad based measure of ecological benefits to be derived from any proposed mitigation project is species diversity. This variable captures the general ecological health of a site, with higher species diversity values indicating greater overall ecological health. It does so in several ways. Ecosystems that are stable over time tend to be those that are most complex. Simple ecological communities are more vulnerable to extreme events, natural or man-made. For example, if an ecosystem (such as the Chesapeake Bay) has had one of its major filter feeding animals, oysters, essentially removed, the remaining filter feeder of ecological significance, menhaden, is more critically needed in its filtering role. The Chesapeake Bay is more vulnerable to additional negative environmental consequences if menhaden stocks collapse than it would be if oyster reefs were still present in ecologically significant numbers. The greater connectivity of various predators and prey provide a variety of food-web interactions such that various animal and plant populations remain present and stable over time. Therefore, ecological food webs are more stable if a complex suit of organisms comprises it.

### 6.3.2 Species Abundance Variable

This variable captures the benefits of increasing the numbers of species present per unit area of bottom or in the water column, with the emphasis being on the bottom, as most of the mitigation options selected focus more on benthic restoration. As the majority of the production loss is due to loss of the 580-acre of bottom area, this is reasonable. Due to the near total absence of once-important filter-feeding species found in the Elizabeth River in great numbers, such as oysters, and very low numbers of other species, such as hard clams, there is a clear need to direct mitigation activities to restore species that have experienced significant declines. Due to the severe decline in wetland acreage of the Elizabeth River watershed caused by many decades of heavy industrial and urban development, wetlands and their associated ecological services and species are also at much lower levels today. When possible, mitigation activities should be directed at increasing the abundance of ecologically or commercially important species that have experienced significant declines. These activities do not necessarily mean direct

intervention, such as stocking with blue crabs, for example, but rather at restoring appropriate environmental conditions or habitats that will allow the depleted stocks of these organisms to recover.

### 6.3.3 Water Column Bio-Filtration

It is well-known that loss of benthic invertebrate filter feeders has had a significant negative environmental impact on the Chesapeake Bay (Blankenship, 2002; Newell, 2002; Ulanowicz, 1992; Newell, 1988). This loss of bio-filtration in the Chesapeake Bay has had profound negative consequences for the bay, including loss of SAV, the decline of many finfish and shellfish species that utilize SAV as a nursery area, significant expansion of low dissolved oxygen "dead zones" in the Chesapeake Bay, a change in composition of benthic and planktonic algae species (Cooper and Brush, 1993), which are the base of the Chesapeake Bay food chain, and others. The "dead zones" are caused by anoxic water conditions that result primarily from the decomposition of phytoplankton that is not consumed. Phytoplankton biomass has increased substantially in the Chesapeake Bay due to eutrophication resulting from human activities (Harding and Perry, 1997), and coupled with the loss of bio-filtration by oysters and other sessile invertebrates, the result has been an increasing size of the "dead zone" and the length of time such anoxic waters are present. Due to the negative bay-wide impacts that the loss of this basic ecological service has caused, efforts to restore this service are of particular importance.

### 6.3.4 Sediment and Water Column Toxin Reduction

Because of the high level of contamination in the local project area, a reduction in the toxin burden in the Elizabeth River was also added as a variable. This variable correlates to species composition, a B-IBI variable. It is a sign of an ecologically healthy benthic population when a more diverse assemblage of species that are pollution-sensitive is found in an area. Because the quantitative environmental impacts were primarily defined as loss of benthic invertebrate production in terms of magnitude, also an important component of BIBI, the use of a toxin burden-related variable was deemed appropriate.

By reducing the toxin burden, it is expected that species composition and abundance will be enhanced with fewer pollution indicative species and more pollution-sensitive species colonizing the area. In the near-total absence of oyster reefs and their oyster biomass, significant bio-filtration could occur from benthic mollusks on open, soft bottom or sandy sediments of the Chesapeake Bay if dense enough populations per unit area could become established. Reduction of toxins in the sediments (which can either sicken or kill benthic invertebrates) or in the water column (which can kill planktonic larvae of filter feeding benthos) could considerably enhance their numbers in the Elizabeth River system. Reduction of toxins would, therefore, have a positive impact on many ecological variables. Where toxin levels are high and can be effectively removed or reduced through remediation, these options should be pursued and are of particular interest. The major environmental impacts resulting from implementation of the Recommended Plan are to the benthic populations within the expansion footprint. Enhancing or restoring the productivity of open bottom areas via sediment restoration in the Elizabeth River system, therefore, seems to represent the closest to in-kind mitigation out of the options considered.

### 6.3.5 Food Web Complexity

Food web complexity is a variable that attempts to capture the effects of restoring a healthy ecosystem. It is known that healthy ecosystems are most often highly complex, with a great number of organisms in any given food chain. The more linkages in a given food web, the more likely the local ecology will remain highly productive and stable over time. Complex ecological communities have far more constraints than simple ecological communities but are also less vulnerable to disruptions. Therefore, complex ecological communities are far more likely to be stable and productive over time.

### 6.3.6 Food Web Stability

Food Web Stability is related to complexity, but reflects the ability of a restored site or area to persist over time. An example of how enhancing food web stability results in positive impacts to the environment would be increasing numbers of blue crabs. While it is well known that blue crabs are a commercial species of great importance to the

Chesapeake Bay, it is perhaps less well known that they also serve a very important ecological function. In estuarine salt marshes, declines in blue crabs due to heavy fishing pressure allow one of the blue crab's main prey species, marsh snails (*Littoraria irrorata*), to proliferate. The marsh snail then over consumes salt marsh grasses, which can lead to additional stress on the salt marsh and even loss of salt marsh acreage. Food web stability then, whether with a crab population, or with a restored habitat, allows benefits to be realized and to persist even under constantly changing natural conditions.

6.3.7 Risk Weighting Factor

One final factor was considered in developing a qualitative product score for the considered mitigation options. This factor was risk – the risk of any given mitigation option performing as desired and producing the expected benefits. Some mitigation options, such as wetland creation, have a decades-long history and many, including the USACE, have considerable experience in restoring/enhancing degraded wetlands or former wetlands – even creating entirely new wetlands from upland or aquatic habitat. Because of the extensive history of wetland restoration, standardization of well-documented methods, including proper grading of soils, specific types of soils to be used, and Recommended Plant lists, the risk involved in restoring wetlands was determined to be low. In the case of the qualitative product score, a low risk would equate to a high score, thus, wetlands scored the highest of the three options considered.

Sediment clean-up was determined to be of a slightly higher risk. Areas of risk include improperly characterizing the extent of the contamination in terms of volume of material removed and failing to remove all of it, or recontamination from a land-based source. As the Elizabeth River is still heavily industrialized, and some land areas are still contaminated by prior industrial activities, there is a chance of recontamination. The overall risk was determined to be low, as it should be possible to fully characterize the extent of contamination at a given site, given a proper sampling regime, and physically removing the contaminated sediments is relatively straightforward, and means to prevent the spread of sediments during dredging operations are fairly effective. Also, much of the contamination in the bottom sediments was derived from industries that are no longer

in operation and, in fact, no longer exist. The historical levels of contaminant input that created the problem (in some cases pure creosote spills) no longer pose a risk.

For oyster reef restoration, potential problems may be faced that make this relatively new type of ecological restoration a challenge. Diseases that cause high oyster mortalities are present in the Chesapeake Bay, and oyster recruitment is at an all time low. This poses great difficulty in establishing healthy oyster reefs in the Chesapeake Bay. However, with proper adaptive management, which includes various measures to repair a failing restored oyster reef, such as cleaning the reef, seeding the reef with additional oysters (which should be disease-resistant strains of native oysters, a number of which are available), or adding additional material to the reef for oyster attachment sites (oyster shells, recycled concrete, or limestone marl being a few options), and a long-term commitment to applying the adaptive management measures, a restored oyster reef has a good chance of being successful over time. The risk involved is still there and must be anticipated and, as a result, oyster reef restoration was determined to be the riskiest of the three types of mitigation considered in this analysis.

### 6.3.8 Qualitative Product Score Calculations

The scores for each of the qualitative variables discussed previously were added together for a total score. This total score was then multiplied by the risk weighting factor to determine the qualitative product score for each mitigation type. The qualitative product score for each mitigation alternative can be seen in the following table.

Table 8. QUALITATIVE PRODUCT SCORES

| Benefit | Use of all 3 types of mitigation | | | Use of 1 or 2 types of mitigation | | |
|---|---|---|---|---|---|---|
| | Oyster-reef construction | Wetland restoration | Sediment clean-up | Oyster-reef construction | Wetland restoration | Sediment clean-up |
| Species diversity | 0.4 | 0.7 | 1.0 | 0.2 | 0.175 | 0.75 |
| Species abundance | 0.5 | 0.4 | 1.0 | 0.25 | 0.1 | 0.75 |
| Water column bio-filtration | 1.0 | 0.5 | 0.8 | 0.5 | 0.125 | 0.6 |
| Water column toxin reduction | 0.2 | 0.2 | 1.0 | 0.1 | 0.05 | 0.75 |
| Food web stability | 0.6 | 0.8 | 1.0 | 0.3 | 0.2 | 0.75 |
| Food web complexity | 0.9 | 0.6 | 0.8 | 0.45 | 0.15 | 0.6 |
| Total score | 3.6 | 3.2 | 5.6 | 1.8 | 0.8 | 4.2 |
| Weighting factor | 0.6 | 1.0 | 0.9 | 0.4 | 0.8 | 0.7 |
| Qualitative product score | 2.16 | 3.2 | 5.04 | 0.72 | 0.64 | 2.94 |

## 6.4 HABITAT UNITS

Habitat units were used as a unit of comparison that captures both the quantitative aspects of the production (kg) and qualitative aspects of the variables discussed previously. The qualitative product scores in the previous table were multiplied by the appropriate production output (kg) to determine the amount of habitat units associated with each alternative plan under consideration (Figure 4). Due to the productivity adjustments discussed previously, the amount of production output (kg) per acre varies depending on the amount of each mitigation measure. While only one of two possible product scores are applied for each mitigation measure, depending on how many mitigation measures are used, the resulting habitat units per acre varies for each amount of mitigation. The habitat units generated by alternative mitigation pans are presented with the following CE/ICA discussion.

# 7 PLAN SELECTION

## 7.1 ALTERNATIVE PLAN DEVELOPMENT

After a thorough screening of various types of mitigation measures available, as discussed previously, the final alternative measures under consideration for mitigation include the construction of oyster reefs, restoration of wetlands, and sediment restoration. Various levels of each of these mitigation measures were determined, based on a percentage of total production output, ranging from 5 to 100 percent of total production output. The alternative plans considered for evaluation include all of the possible combinations of these determined levels of output for each mitigation type that compensate for the estimated 124,423 kg of lost production due to construction of the project under consideration. The alternative plans include 152 combinations of oyster reefs, wetlands, and sediment restoration that result in enough production to mitigate for the estimated 124,423 kg of lost production.

Included in the alternatives under consideration is a consensus plan derived by a mitigation committee consisting of a team of scientists and stakeholders. This consensus plan also known as the LPP consists of approximately 20 acres of oyster reefs, 56 acres of wetland restoration, and 411 aces of sediment restoration. This mitigation plan amounts to an approximate equivalent amount of production than is estimated to be lost from project construction, and is distributed (based on productivity) among the 3 mitigation measures at about

14 percent oyster reefs, 20 percent wetlands, and 70 percent sediment clean up, representing a slightly greater level of production (104 percent) than the target level (that lost with east expansion plan).

## 7.2 COST EFFECTIVENESS AND INCREMENTAL COST ANALYSIS (CE/ICA)

In order to make more informed plan formulation decisions, a CE/ICA was conducted, as required by USACE Planning Guidance, utilizing the IWR-Plan Software. Cost effectiveness analysis identifies the plans that produce various levels of environmental output for the least cost. In this analysis, the environmental output is measured in habitat units, as discussed previously. Incremental cost analysis examines the changes in costs and the changes in environmental outputs for each additional increment of environmental output. The Best Buy Plans represent those plans that produce the greatest increases in environmental outputs for the least increases in costs.

The average annual equivalent costs and benefits (habitat units) were used to conduct the CE/ICA for the alternative plans under consideration, as well as the No Action Plan. Since the plans under consideration are not mutually exclusive, the plans are compared to each single plan and to each possible combination of plans up to the production level that mitigates for the estimated production lost.

### 7.2.1 Description of Costs

All prices used in this analysis are in Fiscal Year 2006 dollars, with a 5-1/8 percent discount rate used in present value and annualized over a 50-year life. Interest during construction of the mitigation project was calculated based upon a 12-month construction period and a 5-1/8 percent discount rate. As explained previously, because of the inconsistency of the quantity and quality of information available about each specific mitigation site, an average cost was developed for each of the three different types of mitigation.

The cost for the construction of oyster reefs is estimated at $150,000 per acre, consisting of $100,000 for construction and $50,000 for seeding. The cost for oyster restoration is based on other USACE oyster restoration projects recently constructed in the Great Wicomico River (2004/2005), Tangier/Pocomoke Sound (2002), and the Rappahannock River (2001/2002).

These costs consist of construction costs, supervision and administration (S&A), monitoring, and operation, management, rehabilitation, repair and replacement (OMRR&R).

A cost of $250,000 was estimated for each acre of wetland restoration. This cost was based upon the total average implementation cost per acre of the wetland restoration estimated for the Elizabeth River Environmental Restoration (ERER) Feasibility Study (2001) conducted by the Norfolk District. For the ERER study, Feasibility-level design and cost estimates were developed for eight sites located along various reaches of the Elizabeth River. These sites are assumed to be representative of the wetland sites considered for this mitigation plan. The total implementation cost includes costs for PED, construction, and real estate acquisition. A more detailed discussion on wetland costs can be found in paragraph 8.

The cost for clean-up of sediments is estimated at $484,000 per acre. This estimate is based on unit cost estimates from remediation projects evaluated in the USACE ERER Feasibility Study. A sediment remediation cost of $100 per cubic yard was derived from the intermediate cost of three common sediment remediation practices: direct removal with upland treatment and disposal ($140), in-situ capping ($100), and removal with disposal in confined aquatic disposal cells ($60). A more detailed discussion on sediment costs can be found in paragraph 8.

7.2.2 Cost Effectiveness Analysis

Cost-effective analysis indicates, for a given level of environmental output, in this case habitat units, no other plan costs less. Similarly, no other plan yields more benefits for less cost. Cost effectiveness analysis indicated 22 of the 152 considered plans to be cost effective. The cost-effective plans can be seen in the following table.

Table 9. COST-EFFECTIVE PLANS

| | Oyster reef restoration[1] | | Wetland restoration | | Sediment restoration[1] | | Total | |
|---|---|---|---|---|---|---|---|---|
| | Production | Acres | Production | Acres | Production | Acres | Production | Acres |
| Plan A | 124,400 | 153 | 0 | 0 | 0 | 0 | 124,400 | 153 |
| Plan B | 112,000 | 137 | 0 | 0 | 12,400 | 38 | 124,400 | 175 |
| Plan C | 99,500 | 122 | 0 | 0 | 24,900 | 100 | 124,400 | 222 |
| Plan D | 93,300 | 114 | 0 | 0 | 31,100 | 133 | 124,400 | 247 |
| Plan E | 99,500 | 122 | 12,400 | 28 | 12,400 | 38 | 124,400 | 188 |
| Plan F | 93,300 | 114 | 6,200 | 14 | 24,900 | 100 | 124,400 | 228 |
| Plan G | 87,100 | 106 | 6,200 | 14 | 31,100 | 133 | 124,400 | 253 |
| Plan H | 80,900 | 99 | 6,200 | 14 | 37,300 | 167 | 124,400 | 280 |
| Plan I | 74,700 | 91 | 12,400 | 28 | 37,300 | 167 | 124,400 | 286 |
| Plan J | 62,200 | 76 | 12,400 | 28 | 49,800 | 233 | 124,400 | 337 |
| Plan K | 49,800 | 60 | 12,400 | 28 | 62,200 | 316 | 124,400 | 404 |
| Plan L | 31,100 | 37 | 6,200 | 14 | 87,100 | 411 | 124,400 | 462 |
| Plan M | 24,900 | 30 | 12,400 | 28 | 87,100 | 411 | 124,400 | 469 |
| Plan N | 18,700 | 22 | 18,700 | 41 | 87,100 | 411 | 124,400 | 474 |
| Plan O | 12,400 | 14 | 24,900 | 55 | 87,100 | 411 | 124,400 | 480 |
| Plan P | 12,400 | 14 | 25,000 | 56 | 87,100 | 411 | 124,600 | 481 |
| Plan Q | 17,100 | 20 | 24,900 | 55 | 87,100 | 411 | 129,100 | 486 |
| Plan R (LPP) | 17,100 | 20 | 25,000 | 56 | 87,100 | 411 | 129,300 | 487 |
| Plan S | 18,700 | 22 | 6,200 | 14 | 99,500 | 603 | 124,400 | 639 |
| Plan T | 12,400 | 14 | 12,400 | 28 | 99,500 | 603 | 124,400 | 645 |
| Plan U | 17,100 | 20 | 12,400 | 28 | 99,500 | 603 | 129,100 | 651 |
| Plan V | 6,200 | 7 | 6,200 | 14 | 112,000 | 711 | 124,400 | 732 |

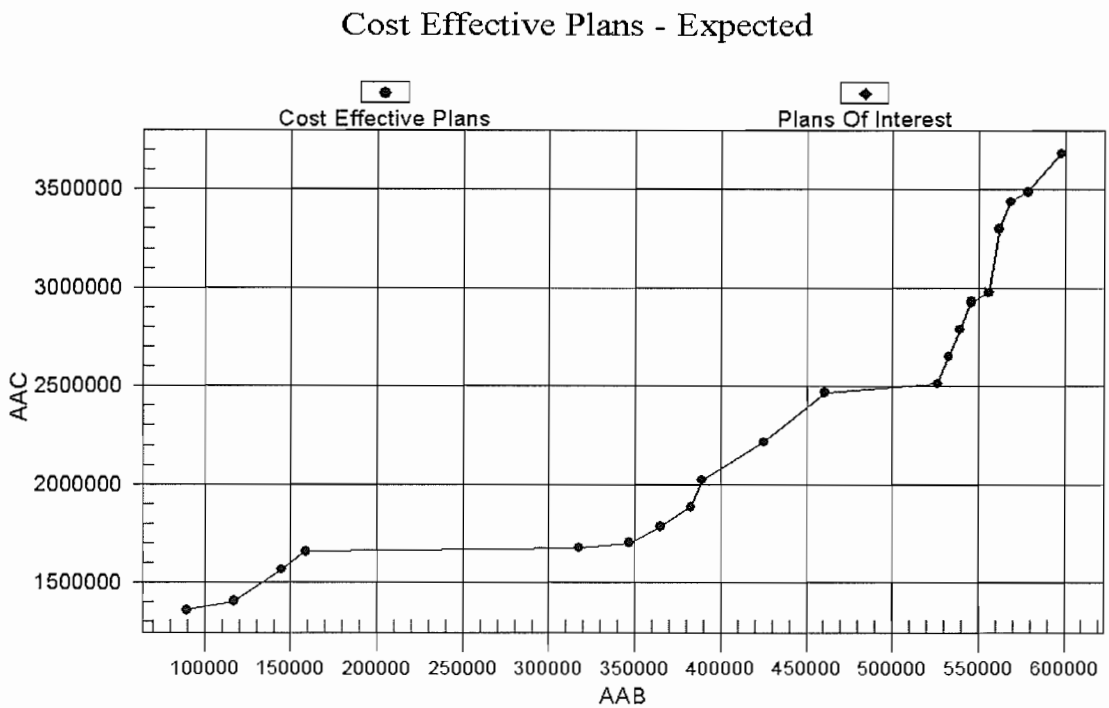
(1) The production amounts reported here reflect production adjustments as described in paragraphs 6.2.1 and 6.2.2.

Cost-effective analysis indicates that each of these 22 plans is the least costly means of providing the associated level of output or benefit. The following table shows the average annual benefits (habitat units), annual costs, and average costs per habitat unit for each of the alternatives. Figure 5 illustrates the cost-effective analysis results, showing average annual environmental benefits (horizontal axis) and average annual costs (vertical axis) of the alternatives.

Table 10. RESULTS OF COST-EFFECTIVENESS ANALYSIS

| Alternative plan | Average annual benefits (habitat units) | Average annual cost ($) | Average cost (cost/benefit)($) |
|---|---|---|---|
| No Action Plan | 0 | 0 | N/A |
| Plan A | 90,000 | 1,359,000 | 15.2 |
| Plan B | 117,000 | 1,403,000 | 12.0 |
| Plan C | 145,000 | 1,566,000 | 10.8 |
| Plan D | 159,000 | 1,656,000 | 10.4 |
| Plan E | 318,000 | 1,677,000 | 5.3 |
| Plan F | 347,000 | 1,702,000 | 4.9 |
| Plan G | 365,000 | 1,785,000 | 4.9 |
| Plan H | 383,000 | 1,886,000 | 4.9 |
| Plan I | 389,000 | 2,023,000 | 5.2 |
| Plan J | 425,000 | 2,214,000 | 5.2 |
| Plan K | 461,000 | 2,468,000 | 5.4 |
| Plan L | 526,000 | 2,514,000 | 4.8 |
| Plan M | 533,000 | 2,652,000 | 5.0 |
| Plan N | 539,000 | 2,789,000 | 5.2 |
| Plan O | 546,000 | 2,926,000 | 5.4 |
| Plan P | 546,000 | 2,931,000 | 5.4 |
| Plan Q | 556,000 | 2,976,000 | 5.4 |
| Plan R (LPP) | 556,000 | 2,981,000 | 5.4 |
| Plan S | 562,000 | 3,300,000 | 5.9 |
| Plan T | 568,000 | 3,438,000 | 6.0 |
| Plan U | 579,000 | 3,488,000 | 6.0 |
| Plan V | 598,000 | 3,682,000 | 6.2 |

Figure 5. COST-EFFECTIVE PLANS




7.2.3 Incremental Cost Analysis

After conducting the CE/ICA was used to examine the changes in costs and changes in environmental benefits (habitat units) for each additional increment of output. The first step is, starting with the No Action Plan, to calculate the incremental change in costs and the incremental change in benefits of moving from the No Action Plan to each of the cost-effective plans. The incremental change in costs is divided by the incremental change in benefits (habitat units) to generate an average cost per unit of output (habitat units) for each of the 22 cost-effective plans. The plan with the lowest overall average cost per unit of output, moving from the No Action Plan, is the first Best Buy Plan. The previous table, entitled "Results of Cost Effectiveness Analysis," shows the alternative with the lowest overall average cost is Plan L with an average cost of $4.80 per habitat unit. Plan L is, therefore, the first Best Buy Plan.

After the first Best Buy Plan is identified, subsequent incremental analyses is done to calculate the change in costs and change in outputs of moving from the first Best Buy Plan to all of the remaining (and larger) cost-effective plans. Again, changes in costs are divided by changes in outputs for each increment to identify the plan with the next lowest incremental cost

per unit of output. The plan with the lowest overall average cost per unit of output, moving from the first Best Buy Plan, is the next Best Buy Plan, and the process continues. The alternative with the next lowest incremental cost per unit of output (as output is increased) is the LPP, Plan R. This alternative, which is the second Best Buy Plan, costs an additional $467,000 on average each year over Plan L and provides an additional 30,000 habitat units on average each year at a cost of $15.57 per habitat unit for those additional 30,000 habitat units.

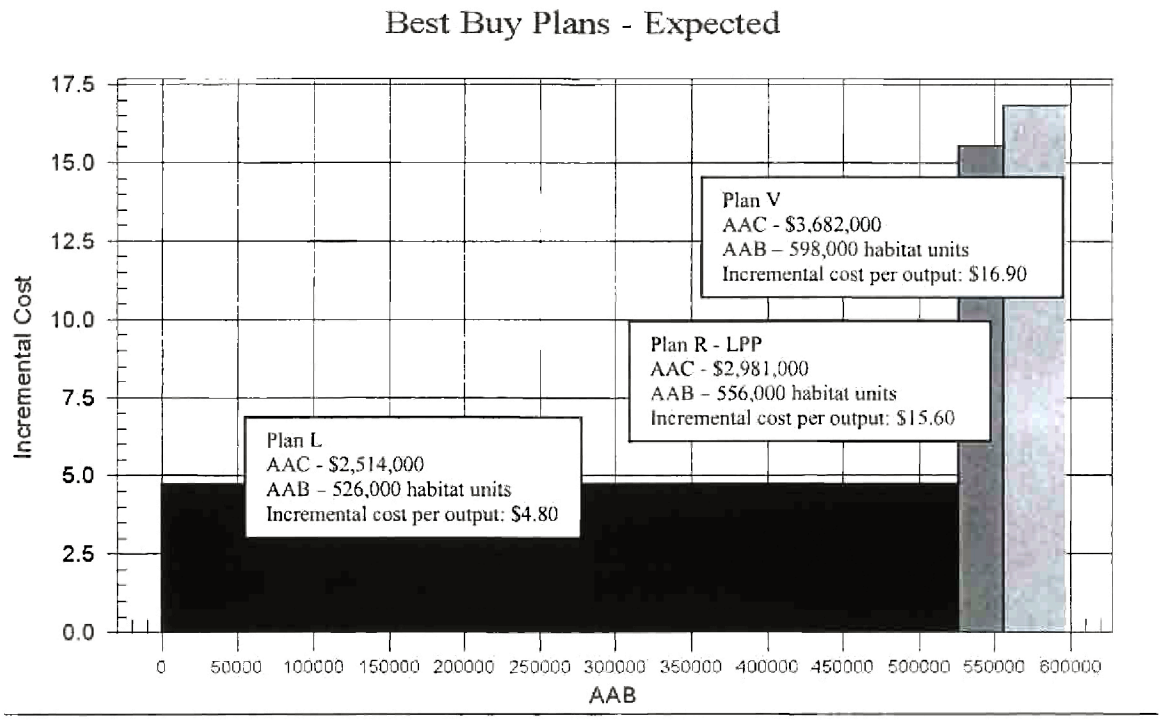
The plan with the lowest overall average cost per unit of output, moving from the second Best Buy Plan, is the next Best Buy Plan. The alternative with the next lowest incremental cost per unit of output (as output is increased) is Plan V. This alternative, which is the third Best Buy Plan, costs an additional $701,000 over the LPP on average each year and provides an additional 41,584 habitat units on average each year at a cost of $16.86 per habitat unit for those additional 41,584 habitat units. This alternative produces the greatest amount of output; therefore, are no other Best Buy Plans. The following table summarizes the information from the incremental cost analysis of the mitigation alternatives, and Figure 6 displays the information graphically.

Table 11. RESULTS OF INCREMENTAL COST ANALYSIS

| Best buy plan | Annual benefits (1) | Annual costs ($K) | Average cost ($/1) | Incremental cost ($K) | Incremental output (1) | Incremental cost per unit ($/1) |
|---|---|---|---|---|---|---|
| Plan L | 526,000 | 2,514 | 4.80 | 2,510 | 526,000 | 4.80 |
| Plan R | 556,000 | 2,981 | 5.40 | 470 | 30,000 | 15.60 |
| Plan V | 598,000 | 3,682 | 6.20 | 700 | 42,000 | 16.90 |

1) Unit of measurement equals habitat units.
Plan L = 25 percent oysters, 5 percent wetlands, 70 percent sediment restoration.
Plan R = LPP, 14 percent oysters, 20 percent wetlands, 70 percent sediment restoration.
Plan V = 5 percent oysters, 5 percent wetlands, 90 percent sediment restoration.

Figure 6. "BEST BUY" PLANS




## 7.3 MITIGATION PLAN SELECTION

The results of the CE/ICA indicate that there are 22 cost-effective plans, 3 of which are Best Buy Plans. The Best Buy Plans include: Plan L; Plan R, which is the LPP; and Plan V. The No Action Plan is not considered a Recommended Plan, as it does not meet the planning objectives to provide "sufficient mitigation to ensure that either plan selected will not have more than negligible adverse impacts on ecological resources" (ER 1105-2-100, Appendix C).

Plan R, the LPP, has been selected as the appropriate mitigation plan that best addresses the project-related injuries. It is important to note that this plan was a Best Buy Plan; however, it was not the least expensive Best Buy Plan. A variety of factors led to the selection of this plan despite the increased cost. A total of 22 plans were determined to be cost effective, including the three Best Buy Plans that included the LPP. The recommended LPP plan is acceptable, efficient (cost-effective), complete, and supported not only by the non-Federal local sponsor but also by

other state, Federal, and non-profit agencies, such as the USEPA, VIMS, and USFWS, all of which were instrumental in the identification of potential mitigation measures.

For the type of mitigation associated with the proposed CIDMMA expansion, the selected mitigation plan is a plan that reasonably maximizes mitigation outputs and associated benefits compared to the costs and is consistent with the Federal objective of preventing a net loss of ecological services in compliance with NEPA, the Clean Water Act, and USACE Engineering Regulations. The selected mitigation plan meets planning objectives and constraints, as well as reasonably maximizing ecological benefits, while passing tests of CE/ICA, significance of outputs, acceptability, completeness, efficiency, and effectiveness as discussed further, below.

### 7.3.1 Selected Mitigation Plan Evaluation

In addition to the CE/ICA, the selected plan was further evaluated based upon consideration of the important planning objectives described below.

*Completeness*

Completeness addresses the extent to which the alternative plans provide and account for all necessary investments and ensure the realization of the planning objectives. The Best Buy Plan selected is cost effective and ensures the realization of the planning objective to provide sufficient mitigation to offset the Recommended Plan's adverse impacts on ecological resources. The remaining criteria describe in more detail how the selected Best Buy Plan achieves this objective.

*Significance*

Decades of heavy industrial activity; over harvesting of shellfish including, oysters and clams; and loss of wetlands due to industrial and residential development have acted together to reduce the Elizabeth River to one of the most impaired waterways of the Chesapeake Bay today. The Elizabeth River was once highly productive from an ecological standpoint, with significant wetland acreage in its watershed, hundreds of acres of oyster reefs, and extensive clam beds. All of these are either severely reduced (wetlands and clams) or entirely lost (oysters) today. The ecological impacts have been severe, and the Elizabeth River does not provide good habitat or

foraging areas for most commercial and non-commercial fish and shellfish species today. The buffering and nutrient reduction services provided by wetlands have been mostly lost, and species that use wetlands for shelter, foraging, or as nursery areas have all suffered as a result. Basic ecological services, which once contributed to the former productivity and diversity of the Chesapeake Bay, such as bio-filtration by oysters and clams, has been almost entirely lost.

The Best Buy Plan was selected over other plans primarily for its balanced focus on restoring the basic ecological services lost. Implementation of this plan will result in the clean-up of the most contaminated "hot spots" in the Elizabeth River by focusing on severely contaminated sites in the Southern Branch of the Elizabeth River, where much of the heavy industry was located and from where most of the contamination has spread. Implementing this plan will also result in making significant progress according to the Elizabeth River Action Plan, a document widely endorsed by Federal, state, and various stakeholders, including scientists, environmental groups, and others.

*Scarcity*

Wetland acreage has been severely reduced in the Elizabeth River watershed due to decades of construction, both industrial and residential. Of those wetlands that remain, many are small and isolated and provide mostly edge habitat, which, will important to many species, will not attract species that require interior habitat. The wetland restoration proposed consists of several nearby parcels of significant size, most of which will provide both edge and interior habitat.

Oyster reefs in the Elizabeth River have been obliterated, no natural oyster reefs remain, and most of the oyster public grounds now consist of soft, muddy clay type sediments. There have been small scale oyster restoration efforts in the Elizabeth River, but the total acreage restored has been small. Originally, hundreds of acres (perhaps thousands) of natural oyster reefs were found in the Elizabeth River. Also, public grounds were formerly located under the current CIDMMA and are also the footprint of the proposed expansion, which indicates that oyster reefs were once found there. Oyster populations are also estimated to be at 0.2 percent of their historic levels.

Clean open bottom areas in the Elizabeth River are also quite scarce due to the long history of heavy industry in the Elizabeth River watershed. The contaminants present are in many cases very persistent in the environment; therefore, this degraded condition is unlikely to ever improve without substantial human intervention to clean it up. The Best Buy Plan selected proposes to do exactly this and restore the areas of the worst contamination.

*Acceptability*

The LPP was developed over a period of several years with a committee made up of Federal (including the USACE), state, and non-governmental partners, including scientists and environmental groups, as well as the local sponsor, the VPA. Very careful consideration was given to enhancing the overall ecology of the area agreed upon to be within the area of influence of the proposed CIDMMA expansion. The committee strongly believed that mitigating the contaminated sediment sites in the river would be very helpful in restoring the entire Elizabeth River to a better ecological condition. In addition, sediment clean-up and wetlands restoration have been identified as the number 1 and number 2 "critical areas" deserving the highest priority attention in VDEQ's Watershed Action Plan (1996, 2002). Given this priority and the committee's input, both sediment remediation and wetlands restoration, the LPP's largest components, were judged the most acceptable mitigation measures to compensate for the impacts to the river.

The ERP, a local environmental group, strongly endorses sediment restoration as the best way to restore the river at this time. Despite the increased cost of the Best Buy Plan selected, the USACE recommendation is based on the findings of this committee. Also, it was determined that all three mitigation options needed to be a significant part of the plan and that sediment restoration should address the "hot spots" in the Southern Branch, which is the most heavily contaminated branch of the Elizabeth River, if not the entire Chesapeake Bay.

*Views of Non-Federal Sponsor*

The non-Federal sponsor, the VPA, has endorsed the Best Buy Plan selected (also the LPP) and was also involved in its development. The VPA recognizes that the Elizabeth River has been heavily impacted by many decades of heavy industrial development and associated activity, as well as residential development. Construction of CIDMMA eastern expansion and,

when filled, a port facility on top of it will add to the industrial activity in the lower James and Elizabeth River area. The VPA agrees with the findings of the committee regarding the impacts and is committed to adequately compensating for them.

By focusing the sediment clean-up on the most contaminated sites in the Elizabeth River, which lie in the Southern Branch, a significant toxin burden adversely impacting the entire Elizabeth River will be removed. Restoring wetlands, the majority of which were lost over time in the Elizabeth River watershed, is also highly desirable, and these wetlands will provide a series of larger, interconnected sites that should allow for colonization of both edge and interior preferring species. Oyster reef restoration is currently ongoing in the Chesapeake Bay and efforts are being undertaken by a number of Federal and state organizations, as well as non-profit groups, such as the Chesapeake Bay Foundation (CBF). The extensive historical oyster reefs in the Elizabeth River have been entirely lost, and as the CIDMMA itself and proposed expansion site are in an area once known to have extensive oyster reefs, it is appropriate to include oyster reef restoration as a part of the Mitigation Plan.

Oyster reef restoration has more risk associated with it than the other selected options. To reduce this risk, a monitoring and adaptive management program will be implemented to maintain the restored oyster reefs over time. Adaptive management includes various measures to repair a restored oyster reef, including, but not limited to, seeding the reef with disease-resistant native oysters, cleaning the reef surface, and adding clean material to the reef to provide attachment sites for oyster larvae.

*Effectiveness*

The Recommended Plan is effective, as it will provide for adequate compensatory mitigation for the proposed eastward expansion of CIDMMA. Sites that have been heavily contaminated for decades in the Southern Branch of the Elizabeth River will be cleaned. Due to the magnitude of the contamination at these sites and their size, this particular aspect of the Mitigation Plan is likely to make the greatest overall contribution to restoring the long-term ecological health of the Elizabeth River. More oyster reefs than currently exist in the entire Elizabeth River system will be restored and maintained. Sizeable, contiguous parcels of wetlands will be restored and provide much needed ecological services to this highly

industrialized and urbanized river and associated watershed. Implementing the proposed mitigation plan will contribute substantially to the goals of the Elizabeth River Watershed Action Plan, a plan to restore the river widely endorsed by scientists; Federal, state and local agencies; and interest groups.

*Efficiency*

The Recommended Plan is the most cost effective means of achieving the associated level of habitat units, with an average cost of $5.40 per habitat unit, and is one of three Best Buy Plans indicated in the incremental cost analysis. The incremental cost of the selected Best Buy Plan is higher than the incremental cost of the first Best Buy Plan. However, it is recommended that it is worth it to pay the extra $467,000 (average annual equivalent) for the additional average annual amount of 30,000 habitat units that would be provided by the selected Best Buy Plan for various reasons.

First, the results of the selected plan are consistent with the goals of the Elizabeth River Watershed Action Plan and the recommendations of the Mitigation Subcommittee. This plan has a high level of support among members of the Mitigation Subcommittee, the VPA, and the non-profit environmental group the ERP. Second, the contiguous wetland restoration proposed for the selected plan will provide both edge and interior habitat, as discussed previously, that might not be provided by the less expensive Best Buy Plan. And third, the high level of risk associated with oyster habitat restoration is minimized with the selected plan compared to the less costly Best Buy Plan, since the habitat restoration efforts are more evenly distributed between wetlands and oysters.

## 8 SELECTED MITIGATION PLAN DESCRIPTION

The selected mitigation plan will achieve the environmental goal of offsetting the ecological services lost related to constructing the proposed CIDMMA eastward expansion. The selected mitigation plan consists of several different activities, including oyster reef restoration, sediment clean-up, and wetland restoration. The selected plan is also the LPP and consists of approximately 20 acres of oyster reefs, 56 acres of wetlands restoration, and 411 acres of sediment restoration. This will provide an approximate equivalent biomass gain compared to the

biomass lost from the proposed CIDMMA east expansion is constructed. The following table presents a concise description of the Mitigation Plan.

Table 12. MITIGATION PLAN FOR CRANEY ISLAND EXPANSION

| Site Name(s) | Mitigation Type | Location | Acreage | Unit Cost | Total Cost |
|---|---|---|---|---|---|
| Wycoff Creosote and Pipe; Republic Creosote; Money Point; Paradise Creek; Scuffletown Creek | Sediment Restoration | S. Br. Elizabeth River | 67 cleanup; 411 restoration | $100 yd3 | $33,200,000 |
| Lamberts Point Wetlands | Wetlands | Mainstem Elizabeth River | 0.6 | $250,000 | $ 150,000 |
| Shotmeyer | Wetlands | S. Br. Elizabeth River | 1 | $250,000 | $ 250,000 |
| Paradise Creek Park (Peck) | Wetlands | S. Br. Elizabeth River | 5 | $250,000 | $ 1,250,000 |
| Elizabeth River Terminals | Wetlands | S. Br. Elizabeth River | 5 | $250,000 | $ 1,250,000 |
| Jones and Gilligan Creek | Wetlands | S. Br. Elizabeth River | 10 | $250,000 | $ 2,500,000 |
| St. Julians Annex (40 ac) | Wetlands | S. Br. Elizabeth River | 30 | $250,000 | $ 7,500,000 |
| Oyster/Clam Restoration | Oysters | Elizabeth River - All Branch | 15 | $150,000 | $ 2,250,000 |
| Hoffler Creek Oyster Reef | Oysters | Hoffler Creek/James River | 1 | $150,000 | $ 150,000 |
| CI Bird Long-term Management Plan | Bird Manage-ment | CIDMMA - James/Elizabeth River | | | $ 150,000 |
| Ragged Island WMA | Wetlands, Clams, Oysters | James River | 4/4 | $250,000 $150,000 | $ 1,600,000 |
| Total | | | 487 | | $50,250,000 |

The following table displays the benefits and costs for the selected mitigation plan. The total project cost estimated to be $50.2 million. The total average annual equivalent cost is estimated to be $3,018,000 (at a 5-1/8-percent discount rate).

Table 13. RECOMMENDED MITIGATION PLAN (PRODUCTION/COST)

| Item | Amount |
|---|---|
| Total average annual benefits (habitat units) | 556,145 |
| Total production (kg) | 129,275 |
| Total average annual costs | $3,018,000 |
| Total project costs | $50,329,360 |

## 8.1 SEDIMENT MITIGATION SITE DESCRIPTIONS

### 8.1.1 Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)/ Resource Conservation and Recovery Act (RCRA) Status of Candidate Sediment Mitigation Sites

The (proposed) mitigation sites for sediment remediation are not within the boundaries of a site designated by USEPA or a state for a response action under CERCLA (Superfund), and they are not part of an NPL site under CERCLA. There are three superfund sites in the Elizabeth River: Atlantic Wood Industries (AWII), St. Julians Annex (Navy), and the U.S. Naval Shipyard in Portsmouth. All three are located on the Southern Branch of the river. Only one site (AWII) has an Operable Unit (OU) in the river. This OU is within the legal boundary lines for the AWII site and does not cross over into any of the sites being proposed for cleanup as part of the mitigation plan.

The non-Federal sponsor will assume full responsibility and liability for any work implicating CERCLA-regulated substances. Furthermore, the non-Federal sponsor will indemnify USACE from any future CERCLA litigation and/or associated cleanup costs related to this project.

8.1.2 Site Descriptions

Sediment restoration at the following locations will provide ecosystem restoration benefits to various aquatic organisms and will provide compensation for many of the functional benefits lost at the site of the east expansion.

Wycoff Creosote and Pipe (Figure 7) - A former creosote plant site similar to Atlantic Wood, this site is located just north of Atlantic Wood and sediment samples taken offshore show elevated levels of PAH's. Site is essential to foster progress at adjacent Atlantic Wood Superfund site by preventing re-contamination. Recently mapped data for Wycoff indicate contaminant levels comparable to Money Point, one of the most contaminated sites on the Chesapeake Bay (see map).

Republic Creosote (Figure 8) - Off-shore of another former creosote plant with high likelihood for sediment contamination. This site is just south of the mouth of Paradise Creek (on eastern shore) and had a large creosoting facility operating on it for a number of years. Off-shore mapping (attached; minimal samples) shows high levels of PAH contamination. Currently there are little/no data to evaluate the overall extent of contamination at this site.

Money Point (Figure 9) - This site is located on the Southern Branch of the Elizabeth River, east bank, approximately 3 nautical miles south of the Eastern Branch/Southern Branch confluence, in the city of Chesapeake. The general area (known as Money Point) has a long history of creosote wood treatment starting around the turn of the century. Wastewater containing creosote was directly discharged into the Elizabeth River before the Korean War (1950-1953). A fire at the E&R plant in 1963 resulted in a spill of creosote into the Elizabeth River. In 1967, ruptured tanks resulted in the drainage of 20,000 to 30,000 gallons of creosote into the river (Mu Zhen Lu, 1982).

Currently the Elizabeth River Restoration Trust (ERRT) has $5 million in mitigation funds from another port project to clean up approximately 35 acres of severe contamination. This amount of funding will likely not cover the entire cost of remediation; therefore, as much as half of the site may be available for mitigation.

Paradise Creek (Figure 10) - Adjacent to the Peck Iron and Metal facility where limited sediment samples show high levels of PCB contamination. ERRT funded the collection and analysis of PCB sediment samples and result are due back from VIMS. This site is the target of an additional Feasibility Study by the USACE to carry out a local watershed plan. Initial studies showed elevated zinc, lead, and PAH's.

Scuffletown Creek (Figure 11) - This 6-acre sediment remediation project is currently being overseen by the USACE in cooperation with non-Federal sponsors and is in the PED Phase for the removal of medium level PAH contamination. Funding for this phase appears probable; however, it is uncertain whether Federal funds or state matching funds will be available for the construction phase of the project. Thus, there is a potential that construction could be completed as a mitigation project.

8.1.3 Sediment Restoration Design Alternatives

An array of scenarios may be considered to address the clean-up of contaminated sediments and restoration of disrupted habitats as part of the Mitigation Plan. All scenarios would have to be more thoroughly evaluated during the next phase of this project.

Clean-up scenarios that may be considered include "No Action," to containing sediment in place (capping), to in-situ treatment, to dredging scenarios that included shallow dredging and deeper dredging, or a combination of dredging and capping.

Table 14. POTENTIAL SEDIMENT REMEDIATION ALTERNATIVES

| Contaminated sediment remediation alternatives | Results | Action |
|---|---|---|
| 1. "No Action" | Continuation of degraded conditions: sediments toxic to aquatic organisms; fish abnormalities, depressed bottom dwelling community health, elevated contaminate levels, widespread migration of contaminated sediments | Not an acceptable option to provide mitigation benefits |
| 2. Contain sediment in place (capping) | Normally not practical in shallow water; may be feasible after some contaminated sediment is removed | Retain for further design analysis |
| 3. Treat sediment in place | Not practical: difficult to ensure all contaminants treated; not demonstrated effective on large scale | Retain for further design analysis |
| 4. Environmental dredging - Remove (dredge) and contain dredged material | Demonstrated to be effective on large scale; tried and proven technology | Retain for further design analysis |
| 5. Environmental dredging - Remove (dredge) and treat dredged material | Demonstrated to be effective on large scale; tried and proven technology | Retain for further design analysis |

8.1.2 Sediment Restoration Cost Estimate

Without the benefit of detailed and site-specific information at each of the proposed sediment restoration sites, estimates were taken from the USACE ERER Feasibility Study (2001), and an average uniform excavation depth of 3 feet was assumed over the entire 67-acre area to achieve a contaminated sediment volume estimate of 324,280 cubic yards.

An estimated sediment remediation cost of $100 per cubic yard was developed by taking the intermediate cost of three common sediment remediation practices, direct removal with upland treatment and disposal ($140), in-situ capping ($100), and removal with disposal in confined aquatic disposal (CAD) cells ($60). The unit cost for each of these methods is based on

cost estimates derived from the USACE ERER Feasibility Study; the APM Terminals Virginia, Inc., Environmental Assessment; and New York Harbor CAD estimates from Moffat & Nichol Engineers.

More recent cost analyses of sediment remediation work give further support to the $100 per cubic yard cost estimate. PED-level cost analyses have been conducted for sediment remediation at Scuffletown Creek as a part of Norfolk District's Section 312 environmental dredging project. Also, Feasibility-level cost analyses have been conducted at Money Point as a part of the mitigation plan for construction of the APM container handling facility. Both Scuffletown Creek and Money Point are located in the Elizabeth River and share very similar sediment characteristics with the 67 acres identified in the mitigation plan. Both of these sites were included in the Feasibility analysis conducted under the Elizabeth River Ecosystem Restoration Feasibility Study.

Detailed cost analysis of sediment restoration at Scuffletown Creek indicates that the average cost per cubic yard of sediment restoration for that project is $106 . The sediments at Scuffletown Creek are expected to be slightly more costly to cleanup than the sediments in the main stem of the Elizabeth River due to site constraints faced within this more isolated arm of the river. The sediment cleanup at Money Point has been estimated to cost between $38 and $116 per cubic yard, depending on the type of material handling and remediation required. At this point, the Money Point analysis has not yet determined the distribution among the various alternatives, and a weighted average cost per cubic yard has not been calculated. However, the range of cleanup cost estimates supports the $100 per cubic yard cost estimate used for the Craney Island mitigation plan analysis.

Using a combination of the various remediation methods available with an average unit cost of $100 per cubic yard, $32,428,000 is needed to restore 67 acres of the Elizabeth River. An additional $851,360 has been added for monitoring and design costs.

## 8.2 WETLAND MITIGATION SITE DESCRIPTIONS

Historically, tidal wetlands within the Elizabeth River watershed have suffered significant losses from dredging, filling, and urban development. Nichols and Howard-Strobel

(1991) provide an indication of the magnitude of wetlands loss with their estimate that the surface area of the Elizabeth River Basin was reduced by 26 percent between 1872 and 1982 through deposition of dredged material on marginal wetlands and subtidal bottoms. As much as 50 percent of tidal wetlands were lost on the Elizabeth River between 1944 and 1977 (Priest, 1999). A recent study of wetlands loss in the Elizabeth River region reported losses of estuarine emergent and scrub-shrub marshes of just over 36 acres for the period from 1982 to 1989/90 (Tiner and Foulis, 1994). Less than 10 percent of the watershed remains undeveloped (ERP, 2002). The Elizabeth River's 350-mile shoreline has experienced extensive loss of wetlands and "vegetated buffers," natural areas that mix trees, shrubs, and grasses. Vegetated buffers provide habitat, absorb runoff, trap sediments and filter pollutants. The vegetation also stabilizes the shoreline, takes up potentially harmful nutrients, improves aesthetics, and improves air quality and controls flooding.

These losses of habitat and water and sediment quality degradation from pollution have led to significant impacts to the biota of the Elizabeth River that have compromised its value as an estuarine system (Birdsong et al., 1994).

1. Wetland restoration returns productivity to the watershed that is being lost from the water column due to filling activities. In addition, wetland restoration improves water quality as wetlands filters and reduces contaminated runoff.
2. Riparian buffer conservation and restoration filters and prevents contaminated runoff, improving water quality and providing habitat for multiple shore species including insects, birds and mammals.
3. In combination, wetlands and related buffers provide a landscape approach for improving water quality. Sites were chosen near sediment sites, where possible, to maximize the landscape approach endorsed by the Mitigation Subcommittee.

8.2.1 Site Descriptions

1. Lamberts Point/Old Dominion University (Figure 12) – Originally developed as part of the USACE Feasibility Study on the Elizabeth River environmental restoration. No Federal funds have been identified to implement this project. The city of Norfolk is still interested in this

project to stabilize the shore and contain stormwater runoff from ODU and vicinity, located immediately across river from the impact area. Saltmarsh wetland restoration is a primary component of the project. The site provides prime raptor habitat. The concept design for this site consists of a vegetated wetland fringe in the intertidal zone where the stormwater drainage canal discharges into the Elizabeth River. Components of the project include a rock weir for low-flow dissipation (discharge from the canal), sand fill for proper elevation of saltmarsh wetland bench, and a low-crested rock sill for river generated wave dissipation. The proposed area of vegetated wetland is approximately 0.6 acre.

2. Former Exxon Terminal (Shotmeyer Property) (Figure 13) - Mature grove of hardwood trees along with tidal wetland habitats adjacent to potential sediment clean-up area of Money Point.

3. Paradise Creek Park (Peck) (Figure 14) - This "eco park" is the centerpiece of a Watershed Management Plan for Paradise Creek recommended by stakeholders and underway by multiple partners. Public education opportunities; proximity to Superfund sites across the creek, including 70 acres wildlife mecca; proximity to an oyster reef established 2004 within sight; proximity to Deep Water Terminals site, St. Julian's, and sediment clean-ups on Southern Branch. Uplands include mature trees. Site contains high elevations, but excavation could result in mined material that could be sold or used for beneficial capping of contamination elsewhere.

4. Elizabeth River Terminals (Figure 15) - Private owner is willing to have the property used for tidal wetland restoration, located just south of Money Point sediment remediation area. Elizabeth River Terminals is an active River Star with ERP. Walter Priest with NOAA evaluated this site and determined an excellent potential for tidal wetland restoration.

5. Property between Jones and Gilligan's Creek (Figure 16) - Available for sale; ERP technical advisors conducted a site visit and identified significant wetland opportunities as well as conservation of forested habitat.

6. St. Julian's Annex (Figure 17) - Provides a landscape approach of sites contiguous to each other (contiguous to Deep Water Terminals, Paradise Creek Park, and Money Point clean-

up). The USACE and VPA, along with other members of the Mitigation Subcommittee, have visited the site and identified restoration and conservation opportunities. In addition, land purchase costs are likely to be avoided through a cooperative agreement with the Navy to allow USACE and/or local sponsor use of the site. According to Priest (2005), contamination in the old disposal area will likely be remediated via removal of contaminated soils, which would contribute to providing the elevations required for salt marsh restoration in these areas. It is estimated that the northeast section could easily provide 30 acres and the northwest section an equivalent acreage or possibly more. Further negotiations with the Navy are ongoing.

Table 15. CRANEY EXPANSION WETLAND MITIGATION SITES

| Site | Current condition | Proposed restoration to provide mitigation (acreage) |
|---|---|---|
| 1. Lambert Point, ODU Drainage Canal | Intertidal; stormwater receiving area | Conversion of intertidal and shallow water habitat to *Spartina* sp. marsh; area degraded due to high stormwater sediment input (0.6 acre) |
| 2. Former Exxon Terminal (Shotmeyer Property) | Filled (former) wetland | Grading and removal of upland fill material from historical wetland; some high marsh areas (*Phragmites* sp. - common reed) will be converted to emergent marsh areas (*Spartina* sp.) (1 acre) |
| 3. Paradise Creek Park (Peck). | Filled (former) wetland | Grading and removal of upland fill material from historical wetland; some high marsh areas (*Phragmites* sp. - common reed) will be converted to emergent marsh areas (*Spartina* sp.) (5 acres) |
| 4. Elizabeth River Terminals | Filled (former) wetland | Grading and removal of upland fill material from historical wetland – (5 acres) |
| 5. Property between Jones and Gilligan's Creek | Filled (former) wetland | Grading and removal of upland fill material from historical wetland (10 acres) |
| 6. St. Julian's Annex | Filled (former) wetland | Grading and removal of upland fill material from historical wetland; some high marsh areas (*Phragmites* sp. - common reed) will be converted to emergent marsh areas (*Spartina* sp.); possible extension of shallow tidal gut to provide tidal exchange to restored marsh (30 acres) |

### 8.2.2 Wetland Mitigation Design Alternatives

Wetland restoration involves either: 1) removal of fill material to attain intertidal salt marsh elevations, grading and planting; and/or 2) depositing clean fill material, building an elevation for intertidal salt marsh, grading, and planting. In higher wave energy environments, protective features, such as rock/oyster shell sills/breakwaters, will be constructed.

Restoring the eight sites to fully functioning wetlands with associated native vegetation will involve use of construction equipment and vehicles to grade and remove upland fill and/or fill with clean soil, depending on the site. It is critical that all sites be graded to achieve the elevations needed to support the desired intertidal wetland. In most cases, emergent wetlands with associated upland buffer areas will be created.

*Grading of Upland Areas*

Most of the wetland restoration sites will require excavation of fill material and some grading to achieve required elevations to sustain saltmarsh intertidal wetlands. Historical maps and records indicate that these areas were wetlands at one time but were filled to create fastland. There will be a permanent loss of upland habitat and associated vegetation. In the case of several sites, there will be a conversion of *Phragmites* sp. (common reed) dominated areas to *Spartina* sp. (saltmarsh cordgrass) dominated areas.

*Fill for Wetland Restoration*

At the Lambert Point, ODU Drainage Canal site, and the NW Jordan Bridge site, coarse grained fill material will be placed in the shallow water/intertidal zone to develop a substrate (bench) for planting the emergent wetland. A low profile breakwater/sill (oyster shell and rock) will be constructed at the seaward edge of the restored wetlands at the ODU Drainage Canal to protect the restored area from wave attack. Placement of material will result in some direct loss of bottom dwelling organisms by burial, except for more motile species, such as crabs, which could escape these effects. Since the wetland base fill will consist of mostly coarse grained material, of similar grain size and composition to indigenous river shoreline sands, turbidity impacts are expected to be short-lived and spatially limited to the vicinity of the fill placement.

### 8.2.3 Wetland Restoration Cost Estimate

The construction costs for all sites consist of three categories- site preparation, earthwork, and landscaping. Site preparation costs include mobilization, brush clearing, timber matting, stone, erosion control, and demobilization. The earthwork category includes all costs for either excavation or filling, as applicable for each site. As examples, costs for an excavation site would include the actual excavation, hauling and disposing of the material, while costs for a filled site include acquiring the material, transporting it to the wetland site, and depositing it. The final category of costs, landscaping, includes all costs associated with constructing the wetland, such as topsoil, plants, and planting.

Detailed site condition and survey information is not available for each of the individual wetland restoration sites proposed in this mitigation plan. During the ERER Feasibility Study conducted by the Norfolk District and approved in 2001, eight wetland restoration sites located along various reaches of the Elizabeth River were recommended. Each of these sites was developed to a Feasibility-level design, and cost estimates were developed. Construction costs included in the analysis were developed using TRACES estimates; they represent total or fixed fee cost estimates. They were a conceptual representation of the approximate order-of-magnitude costs associated with the design concepts described. These estimates were not based upon solicitations from qualified contractors, but rather were based upon representative unit costs for similar construction projects in the Tidewater Virginia area. A 25 percent contingency was added to the construction estimates in order to capture any unforeseen complications.

In addition to the construction costs developed for the ERER study, costs associated with real estate acquisition were also considered and included in the analysis. The estimates were based upon the following assumptions:

1. The property rights would be used for wetlands creation or enhancement;
2. Estimated values apply only to land above the mean high water line;
3. Navigational Servitude will be sufficient for any work below m.h.w.;
4. No improvements would be acquired for the project; and
5. Local sponsors will be entitled to credit for the real estate acquired.

The construction contractor will be responsible for a 90-percent survival rate on all plantings throughout the first 3 years; maintenance costs included in the analysis reflect this responsibility. The maintenance costs, estimated at $1,000 every 5 years, are representative costs associated with limited debris removal and spot control of invasive plant species throughout the 50-year project life and are included in the $250,000/acre estimate. Extensive maintenance costs were assumed unnecessary because the wetland sites are designed to be self-supporting and sustaining.

Potential conflicts with existing utility lines, including telephone, gas, electric, sewer, storm, cable, and water, were considered. No specific utilities have been identified that would have to be relocated, but more investigation will be required during the PED Phase. Considering this information, the 25 percent construction contingency is expected to cover any unforeseen expenses.

Proposed restored sites in the ERER study varied from 0.33 acre to 7.0 acres in area at a total average implementation cost of $250,000 per acre. The estimated acreages available for mitigation were calculated from historical records, maps, aerial photos, and site investigations. Given the similarity of project location (Elizabeth River), project type (salt marsh wetland restoration), and general site condition(s) to the sites being proposed for mitigation, this average cost estimate was applied to the cost per acre calculations for the proposed wetland mitigation sites.

## 8.3 OYSTER REEF SITE DESCRIPTIONS

*Oyster Loss and Degradation*

Oyster populations have declined dramatically Chesapeake Bay-wide since the turn of the century, largely due to over-harvesting, parasitic diseases, loss of habitat due to shell mining, oyster harvesting practices that destroyed oyster reefs, and declines in water quality. Current oyster populations are at 1 percent of historical levels (Newell, 1988) and falling. Today's population estimate puts them at 0.2 percent of their historical level. This destruction of Chesapeake Bay's oysters has resulted in considerable adverse ecological effects, as well as the near-total collapse of Virginia's and Maryland's commercial oyster industries.

The CBF noted oysters as being in the poorest condition of all ranked parameters in the Chesapeake Bay in 2000, which include various types of habitat, fisheries, and water quality parameters. And, in 2001, the CBF rated oysters at 2 out of 100, with 100 representing the oysters at pre-colonial levels.

The Elizabeth and Lafayette Rivers show considerable promise for oyster restoration. The Lafayette River is a small branch of the Elizabeth River that once supported extensive natural oyster reefs. Today, it holds only a remnant oyster population and has been condemned for market oyster production due to high coliform bacteria levels. The Elizabeth and Lafayette River system has a low tidal exchange rate that allows for strong auto recruitment from local oysters and functions essentially as a trap estuary. It is a heavily-urbanized watershed and may be subject to freshets; however, the location of the Lafayette in the lower Chesapeake Bay reduces the probability of a freshet, as the waters are quite saline (Zone 3 year-round). The restorable bottom appears to be mostly sand with small amounts of shell that lie in distinct bars near the shoreline and running parallel to it.

Spatset has been very low in the entire Elizabeth River system for decades, but small scale restoration and subsequent stocking with disease-tolerant and/or resistant native oysters have had positive results. Several small reefs were recently built in the Lafayette and Elizabeth Rivers and then seeded with disease-tolerant broodstock oysters (CROSBreed and DEBY strains) grown by the CBF. The fall 2002 spatset seen in the Lafayette on some of the new reefs was over 2,000 per square meter. This spatset matches historical levels and has not been seen in any waters of the Chesapeake Bay in decades.

The Elizabeth River has extensive Baylor Grounds (documented historic oyster reefs), and over 500 acres lie within the river. However, navigation channels now run through several of these former oyster reefs, rending portions unsuitable for oyster restoration. Extensive acreage of hard bottom likely remains, though a detailed bottom survey is needed to determine this. The Elizabeth River is heavily industrial today, and the large navigation channels through parts of it, particularly the Southern Branch, will limit the potential restorable areas. Existing survey data reflect a similar bottom condition in the Elizabeth River compared to the Lafayette River, as most of the hard bottom appears to lie near the shore and is mostly sand with some

shell pieces and grit. Some of the public grounds in both rivers do have enough oyster shell present to allow for successful restoration and will most likely not be used.

### 8.3.1 Oyster Reef Mitigation Design Alternatives

Oyster restoration, as developed by the USACE Norfolk District, involves the construction of reef structures on the river bottom using either native shell material or alternative substrates to create bottom relief and hard surface. The reefs can vary in height from just a foot to as much as 6 feet off the river bottom. They are then seeded with broodstock disease-resistant oysters in order to jumpstart genetic rehabilitation of the resident populations. Reefs can be constructed in deeper water or along the shoal areas adjacent to the existing shoreline. Monitoring of the reefs is then conducted every year, with more in the first 2 years to fully assess conditions and continued monitoring being needed in order to implement the adaptive management plan.

The Elizabeth and Lafayette River system appears to be highly suitable for implementation of the genetic rehabilitation strategy for the recovery of native oysters. It needs much more extensive knowledge of the current bottom conditions than is available at this time to determine the scope of a potential project. The USACE is undertaking such a survey at this time that can be used to identify potential mitigation sites.

### 8.3.2 Oyster Reef Mitigation Costs

Oyster reef construction has been proposed to provide mitigation for impacted benthic and water column habitat and to offset potential impacts resulting from increased turbidity related to dredging in the area. The construction of 3-D oyster reefs is estimated at $100,000/acre and seeding at approximately $50,000/acre. Three-dimensional or high-relief reefs are defined as a series of shell mounds from 6-8 feet tall. Broodstock seeding is defined as application of reproductively-mature (40 mm minimum size), disease-resistant, native oysters. The implementation costs consist of all costs needed for construction, including design, S&A, shell placement and broodstock seeding, monitoring, and OMRR&R. This cost estimate is based upon USACE oyster restoration projects recently constructed in the Great Wicomico River (2004/2005), Tangier/Pocomoke Sound (2002), and the Rappahannock River (2001/2002).

The mitigation plan proposes the construction of approximately 15 acres of oyster reefs throughout the Elizabeth River to be targeted in areas of the river where other mitigation/restoration projects are being or have been constructed (Figure 18). At a minimum, several acres will be located in the Southern Branch to be in close proximity to other mitigation projects previously described in order to maximize ecosystem functional benefits. An additional acre of oyster reef is proposed in Hoffler Creek, a tidal tributary located within the city of Portsmouth near the southwest side of CIDMMA.

## 8.4 OTHER MITIGATION SITES

### 8.4.1 Ragged Island Wildlife Management Area (Figure 19)

*Wetland and Aquatic Habitat Loss and Degradation*

Ragged Island Wildlife Management Area (WMA) is owned by the Commonwealth of Virginia and maintained by the VDGIF. Located in the lower James River, it contains 1,537 acres of brackish marsh and small pine islands. The major marsh vegetation is saltmarsh cordgrass and black needlerush. Approximately 7 miles of shoreline fronting the river is experiencing a high rate of erosion and an equivalent loss and/or degradation of aquatic, wetland, and riparian fish and wildlife habitat. According to an unpublished VIMS report, erosion along this shoreline averages from 1 to 2 feet per year, resulting in a loss of about 1-2 acres of marsh and riparian buffer per year. A problem directly related to shoreline erosion at Ragged Island is the deposition of eroded sediment into the James River. Suspended sediment is one element of water quality that has been linked directly to the decline of SAV in the James and other portions of the Chesapeake Bay. This eroded sediment degrades the James River's water quality and adversely impacts aquatic resources.

*Restoration Alternative Approach*

The mitigation plan at Ragged Island WMA (Figure 23) proposes the construction of 8 acres of intertidal salt marsh and adjacent shallow water habitat consisting of either oyster reefs and/or clam sanctuary along a portion of the shoreline. Some structural solutions which provide shoreline protection will also be incorporated into the design of the project. In addition to aquatic habitat restoration, it is estimated that eroding salt marsh will be protected from

permanent loss over the next 20 years. Actual location of site along the candidate 7 miles of shoreline will be determined during the Mitigation Plan Engineering and Design Phase.

*Restoration Cost Estimate*

The cost estimate was developed by using the previously explained cost estimate for wetlands ($250,000/acre) at 4 acres, and for oyster/clam restoration ($125,000/acre) at 4 acres. Oyster/clam restoration is slightly less per acre than oyster restoration alone because not as much shell material would be required to provide bottom substrate suitable for clams (veneer on bottom vs. 3-D reef structure for oysters).

8.4.2 Craney Island Bird Management Plan

*Avian Populations*

Of the approximately 50 species of birds on CIDMMA, several species are known to nest on the perimeter dikes. These include the least tern, the killdeer, the red-winged blackbird, song sparrow, meadowlark, and mallard. In addition, numerous species of songbirds, shorebirds, and raptors use the dikes and adjacent areas for feeding and resting. A number of birds use CIDMMA as a resting stop during fall and spring migration (Beck, per USFWS, 1986).

A total of 48 species of birds were identified by Laist (1974) as using the CIDMMA. Of the six zones sampled by Laist over a period of 12 months, the least tern was found in a small area dominated by weeds, such as *Panicum, Melilotus,* and *Solidago* spp, in the northeast corner of the CIDMMA.

The most dramatic avian usage of the CIDMMA is evident from accounts provided by Robert Anderson, an Environmental and Natural Resources Specialist with the U.S. Army Training and Doctrine Command, Fort Monroe, Virginia, and expert local birder. He has compiled an extensive list of well over 200 species of birds utilizing the various habitats of the CIDMMA. Of these, several are identified as using the site for breeding, including Carolina chickadee, tufted titmouse, Carolina wren, blue-gray gnatcatcher, American robin, gray catbird, northern mockingbird, white-eyed vireo, red-eyed vireo, clapper rail, killdeer, and least tern.

Anderson characterizes the site as exceptionally productive bird habitat. Piping plovers, a Federally-threatened species, are also found within the boundaries of the CIDMMA.

*Long-Term Bird Management Plan (BMP)*

CIDMMA's primary use is for dredged material placement and the site is intensively managed to provide long-term storage capacity. However, as mentioned previously, birds use CIDMMA and the USACE has partnered with the College of William and Mary to monitor bird populations and to accommodate their nesting activities when possible. There is a need for a comprehensive, 10-year BMP for bird species at CIDMMA. A BMP would provide a long-range strategy to manage bird populations among required and ongoing construction activities and the routine operation and maintenance of the facility. The BMP would provide a planning tool that incorporates bird conservation and management measures in the overall operation and management of CIDMMA. The BMP would be developed by a team of individuals representing the avian scientific community, the USACE, and permitting state/Federal agencies. The BMP is intended to offset and provide mitigation for avian impacts related to the proposed expansion project. These impacts include the loss of open water resting and foraging areas within the proposed cell footprint. Other wetland restoration projects and adjoining buffer areas are proposed in the Mitigation Plan to make up for other impacts to avian species.

*Cost Estimate*

A cost estimate for developing this plan was provided by Dr. Ruth Beck, an ornithologist from the College of William and Mary ($150,000) who has monitored bird populations at CIDMMA for more than a decade.

## 9 RELATIONSHIP OF MITIGATION PLAN TO THE USACE ENVIRONMENTAL OPERATING PRINCIPLES

The USACE has reaffirmed its commitment to the environment by formalizing a set of Environmental Operating Principles (EOP's) applicable to all its decision-making and programs. These principles foster unity of purpose on environmental issues, reflect a tone and direction for dialogue on environmental matters, and ensure that employees consider conservation, environmental preservation, and restoration in all USACE activities. The principles are

consistent with the NEPA; the Army's Environmental Strategy with its four pillars of prevention, compliance, restoration and conservation; and other environmental statutes and Water Resources Development Acts that govern USACE activities. The following table provides information on how these principles were integrated throughout the process of developing the mitigation plan.

Table 16. MITIGATION PLAN CONSISTENCY WITH USACE ENVIRONMENTAL OPERATING PRINCIPLES

| EOP's | Mitigation Plan Consistency with EOP's |
|---|---|
| 1. Strive to achieve environmental sustainability. An environment maintained in a healthy, diverse, and sustainable condition is necessary to support life. | A "landscape approach" was used that considers sustainability of the plan by focusing on the spatial relationship and interdependence of different ecological communities. |
| 2. Recognize the interdependence of life and the physical environment. Proactively consider environmental consequences of USACE programs and act accordingly in all appropriate circumstances. | Plan recognizes interdependence of life and physical environment and is a proactive proposal to compensate for environmental consequences related to loss of 580 acres of estuarine open water in Elizabeth River. |
| 3. Seek balance and synergy among human development activities and natural systems by designing economic and environmental solutions that support and reinforce one another. | Expansion and Port development produce large economic returns at significant environmental costs. Mitigation plan is solution that balances these losses with significant environmental gains. |
| 4. Continue to accept corporate responsibility and accountability under the law for activities and decisions under our control that impact human health and welfare and the continued viability of natural systems. | Expansion and Port development impact natural systems and the human environment. Corporate responsibility and accountability under the law is satisfied with mitigation plan that maintains viability of natural systems. |
| 5. Seeks ways and means to assess and mitigate cumulative impacts to the environment; bring systems approaches to the full life cycle of our processes and work. | Plan mitigates cumulative impacts and is a systems (or watershed) approach. Provides ecosystem mitigation holistically across the landscape (sediments, wetlands, and oysters). |
| 6. Build and share an integrated scientific, economic, and social knowledge base that supports a greater understanding of the environment and impacts of our work. | Plan was developed via knowledge sharing and consensus building with a Mitigation Subcommittee consisting of 12 Federal and state agencies and 3 local interest groups. The committee convened on 15 occasions between June 2002 and May 2005. |
| 7. Respect the views of individuals and groups interested in USACE activities, listen to them actively, and learn from their perspective in the search to find innovative win-win solutions to the nation's problems that also protect and enhance the environment. | ERP (2,000 members)<br>letter dated November 7, 2005:<br><br>"The degree of diverse stakeholder participation in the mitigation planning process was important and unprecedented."<br><br>"...the current plan offers the potential to achieve the win-win for the river and the economy that has been our long-held goal, offsetting the huge impacts with at least equally large environmental gains."<br><br>USEPA letter dated November 7, 2005:<br><br>"The U.S Army Corps of Engineers (USACE) has done a commendable job in developing a consensus among the resource agencies on the appropriate mitigation." |

# 10 CONCLUSIONS AND RECOMMENDATIONS

The proposed project includes the construction of a 580-acre dredged material placement cell to the east of the existing CIDMMA with the expanded cell used for port development. In accordance with CEQ Regulations for Implementing NEPA, and with ER 1105-2-100, "Policy and Planning Guidance for Conducting Civil Works Planning Studies (Planning Guidance Notebook)," the project-related adverse environmental impacts (i.e., impacts to fish and wildlife resources) have been avoided or minimized to the extent practicable, and a mitigation plan has been developed to compensate for remaining unavoidable significant adverse impacts. A CE/ICA has been performed to identify the most cost-effective plan.

The compensatory mitigation plan was developed with input from a Mitigation Subcommittee consisting of representatives from 12 Federal and state agencies and 3 local interest groups. The committee convened on 15 occasions between June 2002 and May 2005. Using data from existing studies, and those performed specifically for this Feasibility investigation, the group was tasked with assessing the degree of habitat impact associated with the 580-acre fill, formulating mitigation ratios to replace or to increase the ecological function and productivity of the area lost, and developing a conceptual mitigation plan comprised of various tidal and sub-tidal habitats. A "landscape approach" was used to establish physical connectivity between various mitigation sites and to establish ecological synergy. Application of this approach also maximizes productivity and ensures long-term viability of each of the sites. HEA methodology was used to quantify the loss in habitat productivity from the proposed expansion and to provide a scale for a mitigation project that would compensate for the estimated loss in ecosystem services and production at the appropriate trophic levels.

The USACE and VPA used this information and the committee's input to develop and present a "Draft Conceptual Mitigation Plan" at subcommittee meetings in February 2005. The plan considered in-kind relatedness, proximity to impact site, publicly recognized value of the habitat type, risk/long-term viability, ability to restore lost ecological functions, and the habitat productivity lost and productivity supplied by each mitigation option to replace the loss. Subsequent meetings in May 2005 resulted in modifications to the conceptual plan and the development of a "Draft Consensus Mitigation Plan." This consensus plan (Figures 20-23), also

known as the LPP, consists of approximately 20 acres of oyster reef restoration, 56 acres of wetland restoration, and 411 acres of bottom sediment restoration. The production of the mitigation plan is distributed among the 3 mitigation types at about 14 percent oyster reefs, 20 percent wetlands, and 70 percent sediment clean-up representing a slightly greater level of production (104 percent) than that lost with implementation of the Recommended Plan (east expansion).

The CE/ICA resulted in a total of 22 plans that were determined to be cost effective, including three Best Buy Plans. Of the three Best Buy Plans identified, the LPP was selected as the recommended and fully justified mitigation plan. The recommended LPP is acceptable, efficient (cost-effective), complete, and supported by the non-Federal local sponsor (VPA), and also by other state and Federal agencies, such as the USEPA, USFWS, NOAA, and VIMS, and non-profit organizations such as the ERP, who also provided input into the development of the LPP.

In conclusion, the Mitigation Subcommittee, along with the USACE and VPA, has identified specific feasible mitigation options. The USACE has used CE/ICA to evaluate the options and has identified a Best Buy Plan that fully compensates for the unavoidable environmental impacts of the project. During plan development, every effort was made to accommodate the diverse input of the stakeholders involved in this process. The recommended mitigation plan, which is based on 3 years of stakeholder involvement, scientific study, and thorough analysis of all data and information collected, includes 487 acres of compensatory mitigation in the form of large scale ecosystem restoration at a total cost of approximately $50.2 million. Upon successful completion, the Mitigation Plan will replace important ecological functions in the lower James and Elizabeth River estuaries and fully compensate for the water column and benthic productivity lost from the proposed expansion of CIDMMA.

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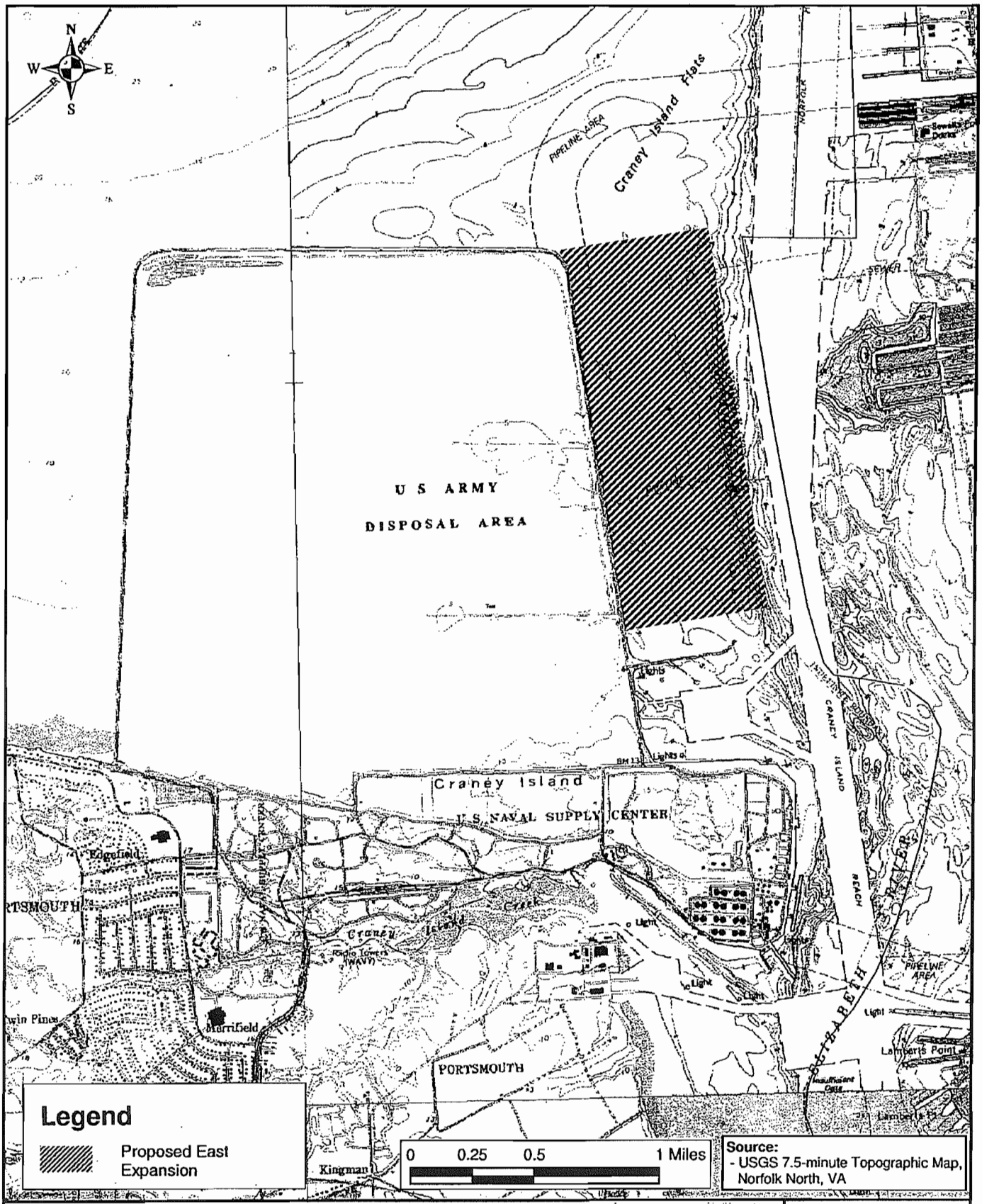
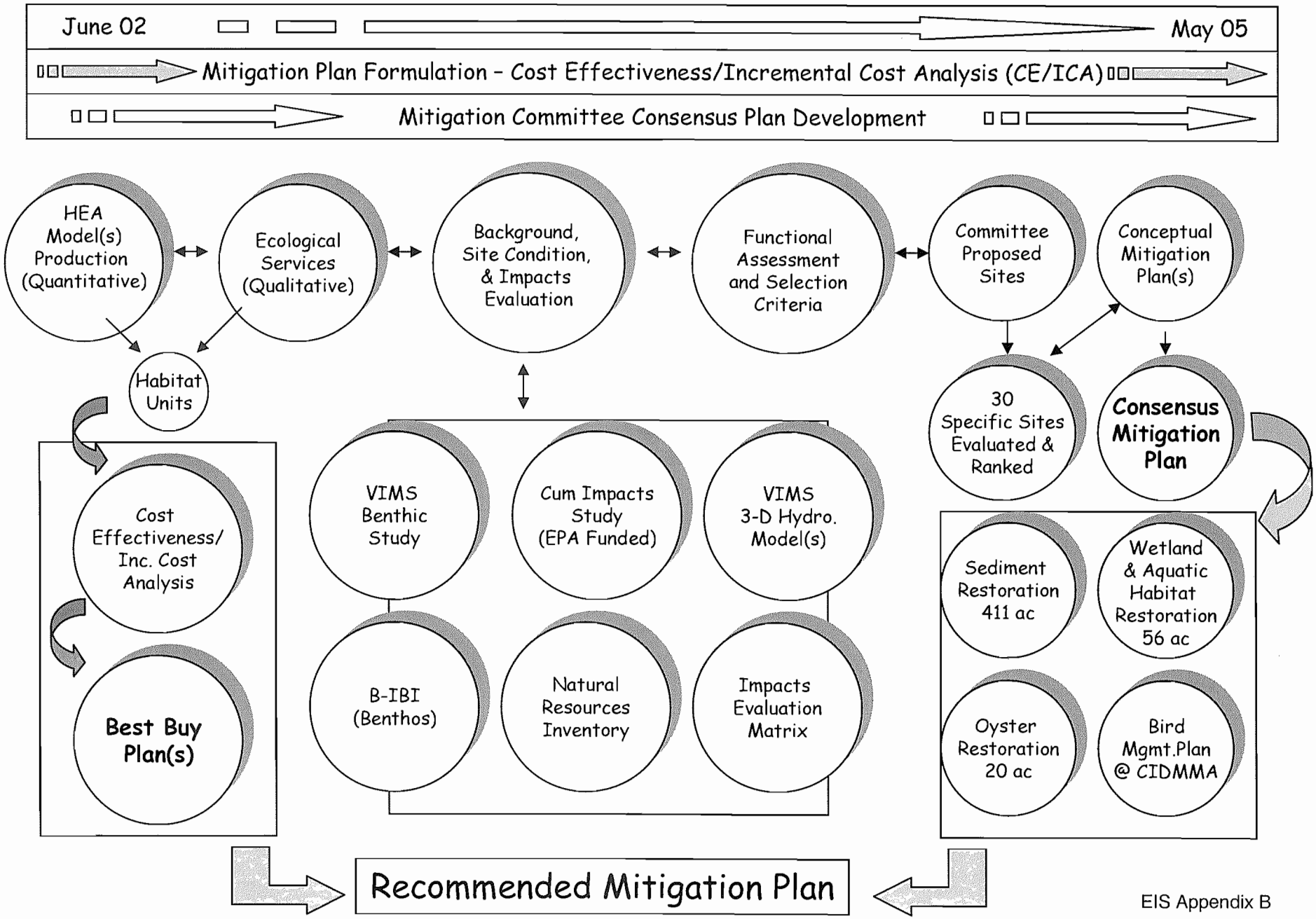



PROJECT RECOMMENDED PLAN
Craney Island East Expansion

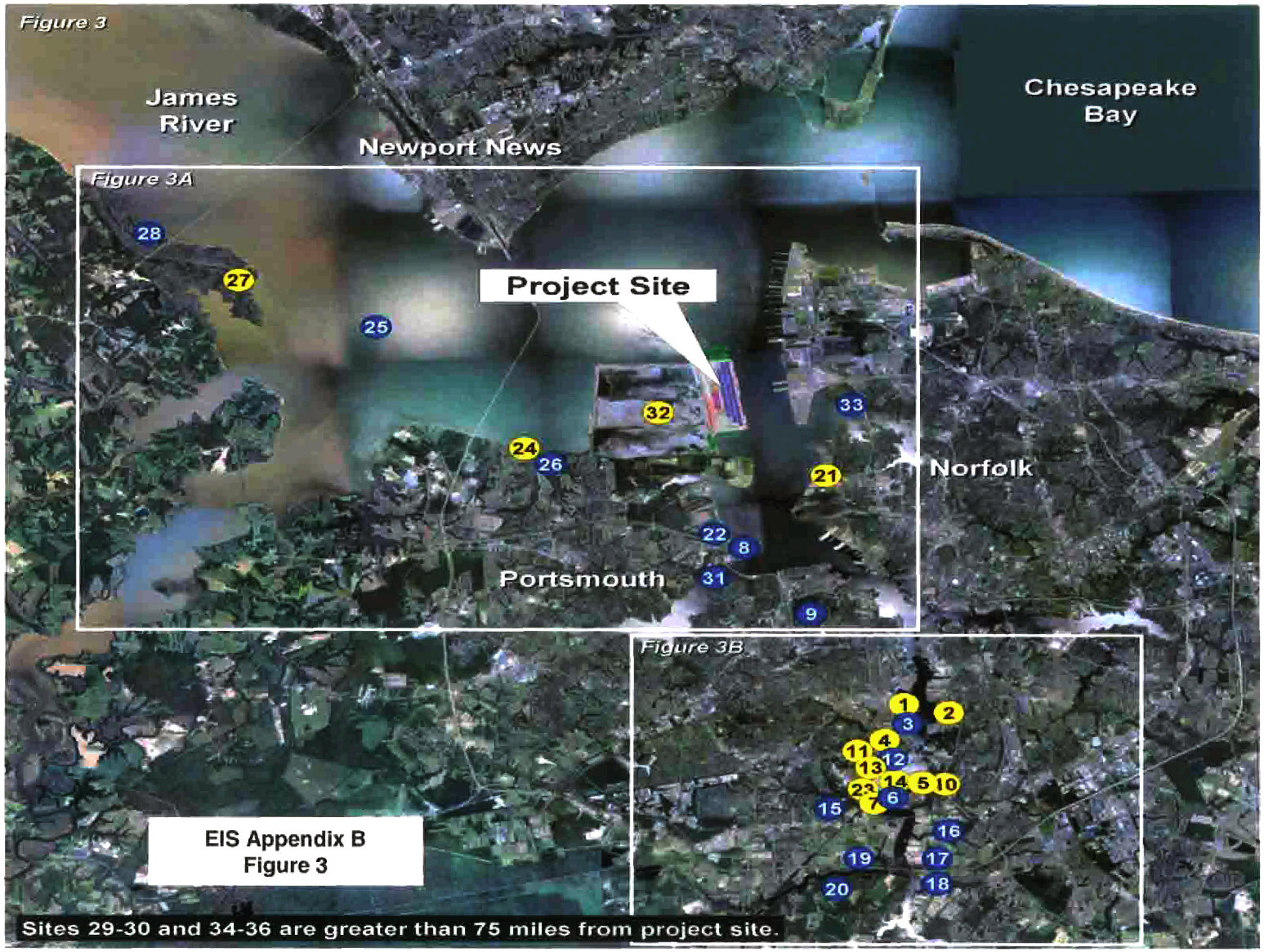
EIS Appendix B
Figure 1




EIS Appendix B

Figure 2

# Candidate Mitigation Sites/Opportunities Evaluated During Second Phase of Screening



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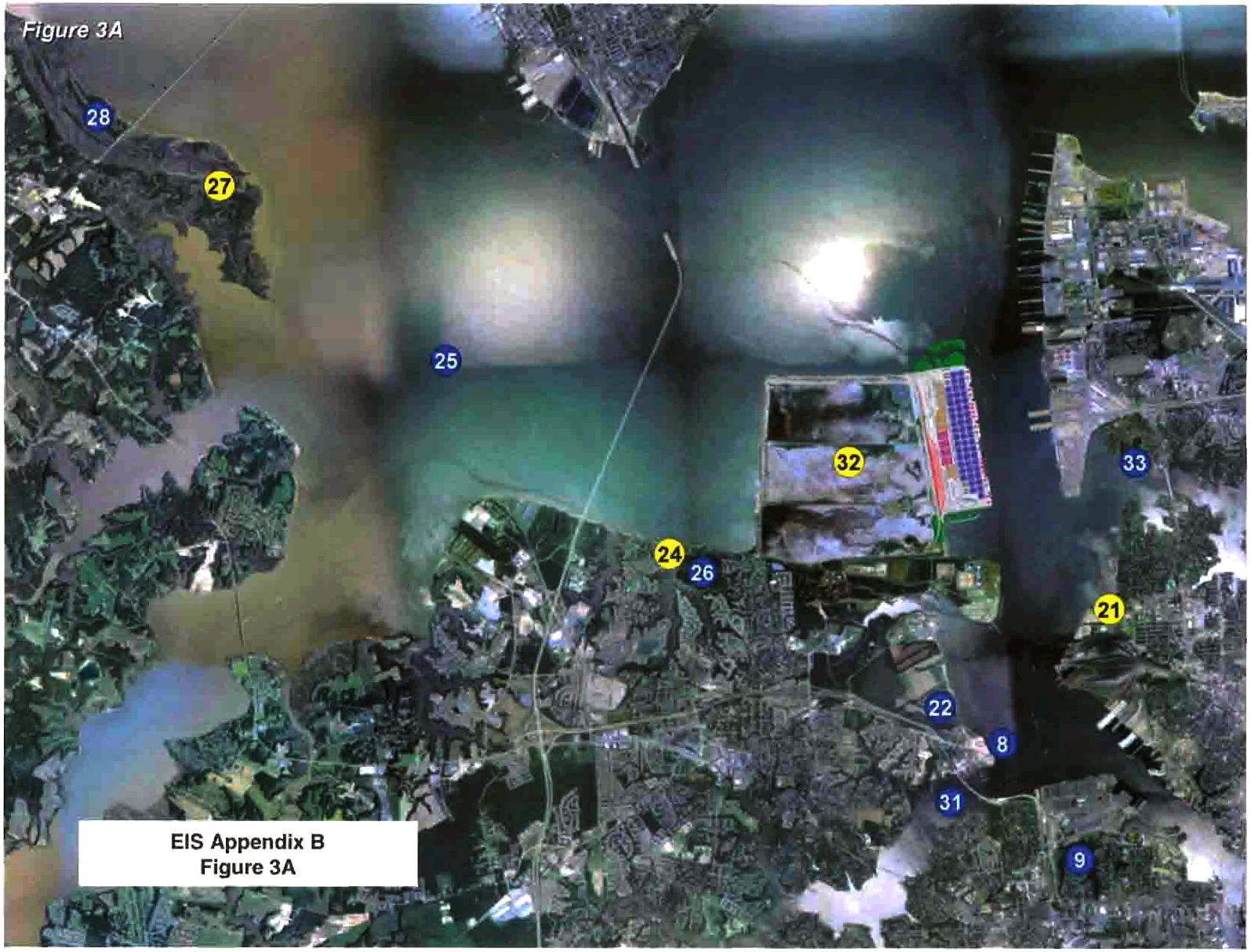

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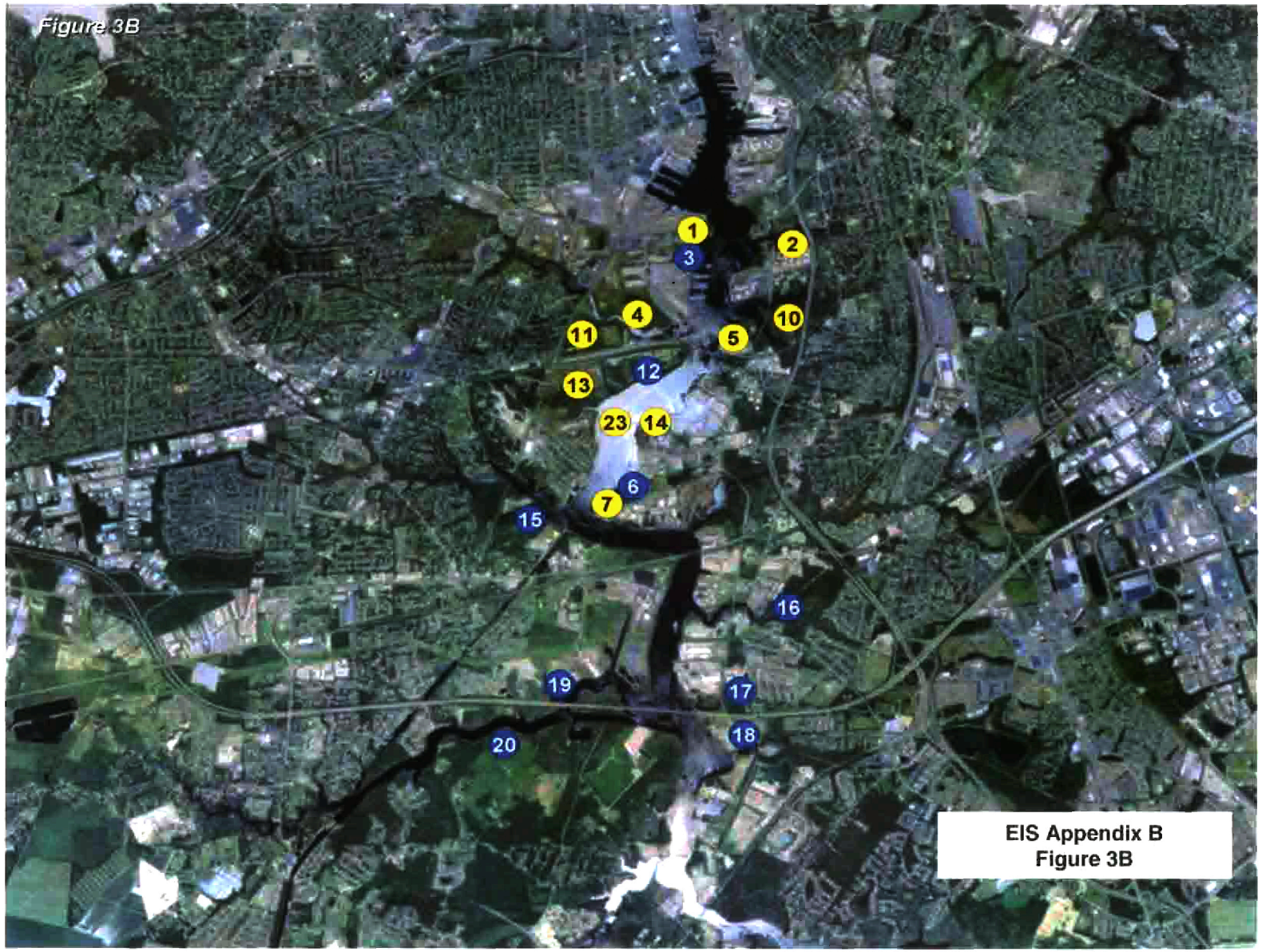
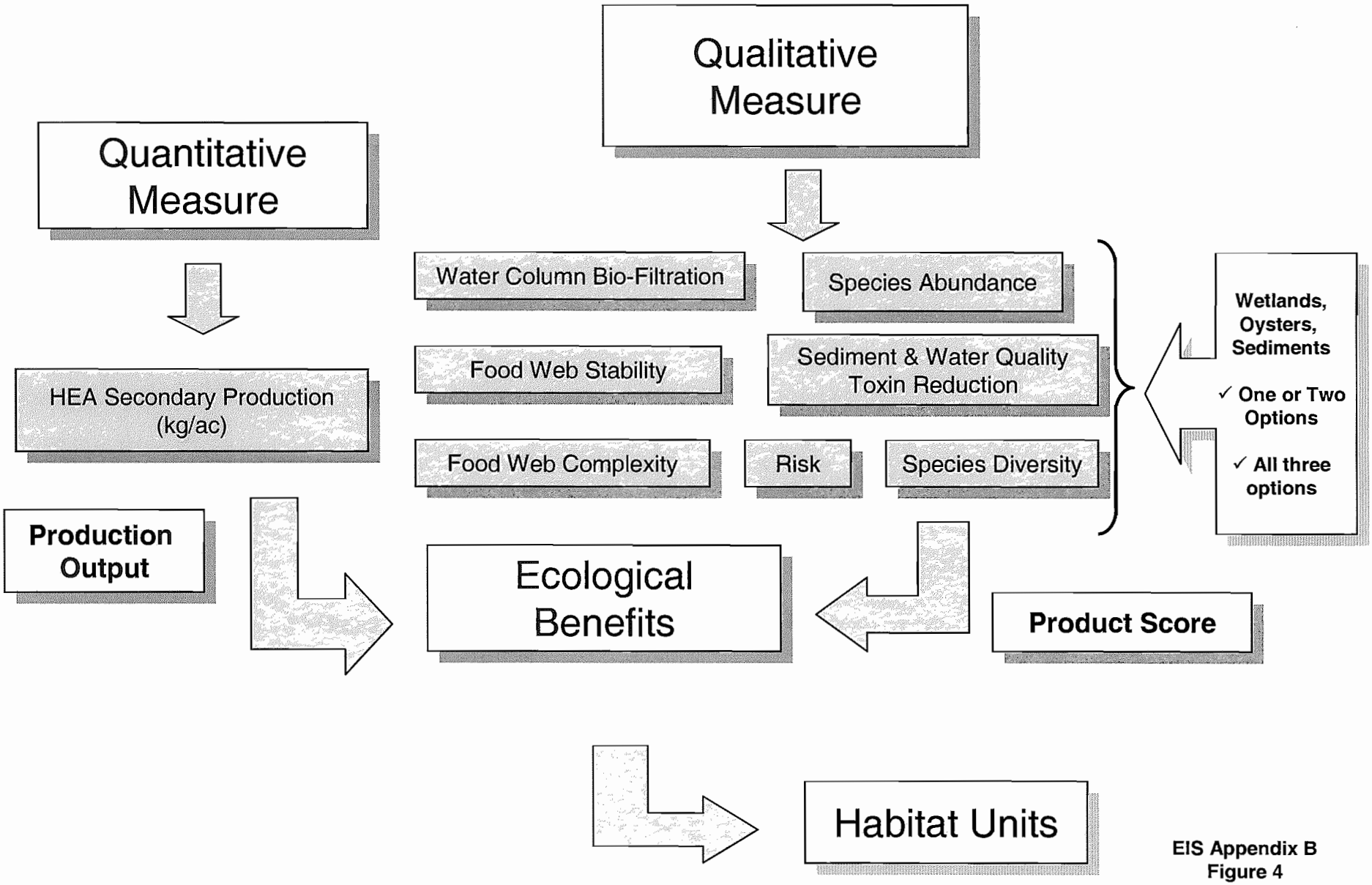


# Mitigation Benefits Calculations




EIS Appendix B
Figure 4

Figure 5. COST-EFFECTIVE PLANS

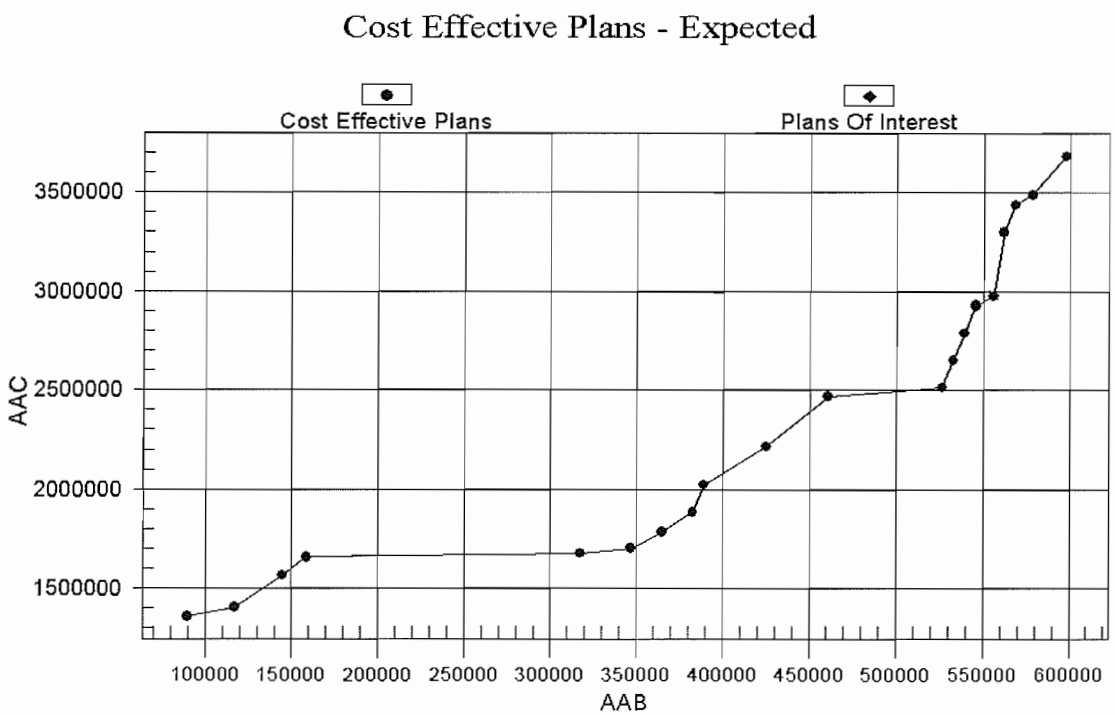
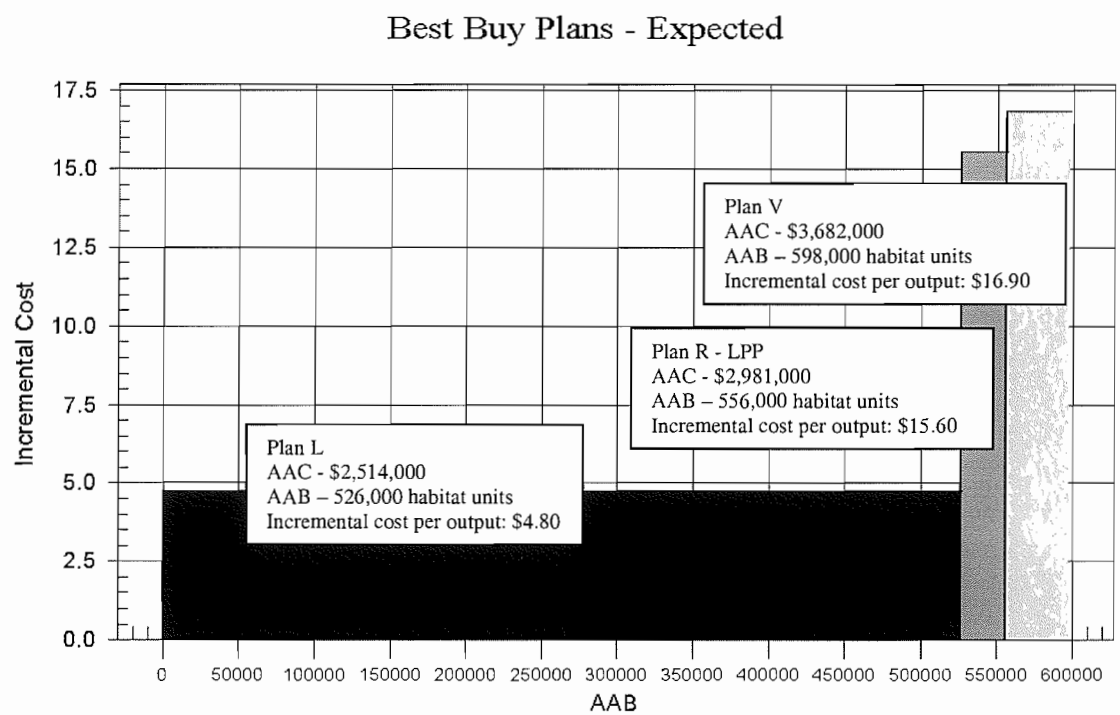



Figure 6. "BEST BUY" PLANS



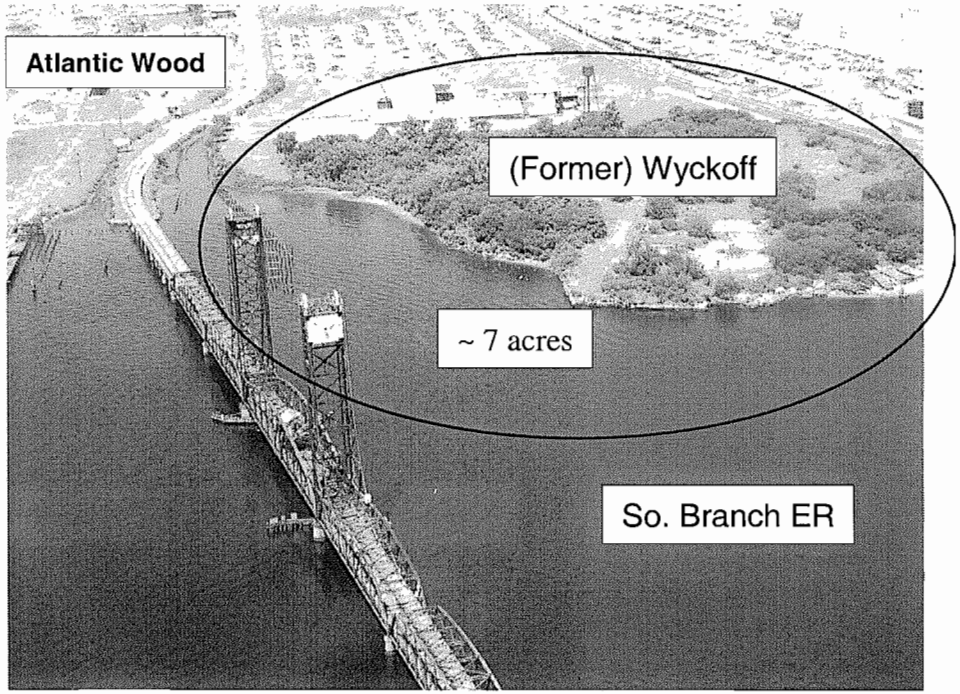
# S1 - Wyckoff Creosote & Pipe, S. Branch Elizabeth River

General Description

- Located just north of Atlantic Wood (Superfund Site)
- Sediment samples taken offshore show elevated levels of PAH's
- Currently little data to evaluate extent of contamination at this site
- Collect and analyze samples to characterize
- Develop & implement remediation plan, as appropriate

Pros:

- Likely source of contamination based on historical use
- Adjacent restoration projects, including Superfund clean-up
- Work at Wycoff may prevent recontamination of Atlantic Wood sediment site to the south




**EIS Appendix B**
**Figure 7**

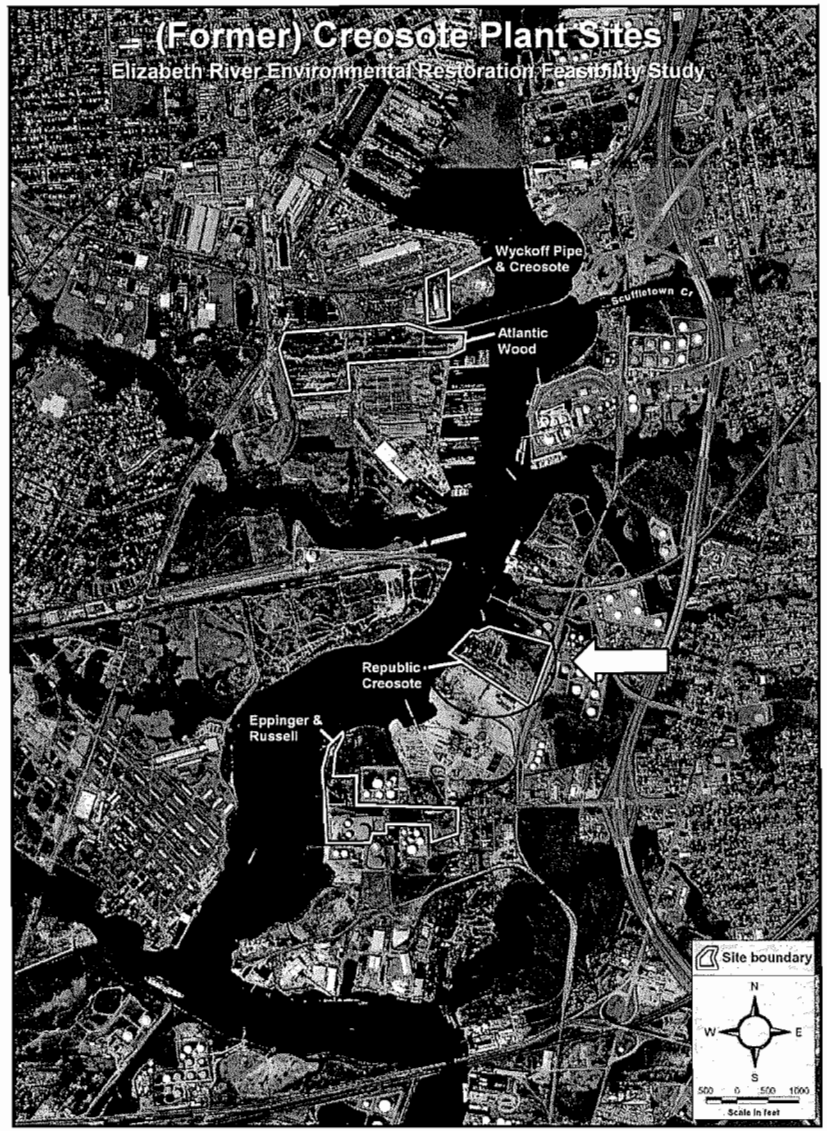
# S2 - Republic Creosote, S. Branch Elizabeth River

General Description

- Just south of the mouth of Paradise Creek (on eastern shore)
- Had a large creosoting facility operating on it for a number of years.
- Currently little data to evaluate extent of contamination at this site.
- Collect and analyze samples to characterize site
- Develop & implement remediation plan, as appropriate

Pros:

- Likely source of contamination based on historical use
- Adjacent restoration projects




**EIS Appendix B**
**Figure 8**

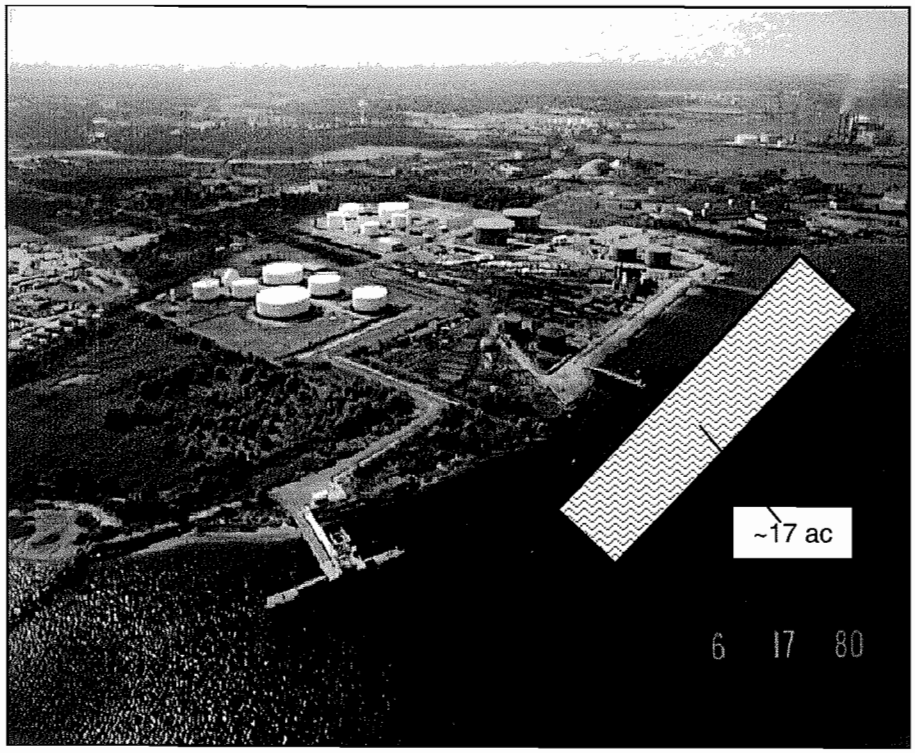
# S3 - Money Pt. (incl. Eppinger & Russell), S. Branch Eliz. River

General Description

- Elizabeth River Restoration Trust (ERRT) $5M mitigation funds to clean-up approx. 35 acres of severe contamination
- Amount of funding may not cover entire cost of remediation
- Some portion of the site (~17 ac) may be available for mitigation/remediation

Pros:

- Known significant source of contamination
- Historical records & some existing data available
- Adjacent restoration projects
- Upland clean-up currently underway (DEQ Voluntary Remediation Program)




EIS Appendix B
Figure 9

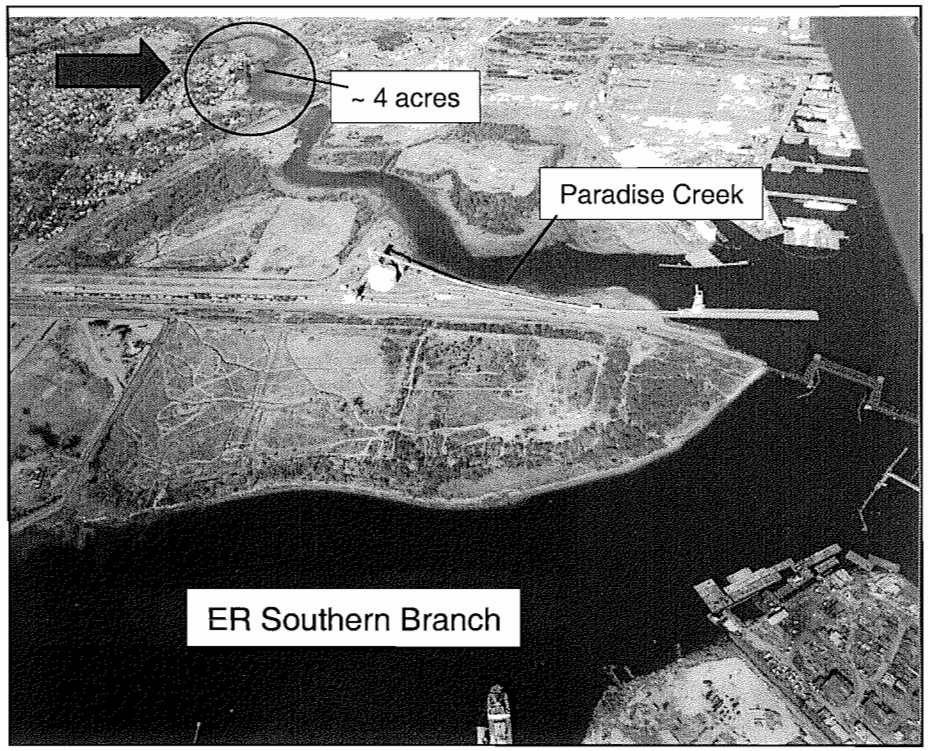
# S4 - Paradise Creek, S. Branch Elizabeth River

General Description

- Adjacent to Peck Iron and Metal facility
- Limited sediment samples show PCB and PAH contamination
- ERRT funded collection and analysis of PCB sediment samples (VIMS)
- Develop & implement remediation plan, as appropriate

Pros:

- Historical land use & existing sediment data available
- Consistent with Paradise Creek Watershed Management Plan
- Adjacent restoration projects, including Superfund clean-up(s), wildlife areas
- Upland property (Peck Iron ) participating in DEQ Voluntary Remediation Program




**EIS Appendix B**
**Figure 10**

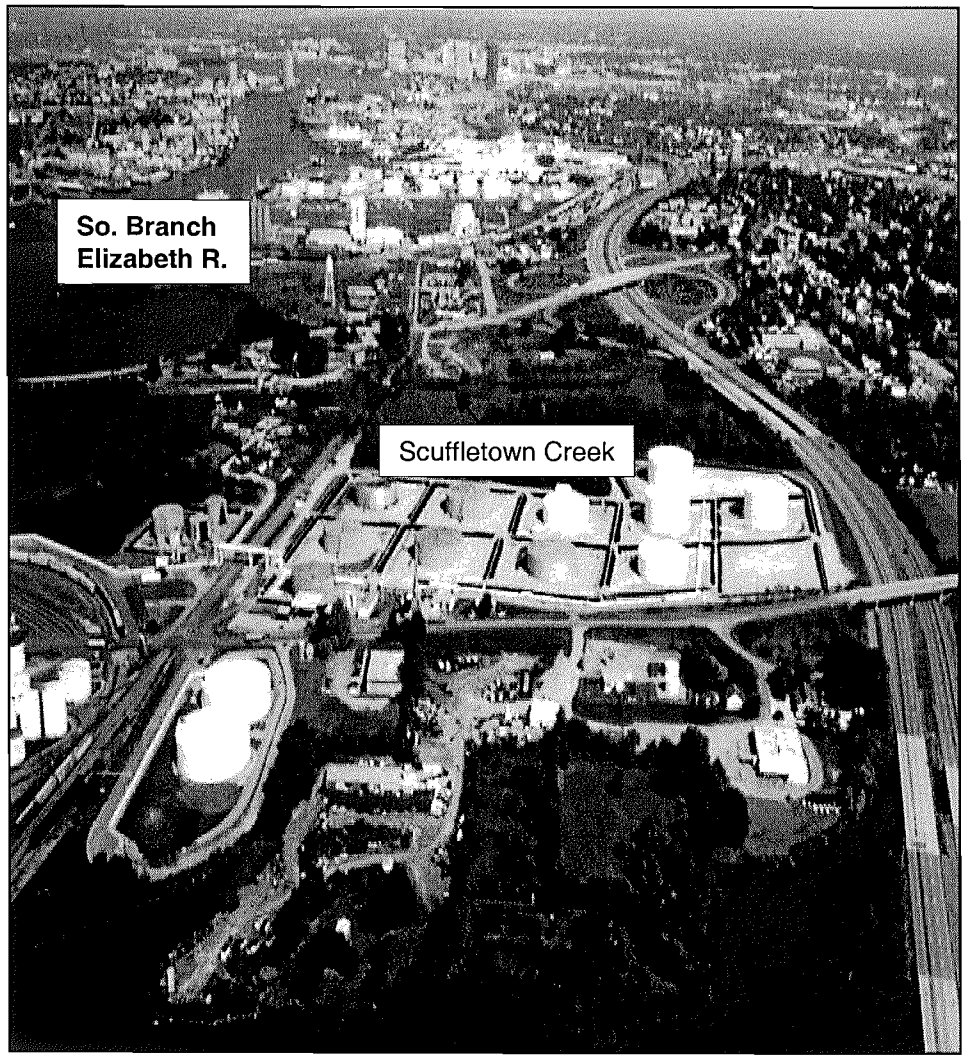
# S5 - Scuffletown Creek, So. Branch Eliz. River

General Description

- 6-acre sediment remediation Civil Works project (Corps/Sponsors)
- In pre-construction final design phase (PED)
- Removal of medium level PAH's
- Funding available for final design phase
- Mitigation could fund construction if Federal or sponsor funds are lacking

Pros:

- Known source of contamination
- Comprehensive existing data available
- Design (will be) complete
- Demo project potential
- Adjacent restoration projects




**EIS Appendix B**
**Figure 11**

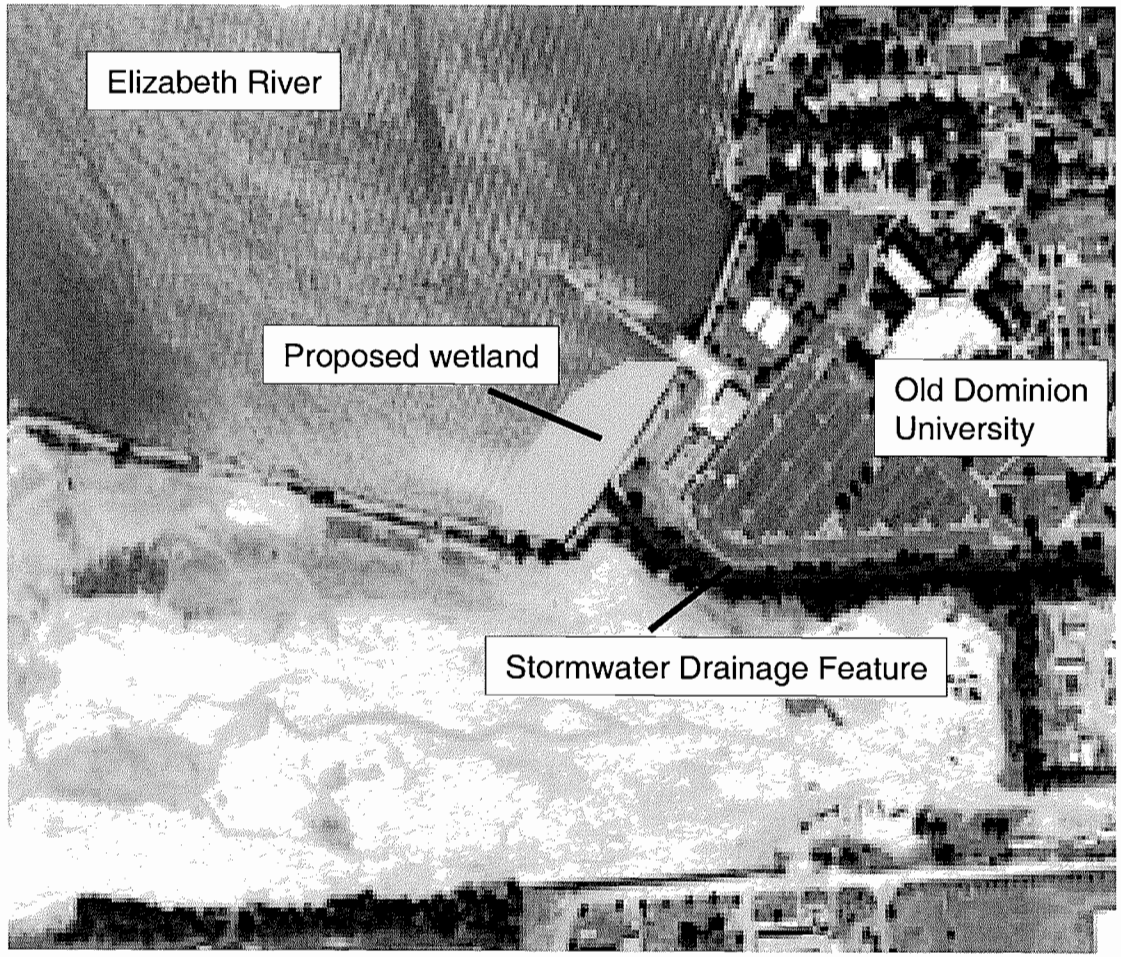
# Lambert Point/ODU Drainage Canal

General Description:

- Receives stormwater drainage from ODU campus
- 0.6 acre restorable saltmarsh on mainstem Elizabeth River

Pros:

- Design completed
- Supportive local sponsor (City of Norfolk)
- Will provide nutrient uptake and stormwater filtering




**EIS Appendix B**
**Figure 12**

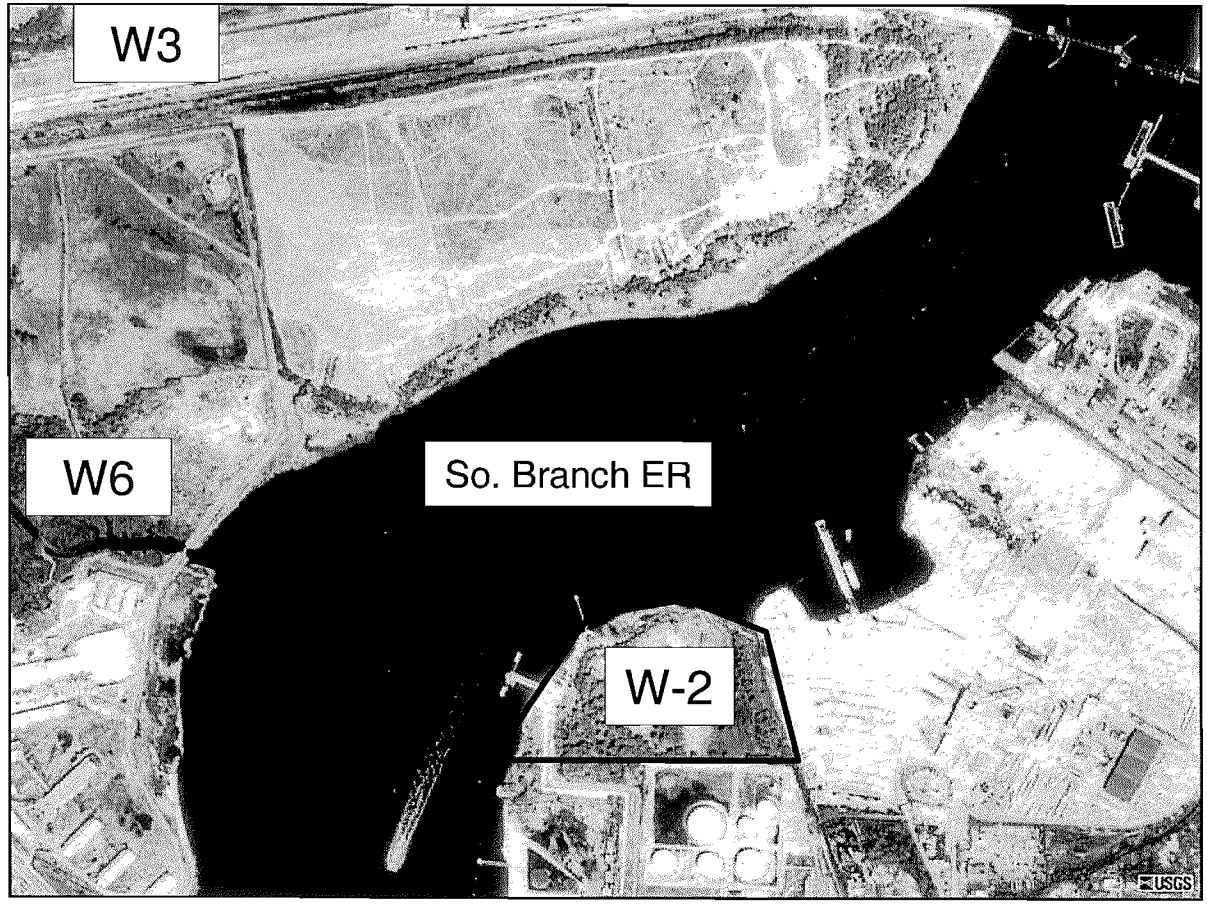
# W2 – Former Exxon Terminal (Shotmeyer Property)

General Description:

- 2 parcels, 1 owner
- 1 acre restorable on SBR. Elizabeth River

Pros:

- Adjacent and opposite other proposed sites
- Available for sale
- No former creosoting operations

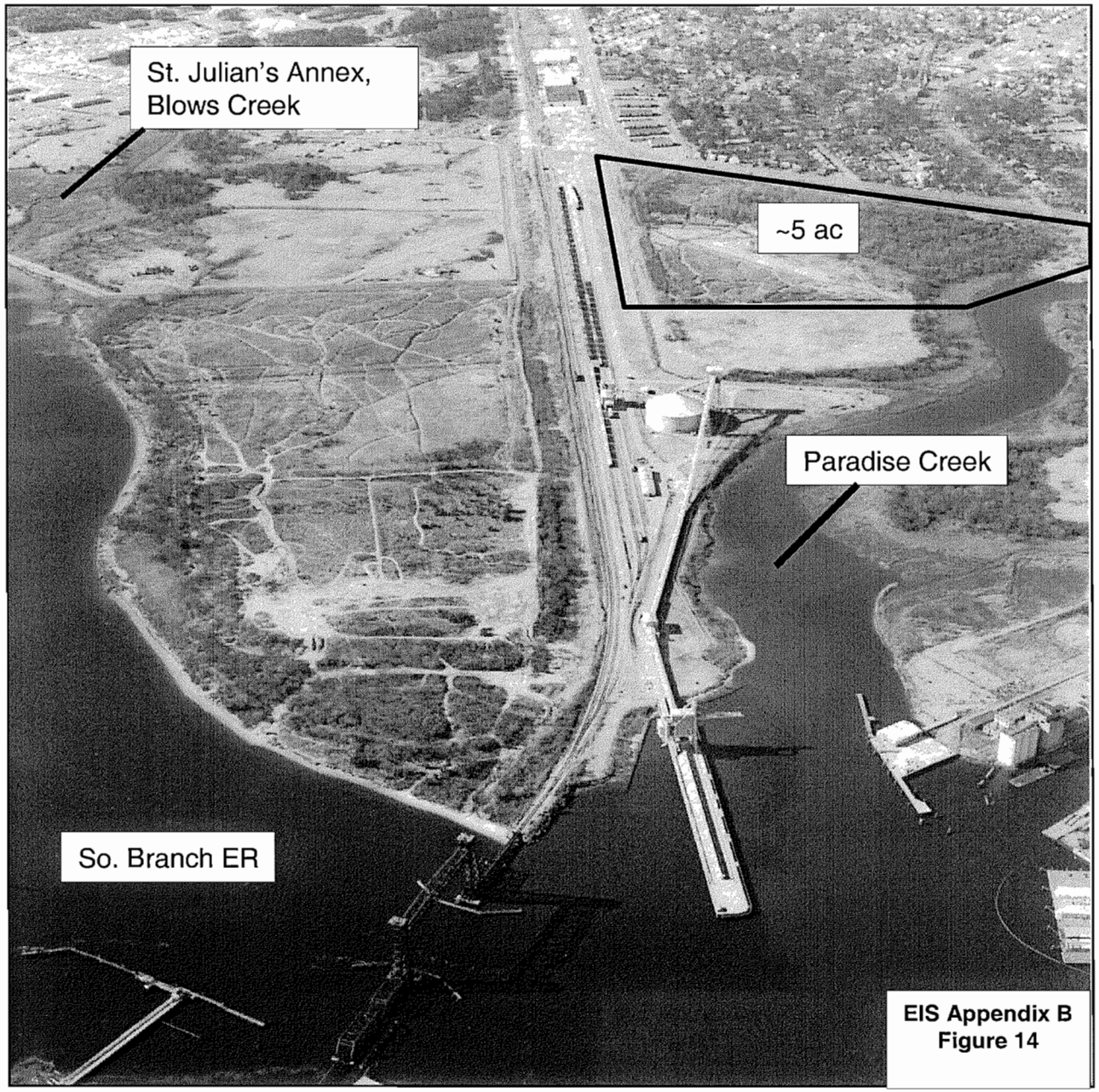



**EIS Appendix B**
**Figure 13**

# W3 Paradise Creek Park, Paradise Creek

General Description
- 40 acres, Portsmouth
- Partially wooded w/dredge disposal area (shell hash)

Pros:
- Approximately 5 acres of wetland creation possible
- Currently available for sale
- Recreational/education opportunities for adjacent Cradock neighborhood
- Contiguous to other proposed mitigation sites
- Dredge material could be used for capping local sediment sites




EIS Appendix B
Figure 14

# W4 - Elizabeth River Terminals

General Description
- 5 acres, City of Portsmouth
- Open field w/ small sand beach and fringe marsh
- Located on S. Branch across from St. Juliens Annex

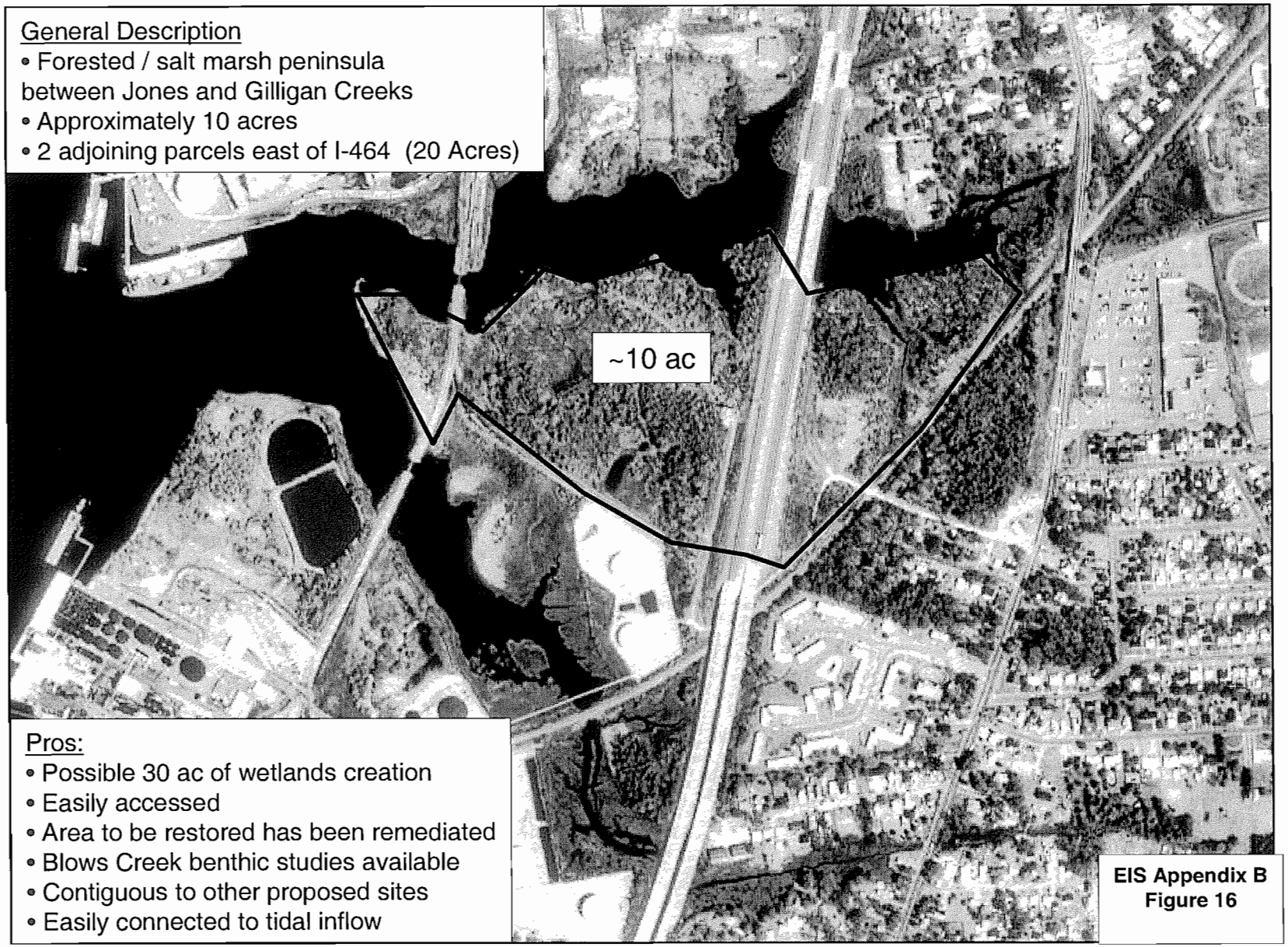
Pros:
- Approximately 5 acres of wetland creation possible

- ER Terminal Master Plan has area slated for conservation/wetlands creation

- Contiguous to other proposed mitigation sites

EIS Appendix B
Figure 15

# W5 - Property Located Between Jones Creek and Gilligan's Creek




General Description
- Forested / salt marsh peninsula between Jones and Gilligan Creeks
- Approximately 10 acres
- 2 adjoining parcels east of I-464 (20 Acres)

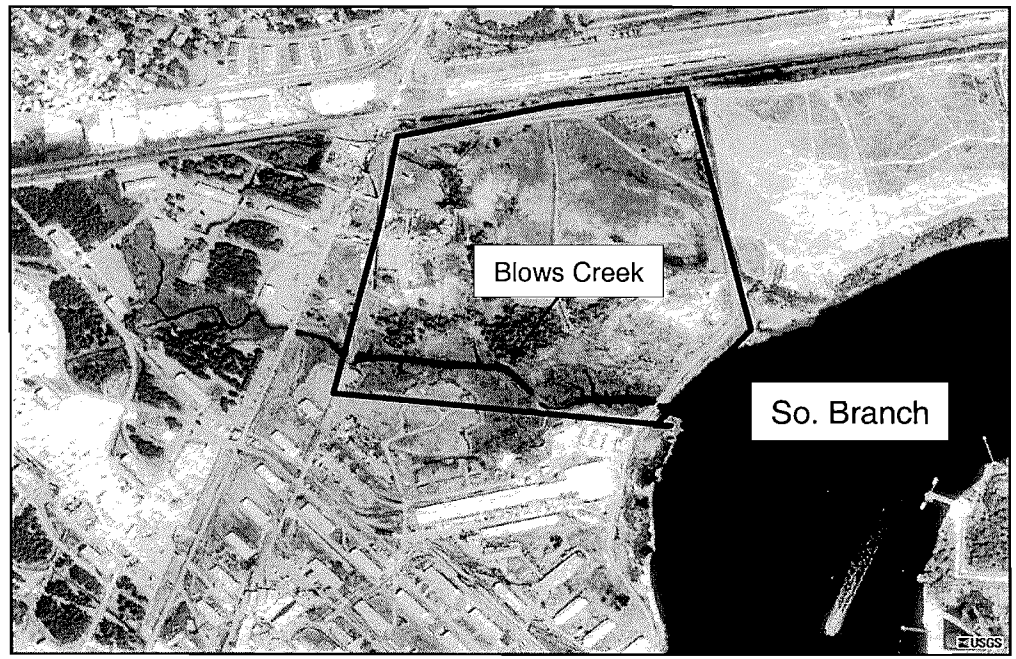
Pros:
- Possible 30 ac of wetlands creation
- Easily accessed
- Area to be restored has been remediated
- Blows Creek benthic studies available
- Contiguous to other proposed sites
- Easily connected to tidal inflow

**EIS Appendix B**
**Figure 16**

# W6 St. Julian's Annex, Blows Creek

General Description

- U.S. Navy Ammunition Depot, Chesapeake
- Adjacent to Paradise Creek Land Co. property and Chesapeake Deep Water Terminals
- Superfund Site

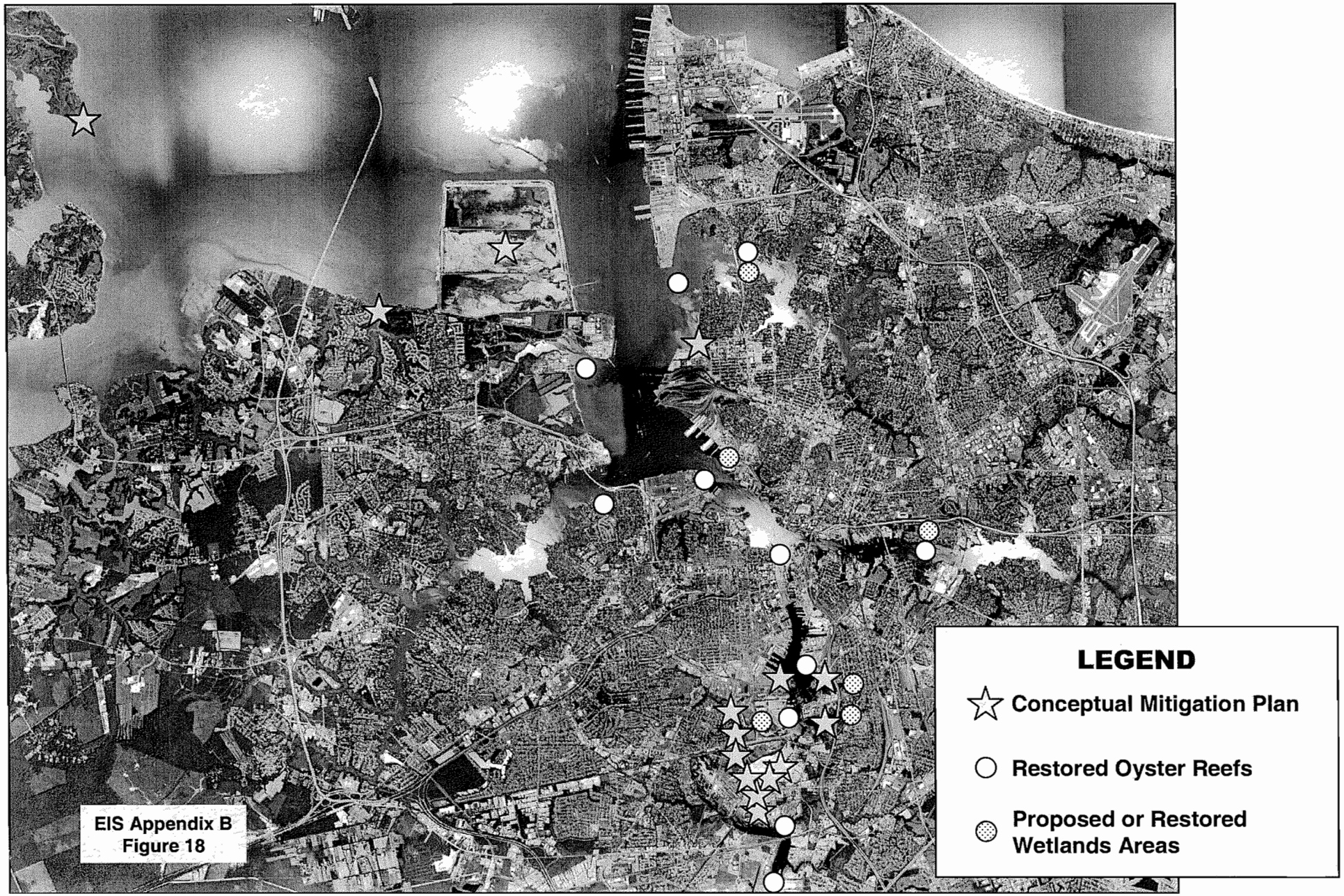



Pros:

- Possible 30 ac of wetlands creation
- Easily accessed
- Area to be restored has been remediated
- Blows Creek benthic studies available
- Contiguous to other proposed sites
- Easily connected to tidal inflow

EIS Appendix B
Figure 17

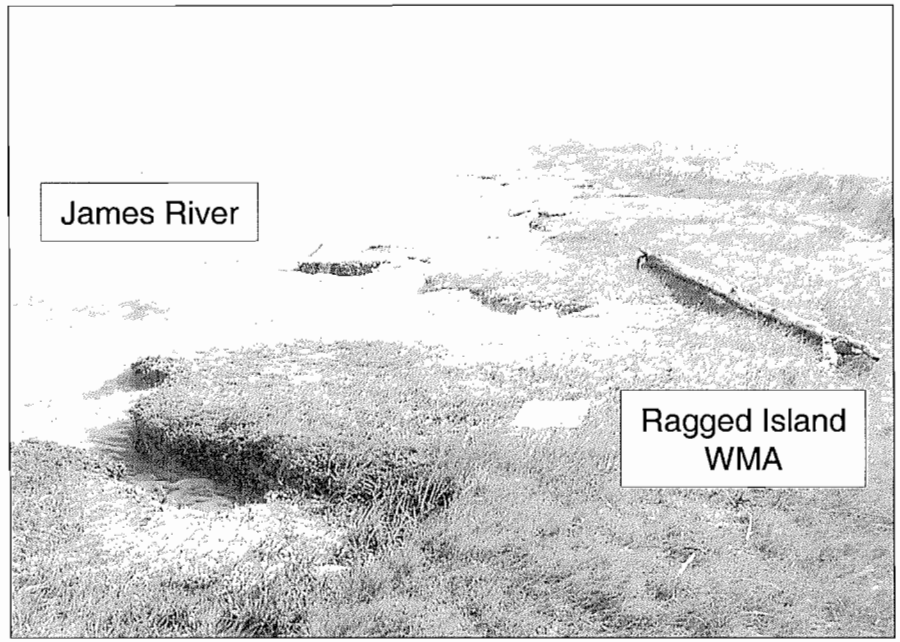
# Craney Island Consensus Mitigation Plan
# Connectivity With Existing Restoration Areas



# Ragged Island Wildlife Management Area, James River

General Description:

- 1,537 acres of brackish marsh and small pine islands on west side of the lower James River
- Major marsh vegetation is saltmarsh cordgrass and black needlerush
- 50,000 feet of shoreline eroding at 1-2 feet per year (1-2 acres/year)
- Results in loss of wetlands and benthic populations and large nutrient input



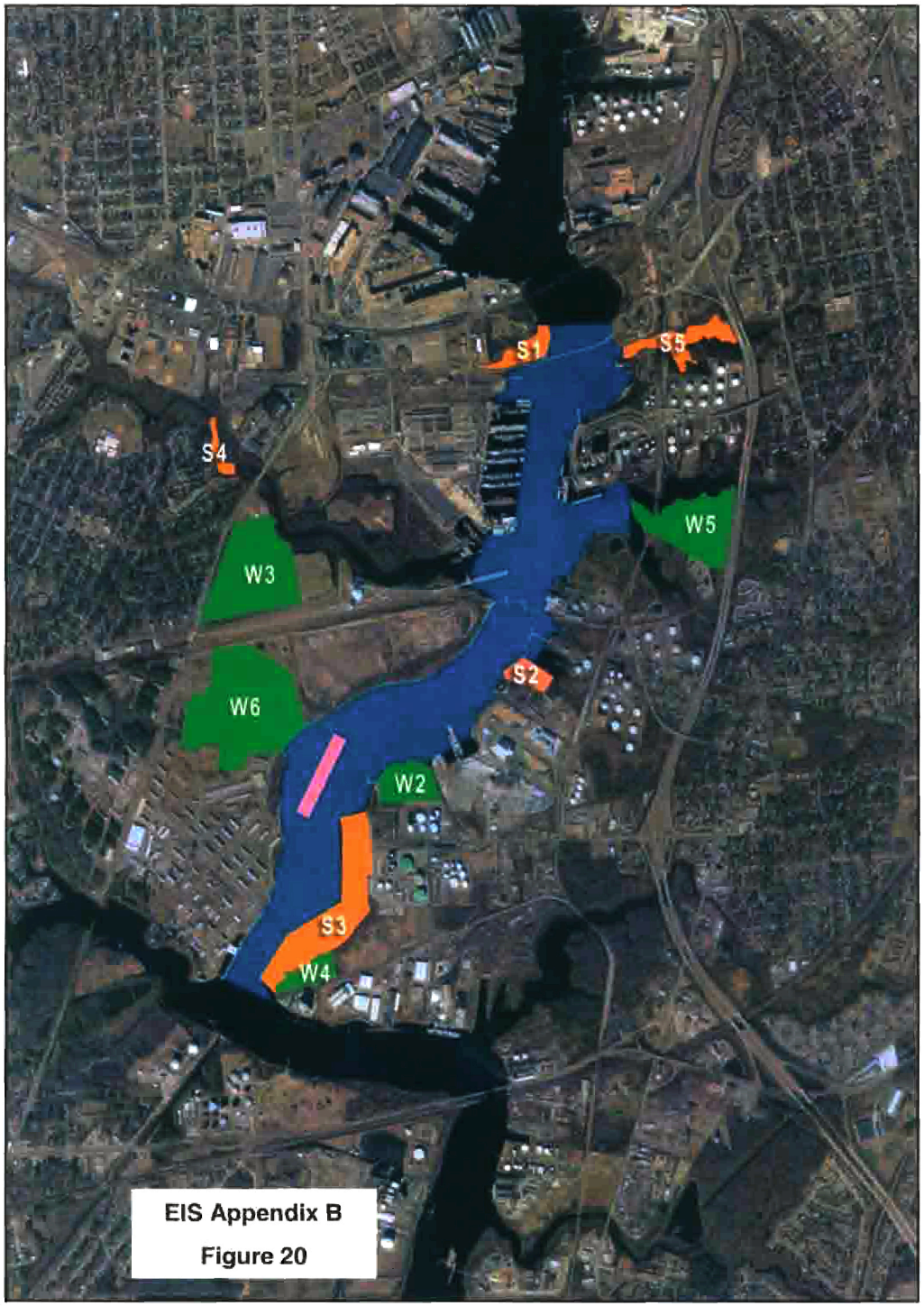

Mitigation Concept:

- Provide wetland restoration/erosion protection to halt erosion, nutrient input, and provide opportunity for shallow water benthic habitat (oysters/clams) restoration/protection

Pros:

- Recognizable benefits
- Preserves wetlands and wildlife (incl. bird) habitat near Craney Island DMMA
- Improves water quality in lower James River
- (Adjacent) Ragged Is. Creek – "Exceptional Waterway" designation

**EIS Appendix B**
**Figure 19**




EIS Appendix B

Figure 20

# Craney Island Consensus Mitigation Plan
# Southern Branch, Elizabeth River

## LEGEND

- Potential Sediment Remediation Opportunities ≈67 Acres
- Wetlands Restoration Areas ≈57 Acres
- Oyster Reef Creation, Site Shown ≈2 Acres
  Total Oyster Reef Creation Proposed ≈15 Acres
- Total River Restoration Area ≈411 Acres

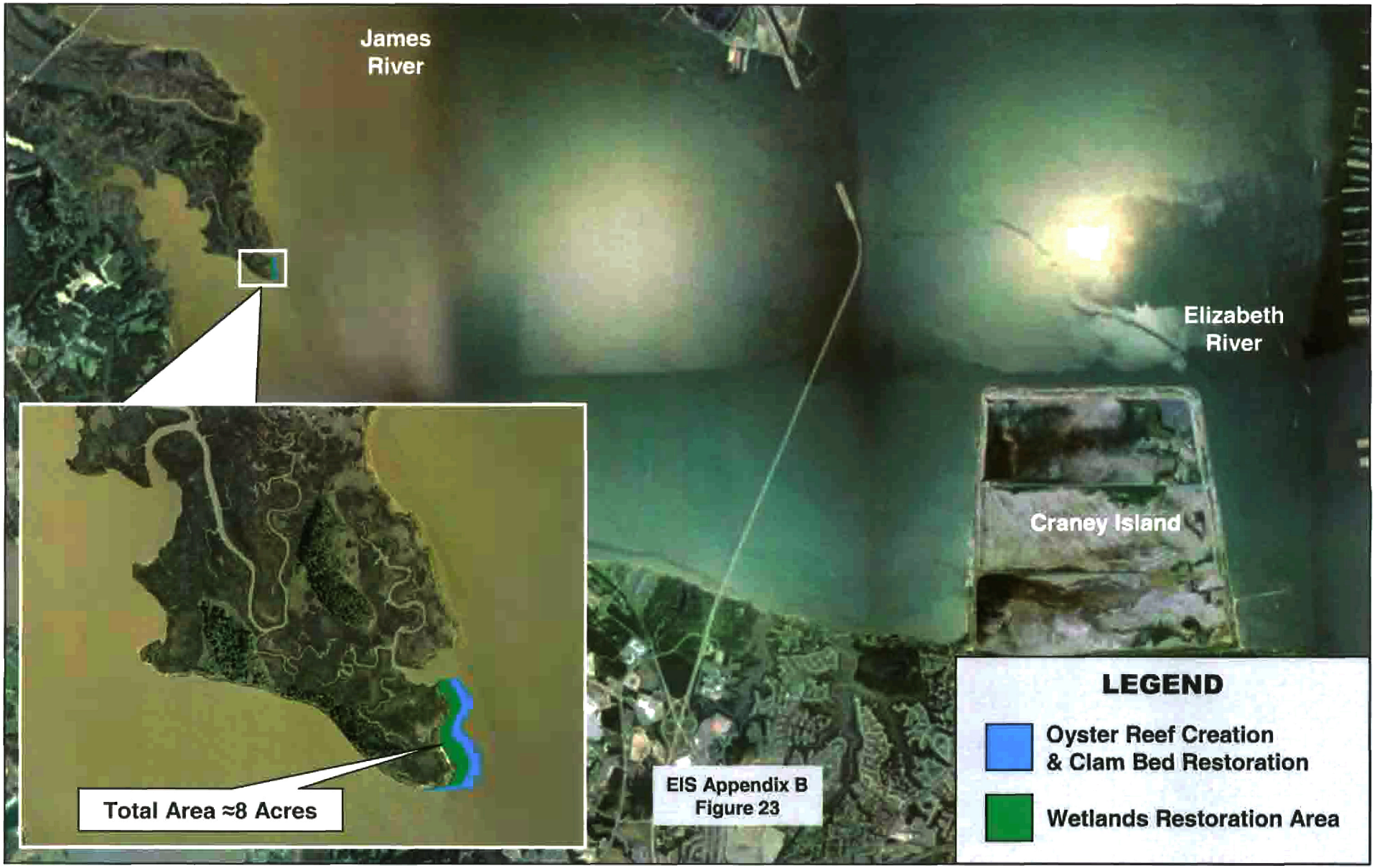
**KEY TO SITES:**

W2 – Former Exxon Site
W3 – Paradise Creek Park
W4 – Elizabeth River Terminals
W5 – Jones and Gilligan Creeks
W6 – St. Julians
S1 – Wycoff
S2 – Republic
S3 – Money Point
S4 – Paradise Creek
S5 – Scuffletown Creek

# Craney Island Consensus Mitigation Plan
## Hoffler Creek Oyster Reef Creation Site and Craney Island Bird Management Planning Area

# Craney Island Consensus Mitigation Plan
# Lamberts Point Wetlands Restoration Area and
# Craney Island Bird Management Planning Area

# Craney Island Consensus Mitigation Plan
## Ragged Island Wetlands Area, Oyster Reef Creation and Clam Bed Restoration



# APPENDIX C

# CUMULATIVE IMPACTS ASSESSMENT

Final Report

# CUMULATIVE EFFECTS ASSESSMENT OF THE EASTWARD EXPANSION OF THE CRANEY ISLAND DREDGED MATERIAL MANAGEMENT AREA (CIDMMA)

by

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Horseshoe Bay, Texas 78657

Submitted to

Norfolk District
U.S. Army Corps of Engineers
Norfolk, Virginia

April, 2004

CONTENTS


| | Page |
|---|---|
| • Contents | ii |
| • Abstract | vi |
| • Ch. 1 -- Context for the CEA Study | 1 |
| Cumulative Effects Issues Identified via Scoping | 2 |
| Definition of Cumulative Effects | 3 |
| Description of Process and 11-Step Plan | 4 |
| Notice of Intent | 6 |
| Contents of this Report | 7 |
| • Ch. 2 -- CIDMMA and Its Expansion | 8 |
| Development of the CIDMMA | 8 |
| Current Features of the CIDMMA | 9 |
| CIDMMA and Activities Associated with the Port of Hampton Roads | 12 |
| Spatial Boundary for the CEA Study | 13 |
| Temporal Boundary for the CEA Study | 19 |
| Expansion of the CIDMMA | 19 |
| Construction Sequencing for the Expansion Cell | 21 |
| • Ch. 3 -- Affected Environment | 23 |
| Water Quality | 23 |
| Hydrodynamics | 33 |
| Submerged Aquatic Vegetation (SAV) | 34 |
| Benthos -- Hampton Roads Area | 34 |
| Benthos -- CIDMMA Eastward Expansion Area | 37 |
| Fish | 39 |
| Waterfowl and Birds -- Hampton Roads Area | 42 |
| Waterfowl and Birds -- CIDMMA Eastward Expansion Area | 44 |
| Threatened and Endangered Species -- Hampton Roads Area | 45 |
| Threatened and Endangered Species -- CIDMMA Eastward Expansion Area | 45 |
| Upland Vegetation -- CIDMMA Eastward Expansion Area | 46 |
| • Ch. 4 -- Existing and Continuing Projects and Actions | 48 |
| Post-Authorization Norfolk District Projects | 48 |
| Authorized and Constructed Projects | 48 |
| Authorized Projects Not Yet Constructed | 63 |
| Maintenance Dredging | 71 |

Navigation Management Plan 78
Problems, Needs, Concerns, and Opportunities 78
Prioritization of Items 85
Implementation Strategy 88

Water-Related Laws, Regulations, and Programs 88
Pertinent Federal and State Laws 92
Permit Programs 92
Management Programs 97

Other Existing and Continuing Projects 98

- Ch. 5 -- Current Projects and Actions 100

Marine Terminal to the South of the CIDMMA 100
Introduction 100
Project Features 102
Project Impacts on Physical Resources 103
Project Impacts on Biological Resources 105
Other Project Impacts 108
Summary of Mitigation 108

Elizabeth River Ecological Restoration Program 110
Introduction 110
Identified Problems and Issues 110
Components of Program 114
Impacts of Ecological Restoration Program 115
Summary of Environmental Assessment 120

Pinner's Point Flyover 123
Introduction 123
Summary of Impacts 123

- Ch. 6 -- Proposed Projects and Potential Future Projects 124

Craney Island Terminal 124
Introduction 124
Description of Proposed Terminal 125
Environmental Impact Analysis 130

Third Crossing of the Hampton Roads Area 147
Introduction 147
Preferred Alternative 149
Conditions of Aquatic Resources 153
Summary of Environmental Consequences 158

Pre-Authorization Norfolk District Studies 170

Midtown Tunnel Project 172

Virginia Intermodal Transportation Center 172

- Ch. 7 -- Delineation of Cumulative Effects 173

Impacts from Navigation Improvements 173

Impacts from Expansion Cell Construction and Operation 178
Planning Aid Report - Key Impacts 181
Impact on Dominant Benthic Species 183
Hydrodynamic Impacts 185

Impacts from Marine Terminal Development and Operation 189

Impacts from Other Actions 194

Observations on the Cumulative Effects 194

- Ch. 8 -- Mitigation of Cumulative Effects 195

Summary of Identified Mitigation Options 195

HEA Method 197

Compensatory Restoration 197

- Ch. 9 -- Summary and Recommendations 204

Summary of Findings 205

Recommendations 205

- Selected References 207

- Appendix A -- Cumulative Effects Issues Identified in Scoping Meetings 211

Introduction 212
Stakeholder Meetings 212
NEPA Technical Committee 213
Mitigation Subcommittee 215
Summary of Scoping Meetings 217
Selected References 218

- Appendix B -- Siting Alternatives for Dredged Material Placement and VPA Marine Terminal 220

Introduction 221
Alternatives Review Committee 221
Preferable Alternative 224
Selected References 226

# CUMULATIVE EFFECTS ASSESSMENT OF THE EASTWARD EXPANSION OF THE CRANEY ISLAND DREDGED MATERIAL MANAGEMENT AREA

**by**
**Larry W. Canter, Ph.D.**
**Professor Emeritus**
**University of Oklahoma**

**April 2004**

## ABSTRACT

The Norfolk District of the U.S. Army Corps of Engineers is conducting a feasibility study to determine the need for and the federal interest in an eastward expansion of the Craney Island Dredged Material Management Area (CIDMMA) located in the Hampton Roads area near Norfolk, Virginia. Such an expansion would extend the useful life of the CIDMMA, provide additional acreage for long-term berthing and landside port facilities, and possibly serve as a logistical and tactical area supporting deployment of national defense forces. The feasibility study involves, among other things, an evaluation of the impacts to about 600 acres of shallow bottom habitat eastward of the CIDMMA. Cumulative impacts from the potential expansion action, and other nearby past, present, and reasonably foreseeable future actions have been identified as a concern. An 11-step methodology promulgated in 1997 by the Council on Environmental Quality was utilized as the framework for the cumulative effects assessment study described herein.

A total of 17 types of actions may contribute to cumulative effects in the Hampton Roads area. These actions include those that have occurred since the mid-1950s, are now taking place, or are anticipated to occur to the year 2050. Examples of the 17 types of actions include the continuing use of the 3 existing cells at the CIDMMA; an approximate 600-acre eastward expansion of the CIDMMA (the potential proposed action); historical and presently authorized navigation channel deepening; maintenance dredging for navigation; other existing and continuing industrial and military facilities in the local area; a new marine terminal (APM Terminals, Inc.); sediment cleanup and wetland restoration components of the Elizabeth River Ecological Restoration Program; the Craney Island Terminal (proposed by the Virginia Port Authority for construction on the eastward expansion area of the CIDMMA); and the Third Crossing of the Hampton Roads area (a bridge-tunnel connector). The cumulative effects of these 17 types of actions have been addressed for water quality, hydrodynamics, air quality, noise, biological resources (including benthic habitat in the approximate 600-acre eastward expansion area for the CIDMMA), protected species and critical habitat, recreation (boating and fishing), aesthetics, cultural resources, and socioeconomics (including area traffic and environmental justice). In the absence of appropriate monitoring and mitigation efforts, potentially significant adverse cumulative effects could occur on water quality, benthic habitat, and protected species and critical habitat. Beneficial cumulative effects are anticipated for the socioeconomic conditions of the Hampton Roads area.

Based on the above information, it is recommended that existing and continuing monitoring programs in the area should be systematically described. The "monitoring focus" should be broad; i.e., it should include aquatic ecology, water quality, recreational usage of the area, navigation traffic, quantities of dredged material received by the CIDMMA, etc. Further, consideration should be given to establishing a Hampton Roads Area Environmental Management Committee. Multiple agencies and entities should be represented on the Committee. The Committee should meet on a periodic basis, review the monitoring information, and adopt practices or management strategies to decrease adverse cumulative effects in the Hampton Roads area.

SUMMARY OF FINDINGS

A total of 17 types of actions have been identified as contributing to cumulative effects in the Hampton Roads area, including the Elizabeth River basin. These actions include those that have occurred since the mid-1950s, are now taking place, or are anticipated to occur in the future to the year 2050. The 17 types of actions include: (1) continuing use of the 3 existing cells at the CIDMMA; (2) an approximate 600-acre eastward expansion of the CIDMMA (the potential proposed action); (3) historical navigation channel deepening and provision of anchorages; (4) presently authorized channel deepening and anchorages (not yet constructed); (5) continuance of maintenance dredging for navigation; (6) planning for future channel deepening and maintenance dredging; (7) water-related laws, regulations, and programs; (8) other existing and continuing industrial and military projects and facilities in the local area; (9) a new marine terminal (APM Terminals, Inc.); (10) sediment cleanup and (11) wetland restoration components of the Elizabeth River Ecological Restoration Program; (12) Pinner's Point Flyover; (13) Craney Island Terminal (proposed by the Virginia Port Authority for construction on the eastward expansion area of the CIDMMA); (14) the Third Crossing of the Hampton Roads area (a bridge-tunnel connector); (15) pre-authorization studies by the Norfolk District of the Corps; (16) the Midtown Tunnel Project; and (17) the Virginia Intermodal Transportation Center. Table 7-1 delineates the respective time periods (past, present, and/or future) for the 17 actions.

The cumulative effects of these 17 types of actions have been addressed for water quality, hydrodynamics, air quality, noise, biological resources (including benthic habitat in the approximate 600-acre eastward expansion area for the CIDMMA), protected species and critical habitat, recreation (boating and fishing), aesthetics, cultural resources, and socioeconomics (including area traffic and environmental justice). Table 7-2 summarizes the connections between these resources ecosystems, and human communities and the major affecting actions from the 17 types of actions. In the absence of appropriate monitoring and mitigation efforts, potentially significant adverse cumulative effects could occur on water quality, benthic habitat, and protected species and critical habitat. Beneficial cumulative effects are anticipated for the socioeconomic conditions of the Hampton Roads area.

## RECOMMENDATIONS

Based on the above information, the following recommendations are made:

(1) As soon as more detailed information on the CIDMMA eastward expansion becomes available, Chapter 2 of this report should be updated as appropriate. Further, a more definitive composite timeline should be developed; this timeline should better define anticipated periods of construction and operation of the eastward expansion of the CIDMMA, as well as the various other relevant actions addressed in Chapters 4 through 6.

(2) Existing and continuing monitoring programs related to the Hampton Roads area and the Elizabeth River basin should be systematically identified and described relative to what is monitored, the monitoring frequency, the availability of the data, and the agencies responsible for the programs. The "monitoring focus" should be broad; i.e., it should include aquatic ecology, water quality, recreational usage of the area, navigation traffic, quantities of dredged material received by the CIDMMA, etc. This information could be placed in a separate companion report to this report, or it could be incorporated as a separate chapter and related appendices in this report. Further, it should be included in the subsequent Environmental Impact Statement (EIS). This recommendation is related to Step 10 in the CEQ methodology.

(3) Consideration should be given to establishing a Hampton Roads Area Environmental Management Committee. Multiple agencies and entities should be represented on the Committee. The Committee should meet on a periodic basis, review the monitoring information, and adapt practices or management strategies that may influence cumulative effects in the Hampton Roads area and the Elizabeth River basin. The Corps should probably take the lead on establishing this Committee. This concept is related to longer-term adaptive environmental management; further, it is being increasingly used by the Corps for large-scale projects. The overall concept and framework could be included in a separate chapter in this report, or it could be addressed as appropriate in a subsequent EIS. This recommendation is related Step 11 in the CEQ methodology.

# CHAPTER 1

## CONTEXT FOR THE CEA STUDY

A September 24, 1997, resolution of the U.S. House Committee on Transportation and Infrastructure authorized the Norfolk District of the U.S. Army Corps of Engineers to conduct a reconnaissance study of the expansion of the Craney Island Dredged Material Management Area (CIDMMA). The study, which was completed in March, 1999, determined that there was a Federal interest (U.S. Army Corps of Engineers, February, 2000, p. III-7). The Norfolk District is currently conducting a follow-on feasibility study to determine the need for and the federal interest in an eastward expansion of the CIDMMA. This study will serve three main purposes. First, the additional cell would extend the useful life of the CIDMMA as a dredged material containment area. Secondly, once filled, it could provide additional acreage for the development of projected long-term berthing and landside port facilities adjacent to the Norfolk Harbor Channel. Thirdly, it could serve as a logistical and tactical area supporting deployment of national defense forces. The feasibility study is being conducted as a result of a favorable reconnaissance report, which was certified by HQUSACE on 20 January 1999 (U.S. Army Corps of Engineers, December 2, 2003).

The feasibility study involves, among other things, an evaluation of the environmental impacts to about 600 acres of shallow bottom habitat eastward of the CIDMMA. Cumulative impacts from the current potential action, and other nearby past, present, and reasonably foreseeable future actions, also need to be identified and assessed for the shallow bottom habitat and other pertinent resources. Accordingly, this report addresses a cumulative effects assessment (CEA) study conducted as part of the CIDMMA expansion feasibility study.

The CEA study was conducted in the latter part of 2003 and early in 2004. The study included three primary work elements: (1) a study orientation visit to the Norfolk District and the CIDMMA; (2) the procurement, review, and summarization of over 50 pertinent reference documents and materials; and (3) preparation of this CEA report. The orientation visit was conducted on May 15, 2003. The first part consisted of a meeting at the Norfolk District Office, and the second part included a visit to the CIDMMA and its environs. The overall purposes of the study orientation visit were to become acquainted with the context for the CEA study, and to identify and gather pertinent information. Both of these purposes were fulfilled. The majority of the pertinent reference documents and materials were procured from the Corps, with the remainder from other literature searching and the Internet. For example, several relevant information items were identified on two Norfolk District websites. The Selected References section of this report includes the cited references in the main sections; pertinent references cited in the appendices are included with the respective appendices.

## CUMULATIVE EFFECTS ISSUES IDENTIFIED VIA SCOPING

The feasibility study of the eastward expansion of the CIDMMA has included at least 12 public meetings involving persons and groups with various interests and expertise. The total includes four stakeholder meetings, five meetings of a NEPA Technical Committee, and four meetings of a Mitigation Subcommittee of the NEPA Technical Committee. These meetings included extensive discussions that are associated with the scoping process as delineated within the NEPA regulations of the Council on Environmental Quality. Details related to the scoping meetings are in Appendix A of this report. A central theme in many of the discussions related to the need for a CEA study. More specifically, the following items reflect the manner in which the issues related to cumulative effects were articulated:

- A comprehensive EIS should be prepared to address connected actions, cumulative actions, and cumulative effects. A piecemeal approach wherein multiple EISs are prepared without referring to other nearby actions would not provide the best approach from an environmental management perspective.

- The environmental effects of multiple current and future projects in the vicinity of the eastward expansion of the CIDMMA should be considered together. Examples of these other projects include dredging of the inbound portion of the Norfolk Harbor Channel to a depth of 50 feet (by the Corps), construction and operation of a major marine terminal on the completed expansion cell (by the Virginia Port Authority), construction and operation of a second marine terminal about 1.5 to 2.0 miles south of the CIDMMA (by APM Terminals, Inc.), construction and use of a Third Crossing bridge tunnel project (by the Virginia Department of Transportation), and implementation of sediment cleanup and wetland restoration projects in the Elizabeth River Basin (by the Elizabeth River Ecological Restoration Program).

- The environmental impact study of the eastward expansion of the CIDMMA should encompass the direct, indirect, and cumulative effects on specific resources such as, but not limited to, water quality, benthos, fisheries, protected species, birds, and wetlands.

- Hydrodynamic modeling should be used as a tool to explore the effects of single and multiple projects on various important hydrodynamic parameters in the Hampton Roads area.

- Mitigation measures for the direct effects of the eastward expansion of the CIDMMA should be developed. Such measures could also be utilized, in a collaborative manner with other agencies and parties, to systematically provide opportunities for mitigating cumulative effects on specific resources and ecosystems.

## DEFINITION OF CUMULATIVE EFFECTS

Cumulative impacts (effects) refer to the impacts (effects) on the environment that result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts (effects) can result from individually minor but collectively significant actions taking place over a period of time (40 CFR 1508.7). This definition encompasses the following implications relative to this cumulative effects study:

- the action refers to the construction and completion of an eastward expansion of the CIDMMA on about 580 to 600 acres of shallow bottom habitat (the expansion includes the construction of containment dikes around the approximate 580 to 600 acres, and the filling of the disposal area to an elevation of 12.0 feet above the mean low water level)

- the direct and indirect incremental impacts (effects) of the proposed action itself represent a key criterion in determining if cumulative effects on localized and regional environmental and natural resources, ecosystems, and human communities need to be addressed (e.g., if the action has no effects on a given resource, then it is not necessary to address the existing cumulative effects which have occurred on the resource)

- for those cumulative effects which need to be addressed, it is necessary to consider the direct and indirect effects of past, present, and reasonably foreseeable future actions on the affected resources, ecosystems, and human communities (past actions can include those in the area prior to and during the construction and use of the CIDMMA, as well the 40 (+) years of placement of dredged material at the CIDMMA; present actions include those involving on-going dredging and materials placement in the CIDMMA, and other projects that are under construction in the area; and reasonably foreseeable future actions include those beyond mere speculation, but within the time frame for analysis)

- direct effects are those effects caused by the proposed action, past actions, present actions, or reasonably foreseeable future actions, which occur at the same time and place as the respective actions (40 CFR 1508.8a); indirect effects are caused by the respective actions and are later in time or farther removed in distance, but are still reasonably foreseeable (indirect effects may include growth inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems) (40 CFR 1508.8b)

- the respective actions may have been, or will be, the result of decisions made by various governmental levels (federal, state, or local) or the private sector; further, such actions may be on or nearby the CIDMMA, or off-site (the key issue is that common resources, ecosystems, or human communities are being affected)

- five reasonably foreseeable future actions of particular relevance to this study are the deepening of the inbound lanes of the Norfolk Harbor Channel and the Craney Island Channel from 45 to 50 feet to accommodate larger container ships; the Virginia Port Authority's (VPA's) proposed construction and operation of a new marine terminal on the approximate 580 to 600 acre eastward expansion of the CIDMMA; the Virginia Department of Transportation's (VDOT's) proposed Third Crossing of the Hampton Roads area; the Ecosystem Restoration Program for the Elizabeth River; and the construction and operation of a new marine terminal by APM Terminals, Inc.

- cumulative effects need to be analyzed relative to a place-based perspective (the situation at the CIDMMA and in nearby areas) regarding the specific resources, ecosystems, and human communities being affected

- each affected resource, ecosystem, and human community must be analyzed in terms of its sustainability and capacity to accommodate additional effects, based on its own time and space parameters

## DESCRIPTION OF PROCESS AND 11-STEP PLAN

The 11-step CEA methodology published in 1997 by the Council on Environmental Quality (CEQ) was utilized as the framework for this cumulative effects study (Council on Environmental Quality, 1997). The concepts embodied in the 11 steps are also included in a U.S. Environmental Protection Agency report related to the review of cumulative effects information in environmental impact statements (EISs) (U.S. Environmental Protection Agency, 1999). Following is the explanation of each step, modified as appropriate for the CIDMMA CEA study. Steps 1-4 relate to scoping for cumulative effects, Steps 5-7 to describing the affected environment, and Steps 8-11 to determining the cumulative environmental consequences.

- Step 1: Identify the significant cumulative effects issues associated with the proposed action and define the assessment goals. This step will focus on the experienced impacts of the CIDMMA, the anticipated impacts of the phased construction of the eastward expansion for a port facility, and the typical impacts of marine terminals during the receipt and movement of goods. The focus will be upon those resources, ecosystems, and human communities that have been or will be impacted by the "proposed action".

- Step 2: Establish the geographic scope for the analysis. The geographic scope is dependent on the affected resources, ecosystems, and human communities within the vicinity of the CIDMMA. Further, it may be necessary to utilize different boundaries for some of the impacted items. Both localized and regional boundaries will be considered as appropriate.

- Step 3: Establish the time frame for the analysis. The time frame is to include the past, present, and future. A possible historical (past) boundary (or reference point) would be just prior to construction of the CIDMMA. Historical trends, up to the current time, for the impacted resources, ecosystems, and human communities will also be examined. The future time boundary should probably encompass the anticipated lifetime of the CIDMMA (to approximately 2030), as well as the complete build-out for the VPA's Craney Island Terminal (2050).

- Step 4: Identify other actions affecting the resources, ecosystems, and human communities of concern. Other actions include past actions, present actions, and reasonably foreseeable future actions (RFFAs), regardless of whether these actions have been or will be done by governmental agencies or the private sector. Some RFFAs may be difficult to identify with any specificity due to uncertainties related to approvals, funding, etc. Many of the reference documents and materials delineate historical and current actions, while others are related to RFFAs. Examples of RFFAs include VDOT's Third Crossing of the Hampton Roads area, the proposed containership terminal by APM Terminals, Inc., and continued projects associated with the Elizabeth River Ecological Restoration Program. The output of this step will include several tables that summarize various pertinent actions.

- Steps 5 and 6: Characterize the resources, ecosystems, and human communities identified in Steps 1 through 4 in terms of their response to change and capacity to withstand stresses. Further, characterize the stresses affecting these resources, ecosystems, and human communities and their relation to regulatory thresholds. Considerable information on the conditions of these environmental categories, their current stress, and their relation to regulatory thresholds and requirements has been accumulated via special studies sponsored by the Corps, and related documents by the Corps, VPA, VDOT, and Virginia environmental departments. The major effort associated with Steps 5 and 6 involved the extraction and summarization of existing information from these various reports.

- Step 7: Define a baseline condition for the resources, ecosystems, and human communities. The words "baseline condition" can be used in three ways in an impact study: (1) to define the conditions of pertinent resources, ecosystems, and human communities at an "historical reference date and as reflected by trends" to the current date; (2) to define the "current conditions" (such as done in the Description of the Environment section in EISs, with the current conditions reflective of historical cumulative effects); and (3) to define the "future without the proposed action conditions" based upon forecasting of changes over the future time period within the analysis. Descriptive information will be assembled on conditions reflective of an "historical reference date and trends". Steps 5 and 6 above relate to "current conditions". The "future without the proposed action conditions" is summarized in conjunction with Step 9 below.

- Step 8: Identify the important cause-and-effect relationships between human activities and resources, ecosystems, and human communities. These relationships will be addressed by identifying and describing common pathways or connections between the CIDMMA eastward expansion and the construction and operation of the proposed port facility, related past, present, and reasonably foreseeable future actions, and the affected resources, ecosystems, and human communities. This step is related to Steps 1 and 4 above. The cause-and-effect relationships will be qualitatively described and displayed as appropriate.

- Step 9: Determine the magnitude and significance of cumulative effects. It would be desirable to quantify all of the cumulative effects, however, such data was not available for many issues. In most cases, qualitative descriptions of cumulative effects will be prepared based upon field studies and related reports, and professional judgment. The significance of the cumulative effects will be determined based upon considering historical, current, and forecasted conditions for the affected resources, ecosystems, and human communities, along with relevant regulatory thresholds and professional judgment.

- Step 10: Modify or add alternatives to avoid, minimize, or mitigate significant cumulative effects. The current feasibility-level study has already examined several expansion locational alternatives. Further, the design features and operational practices of the CIDMMA have been and are focused on avoiding, minimizing, or mitigating associated direct effects. Also, it should be noted that the proposed main terminal already includes a number of design, construction, and operational measures which are focused on avoiding, minimizing, or mitigating direct, indirect, and cumulative effects. Accordingly, summaries of these existing and planned efforts have been prepared for these steps. Further, of particular note are the mitigation planning efforts of the Mitigation Subcommittee of the NEPA Review Team. These efforts will also be summarized.

- Step 11: Monitor the cumulative effects of the selected alternative (proposed action) and adapt management. Extensive monitoring of the physical-chemical and biological environment is already conducted at the CIDMMA, and in the general vicinity in conjunction with related programs of other Federal and state agencies. If significant potential cumulative effects are identified, then a coordinated monitoring program for selected indicators will be recommended, along with a protocol for identifying and implementing adaptive management strategies.

## NOTICE OF INTENT

On March 2, 2001, the U.S. Army Corps of Engineers published an associated Notice of Intent (NOI) in the Federal Register (U.S. Army Corps of Engineers, March 2, 2001). The NOI announced the Corps' intent to prepare a Draft EIS for an expansion of the existing CIDMMA in the Hampton Roads area near Norfolk, Virginia. Reference was

also made to providing port facilities in a collaborative effort with the VPA. At this time, this provision would be accomplished by building terminal facilities on about 580 to 600 acres of an eastward expansion of the CIDMMA. It is assumed that information from this CEA report will be included in the Draft EIS.

## CONTENTS OF THIS REPORT

This report is organized into nine chapters and two appendices. Following this introductory context chapter, Chapter 2 focuses on the CIDMMA and its expansion. It also includes Steps 2 and 3 of the CEQ's 11-step methodology. Chapter 3 summarizes information on the affected environment, and it encompasses Steps 5 to 7 of the 11-step methodology. Chapters 4 to 6 highlight Step 4 of the methodology, with Chapter 4 focused on past, present and continuing projects and actions; Chapter 5 on current actions under implementation; and Chapter 6 on proposed and possible future projects. Chapter 7 addresses the cumulative effects of the eastward expansion of the CIDMMA (Step 1) along with the contributing effects of other actions (Step 4). Information on the effects of other actions is contained in Chapters 4 to 6. Further, Chapter 7 also includes Steps 8 and 9 of the CEQ methodology. Chapter 8 highlights potential mitigation measures for the eastward expansion of the CIDMMA (Steps 10 and 11). Finally, Chapter 9 summarizes the findings and recommendations related to this CEA study.

# CHAPTER 2

# CIDMMA AND ITS EXPANSION

This chapter highlights the development and current features of the CIDMMA, the relationship between the CIDMMA and the key activities of the Port of Hampton Roads, and summary information related to the potential eastward expansion of the CIDMMA. Specific engineering design details are not available on the expansion; however, some information is included on a potential overall timing schedule and the construction sequence for the containment dikes around the expansion cell. Further, information is included on the spatial and temporal boundaries of the CEA study. Information related to the potential environmental impacts of the expansion is in Chapter 7.

## DEVELOPMENT OF THE CIDMMA

The CIDMMA is a Federally owned, Corps-operated, trapezoidal-shaped, 2,500-acre, man-made dredged material placement area located in Portsmouth, Virginia (U.S. Army Corps of Engineers, February, 2000, pp. II-31 and II-32). The disposal area, which was originally named the Craney Island Disposal Area, represented the first project of this type implemented by the Corps of Engineers (Warren, 1957). It was authorized by the Rivers and Harbors Act of 1946 and constructed from 1954 to 1957. In accordance with the original design dimensions, the main exterior levees were constructed to 8 feet above the Corps' designated low water level, with step levees ultimately constructed to 18 feet above the designated low water level. Users of the facility may pump material directly into the diked area. There is also a rehandling basin to the southeast of the containment area that may be used by bottom-dump scows. Materials from maintenance, private, and permitted dredging in the Hampton Roads area have been placed at the CIDMMA since its 1957 opening (U.S. Army Corps of Engineers, December 3, 2003).

It is of interest to note that prior to its conversion to the CIDMMA, the original Craney Island was a part of several significant events in this nation's history. For example, during the War of 1812, Norfolk's defenses were chiefly on Craney Island, which guarded the narrow channel of the Elizabeth River. The island had a 7-gun fortification and was manned by 580 regulars and militia in addition to 150 sailors and marines from the Constellation. The British planned to land an 800-man force on the mainland and, when low tide permitted, march onto the island in a flanking movement. As the tide rose, another 500 men would be rowed across the shoals for a frontal assault. On June 22, 1812, the landing party debarked four miles northwest of Craney Island, but the flanking move was countered by the highly accurate marksman-ship of the USS Constellation's gunners and was forced to pull back. The frontal assault also suffered from well-directed American fire, which sank three barges and threw the rest into confusion. After taking 81 casualties, the British sailed off in disorder. The defenders counted no casualties (U.S. Navy, undated).

The CIDMMA was originally designed to hold about 100 million cubic yards of material. Based on authority contained in Section 148 of WRDA 1976, the Craney Island Management Plan was developed in December, 1981, to intensively manage the site with a view to extending its life. The plan involved: (1) subdividing the area into three cells; (2) constructing new retaining dikes 1,000 feet inside the main exterior levee to allow eventual dredged material placement up to an average elevation of 30 feet above the designated low water level; and (3) rotating future placement annually among the three subcontainments, allowing a 1-year active placement cycle followed by a 2-year inactive cycle for each subcontainment.

CIDMMA is now an income-producing facility that receives funds from toll charges levied on non-Corps of Engineers users. The tolls, which are adjusted periodically, cover both the original construction cost and the subsequent operation and maintenance requirements, including implementation of the management plan. Currently, there are no items of local cooperation associated with CIDMMA. The original river bottom was deeded to the Corps by the Commonwealth of Virginia. This strategically located facility is designated for use by all private interests, municipalities, and government agencies accomplishing dredging in Hampton Roads harbor and adjacent waters (U.S. Army Corps of Engineers, February, 2000, p. II-32). An aerial photograph of the current CIDMMA is in Figure 2-1 (U.S. Army Corps of Engineers, December 5, 2003).

## CURRENT FEATURES OF THE CIDMMA

Some pertinent current "facts" about the operations of the CIDMMA include the following:

- From 3 to 4 million cubic yards of dredged material is disposed annually into the CIDMMA.

- The CIDMMA currently has three cells that are used in a rotating pattern; one receives the dredged material, and the other two are in a drying phase. Because of the rotating pattern, large shallow water zones can be created in the receiving cell of the CIDMMA during large disposal operations. Gradual drying and vegetative colonization (typically by *Phragmites grasses*) occurs between disposal cycles to each cell. The amount of dredged material that is deposited can vary significantly from year to year (Ruddy, 2002).

- Mainly hydraulically dredged material is put into the east side of the cells, with "flow" toward the west side where the liquid effluent is discharged via weirs.

- Telescoping weirs are used at the west end of all three cells. In comparison to traditional notched weirs, telescoping weirs are easier to operate and require less manpower, resulting in better effluent water quality, and they are safer to operate. Another advantage is that they are remotely controlled and several weirs can be operated from one location. The telescoping weirs in the CIDMMA

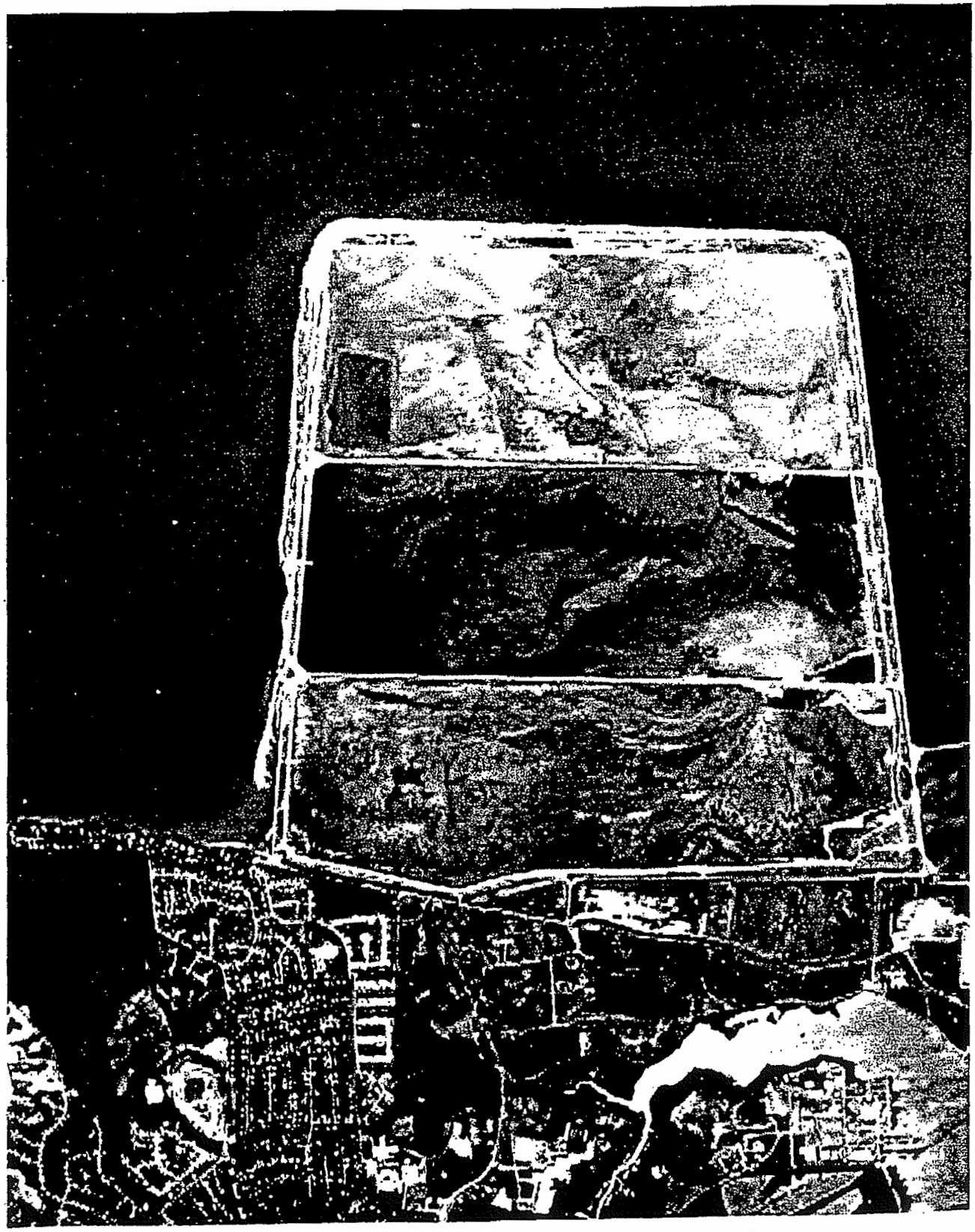

Figure 2-1: Aerial Photograph of the CIDMMA (U.S. Army Corps of Engineers, December 5, 2003)

cells can be raised or lowered to adjust for greater or lesser amounts of dredged material being pumped into the cells. The electrically driven weirs can be adjusted for any depth from the surface down to 15 feet. The weirs have an estimated service life of about 15 years (U.S. Navy, undated).

- The CIDMMA has:

  (1) wick drains inside the west levees (to help dry out deeper materials in the cells)

  (2) piezometers on the water side of the west levee (to measure the "water line")

  (3) an estimated current lifetime to 2029; with the eastward expansion this could be extended to about 2035

  (4) a levee height on the west side which could be increased, with or without the eastward expansion

  (5) a hopper dredge dump and rehandling basin at the southeast corner; the dumped material from the Elizabeth River is moved to the cells via hydraulic pumping

- The Virginia Department of Environmental Quality routinely monitors the effluent quality from the CIDMMA. In addition, special studies are periodically conducted. For example, a recent short-term project to determine the effectiveness of the CIDMMA in retaining/removing contaminants from the deposited dredged material was conducted by McDavitt (2003). The objective was to determine if heavy metals and Polycyclic Aromatic Hydrocarbons (PAH) were escaping from the CIDMMA. Influent samples were collected from the inlet pipe at the east end one of the cells; samples were collected at one-hour intervals for three hours. In order to allow for liquid flow-through, on the next day effluent samples were collected in the same manner from a discharge weir at the west end of the same cell. The total of six samples were subjected to standardized tests for salinity, the 6010A and 7000 series for RCRA (Resource Conservation and Recovery Act) metals, and the 8100 series for PAH. The results indicated that the CIDMMA was functioning as designed and containing the entering contaminants. The only exceptions came from arsenic and barium whose effluent values were equivalent or slightly higher than their influent values.

- Consideration has been given to expanding the CIDMMA to the north or west; however, a Virginia state law prohibiting these directional expansions was passed in the early 1990s.

- Broad environmental observations related to the CIDMMA include:

(1) There are no unique ecological resources specifically associated with the CIDMMA; however, some protected bird species occasionally use the area.

(2) The Elizabeth River drainage area is one of three "regions of concern" in Chesapeake Bay; it is also one of four urban rivers in the Corps of Engineers and U.S. Environmental Protection Agency Memorandum of Agreement (COE/EPA MOA) on urban rivers. The River has contaminated sediments from industrial sources, and losses of adjacent wetlands have occurred over time.

(3) Designated public oyster grounds are located around the CIDMMA.

CIDMMA AND ACTIVITIES ASSOCIATED WITH THE PORT OF HAMPTON ROADS

The principal activities associated with the Port of Hampton Roads include waterborne commerce and vessel traffic, port industries, military activities, and other port-related activities such as seafood processing and recreation. Marine terminal facilities accommodate movements of coal and petroleum products; grain; forest, lumber, and wood products; farm and food products; non-metallic minerals; stone, clay, glass, and concrete products; chemicals and allied products; metallic and primary metal products; manufactured goods and products; machinery and transportation equipment; beverages; and tobacco. A total of 67.4 million short tons of commodities were moved through various Port facilities in 1997, with 67% of this tonnage associated with coal (U.S. Army Corps of Engineers, February, 2000, p. I-6). A total of 39,103 vessels used the Port in 1997. Due to the increasing use of containerization and deeper draft vessels, it is expected that the usage of the Port by these larger ships will increase in the coming years.

A wide range of port-related activities are required to accommodate the movement and transfer of commerce, as well as to provide services for the vessels engaged in foreign and domestic trade. Directly port-dependent industrial activities include railroads, trucking firms, ship chandlers, marine and industrial suppliers, stevedoring and charter firms, marine terminals, ship repair firms, towing and tug services, and broker and warehousing services. A large number of manufacturing firms in the Hampton Roads area either import a substantial portion of their raw materials through the port and/or export commodities to foreign and domestic markets. Agricultural and mining activities are also dependent on the port for shipment and receipt of commodities such as grain, ores, and coal. In fact, it was estimated that the 1997 employment in industry directly and indirectly associated with the Port was over 128,000 (U.S. Army Corps of Engineers, February, 2000, p. I-10).

The Hampton Roads area is also the home base for about 116,000 active duty military personnel and over 37,000 civilian employees. The largest facilities are the naval installations on the southside, where over 20 percent of the Navy's active duty personnel worldwide are assigned. Other facilities include the Army and Air Force bases on the northside in Newport News and Hampton. Further, the Army, Navy, Air Force,

Marines, and Coast Guard all have a significant presence in the region extending from northside and southside Hampton Roads to the North Carolina border. Many of the headquarters of major military commands are also located in the area. Military activities are expected to continue to be a major economic force in the area, and the Hampton Roads harbor will continue to play a major role in accommodating and enhancing many aspects of military activities (U.S. Army Corps of Engineers, February, 2000, p. I-11).

Other port-related activities including seafood harvesting and processing; pleasure boating and sport fishing; and visitation to several port-related recreational and historical points of interest located adjacent to the harbor. Commercial seafood operations have a history dating from the Colonial period. In 1998, the amount and value of shellfish and finfish landings within the regional study area totaled 24.7 million pounds and $30.2 million (U.S. Army Corps of Engineers, February, 2000, p. I-14).

Boating, water sports, and sport fishing are frequent recreational activities enjoyed by residents and visitors to the Hampton Roads area. Numerous marinas provide access, harborage, and storage for thousands of recreational craft. Several sightseeing tour boats are operated daily out of adjacent cities. The importance of recreational boating in the Hampton Roads area is clearly demonstrated by the fact that pleasure boat registrations increased by 51% from 1980 (27,997 boats) to 1998 (42,332 boats). Finally, in the vicinity of the Hampton Roads harbor, there are several points of historical and recreational interest. The more notable ones include the site of the Civil War battle between the "Monitor" and "Merrimac", Fort Monroe, Fort Norfolk, Norfolk Naval Base, Norfolk Naval Shipyard, Waterside Festival Market Place, Mariners Museum, and Nauticus -- The National Maritime Center (U.S. Army Corps of Engineers, February, 2000, pp. I-15 and I-16).

The CIDMMA serves as the major dredged material disposal area for navigation channel maintenance dredging conducted in the Hampton Roads area. Further, such materials from new shoreline developments and periodic navigation channel deepening can also be placed in the CIDMMA. Additional details on such dredging in the Hampton Roads area is in Chapter 4.

## SPATIAL BOUNDARY FOR THE CEA STUDY

Regarding the spatial boundary for the CEA study, a regional boundary that includes the Port of Hampton Roads will be used. The Port is located in the southeastern part of the Commonwealth of Virginia at the southern end of Chesapeake Bay. The Port is approximately 170 miles south of Baltimore, Maryland, and 220 miles north of Wilmington, North Carolina. The harbor itself is a natural roadstead of 25 square miles formed by the confluence of the James, Nansemond, and Elizabeth Rivers. It is recognized as one of the largest and finest natural harbors in the world and is a primary stimulus to the economic well being of the region, the Commonwealth of Virginia, and the nation. The land area surrounding the harbor encompasses about 1,500 square miles and includes the Cities of Chesapeake, Norfolk, Portsmouth, Suffolk, and Virginia Beach and the Isle of Wight County on the southside and Hampton

and Newport News on the northside, as shown in Figure 2-2 (U.S. Army Corps of Engineers, February, 2000, Plate I). The population of this area is over 1.3 million people (U.S. Army Corps of Engineers, February, 2000, p. I-3).

Shoreline land use in the Port region is extensive, with little underdeveloped land still available. As a result, there is minimal land that could be used for development of a new marine terminal. To illustrate, the main Elizabeth River Channel, bordered by the Cities of Norfolk and Portsmouth, includes the world's largest naval base; coal, grain, container cargo, and general cargo facilities; and residential and recreational areas. The CIDMMA is located adjacent to the Channel on the Portsmouth side. Shoreline use along the Eastern Branch of the Elizabeth River consists primarily of shipbuilding and repair facilities and oil terminals. Some of these facilities are unused and/or underutilized. Along the Southern Branch of the Elizabeth River are the Norfolk Naval Shipyard; private shipyards and repair facilities; and oil, natural gas, grain, and bulk and liquid terminals. There is also some vacant and underutilized land located along the Southern Branch of the Elizabeth River. Land along the Chesapeake Bay from Willoughby to Cape Henry generally consists of naval installations, recreational boating facilities, residential development, and recreational beaches. Along the City of Newport News waterfront, land use consists primarily of shipbuilding and repair, coal loading terminals, container and general cargo facilities, commercial moorings, fish landing/processing facilities, and fuel terminals. Land areas along the shoreline in the City of Hampton are used primarily for recreational boating, oil and seafood terminals, and residential development (U.S. Army Corps of Engineers, February, 2000, pp. C-1 to C-2). Figures 2-3 through 2-5 identify lands adjacent to the water by their type of use (U.S. Army Corps of Engineers, February, 2000, Plates C-1 through C-3). These maps reflect the predominant character of the various segments of shoreline.

As shown in Figure 2-2, large commercial and military vessels entering the Hampton Roads area from the Atlantic Ocean follow the Atlantic Ocean Channel through the Virginia Capes near Cape Henry, pass through Thimble Shoal Channel, which crosses the lower end of the Chesapeake Bay, and enter the Hampton Roads area between Old Point Comfort on the north and Willoughby Spit on the south. Two deep-water channels extend through Hampton Roads; one channel extends southward along the eastern side through the Elizabeth River and its Southern Branch, and the other channel extends westward to Hampton and Newport News. Principal waterways on the southside include the Lynnhaven River; Little Creek; the Elizabeth River and its Eastern, Southern, and Western Branches; the Lafayette River; Scotts Creek; the Nansemond River; and Chuckatuck Creek. On the northside, principal waterways include the James River, Newport News Creek, and Hampton Creek. Details on the locations of these waterways are available elsewhere (U.S. Army Corps of Engineers, February, 2000, Appendix C).

Following is a brief summary of the federal navigation channels that are in or near the Hampton Roads area (Virginia Port Authority, 2003, Part III, pp. 7-4 and 7-5):

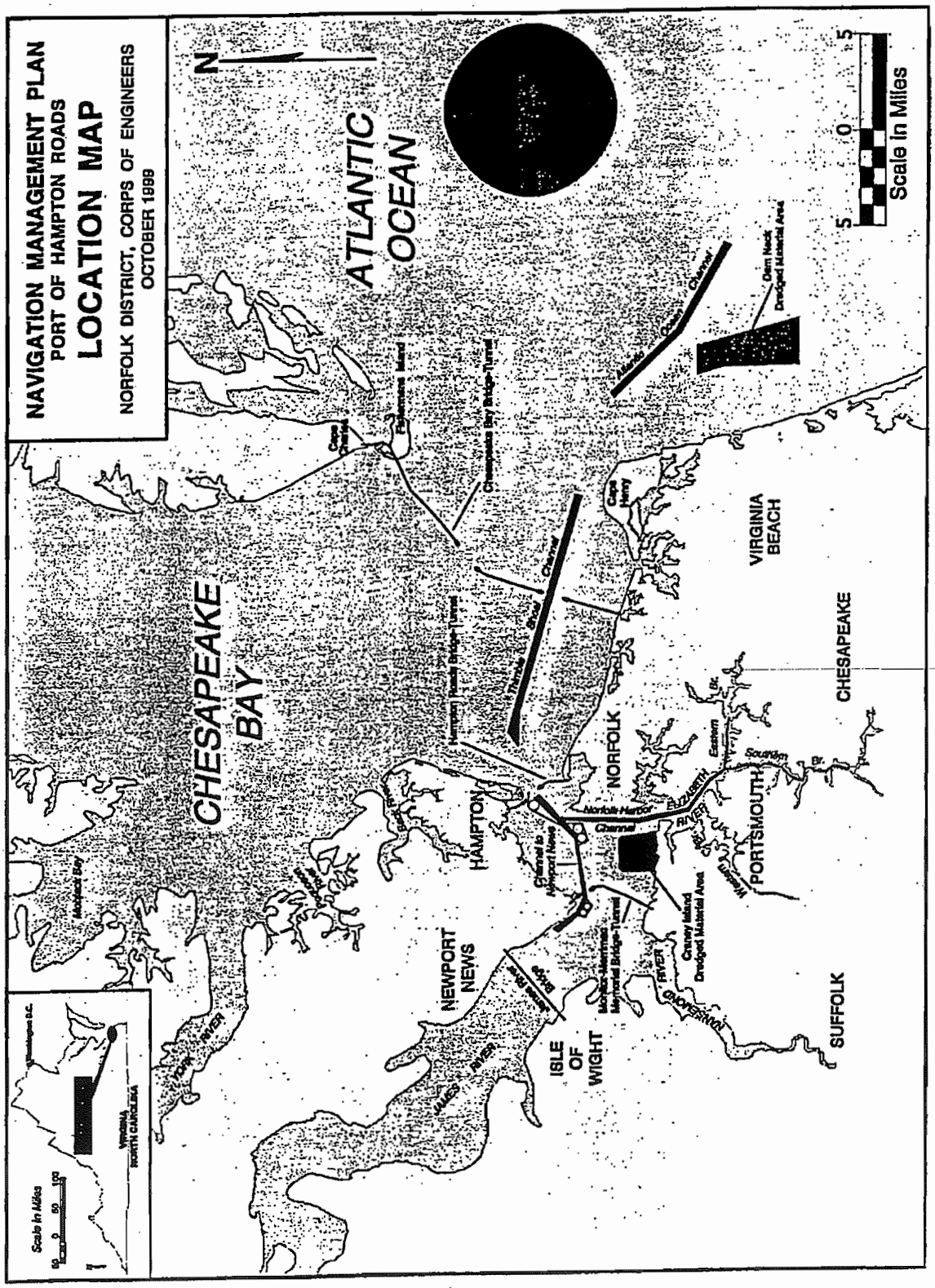


Figure 2-2: Location Map for Port of Hampton Roads (U.S. Army Corps of Engineers, February, 2000, Plate 1)

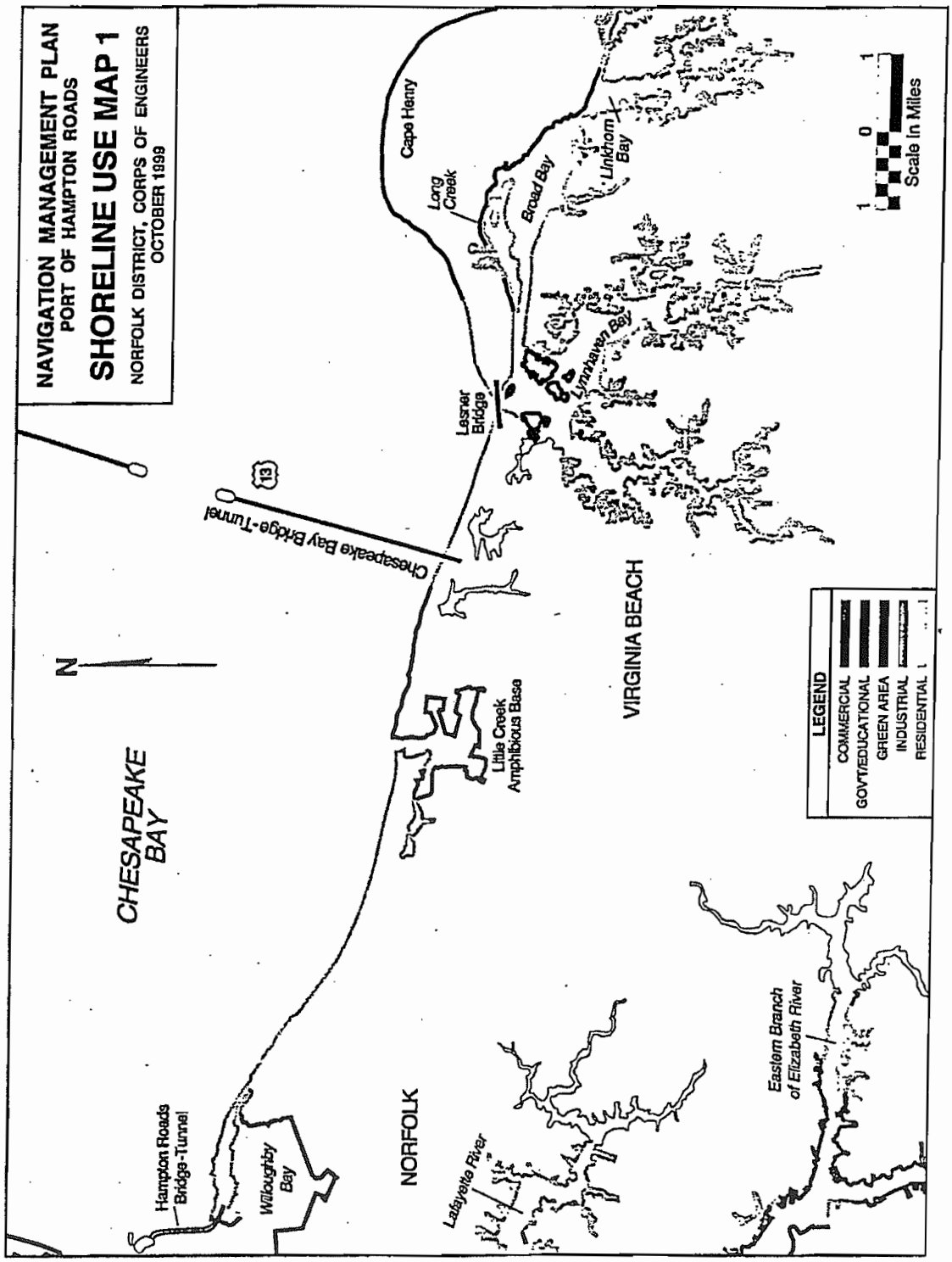


Figure 2-3: Shoreline Use Map 1 (U.S. Army Corps of Engineers, February, 2000, Plate C-1)

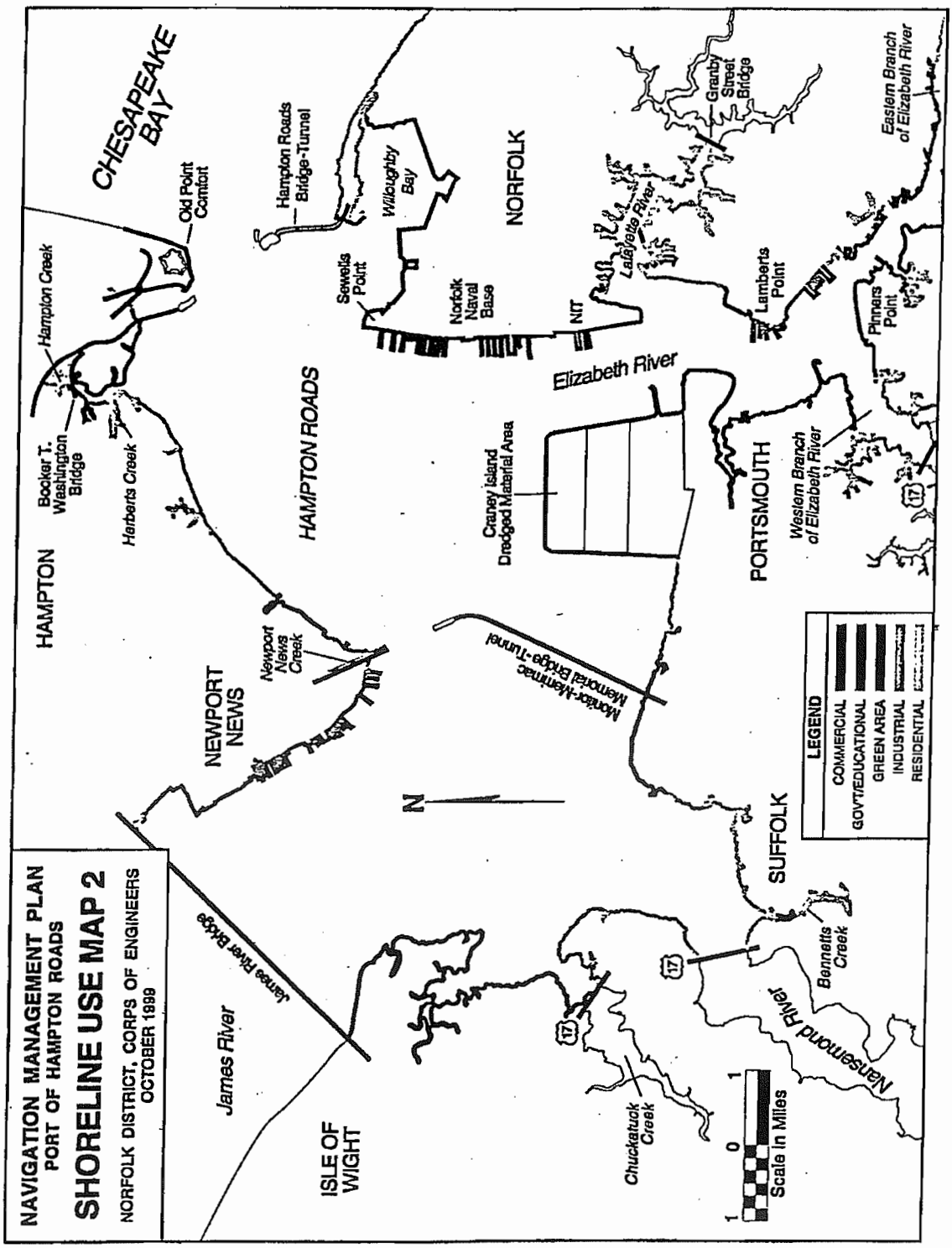


Figure 2-4: Shoreline Use Map 2 (U.S. Army Corps of Engineers, February, 2000, Plate C-2)

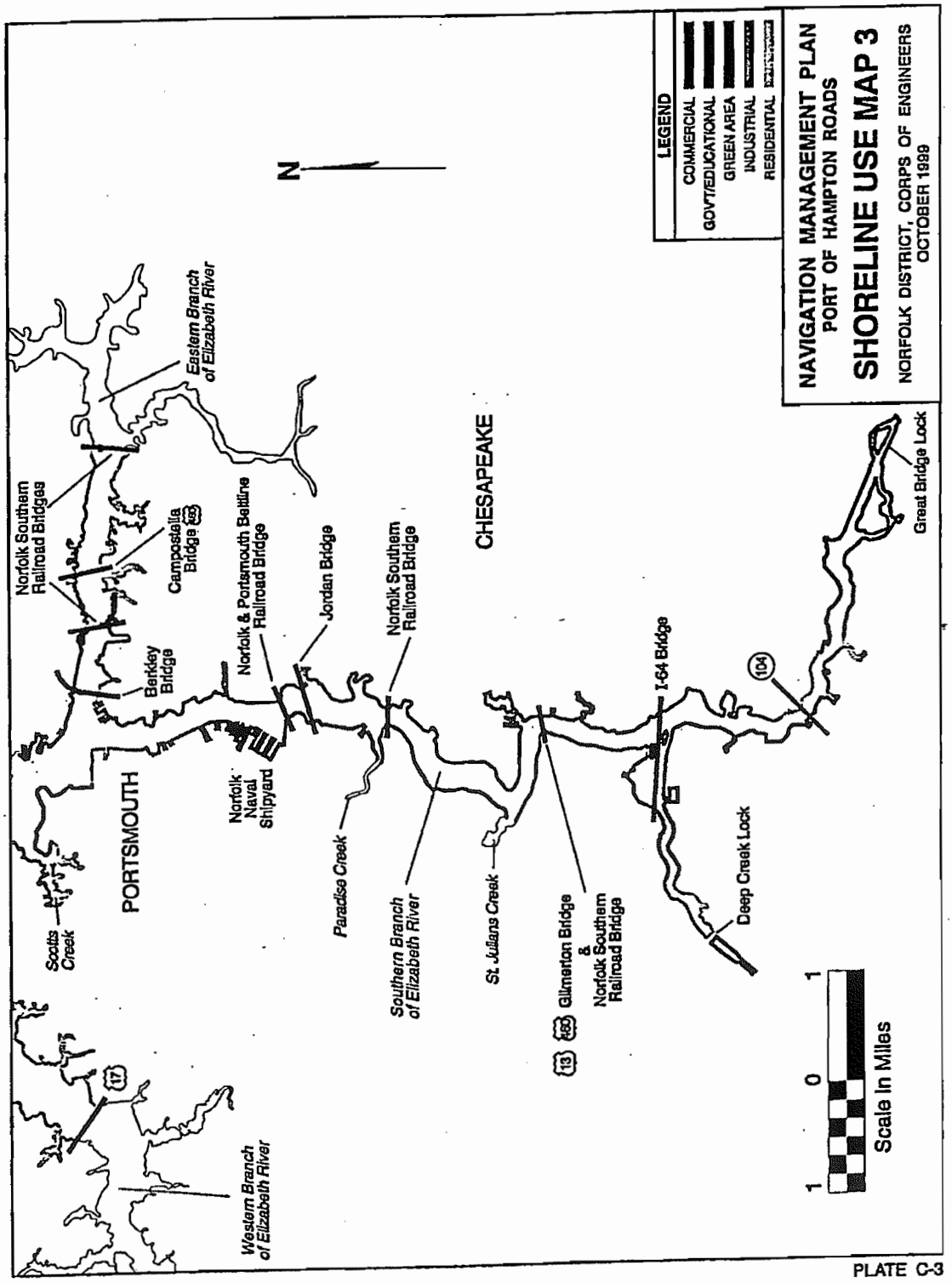


Figure 2-5: Shoreline Use Map 3 (U.S. Army Corps of Engineers, February, 2000, Plate C-3)

Access to and from the Hampton Roads area and the Atlantic Ocean is provided via the Atlantic Ocean Channel, which connects deep water in the Chesapeake Bay to deep water in the Atlantic Ocean (a distance of about 10 miles). The channel is not currently dredged for navigation, as water depths are apparently sufficient for existing vessel traffic. The channel is slated for improvements with the 50-foot inbound channel. The channel is authorized to an ultimate depth of 60 feet and width of 1,300 feet.

The Norfolk Harbor Channel and Newport News Channel are the focal points for commercial marine transportation in the Hampton Roads area. Both of these channels are accessed from the Chesapeake Bay via the Thimble Shoal Channel and from Hampton Roads through ancillary channels. The Thimble Shoal Channel is 1,000 feet wide and approximately 13 miles in length. The channel is 50 feet deep within the 650-foot wide outbound lane and 45 feet deep within the remaining 350-foot inbound lane. Authorized improvements for the Thimble Shoal Channel provide for deepening to 55 feet.

Norfolk Harbor Channel extends from Hampton Roads into the southside cities of Norfolk, Portsmouth and Chesapeake via the Elizabeth River. Between deep water in Hampton Roads and Lambert's Point, the channel is 800 feet to 1,500 feet wide and 45 feet in depth, with the outbound lane being 650 feet to 800 feet wide and 50 feet in depth. Authorized improvements provide for deepening the Norfolk Channel to 55 feet in depth between Hampton Roads Bridge Tunnel and Lambert's Point. A channel 40 feet in depth extends from the coal piers to the Norfolk Southern Railway Bridge on the Southern Branch. The Newport News Channel extends about seven miles from Hampton Roads to Newport News. The Channel is 50 feet deep and over 800 feet wide. Authorized improvements for the Channel provide for deepening it to 55 feet.

## TEMPORAL BOUNDARY FOR THE CEA STUDY

The temporal boundary for this CEA study has been chosen to coincide with the initiation of construction on the original CIDMMA (mid-1950s) and extend to the completion of the Build-out phase for the proposed Craney Island Terminal (2050). The initial date coincides with the development of the CIDMMA for usage as a disposal area for multiple dredging activities in the Hampton Roads area. The latter date coincides with the anticipated peak usage of the Terminal by the Virginia Port Authority.

## EXPANSION OF THE CIDMMA

In 1980, the Norfolk District prepared a final EIS on a combined project to deepen existing navigation channels in Norfolk Harbor and related areas, and to utilize a new inland dredged material disposal area (U.S. Army Corps of Engineers, 1980). The westward expansion of the CIDMMA was not recommended; rather, a 6000-acre inland site located in the eastern part of the City of Suffolk (referred to as the Suffolk Site) was included in the recommended plan. The project feasibility report and final EIS

was then reviewed by the Board of Engineers for Rivers and Harbors. The Board's December, 1980, addendum to the final EIS included the following conclusions (U.S. Army Corps of Engineers, 1980):

> "While noting that ocean disposal of dredged materials from within Hampton Roads would be more expensive than the plan proposed by the reporting officers, the Board concluded that it is the preferred solution when weighed against environmental criteria. Specifically, the Board concluded that:
>
> - Channel modifications and anchorage facilities in the recommended plan should be implemented with disposal of all suitable dredged material in the ocean.
>
> - The existing Craney Island diked disposal area should be utilized for dredged material from the deepening project that is not suitable for ocean disposal.
>
> - The proposed Suffolk upland disposal area should not be recommended for acquisition and implementation at this time."

As a follow-up to these conclusions, in March, 1988, the U.S. Environmental Protection Agency designated a dredged material disposal site located offshore of Virginia Beach, Virginia, as an approved ocean dumping site for dredged material. The site, known as the Dam Neck Ocean Disposal Site (DNODS), is located approximately 3 nautical miles (nm) due east of the Dam Neck/Virginia Beach section of the Virginia coast and about 7 nm south of the mouth of the Chesapeake Bay (U.S. Environmental Protection Agency, March 1, 1988).

The current feasibility study is determining the need for and the federal interest in an eastward expansion of the CIDMMA. The eastward expansion option was chosen based on an evaluation of both off-site and various on-site directional expansion options. An Alternatives Review Committee assisted the Corps in identifying and evaluating various choices. Appendix B herein summarizes the process and rationale for selecting an eastward expansion option. This option would entail creating a 580 ac. to 600 ac. cell that would also provide an acceptable location for a new marine terminal to be developed by the Virginia Port Authority. The primary rationale was that this option would cause the least amount of change to the surrounding environment.

The general time requirements for the eastward expansion of the CIDMMA, the Phase I development of the Craney Island Terminal on the expansion cell, and a connector road and rail system for the Terminal are as follows (Bray and Knott, 2000):

- Eastward expansion of the CIDMMA -- by the Norfolk District of the U.S. Army Corps of Engineers

  -- preconstruction engineering and design (2 years)

-- containment dike design (1 year)

-- containment dike construction and material placement (7.25 years)

- Craney Island Terminal (Phase I -- development of 220 acres) -- by the Virginia Port Authority

  -- terminal planning and design (3 years)

  -- dredging and wharf construction (3 years)

  -- upland and intermodal container transfer facility construction (4.25 years)

- Connector road and railway -- by the Virginia Department of Transportation

  -- Western Freeway connector road and railway design (5 years)

  -- Western Freeway connector road and railway construction (3 years)

It should be noted that several of the above time requirements could occur in an overlapping manner. Such planning indicates that all three components could be completed by the end of 2012 (Bray and Knott, 2000).

CONSTRUCTION SEQUENCING FOR THE EXPANSION CELL

Preliminary planning for the construction sequencing for the containment dike around the eastward expansion has identified the following steps. Specific timing and details could change; however, the anticipated steps include (Bray and Knott, 2000):

- Step 1 -- dredge dike alignment to an elevation of -55.0 feet (with the mean low water level for the area set equal to 0.0 feet);

- Step 2 -- prepare the dike foundation by using geotextile reinforcement;

- Step 3 -- construct the dike and surcharge foundation (including wick drains from an elevation of -55.0 feet to -110.0 feet; the -110.0 feet corresponds to the top of the Yorkshire formation), and allow settlement for 12 months;

- Step 4 -- construct the containment dike to a top elevation of +5.0 feet, install wick drains within the dike itself down to a depth of -110.0 feet (top of Yorkshire formation), and place dredged material in the approximate 600 acre eastward expansion area to an elevation of 0.0 feet; then, allow the dredged material to dessicate through one summer season;

- Step 5 -- install wick drains within the emplaced dredged material and extend their depth to -110.0 feet (to the top of the Yorktown formation), place geotextile

reinforcement across the top of the emplaced dredged material, and place a sand blanket surcharge over the dredged material to a depth of +30.0 feet;

- Step 6 -- steepen the dike and sand blanket surcharge on the water side, include slope protection on the dike, then dredge the area to the east of the dike (water side) to a depth of -62.0 feet; finally, allow settlement for 12 to 18 months; and

- Step 7 -- remove the sand surcharge from the emplaced dredged material, finish the grade of the eastward expansion area to +12.0 feet, construct a pile-supported wharf (the pilings extend into the Yorktown formation) and pertinent landside facilities for the Craney Island Terminal.

# CHAPTER 3

# AFFECTED ENVIRONMENT

This chapter summarizes historical and current information related to the biophysical features of the aquatic environment of the Hampton Roads area. As such, it addresses Steps 5 through 7 of the 11-step CEA methodology promulgated by the Council on Environmental Quality. Information is summarized from the perspective of the Hampton Roads regional area; then, as appropriate, information related to the specific local area encompassing the eastward expansion of the CIDMMA is presented. The topical categories in this chapter include water quality, hydrodynamics, submerged aquatic vegetation (SAV), benthos, fish, waterfowl and birds, threatened/endangered species, and upland vegetation associated with the CIDMMA and its immediate environs. In addition to the information in this chapter, Chapters 4 through 6 includes environmental setting data and information, as appropriate, for the other actions addressed in this CEA study.

Selected information from two key reports formed the basis for this chapter. First, the Norfolk District prepared a draft Ecological Resources Review report that addressed vegetative communities, benthos, water quality and hydrodynamics, fisheries, avian resources, and endangered species (U.S. Army Corps of Engineers, June 21, 2002). Secondly, a Planning Aid Report (PAR) for the feasibility study on the eastward expansion of the CIDMMA was prepared by the Chesapeake Bay Field Office of the U.S. Fish and Wildlife Service (Ruddy, 2002). The PAR was prepared in accordance with provisions of the Fish and Wildlife Coordination Act and Section 7 of the Endangered Species Act. The PAR includes summary information on baseline biological conditions in the tidal estuarine environment (water quality; zooplankton; benthic macroinvertebrates such as blue crabs, hard clams, and oysters; fish; and wintering waterfowl); baseline biological conditions at the CIDMMA (waterfowl and shorebirds); endangered species in the area; and anticipated project impacts and mitigation needs. Selected information from the PAR is used in a summary fashion for the sections within this chapter.

## WATER QUALITY

The Hampton Roads area is designated as a Class II (a) water by the State of Virginia Department of Environmental Quality. Compliance with water quality criteria for such waters requires a minimum of 4.0 mg/l dissolved oxygen (DO), pH between 6.0 and 8.5, and temperature increases above background no greater than 4 degrees F in the summer and 1.5 degrees F in the winter. Special standard (a) is applicable to the waters of the Hampton Roads area as this standard applies to all waters capable of propagating shellfish, including those that are restricted or condemned by the State Department of Health. The shellfish beds of the Hampton Roads area within the immediate vicinity of the CIDMMA are condemned for harvest but shellfish may be transplanted to acceptable areas for later harvest. The Elizabeth River, including the

Eastern and Southern Branches, as well as the Lafayette River, does not meet the Class II water quality standards (U.S. Army Corps of Engineers, June 21, 2002, p. 14).

No potable water supplies, Outstanding State Resource Waters, or Wild and Scenic Rivers are located in the vicinity of the eastward expansion of the CIDMMA. Additionally, no designated sole source aquifers or wellhead protection areas are present in the area (U.S. Army Corps of Engineers, June 21, 2002, p. 16).

A recent report by four state agencies summarized the status and trends of water quality monitoring data from the James River and the Elizabeth River (Virginia Secretary of Natural Resources, et al., 2000). As part of the study, three regions of the tidal James River were defined based on salinity (Upper = tidal fresh/0-0.5 ppt; Middle = oligohaline/0.5-5 ppt; and Lower = mesohaline/5-18 ppt). The "status" of water quality conditions was based on analyses of the most recent 3-year period of record, compared to the *poor* and *good* extremes of the first 12 years of the entire water quality data set (starting in 1984) for each salinity regime throughout the entire Chesapeake Bay area. Values in the lowest third of the dataset were classified as *poor*, those in the middle third were classified as *fair*, and values in the upper third were classified as *good*. The "trends" are statistically derived from the entire period of record, indicating long-term changes (positive, negative, or none detected) for each water quality parameter.

From the foregoing descriptions, it can be seen that the status of water quality represents relative values, being compared to other regions throughout the Chesapeake Bay with similar salinity. Thus, use of the term *good, fair,* or *poor* is not an absolute evaluation of status but rather a statement relative to other areas of a system that is pervasively stressed by nutrient over-enrichment and high sediment loadings. If these status evaluations compared current nutrient and sediment pollution levels of the James River to those found in the James River 100 years ago, or to current status of other less impacted estuaries, most statements regarding status would likely use the term *poor* (Virginia Secretary of Natural Resources, et al., 2000, pp. 12-13).

The status and trends relative to water quality in the James River are summarized in Tables 3-1 and 3-2, respectively (Virginia Secretary of Natural Resources, et al., 2000, pp. 13 - 16). Some key observations based on Tables 3-1 and 3-2 are:

- The status assessment noted generally good water quality relative to comparable locations in the Chesapeake Bay area.

- The trends analyses revealed some improving and some degrading trends for the various parameters and sampling locations.

The status and trends relative to water quality in the Elizabeth River Basin are summarized in Tables 3-3 and 3-4, respectively (Virginia Secretary of Natural Resources, et al., 2000, pp. 17-19). Some key observations based on Tables 3-3 and 3-4 are:

Table 3-1: Status Assessment of James River Water Quality (Virginia Secretary of Natural Resources, et al., 2000, pp. 13-14)

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Nitrogen

- Status of surface and bottom total nitrogen and dissolved inorganic nitrogen was good in all portions of the James River.
- No change in status since 1996

Phosphorus

- Status of surface and bottom total phosphorus and dissolved inorganic phosphorus was good in majority of regions in the James River. Status of surface total phosphorus was fair in the Lower James River (JMSMH) and the James River mouth (JMSPH). Status of bottom total phosphorus was fair in the Middle James River (JMSOH), Lower James River (JMSMH) and the James River mouth (JMSPH). Status of surface dissolved inorganic phosphorus was fair in the Lower James River. Status of bottom dissolved inorganic phosphorus was fair in the Upper James River (JMSTF) and the Lower James River (JMSMH). [1]
- No change in status since 1996.

Chlorophyll *a*

- Status of surface and bottom chlorophyll *a* was good in all portions of the James River.
- No change in status since 1996.

Suspended solids

- Status of surface and bottom total suspended solids ranged from fair to good in all portions of the James River.
- Status of surface total suspended solids in the Appomattox River (APPTF) and Upper James (JMSTF) improved from fair to good since 1996.

Water clarity

- Status of secchi depth ranged from fair in the upper James River (JMSTF) and the Chickahominy River (CRRMH) to poor in all other regions.
- Little change in status of secchi depth except that Chickahominy went from poor to fair since 1996.

Dissolved oxygen

- Status of bottom-dissolved oxygen was good in all portions of the James River.
- No change in status since 1996.

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[1] JMSTF = James Tidal Fresh; JMSOH = James Oligohaline; JMSMH = James Mesohaline; JMSPH = James Polyhaline

Table 3-2: Trends Analyses of James River Water Quality (Virginia Secretary of Natural Resources, et al., 2000, pp. 15-16)

---

Nitrogen

- Improving trends in surface total nitrogen were detected in all segments in the James River except the River mouth (JMSPH)
- Improving trends in bottom total nitrogen were detected in all segments in the James River except the Chickahominy River (CHKOH).
- Improving trends in surface dissolved inorganic nitrogen were detected in the Upper James River (JMSTF) the Middle James River (JMSOH) and the Lower James River (JMSMH).
- Improving trends in bottom dissolved inorganic nitrogen were detected in all segments except the Appomattox River (APPTF) and the Chickahominy River (CHKOH).
- There were no degrading trends in any nitrogen parameters in the James River.

Phosphorus

- Improving trends in surface total phosphorus were detected in the Upper James River (JMSTF), the Appomattox River (APPTF), the Lower James River (JMSMH) and the river mouth (JMSPH). Through 1996, improving trends in surface total phosphorus were limited to two station-specific decreasing trends in the Upper James River and a seasonal decreasing trend in the Lower James River (JMSMH).
- Improving trends in bottom total phosphorus were detected in the Upper James River (JMSTF), the Appomattox River (APPTF) and the James River Mouth (JMSPH).
- A degrading trend in bottom total phosphorus was detected in the Middle James River (JMSOH).
- Improving trends in surface dissolved inorganic phosphorus were detected at three stations in the Upper James River (JMSTF). Through 1996, two station-specific decreasing trends in surface dissolved inorganic phosphorus were detected in the Upper James River (JMSTF).
- Improving trends in bottom dissolved inorganic phosphorus were detected in the Upper James River (JMSTF) and the Appomattox River (APPTF).
- There were no degrading trends in surface total phosphorus and surface dissolved inorganic phosphorus in data collected through 1997. Degrading trends in surface total phosphorus were detected in the data collected through 1996 in the Middle and Lower James River but these trends disappeared or reversed direction after the addition of the 1997 data.

Table 3-2: (continued)

Chlorophyll *a*

- Improving trends in surface chlorophyll *a* were limited to a decreasing overall trend in the Appomattox River (APPTF) and a single season-specific decreasing trend at the river mouth (JMSPH).
- Degrading trends in surface chlorophyll *a* were limited to two season-specific trends at the river mouth (JMSPH)

Suspended solids

- There were no improving trends in surface total suspended solids in the James River data collected through 1997.
- Degrading station and season-specific trends in surface total suspended solids were detected in the Upper James River (JMSTF) and the Lower James River (JMSMH), respectively, in data collected through 1996. These two trends disappeared after the addition of the 1997 data.
- There were no trends in bottom total suspended solids in the James River data collected through 1997.

Water clarity

- There were no improving trends in secchi depth in the James River.
- There was a single overall degrading trend in secchi depth at the James River mouth (JMSPH).
- A station-specific improving trend in secchi depth in the Upper James and a degrading trend in the Middle James detected in the data collected through 1996 disappeared after the addition of the 1997 data.

Dissolved oxygen

- Improving trends in bottom-dissolved oxygen were limited to a station-specific increasing trend at the James River mouth (JMSPH) and an overall increasing trend in the Upper James River (JMSTF).
- There were no degrading trends in bottom-dissolved oxygen in the James River.
- In general, there were no changes in trend analysis results between 1996 and 1997 for this parameter.

Table 3-3: Status Assessment of Elizabeth River Water Quality (Virginia Secretary of Natural Resources, et al., 2000, pp. 17-18)

---

Nitrogen

- Status of surface and bottom total nitrogen was fair in most regions in the Elizabeth River.
- Status of surface and bottom dissolved nitrogen was poor in the Southern Branch (SBEMH), good in the mainstem of the Elizabeth River (ELIMH) and fair in all other segments.

Phosphorus

- Status of surface and bottom phosphorus was fair in all segments of the Elizabeth River except in the Western Branch (WBEMH) where status in surface total phosphorus was poor.
- Status of surface dissolved inorganic phosphorus ranged from poor in the Western Branch (WBEMH) to good in the mainstem of the Elizabeth River (ELIMH).
- Status of bottom dissolved inorganic phosphorus was poor in the Southern Branch (SBEMH), fair in the Eastern Branch (EBEMH) and mouth of the Elizabeth River (ELIPH), and good in the Western Branch (WBEMH) and mainstem of the Elizabeth River (ELIMH).

Chlorophyll *a*

- Status of surface and bottom chlorophyll *a* was fair to good in all segments of the Elizabeth River.

Suspended solids

- Status of surface and bottom total suspended solids was fair to good in all segments of the Elizabeth River.

Water clarity

- Status of secchi depth was poor in all segments of the Elizabeth River.

Dissolved oxygen

- Status of bottom-dissolved oxygen was good in the Western Branch (WBEMH) and Eastern Branch (EBEMH) and fair in all other segments.

Table 3-4: Trends Analyses of Elizabeth River Water Quality (Virginia Secretary of Natural Resources, et al., 2000, pp. 18-19)

---

Nitrogen

- Improving trends in surface and bottom total nitrogen were detected in the Western Branch (WBEMH) and Southern Branch (SBEMH) and Elizabeth River Mouth (ELIPH).
- Improving trends in surface and bottom dissolved inorganic nitrogen were detected in all segments in the Elizabeth River except surface dissolved inorganic nitrogen in the Western Branch (WBEMH).

Phosphorus

- Improving trends in surface and bottom total phosphorus were detected in all segments in the Elizabeth River except bottom total phosphorus in the mouth of the Elizabeth River (ELIPH).
- Improving trends in surface dissolved inorganic phosphorus were detected in the Eastern Branch (EBEMH) and Southern Branch (SBEMH) and mainstem (ELIMH) of the Elizabeth River
- Improving trends in surface dissolved inorganic phosphorus were detected in the Eastern Branch (EBEMH), and Southern Branch (SBEMH) and the Western Branch (WBEMH) of the Elizabeth River.

Chlorophyll *a*

- There were no trends in surface or bottom chlorophyll *a*.

Suspended solids

- There was a single overall degrading trend in surface total suspended solids in the Eastern Branch (EBEMH) of the Elizabeth River.
- Improving trends in bottom total suspended solids were detected Eastern Branch (EBEMH), Southern Branch (SBEMH) and Western Branch (WBEMH) of the Elizabeth River.

Water clarity

- There were no trends in secchi depth.

Dissolved oxygen

- Improving trends in bottom-dissolved oxygen were detected in the Western Branch (WBEMH), Eastern Branch (EBEMH) and Southern Branch (SBEMH) and mainstem (ELIMH) of the Elizabeth River.
- There were no degrading trends in bottom-dissolved oxygen in the Elizabeth River.

- The status assessment noted generally fair to poor water quality for most of the parameters.

- The trends analyses denoted some improving trends and some no trend (no changes) situations for most of the parameters.

Water quality protection programs in Virginia are summarized in Table 3-5 (U.S. Army Corps of Engineers, February, 2000, pp. V-64 and V-65). The management programs include water quality standards, several types of permits, regulations for pollution minimization, and various guidelines.

Key water quality information in the PAR by the U.S. Fish and Wildlife Service is abstracted as follows. The original references for the information are cited in the PAR. The abstracted information includes (Ruddy, 2002):

> The Hampton Roads area is an estuarine area that has a mean tidal range of 2.6 feet and a spring tidal range of 3.1 feet. The typical salinity range based on monthly averages observed in the Hampton Roads area off the CIDMMA is 16 to 22 parts per thousand (PPT) on the surface and 15-23 ppt at the bottom. The monthly average difference between the surface and bottom salinity can be as much as 6 ppt during periods of high freshwater discharge when water column stratification is enhanced.
>
> The Hampton Roads area has two noteworthy water quality concerns. The area is included within a contaminant advisory covering the James River and all tributaries from the fall line at Richmond to the Hampton Roads-Norfolk Bridge Tunnel. This advisory is a legacy from Kepone contamination that occurred between 1966 and 1975. A fishing ban was instituted in 1975, but was rescinded in 1988 when the levels of contamination decreased sufficiently. A public advisory remains in effect as a precautionary measure; however, it does not recommend any specific limits on fish consumption. The second water quality concern is a restriction on the harvesting of shellfish from the waters of the Hampton Roads area around the CIDMMA. With a permit from the Marine Resources Commission, shellfish may be harvested from this area in the summer, provided that they are relayed to a clean area for a period of depuration. This restriction is based mainly on the potential for bacterial contamination.
>
> The Elizabeth River is the site of numerous water port facilities supporting commerce, military activities, and industry. It has a long history of extensive dredging and shoreline alteration. Over the years man's aquatic filling activities have reduced the river's surface area by 27%. The area is highly urbanized with some of the most severe pollution problems in the Chesapeake Bay watershed.

Because of its toxic contamination problems, the Chesapeake Bay Program has identified it as one of three Regions of Concern in the Bay. Significant contaminants include polycyclic aromatic hydrocarbons, various metals,

Table 3-5: Water Quality Protection Programs in Virginia (U.S. Army Corps of Engineers, February, 2000, pp. V-64 and V-65)

| Management program | Oversight agency | Program intent |
|---|---|---|
| Water Quality Standards (VR 680-21-00) | DEQ - Water Division | Provides both qualitative descriptions and numeric limits for specific physical, chemical, biological, and radiological characteristics of both surface waters and groundwater. Regulates mixing zones associated with point source discharges. Includes protection of wetlands along with Virginia's waters. |
| Virginia Pollutant Discharge Elimination System (VPDES) (VR 680-14-01) | DEQ - Water Division | Controls industrial and municipal waste discharges to surface waters. Include numeric effluent limitations, as well as self-monitoring and reporting requirements. Best management practice measures required as part of VPDES program. |
| Toxics Management Regulation (VR 680-14-03) | DEQ - Water Division | Provides guidelines for the administration and implementation of the Toxics Management Program. Controls the input of toxic pollutants to surface waters from point source discharges. |
| Virginia Pollution Abatement Permits (VR 680-14-01) | DEQ - Water Division | Applies to waste management facilities and operations that do not directly discharge to surface waters. Issued for land application of sewage sludge, animal waste, and industrial waste. |
| VWPP | DEQ - Water Division | Clean Water Act Section 401 Certification. Ensures that projects with Federal approval will have no adverse effect on water quality or existing beneficial uses of Virginia's waters. |
| Pretreatment Program | Hampton Roads Sanitation District (HRSD) | Regulates the "non-domestic" users that discharge toxic or unusually strong conventional waste to publicly owned treatment works. HRSD is responsible for controlling the industrial users under the program. |

tributyltin, and polychlorinated biphenyls. The problem tends to be more severe in the branches, particularly in the Southern Branch. Shellfish harvesting is prohibited in the Elizabeth River due to the presence of chemical and bacterial contamination. While the Elizabeth River drains an area of about 300 square miles, the basin is rather flat and the freshwater input to the estuary is relatively low. In the summer, dissolved oxygen in the bottom water is known to periodically drop below 4.0 mg/l, which is considered the minimum for general estuarine aquatic life. The Southern Branch appears to have the lowest dissolved oxygen, with levels sometimes nearing 1.0 mg/l.

HYDRODYNAMICS

Hydrodynamic changes in the Hampton Roads area resulting from the CIDMMA, dredging, and numerous shoreline marine terminals and industries have been the focus of several previous modeling and field studies. Some key findings from these previous studies are summarized as follows; citations for these studies are in the ecological resources review report prepared by the Norfolk District (U.S. Army Corps of Engineers, June 21, 2002, pp. 15-16 and 41-46):

- The general circulation pattern for the Hampton Roads area is well known. For example, on a flood tide, water from the Chesapeake Bay generally enters the Hampton Roads area across Hampton Flats and through Newport News Channel into the James River, with a lesser amount flowing into the Elizabeth River. On an ebb tide, water generally flows out of the James River through both the Newport News Channel and the area to the south of the Newport News Middle Ground, joining with the water flowing out of the Elizabeth River along the Norfolk Reach Channel.

- The geometry of the Hampton Roads area results in tidal phasing that sets up circulation cells and a strong frontal system off of Newport News Point. It is believed that this frontal system is critical to the maintenance of planktonic oyster larvae within the Hampton Roads area and the lower James River estuary. Salinity is also a major factor in these circulation patterns since higher salinities are found at depth, which sets up strong density gradients.

- Alterations to circulation patterns and current velocities are of primary concern. Estuarine circulation is of concern because such processes transport organisms, sediments, and contaminants. Of particular importance is the effect of circulation on the distribution of larval forms that are not free-swimming and thus depend solely upon currents for their transport to suitable habitat.

- It has been estimated that 24 percent of the tidal prism of the Elizabeth River has been lost as a result of filling and that tidal currents at the mouth of the River

have been reduced by 17 percent. Salinity values have also probably increased from historic levels. These changes have likely contributed to the low flushing rates in the Elizabeth River. While such changes have exacerbated the poor water quality of the Southern Branch, they have also acted to contain the high loading of contaminants within the Southern Branch.

- Hydrodynamic studies between the 1950s and 1960s demonstrated an increase from 24 to 36 percent in the volume of flow in the natural channel to the south of the Newport News Middle Ground, and a decrease from 27 to 18 percent in the volume of flow over the shallows in the area. This change was attributed to the construction of the CIDMMA, which shifted flows northward into the Hampton Roads area.

SUBMERGED AQUATIC VEGETATION (SAV)

Eelgrass is found in salinities of 10-35 ppt and is the only species of submerged aquatic vegetation (SAV) in the Hampton Roads area. The closest beds, which total about 50 to 60 acres in size, are found along the north shore of Hampton Roads area between Newport News Creek and Salter Creek and by the mouth of Hampton Creek. Due to their location across the Hampton Roads area from the CIDMMA, no direct or indirect effects from the eastward expansion of the CIDMMA are anticipated.

The area encompassed by the eastward expansion of the CIDMMA lies almost entirely within a designated SAV Exclusion Zone. Such a zone refers to an area defined as never supporting SAV historically nor able to support SAV now or in the future. A small area that includes part of the northern portion of the proposed eastward expansion does not lie with this SAV Exclusion Zone. However, this area does not lie within the Tier III SAV distribution goal, which represents a return of SAV to its historical distribution in the Bay, to a depth of six feet in areas capable of supporting SAV growth. The water in this northern portion is about twelve feet deep. SAV have not been found in the eastward expansion area historically and, based on total suspended solids (TSS) and water depth, will not be found in the area in the future. Therefore, no direct impacts to SAV in the eastward expansion area are expected (U.S. Army Corps of Engineers, June 21, 2002, pp. 2-3).

Additional information on the location and extent of historic SAV beds in the Hampton Roads area, and goals for their restoration and protection, is available elsewhere (Virginia Secretary of Natural Resources, et al., 2000, pp. 20-22 and 26-27).

BENTHOS -- HAMPTON ROADS AREA

Several historical studies of macrobenthic species in the Hampton Roads area have been conducted, beginning in the early 1970s. Summary findings from these studies are available elsewhere, as well as their specific citations (U.S. Army Corps of Engineers, June 21, 2002, pp. 4-7 and 41-46). As would be expected, it was generally found that benthic communities depend, to a large extent, upon sediment type. Further,

several studies of sediment types in the vicinity of the CIDMMA have also been conducted. In general, the inshore areas nearest the dikes demonstrated a silty sand habitat, while areas further away exhibited a mud habitat characterized by a high silt-clay content. Muddy or mixed substrates dominate the areas to the west, north, and east of the CIDMMA (U.S. Army Corps of Engineers, June 21, 2002, pp. 5-7). Higher densities of benthic organisms tend to be associated with silty sand habitat.

The Chesapeake Bay Long-Term Benthic Monitoring Program (LTBP), a joint effort between the states of Maryland and Virginia, and the U.S. Environmental Protection Agency, began evaluating benthic community health bay-wide in 1984. Monitoring efforts measure water quality, sediment texture, and the abundance and richness of benthic invertebrate communities. The Program contains two primary elements: a fixed site monitoring effort directed at identifying trends in benthic community condition, and a probability-based sampling effort intended to estimate the area of the Chesapeake Bay and its major tributaries with benthic communities meeting the Chesapeake Bay Program Benthic Community Restoration Goals. Forty-eight sites are monitored annually in areas targeted for pollution abatement and other management actions to assess whether the benthic community condition is changing.

The data collected from the Program are organized into a Benthic Index of Biotic Integrity (B-IBI). This index is calculated by scoring each of several attributes of benthic community structure and function (abundance, biomass, Shannon diversity, etc.) according to thresholds established from reference data distributions. The scores (on a 1 to 5 scale) are then averaged across attributes to form the index. Samples with index values of 3.0 or more are considered to have diverse benthic communities indicative of good habitat quality.

A specific benthic biological monitoring study was conducted in the Elizabeth River watershed in 1999, 2000, and 2001 (Dauer, 2000 and 2001). In the 1999 study, five primary strata were characterized: the Mainstem of the Elizabeth River, the Southern Branch, Western Branch, and Eastern Branch, and the Lafayette River. In 2000, a single stratum, the entire Elizabeth River watershed, was sampled with 25 random samples. The condition of each stratum was compared to the results for all Virginia tidal waters for 1999 based upon the random sampling of 100 sites as part of the on-going Benthic Monitoring Program. In 1999, tidal waters in Virginia averaged a 30% degraded benthic bottom. All five strata for the Elizabeth River were higher than this value: 52% for the Mainstem of the River, 64% for the Eastern Branch, 72% for the Western Branch, 92% for the Southern Branch, and 54% for the Lafayette River. In general for all Elizabeth River strata, species diversity and biomass were below reference condition levels, while abundance values were within reference condition levels. Community composition was unbalanced with levels of pollution indicative species above, and levels of pollution sensitive species below, reference conditions. In 2000, the estimate of benthic bottom not meeting the benthic restoration goals was 72%, and in 1999 it was 64% (Dauer, 2000 and 2001). Comparison of the results for the Elizabeth River watershed to the Chesapeake Bay Benthic Restoration Goals shows that the macrobenthic communities of the Elizabeth River can be characterized as

having lower than expected species diversity and biomass, abundance levels generally higher than reference conditions, and species composition with levels of pollution indicative species higher than reference conditions and levels of pollution sensitive species lower than reference conditions (Dauer, 2000).

The 1999 study by Dauer (2000) included five sampling stations located within the footprint of the potential eastward expansion area for the CIDMMA. Three of the five stations had B-IBI scores less than 3.0 (2.0, 2.33, and 2.33), thus exhibiting degraded conditions. Two of the stations had B-IBI scores greater than or equal to 3.0 (3.0 and 4.0), thus indicating that the sites were meeting Restoration Goals (U.S. Army Corps of Engineers, June 21, 2002, pp. 8-10).

Summary information on benthic species in the Hampton Roads area is contained in the PAR by the U.S. Fish and Wildlife Service. Following is abstracted information from the summary; the original references are cited in the PAR (Ruddy, 2002):

> Benthic macroinvertebrates comprise an important prey base for many fishes and crabs. Based on several studies, it has been determined that polychaetes, mollusks, and arthropods are the main groups inhabiting the Hampton Roads area and the Elizabeth River. Diversity and abundance vary with the type of substrate, time of year, and location. Sand habitats tend to be more diverse, because of the presence of shell and other hard substrates that allow epifaunal colonizers.
>
> In 2000, a benthic index of biotic integrity (B-IBI) was used to characterize the benthic community condition of the Elizabeth River mainstem and its main tributaries. The B-IBI is an index that incorporates several metrics representing species diversity, biomass, abundance, and certain community composition characteristics. Interpretation of the index is based on comparison with reference sites grouped according to salinity and substrate type. The Chesapeake Bay Program has used this index for several years to monitor the condition of the benthic community. Sampling was conducted at 25 stations in each of the Elizabeth River segments. The mainstem had a higher mean B-IBI value (better condition) than the tributaries. However, only 48% of the mainstem stations met the good condition level (B-IBI >3) compared to 70% for the Virginia average for the survey year (1999). Low species diversity and the presence of relatively large numbers of organisms from pollution tolerant taxa are the main reasons why many of the Elizabeth River mainstem stations failed to attain the good condition level. The community was numerically dominated by polychaete and oligochaete worms, while arthropods and mollusks were notably uncommon. Detailed information on the dominant benthic invertebrate taxa, by abundance, for the 25 Elizabeth River mainstem stations, is in the PAR (Ruddy, 2002).
>
> The blue crab (*Callinectes sapidus*), hard clam (*Mercenaria mercenaria*), and Eastern oyster (*Crassostrea virginia*) are particularly important benthic

species in the Hampton Roads area, because of their commercial and recreational value. The blue crab is widely distributed and highly sought after by commercial and recreational fisherman. This swimming crab occurs around the CIDMMA, and watermen often set crab pots off the eastern perimeter during the warm months of the year.

The hard clam is distributed throughout the Hampton Roads area. Commercially harvestable densities are found just west of Newport News Point, on Hampton Flats between Newport News Point and Old Point Comfort, and on the Newport News Middle Ground. The clam fishery in the Hampton Roads area and lower Chesapeake Bay is managed on a rotational basis with certain areas being opened and closed at various times of the year to limit the harvest in any one region. In addition, the regulations allow clams from regions closed for direct harvest because of elevated coliform levels to be relayed to appropriate clean areas for depuration and subsequent harvest.

Even though the abundance of adult oysters in the Hampton Roads area is relatively low, this area is thought to play a critical role in the retention of oyster larvae in the James River. The James River, particularly the region from Route 17 bridge upstream to Mulberry Point is the primary area for producing seed oysters in Chesapeake Bay. Seed oysters are young oysters that are harvested and transplanted to other areas for growing to harvestable size. What makes the James River so important is the extremely high oyster set and survival. An unusual intersection of currents in the Hampton Roads area tends to prevent the oyster from being carried out of the River and facilitates their transport back upstream to the setting area. This is believed to be the main reason for the usually high set in the James River.

Information from several historical surveys of crab, clam, and oyster populations in the Hampton Roads area is summarized in a review of ecological resources assembled by the Norfolk District (U.S. Army Corps of Engineers, June 21, 202, pp. 7-13).

BENTHOS - CIDMMA EASTWARD EXPANSION AREA

Specific summary information on benthic species in the area to be included in an eastward expansion of the CIDMMA is included in the PAR by the U.S. Fish and Wildlife Service. Following is the abstracted summary information; the original studies are cited in the PAR (Ruddy, 2002):

Several benthic surveys conducted from 1986 to 2002 included stations adjacent to the CIDMMA within the proposed expansion area. A 1986 study found that a silty sand bottom was located within 50 yards of the eastern CIDMMA shoreline. Further offshore the sediment contained a higher silt/clay content. No major differences in benthic invertebrate composition were detected between the nearshore silty, sand bottom and the offshore higher silt/clay content

bottom. Both areas were dominated by widely distributed species, many of which are classified as euryhaline opportunists. Polychaete worms were the most abundant group. Additional details on the top 14 numerically dominant species are available elsewhere (Ruddy, 2002). Sometime after the 1986 study was conducted, 3-5 million cubic yards of sediment from the deepening of the channel to Newport News was deposited around the CIDMMA to increase dike stability. This alteration of the benthic environment would have affected the invertebrate community, but the long-term change may not be significant, since the community was dominated by widely distributed opportunistic species that were not restricted to particular bottom sediment conditions.

Referring to the B-IBI survey noted earlier, the conditions within the immediate vicinity of the eastern expansion area for the CIDMMA appear to be generally similar to the Elizabeth River mainstem B-IBI findings. For example, 3 of the 7 stations (43%) in the eastward expansion area met the good condition level (B-IBI >3). For the Elizabeth River mainstem, 48% of the stations had a B-IBI >3.

Finally, Seitz and Lipcius (2002) sampled bivalves (clams) within the proposed CIDMMA eastern expansion area (41 sites), and at 40 deep and 40 shallow (<4 feet) sites within the Elizabeth River entrance/Lafayette River area. The sampling at the CIDMMA sites only found four species; this number was relatively low in comparison to the other deep sites (7 species) and the shallow sites (8 species) sampled in the Elizabeth River mouth/Lafayette River area. The total bivalve density in the CIDMMA area was also relatively low ($7.8/m^2$) in comparison to the other deep ($10.8/m^2$) and shallow ($71/m^2$) sites. Because of the relatively low bivalve abundance, the investigators concluded that the proposed fill area on the east side of the CIDMMA is not likely to be an important feeding area for blue crabs or demersal fish.

A 1986 clam survey around the CIDMMA showed that hard clams were present in generally low numbers. The highest densities were found on the north side (7-14 clams per 5-minute dredge tow), while the east side yielded 1-2 clams per 5-minute tow. The Virginia Institute of Marine Science and the Virginia Marine Resources Commission initiated a hard clam survey for the Hampton Roads area and the Elizabeth River in 2001. Sampling was accomplished using modified hydraulic patent tongs with coverage of one square meter. The three areas sampled around the CIDMMA had low densities of clams, especially on the east side where only one clam was obtained in 28 tong grabs. The densities for the three areas were 0.04, 0.26, and 0.29 clams/$m^2$. The densities for 41 other locations ranged from 0.0 to 8.38 clams/$m^2$. The overall average density for the 44 sampled areas was 0.93 clams/$m^2$.

Finally, Baylor Grounds (designated public oyster grounds) are located off the east, west and north sides of the CIDMMA. The Baylor Grounds were originally naturally productive oyster areas that were surveyed on a statewide

basis and set aside for public use in 1894. The grounds in the vicinity of the CIDMMA and the Hampton Roads area have not been productive for many years. One reason for the decline in oyster productivity is the introduction of two oyster pathogens, MSX (*Halosporidium nelsoni*) and dermo (*Perkinsus marinus*) beginning in the late 1950s. The oysters could have also been affected by anthropogenic disturbances including the construction of the CIDMMA and municipal and industrial pollution. However, some oysters still set in this area and surveys around the CIDMMA have revealed a patchy, low density distribution. Baylor Grounds retain protection under state law and any permanent destruction, such as from the eastern expansion of the CIDMMA, would require legislative approval.

FISH

Multiple studies of fish communities in the Hampton Roads area have been conducted over several decades. The results of two such studies from the early 1980s are summarized in an ecological resources review by the Norfolk District; the original reference citations are included in the review (U.S. Army Corps of Engineers, June 21, 2002, pp. 17-19 and 41-46). Summary information from these two studies is as follows:

- The lower James River and the Elizabeth River provide an estuarine habitat for many species of commercial and recreational importance. These areas are important nursery grounds for spot, Atlantic croaker, Atlantic menhaden, weakfish, striped bass, black seabass, and summer flounder. Furthermore, they are important as feeding grounds for adult bluefish, weakfish, spot and Atlantic croaker. Anadromous species such as striped bass, American shad, blueback herring, and alewife travel through these areas to reach their freshwater spawning grounds.

- Temperature is the major factor determining the winter distribution of fishes, while food availability is the major factor controlling the summer distribution of fishes.

- Travel surveys from 1984 indicated that the top five dominant species in the general area where the eastward expansion of the CIDMMA would occur included, in order, bay anchovy, spot, weakfish, menhaden, and spotted hake.

The Magnuson-Stevens Fishery Conservation and Management Act, as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267), requires all Federal agencies to consult with the National Marine Fisheries Service (NMFS) on all actions, or proposed actions, permitted, funded, or undertaken by the agency, that may adversely affect Essential Fish Habitat (EFH). Designations of EFH for the eggs, larvae, juveniles, and adult life stages of various managed marine species have been made by the NMFS. Pertinent areas related to this cumulative effects study include the lower Chesapeake Bay and the Hampton Roads area, including the lower reaches of the James River and the Elizabeth River. Such designations have been made for

windowpane flounder, King/Spanish mackerel, summer flounder, bluefish, black sea bass, red drum, cobia, sandbar shark, Atlantic butterfish, and dusky shark (U.S. Army Corps of Engineers, June 21, 2002, pp. 19-20). Additional information on life cycle and habitat requirements, and the overall marine fishery, is available elsewhere on the first nine of the eleven species listed above (U.S. Army Corps of Engineers, June 21, 2002, pp. 24-41).

The lower Chesapeake Bay and the Hampton Roads area are also designated as a Habitat Area of Particular Concern (HAPC) for the sandbar shark, which uses the lower Chesapeake Bay as a "pupping ground", where females give birth to live young. The lower James River and nearby areas near the mouth of the Chesapeake Bay cover approximately 29,500 acres of open water, and the total HAPC for the sandbar shark in the lower Chesapeake Bay is approximately 89,000 acres of open water. The sandbar shark is also an important commercial shark actively fished, representing approximately two-thirds of the directed commercial shark catch on the east coast of the United States (U.S. Army Corps of Engineers, June 21, 2002, p. 20).

Summary information on fish species in the Hampton Roads area and the Elizabeth River is contained in the PAR by U.S. Fish and Wildlife Service. Following is abstracted information from the summary; the original references are cited in the PAR (Ruddy, 2002):

> Fish surveys of the lower James River and Elizabeth River have revealed a diverse assemblage of species. A list of the fish species collected from seven surveys conducted in the area from 1960 to 1999 is available elsewhere (Ruddy, 2002). The surveys have determined that the fish fauna is quite dynamic, with the relative distribution and abundance changing markedly over time. A majority of the species are marine migrants that enter the area at various times and life stages. This group includes many species with commercial or recreational value. They may enter the area as adults, but more often as juveniles. Some of the more important marine species include: Atlantic croaker, spot, Atlantic menhaden, weakfish, bluefish, and summer flounder. Anadromous species such as alewife, blueback herring, American shad, and striped bass pass through the area as adults on their way to and from freshwater spawning areas. The use of the Elizabeth River for anadromous fish spawning appears to be negligible. However, juveniles spend variable amounts of time in the area before eventually returning to the sea.
>
> Some species are permanent residents of Chesapeake Bay. These would include bay anchovy, Atlantic silverside, killifish, blennies, skilletfish, gobies, pipefish, lined seahorse, oyster toadfish, blackcheek tonguefish, hogchoker, windowpane, white perch, yellow perch, and silver perch. These species also often display movements into and out of the area, as well as within the area, in response to changes in water temperature, other water quality conditions, and food availability.

Fish diversity in the area reaches a maximum in late summer and early fall. As fall progresses many species migrate out to the ocean and southward. A few cold-water adapted species such as the spotted and red hakes enter the area during the colder months, but leave before the summer.

Monthly trawl collections were made between January, 1982, and January, 1984, at 8 stations distributed within the lower Chesapeake Bay, lower James River, and the Elizabeth River. The two Elizabeth River mainstem stations were among the most prolific producers of fishes. Species with relatively high abundance in the entire survey included: bay anchovy, Atlantic croaker, spotted hake, weakfish, blueback herring, Atlantic silverside, silver perch, and spot.

The National Marine Fisheries Service (NMFS) has designated "essential fish habitat" (EFH) for 11 fish species associated with the Hampton Roads area. EFH is a designation that applies to species that are managed under a Federal fishery management plan. EFH was established under the 1996 amendments of the Magnuson-Stevens Fishery Conservation and Management Act, and it is defined as "those waters and substrate necessary to fish for spawning, breeding, or growth to maturity". The 11 species with designated EFH for one to four stages of their life cycle (egg, larva, juvenile, and adult) include the windowpane flounder, summer flounder, black sea bass, bluefish, Atlantic butterfish, king mackerel, Spanish mackerel, cobia, red drum, dusky shark, and sandbar shark. If the eastward expansion of the CIDMMA adversely affects any of the pertinent EFHs, consultation with the NMFS will be necessary. Further, the lower James River is included within an area of the lower Chesapeake Bay that is designated as a "habitat area of particular concern" (HAPC) for the sandbar shark. This designation denotes EFH that is particularly important to the long-term productivity of the species and/or is particularly vulnerable to degradation. The intent of the designation is to focus greater attention on conservation efforts.

Summary information on zooplankton in the Hampton Roads area is contained in the PAR by the U.S. Fish and Wildlife Service. Following is abstracted information from the summary; the original references are cited in the PAR (Ruddy, 2002):

Zooplankton in the Hampton Roads area are known to display a bimodal pattern of abundance with peaks in the Spring (March-April) and summer (July-August). Copepods are the dominant group with cladocerans comprising a minor fraction. Also present are the of invetebrates such as barnacles, polychaete worms, mollusks, and crabs, and the eggs and larvae of resident estuarine fishes such as bay anchovy, hogchoker, goby, pipefish, blenny, and skillet fish. Zooplankton abundance is conspicuously reduced in the Elizabeth River and the species composition varies with the salinity gradient proceeding upriver. High concentrations of dissolved copper and zinc in the Elizabeth River have been shown to reduce the survival of the copepod *Acartia tonsa*, and are believed to be at least partially responsible for the unusual low abundance of zooplankton there.

Additional information on the status and trends of phytoplankton, zooplankton, and benthos in the upper, middle, and lower James River is available elsewhere (Virginia Secretary of Natural Resources, et al., 2000, pp. 14-17). Similar information is also available for various locations in the Elizabeth River and its tributaries (Virginia Secretary of Natural Resources, et al., 2000, pp. 18-20).

WATERFOWL AND BIRDS -- HAMPTON ROADS AREA

The Hampton Roads area, including the lower James River, has low to moderate numbers of wintering waterfowl. Table 3-6 includes species counts based on 5-year averages from 1981 to 2000 (Ruddy, 2002, p. 13). The more numerous species from the most recent survey include: canvasback, Canada goose, bufflehead, ruddy duck, mallard, American widgeon, ringneck duck, northern shoveler, black duck, and mergansers. Waterfowl appear to be relatively more common on the western side of the CIDMMA and along the shoreline up to the Nansemond River. Some wintering waterfowl also use the shallow water areas within the CIDMMA. During the warmer months, various gulls, terns, cormorants, shorebirds, and wading birds are common in and around the CIDMMA (Ruddy, 2002).

The various nearshore and terrestrial habitats at the CIDMMA are periodically utilized by upwards of 200 species of birds (U.S. Army Corps of Engineers, June 21, 2002, pp. 20-21). Specific studies from the mid-1970s to mid-1980s identified approximately 50 species using the habitats for various purposes. Several species nest on the perimeter dikes, including least terns, killdeers, red-winged blackbirds, song sparrows, meadowlarks and mallards. In addition, numerous species of songbirds, shorebirds, and raptors use the dikes and adjacent areas for feeding and resting. The CIDMMA is also used as a resting stop during fall and spring migration. Although no definitive quantitative information is available, it does appear that the numbers of both species and individual birds using the CIDMMA has declined in recent years.

The existing CIDMMA mimics a typical coastal barrier island complete with shoreline, small ponds, mudflats, marsh and sparsely vegetated areas. As such, shorebirds by the thousands use this site as a stopover in spring and fall to feed and rest along the migratory pathway. Large flocks of waterfowl have been observed wintering at the CIDMMA in ponds, pools within the cells, and the open water of the James and Elizabeth Rivers (Beck and LeClerc, 2003). Other species such as black-necked stilt usually nest at the site. Brown pelicans and large flocks of royal terns, common terns, gull-billed terns, and black skimmers also use the CIDMMA as a foraging and roost site. The highest concentrations of birds typically occur at three sites at the CIDMMA: the southwest corner of the north cell, the southwestern shore of the south cell, and the southeastern corner of the center cell. Bird surveys conducted over several years have indicated that the CIDMMA is an excellent site for migrating, wintering, and breeding bird species (Beck and LeClerc, 2003).

Table 3-6: Mid-winter Waterfowl Survey Results (5-year averages) for the lower James River including the Elizabeth and Nansemond Rivers (Ruddy, 2002, p. 13)

| Species/Group | 1981-1985 | 1986-1990 | 1991-1995 | 1996-2000 |
|---|---|---|---|---|
| mallard (*Anas platyrhyncos*) | 349 | 182 | 368 | 124 |
| black duck (*Anas rubripes*) | 170 | 49 | 92 | 28 |
| gadwall (*Anas streptera*) | 6 | 5 | 6 | 87 |
| widgeon (*Anas americana*) | 247 | 42 | 42 | 91 |
| green-winged teal (*Anas crecca*) | 0 | 2 | 12 | 40 |
| northern shoveler (*Anas clypeata*) | 80 | 0 | 60 | 208 |
| northern pintail (*Anas acuta*) | 140 | 0 | 0 | 50 |
| redhead (*Aythya americana*) | 20 | 7 | 0 | 4 |
| canvasback (*Aythya valisineria*) | 1720 | 451 | 990 | 1271 |
| scaup (*Aythya marila & A. affinis*) | 75 | 102 | 21 | 12 |
| ring-neck duck (*Aythya collaris*) | 166 | 105 | 79 | 58 |
| common goldeneye (*Bucephala clamgula*) | 56 | 14 | 18 | 12 |
| bufflehead (*Bucephala albeola*) | 193 | 71 | 183 | 370 |
| ruddy duck (*Oxyura jamaicensis*) | 45 | 1 | 136 | 916 |
| scoters (*Melanitta* spp.) | 66 | 11 | 15 | 12 |
| oldsquaw (*Clangula hyemalis*) | 127 | 5 | 12 | 2 |
| mergansers (*Mergus* spp.) | 279 | 22 | 76 | 56 |
| Atlantic brant (*Branta bernicla*) | 200 | 0 | 25 | 0 |
| snow goose (*Chen caerulescens*) | 40 | 0 | 0 | 0 |
| Canada goose (*Branta canadensis*) | 662 | 1160 | 557 | 554 |
| tundra swan (*Cygnus columbianus*) | 0 | 2 | 1 | 0 |
| Grand Total | 4641 | 2231 | 2693 | 3895 |

The staff of the CIDMMA received the Virginia Society of Ornithology Jack M. Abbott Conservation award for 1996. The award was presented for "their contributions and assistance in the creation, protection and preservation of critical habitat for beach nesting birds. The management of these nesting areas and protection of these sites has resulted in the increased population of the piping plover and the least tern." The award was a result of a bird protection project that was formalized in 1984 under a cooperative agreement with the College of William and Mary, the Virginia Department of Game and Inland Fisheries, and the Corps (U.S. Navy, undated).

WATERFOWL AND BIRDS -- CIDMMA EASTWARD EXPANSION AREA

Summary information on waterfowl and shorebirds at the CIDMMA is included in the PAR prepared by the U.S. Fish and Wildlife Service. Following is abstracted summary information from the PAR; citations for the original studies and references are in the PAR (Ruddy, 2002):

> The large, open expanse of the 2500 acres of the CIDMMA, and its relative isolation help to make the CIDMMA an attractive area for birds that use shallow water, beaches, or open flats. Large numbers of waterfowl and shorebirds often occur, especially during migration. The site is also used by a variety of other types of water-oriented birds including terns, gulls, wading birds, and osprey. The open habitat and large concentrations of birds also make the area attractive to peregrine falcons. This avian predator was removed from the Federal list of endangered species in 1999. Finally, many thousands of birding enthusiasts come to the CIDMMA each year to observe the waterfowl and shorebirds.
>
> Several species of ground nesting birds are known to nest at the CIDMMA. Examples include: least tern, killdeer, willet, piping plover, blackneck stilt, avocet, horned lark, and nighthawk. Least tern is the most numerous nesting species. In the latter 1980s, specific habitat management measures were implemented at the CIDMMA to attract beach-nesting birds. Fine sand and shell material was deposited and graded to provide nesting habitat. Wood decoys also, were set out to attract birds to the new habitat. Mammalian predators, such as red fox, were removed. Least terns responded positively to this effort and reached a peak of 300 pairs in 1989, although 60 to 100 pairs were more typical during this period. The number of nesting pairs declined during the 1990s, and only 30 to 45 pairs nested during the last 3 years. A number of factors were responsible for the decline. The previous habitat management activities were not continued, and the quality of the nesting habitat declined. Mammalian predators, including red fox, feral cats, and feral dogs, increased. There was also an increase in the amount of human activity, including a major operation to install wick drains along the perimeter dike.

THREATENED AND ENDANGERED SPECIES -- HAMPTON ROADS AREA

Summary information on several threatened or endangered turtle species, and two threatened bird species is in the PAR prepared by the U.S. Fish and Wildlife Service. Following is abstracted summary information; specific citations for the original studies and information is in the PAR (Ruddy, 2002):

> Immature loggerhead and Kemp's ridley sea turtles regularly inhabit the lower Chesapeake Bay, including the Hampton Roads area, during the summer months. The loggerhead is Federally listed as a threatened species and the ridley is listed as endangered. The endangered green and endangered leatherback sea turtles could also occur in the area, but only as rare transients. Sea turtles typically arrive in late May and depart in the fall as the water temperature drops below 20 degrees C. Loggerhead and Kemp's ridley sea turtles spend a considerable amount of time feeding on the bottom. They have been known to be killed by entrainment by hopper dredges. Since sea turtles are under the jurisdiction of the NMFS, it will be necessary to coordinate with NMFS to determine the need for consultation under Section 7 of the Endangered Species Act.
>
> An active bald eagle nest is located approximately 0.5 miles west of the CIDMMA. The bald eagle is Federally listed as a threatened species. However, based on the current understanding of the eastward expansion of the CIDMMA, and the related marine terminal, there should be no effect on the bald eagle.
>
> Finally, the piping plover, a Federally listed threatened species, nested at the CIDMMA from 1989 to 1997. The number of nesting pairs during this period ranged from 1 to 5. They were responding to the same favorable nesting habitat conditions that benefited the least terns. Unlike least terns, piping plover produce precocial young that leave the nest shortly after hatching to travel to moist sand or mud flats for foraging. Since the young cannot fly, the foraging areas need to be located reasonably close to the nesting areas. The failure of piping plover to nest at the site since 1997 reflects the same decline in habitat conditions experienced by the least tern. In addition, some of the chick foraging areas on the outside of the perimeter dike and within the interior became unsuitable or inaccessible. It appears that piping plover would not be likely to use the site in the future, unless an active habitat management effort was implemented.

THREATENED AND ENDANGERED SPECIES -- CIDMMA EASTWARD EXPANSION AREA

The sand/shell substrate at the CIDMMA is prime nesting material for two endangered and threatened bird species. For example, it is one of two sites west of the Virginia barrier islands used by the endangered piping plover (Grandview Nature Preserve in Hampton, Virginia, is the other site). The first confirmed nesting pair of piping plover at the CIDMMA was reported in 1989. The plovers nested successfully at

the CIDMMA until 1997. No nesting pairs have been observed since 1997. One adult male was present during the 1998-nesting season (Beck, 1999). Adult piping plover have been observed during the spring migration annually (1999-2002), and both adult and young of the year have been observed during fall migration (Beck and LeClerc, 2003).

Least terns, a threatened species, have been nesting at the CIDMMA since the late 1960s and continue to nest at the site to the present. The least tern population has been as high as 125 pairs to the low of 10 pairs (Beck and LeClerc, 2003).

For the piping plover and least tern, the CIDMMA has provided habitat critical for their continued existence on the western shore of the Chesapeake Bay in Virginia. However, populations of both species have experienced a decline at the site, although the habitat is still suitable for the continuance of both the piping plover and least tern. Based on 2002 data and surveys, it appeared that there was a major predator problem with the presence of the two pairs of red fox. Thus, predator control was recommended. Further, there has been an on-going coordination with the Mosquito Control Project/ Spraying at the CIDMMA. It was recommended that all spraying and/or other methods of control be coordinated with the bird use of the CIDMMA, especially during the breeding season of the bird species of concern (Beck and LeClerc, 2003).

UPLAND VEGETATION -- CIDMMA EASTWARD EXPANSION AREA

Vegetative communities that occur in the immediate vicinity of the CIDMMA are upland woodland, scrubland, low grassland, tall grassland and mixed weeds, reed thickets, hydric ditch habitat, disturbed areas and active fill and construction sites. Low grassland constitutes the most common vegetation type. These communities are comprised mainly of commercial blends of grasses such as Bermuda, fescue, rye, etc. Other grasses are present, including goosegrass, crabgrass, sweet clover, curly dock, evening pemrose, and poor man's pepper. Tall grassland communities include species such as horseweed, ragweed, cocklebur, clover, and alfalfa. Several areas contain mostly pure tall stands of monotypic grasses. Blackberry is common along the fencerows and in disturbed areas, as are elderberry and hackweed. Upland woodland species include a variety of arboreal species, such as hackberry, black cherry, loblolly pine, sassafras, red cedar, chinaberry, and mimosa. Disturbed lands typically support large stands of reed grass, saltbush, cocklebur, jimpson weed, and bitter-weed (U.S. Army Corps of Engineers, June 21, 2002, p. 2).

Observations of the vascular plant community made during the 1987 perimeter dike stabilization of the CIDMMA revealed a relatively uniform species composition. *Salicornia virginica* and *Chenopodium album* were the only two species able to establish themselves on the fine sediments of the major portion of the mudplain. These plants, both halophytes, are extremely salt tolerant. The other dominants are grasses, particularly *Phragmites australis* and certain members of the family Asteraceae. In the 15 years since this survey was conducted, *Phragmites*, an aggressively invasive,

species, has continued to spread at the CIDMMA (U.S. Army Corps of Engineers, June 21, 2002, p. 2).

The most recent National Wetlands Inventory (NWI) map of the CIDMMA is a draft dated 1993. The map indicates that the CIDMMA is bounded primarily by upland (the dikes), yet a narrow zone of emergent, intertidal wetland is present interior of the eastern and the northeastern perimeter dikes, totaling approximately 74 acres. The interiors of the three partitions (cells) are mapped as areas of L2USChs (lacustrine, littoral, unconsolidated shore, seasonally flooded, diked/impounded, spoil). Several palustrine wetlands are mapped interior of the eastern dike, the largest single one encompassing approximately 20 acres. A palustrine emergent/scrub shrub wetland is present along the southern boundary, totaling approximately 20 acres (U.S. Army Corps of Engineers, June 21, 2002, p. 1).

# CHAPTER 4

# EXISTING AND CONTINUING PROJECTS AND ACTIONS

This chapter summarizes information on existing and continuing projects and actions that relate to the operation and/or expansion of the CIDMMA; further, they could also contribute to cumulative effects on specific resources such as water quality and aquatic ecology. Accordingly, this chapter encompasses a portion of Step 4 in the 11-step CEA methodology. Projects and actions addressed herein include post-authorization projects of the Norfolk District, the Navigation Management Plan developed by the District, and water-related laws, regulations, and programs. The final section includes a non-inclusive listing of other existing and continuing projects in the vicinity of the CIDMMA.

## POST-AUTHORIZATION NORFOLK DISTRICT PROJECTS

There are several Federally-authorized Corps of Engineers navigation projects located in the Hampton Roads area. The primary project is known collectively as the Norfolk Harbor and Channels project, which is a series of deep-draft channels, shallow-draft side channels, anchorages, and a dredged material placement area. For the purposes of this cumulative effects study, the Norfolk Harbor and Channels project can be divided into two sections: (1) the Inner Harbor, which refers to that portion west of the Hampton Roads Bridge-Tunnel, and (2) the Outer Harbor, which refers to that portion east of the Hampton Roads Bridge-Tunnel. The Inner Harbor includes the Channel to Newport News project and the Norfolk Harbor project (the Norfolk Harbor Channel; the Elizabeth River Channel; the Southern, Eastern, and Western Branches of the Elizabeth River; Scotts Creek; various anchorages; and the CIDMMA. The Outer Harbor includes the Thimble Shoal Channel in the Chesapeake Bay and the Atlantic Ocean Channel east of Virginia Beach. The remaining projects include several shallow-draft channels and two offshore dredged material placement areas.

### Authorized and Constructed Projects

Table 4-1 is a lengthy table that contains a summary of the projects or elements thereof that are authorized and constructed, and those project elements that are authorized but not yet constructed (U.S. Army Corps of Engineers, February, 2000, pp. II-2 to II-15). Constructed projects or elements thereof are considered to be in the "past, present, or continuing actions" group according to cumulative effects guidance from the Council on Environmental Quality, while those elements not yet constructed are in the "reasonably foreseeable future actions" category (Council on Environmental Quality, 1997).

Some observations that can be drawn from Table 4-1 include:

- dredging of navigation channels, and perhaps their deepening or widening, is associated with most of the authorized projects;

Table 4-1: Corps of Engineers Post-Authorization Projects (1) (U.S. Army Corps of Engineers, February, 2000, pp. II-2 to II-15)

| Project | Authorized | Constructed | Not yet constructed |
|---|---|---|---|
| Atlantic Ocean Channel | • 57' depth; 1,000' width; 11.1-mile length in Atlantic Ocean off Virginia Beach. Subsequently, advanced engineering and design recommended 60' depth; 1,300' width; 11.1-mile length. | (• Naturally over 50' depth over its 11.1-mile length; channel marked with 1,300' width.) | • 60' depth; 1,300' width; 11.1-mile length. |
| Thimble Shoal Channel | • 55' depth; 1,000' width; 13.4-mile length from entrance to Chesapeake Bay at Cape Henry westward to a point near Old Point Comfort. | • Outbound element: 50' depth; 650' width.<br>• Remaining 350' width maintained at 45' depth. | • Inbound element: 50' depth; 350' width. (2)<br>• 55' depth; 1,000' width. |
| Norfolk Harbor Project:<br>• Norfolk Harbor Channel | • Entrance Reach: 55' depth; 1,500' width; 2.0-mile length from I-64 Bridge-Tunnel westward to junction with Channel to Newport News. Subsequently, advanced engineering and design recommended 1,000' width. | • 50' depth; 1,000' width. | • 55' depth; 1,000' width. |

Table 4:1 (continued):

| Project | Authorized | Constructed | Not yet constructed |
|---|---|---|---|
| • Norfolk Harbor Channel (cont'd) | • Norfolk Harbor Reach: 55' depth; 1,500' width; 4.3-mile length from junction with Channel to Newport News southward to Norfolk International Terminal. Subsequently, advanced engineering and design recommended 1,000' width. | • Outbound element: 50' depth; 650' width.<br>• Remaining 350' width maintained at 45' depth; additional 250' width maintained at 45' depth under previous authorization. Total 600' width. | • Inbound element: 50' depth; 350' width. (2)<br>• 55' depth; 1,000' width. |
| | • Craney Island Reach: 55' depth; 800' width; 2.6-mile length from Norfolk International Terminal southward to Lamberts Point. | • First 4,000' downstream from Lamberts Point 50' depth; full 800' width to provide maneuvering area.<br>• Remaining portion of outbound element: 50' depth; 650' width; remaining 150' width maintained at 45' depth. | • Remaining portion of full-width channel: 50' depth; 150' width.<br>• 55' depth; 800' width. |
| • Elizabeth River Channel | • Port Norfolk Reach and Town Point Reach: 45' depth; 750' width; 3.0-mile length from Lamberts Point to junction of Eastern Branch Channel and Southern Branch Channel. | • 40' depth; 750' width. | • 45' depth; 750' width. |

Table 4:1 (continued):

| Project | Authorized | Constructed | Not yet constructed |
|---|---|---|---|
| • Southern Branch of Elizabeth River | • Lower Reach: 45' depth; 450' width; 2.0-mile length from junction with Eastern Branch Channel to Norfolk and Portsmouth Belt Line Railroad bridge. | • 40' depth; 450' width. | • 45' depth; 450' width. |
| | • Middle Reach: 45' depth; 375' width; 1.0-mile length from Norfolk and Portsmouth Belt Line Railroad bridge upstream to Norfolk Southern Railroad bridge. | • 40' depth; 375' width. | • 45' depth; 375' width. |
| | • Upper Reach:<br>• 40' depth; 250' to 500' width; 2.4-mile length from Norfolk Southern Railroad bridge upstream to Gilmerton Bridge. | • 35' depth; 250' to 500' width. | • 40' depth; 250' to 500' width. |
| | • 35' depth; 300' width; 0.6-mile length from Gilmerton Bridge upstream. Thence 250' width; 1.5-mile length upstream to end of project at a point 0.8 mile above I-64 highway bridge. Total 2.1-mile length. | • Authorized project constructed; however, upsteammost portion of channel with 250' width will be maintained at 25' depth. | |

Table 4:1 (continued):

| Project | Authorized | Constructed | Not yet constructed |
|---|---|---|---|
| • Southern Branch of Elizabeth River (cont'd) | • Approach and turning basin opposite Norfolk Naval Shipyard, just downstream of Norfolk and Portsmouth Belt Line Railroad bridge; 45' depth; 450' to 830' width; 2,900' length. | • 40' depth; 450' to 830' width; 2,900' length. | • 45' depth; 450' to 830' width; 2,900' length. |
| | • Turning basin at mouth of St. Julians Creek; 40' depth; 800' width; 400' to 600' length. | • 35' depth; 800' width; 400' to 600' length. | • 40' depth; 800' width; 400' to 600' length. |
| | • Turning basin at mouth of Milldam Creek, just downstream of Gilmerton Bridge; 40' depth; 800' square. | | • 40' depth; 800' square. |
| | • Turning basin at mouth of Newton Creek; 35' depth; 600' square. | • Authorized project constructed. | |
| | • Turning basin at mouth of Mains Creek near upstream end of project; 35' depth; 800' square. | • Authorized project constructed; will be maintained at 25' depth. | |
| • Eastern Branch of Elizabeth River | • 25' depth; 500' width; 1.1-mile length from junction with Southern Branch Channel to Norfolk Southern Railroad bridge. | • Authorized project constructed. | |

Table 4:1 (continued):

| Project | Authorized | Constructed | Not yet constructed |
|---|---|---|---|
| • Eastern Branch of Elizabeth River (cont'd) | • 25' depth; 300' width; 0.5-mile length from Norfolk Southern Railroad bridge upstream to Campostella Bridge.<br><br>• 25' depth; 200' width; 0.9-mile length from Campostella Bridge upstream to end of project at second Norfolk Southern Railroad bridge.<br><br>• Turning basin near upstream end of project; 25' depth; 5.5 acres in area. | • Authorized project constructed.<br><br>• Authorized project constructed; however, it is no longer maintained.<br><br>• Authorized project constructed. | |
| • Western Branch of Elizabeth River | • 24' depth; 300' width; 0.8-mile length connecting from main Elizabeth River Channel. Thence 200' width; 0.4-mile length to a point downstream of West Norfolk Bridge. Total 1.2-mile length.<br><br>• 18' depth; 150' width; 0.6 mile length from a point downstream of West Norfolk Bridge upstream to end of project at a point 0.3 mile upstream of West Norfolk Bridge. | • Authorized project constructed; however, an 18' depth is now maintained.<br><br>• Authorized project constructed. | |
| • Scotts Creek | • 12' depth; 100' width; 0.7-mile length connecting from main Elizabeth River Channel into creek. | • Authorized project constructed; however, it is no longer maintained. | |

Table 4:1 (continued):

| Project | Authorized | Constructed | Not yet constructed |
|---|---|---|---|
| • Anchorages | • 3 fixed mooring anchorages just west of I-64 Bridge-Tunnel; 55' depth. Subsequently, advanced engineering and design recommended one anchorage (F); 55' depth; 1,500' swinging radius. (3) | • Anchorage F: 50' depth; 1,500' swinging radius. | • 55' depth; 1,500' swinging radius. |
| | • 2 anchorages opposite Sewells Point; 45' depth; easternmost (K-1) 1,200' swinging radius and westernmost (K-2) 1,200' swinging radius. Subsequently, advanced engineering and design recommended enlarging the K-1 anchorage to 45' depth; 1,500' swinging radius. (3) | • Easternmost anchorage: 45' depth; 1,200' swinging radius.<br>• Westernmost anchorage: 40' depth; 1,200' swinging radius. | • Easternmost anchorage: 45' depth; 1,500' swinging radius.<br>• Westernmost anchorage: 45' depth; 1,200' swinging radius; however, construction has been deferred. |
| | • 3 anchorages opposite Lamberts Point in 173-acre area (P) on west side of 55' depth channel; 38' depth and 1,500' square; 35' depth and 1,500' square; 20' depth, 1,000' width, 3,000' length. (3) | • Authorized project constructed; however, it is no longer maintained. | |
| | • 45-acre anchorage near Pinners Point (R); 12' depth. (3) | • Authorized project constructed; however, it is no longer maintained. | |

Table 4:1 (continued):

| Project | Authorized | Constructed | Not yet constructed |
|---|---|---|---|
| | | | |
| • Craney Island Dredged Material Area | • 2,500-acre diked dredged material placement area located in Portsmouth; rehandling basin with approach and exit channels connecting rehandling basin to Craney Island Reach of Norfolk Harbor Channel. | • Authorized project constructed; currently being intensively managed under authority of Section 148 of Water Resources Development Act of 1976 (Public Law 94-587). | |
| | | | |
| Channel to Newport News | • 55' depth; 800' width; 6.0-mile length connecting from Norfolk Harbor Channel to coal terminals in Newport News.<br><br>• 2 anchorages (I-1 and I-2); 45' depth; 1,200' swinging radius each. (3) | • 50' depth; 800' width.<br><br>• 40' depth; 1,200' swinging radius each. | • 55' depth; 800' width.<br><br>• 45' depth; 1,200' swinging radius each; however, construction has been deferred. |
| | | | |
| <u>Atlantic Intracoastal Waterway:</u><br>• General | • Extends from Massachusetts to Florida; coming south, it passes through Hampton Roads and down Southern Branch of Elizabeth River and splits into two routes. | | |

Table 4:1 (continued):

| Project | Authorized | Constructed | Not yet constructed |
|---|---|---|---|
| | | | |
| • Albemarle and Chesapeake Canal Route | • 12' depth; 90' width in land cuts and 125' to 250' width in rivers; tidal guard lock at Great Bridge. | • Authorized project constructed. | |
| • Dismal Swamp Canal Route | • 10' depth; 100' width in Deep Creek; tidal guard lock at Deep Creek. | • Authorized project constructed; however, a 6' depth project is now maintained. | |
| | | | |
| Lynnhaven Inlet | • 10' depth; 150' width; 1.0-mile length from Chesapeake Bay into inlet to Lesner Bridge.<br><br>• Mooring area and turning basin just upstream from Lesner Bridge; 10' depth; 700' width; 1,250' length.<br><br>• 9' depth; 90' width; 2.0-mile length from turning basin to Broad Bay via Long Creek-Broad Bay canal.<br><br>• 6' depth; 90' width; 0.5-mile length through The Narrows connecting Broad and Linkhorn Bays. | • Authorized project constructed.<br><br>• Authorized project constructed.<br><br>• Authorized project constructed.<br><br>• Authorized project constructed. | |

Table 4:1 (continued):

| Project | Authorized | Constructed | Not yet constructed |
|---|---|---|---|
| | | | |
| Lynnhaven Inlet (cont'd) | • 8' depth; 100' width; 0.3-mile length side channel connecting into Long Creek. | • Authorized project constructed. | |
| | | | |
| Little River (Creek) | • 20' depth; 400' width; 1.4-mile length from Chesapeake Bay into inlet to basin.<br><br>• Turning basin adjacent to railroad terminals; 20' depth; 400' to 1,240' width; 1,160' length. | • Authorized project constructed; however, it is maintained by the Navy.<br><br>• Authorized project constructed; however, it is maintained by the Navy. | |
| | | | |
| Willoughby Channel | • 10' depth; 300' width; 1.5-mile length from Hampton Roads to a point near tip of Willoughby Spit in Willoughby Bay. | • Authorized project constructed; however, a 6' depth; 200' width project is now maintained. | |
| | | | |
| Lafayette River:<br>• Main channel | • 8' depth; 100' width; 1.7-mile length from Hampton Roads to Hampton Boulevard Bridge. | • Authorized project constructed. | |

Table 4:1 (continued):

| Project | Authorized | Constructed | Not yet constructed |
|---|---|---|---|
| | | | |
| • Main channel (cont'd) | • 6' depth; 100' width; 2.3-mile length from Hampton Boulevard Bridge upstream to a point opposite East Haven Creek. | • Authorized project constructed. | |
| • Knitting Mill Creek | • 6' depth; 40' to 80' width; 0.6-mile length connecting from Lafayette River Channel into creek to settling basin (8' depth; 50' width; 100' length) at upstream end of creek. | • Authorized project constructed. | |
| • East Haven Creek | • 6' depth; 50' width; 0.3-mile length connecting from Lafayette River Channel into creek to settling basin (8' depth; 50' width; 100' length) at upstream end of creek. | • Authorized project constructed. | |
| | | | |
| Channel to Nansemond Ordnance Depot | • 12' depth; 100' width; 0.5-mile length from Hampton Roads shoreward. | • Authorized project constructed; however, project no longer required and maintenance has been discontinued. | |

Table 4:1 (continued):

| Project | Authorized | Constructed | Not yet constructed |
|---|---|---|---|
| | | | |
| Channel to Nansemond Ordnance Depot (cont'd) | • Turning basin at shoreward end of channel; 12' depth; 100' to 300' width; 300' length.<br><br>• Construction of timber wharf; 650' length. | • Authorized project constructed; however, project no longer required and maintenance has been discontinued.<br><br>• Authorized project constructed; however, project no longer required and maintenance has been discontinued. | |
| | | | |
| Bennetts Creek | • 6' depth; 60' width; 2.4-mile length from Nansemond River into creek to city boat ramp at Bennetts Creek Park. | • Authorized project constructed. | |
| | | | |
| Nansemond River | • 12' depth; 100' width; 18.2-mile length from Hampton Roads into river to Business Route 460 highway bridge in Suffolk.<br><br>• 10' depth; 80' width; 2.0-mile length side channel connecting from main channel into Western Branch to Reids Ferry. | • Authorized project constructed; however, maintenance is no longer required.<br><br>• Authorized project constructed; however, a 6' depth is now maintained. | |

Table 4:1 (continued):

| Project | Authorized | Constructed | Not yet constructed |
|---|---|---|---|
| | | | |
| Nansemond River (cont'd) | • Turning basin at upstream end of project in Suffolk; 12' depth; 200' square. | • Authorized project constructed; however, maintenance is no longer required. | |
| | | | |
| Newport News Creek | • Dual, overlapping, entrance channel:<br>• 16' depth; 125' width; 0.2-mile length from Hampton Roads into wave screen area. | • Authorized project constructed. | |
| | • 12' depth; 90' to 150' width; 0.9-mile length from Hampton Roads upstream to turning basin. | • Authorized project constructed. | |
| | • North access channel: 16' depth; 150' width; 0.2-mile length; located within wave screen. | • Authorized project constructed. | |
| | • South access channel: 16' depth; 200' width; 0.2-mile length; located within wave screen. | • Authorized project constructed. | |
| | • Barge fleeting area: 16' depth; 100' to 500' width; 1,100' to 1,140' long; located within wave screen. | • Authorized project constructed. | |

Table 4:1 (continued):

| Project | Authorized | Constructed | Not yet constructed |
|---|---|---|---|
| Newport News Creek (cont'd) | • Turning basin/anchorage area/municipal boat harbor at upstream terminus of creek; 12' depth; 188' to 214' width; 500' length. | • Authorized project constructed. | |
| Hampton Creek | • 12' depth; 150' to 200' width; 2.5-mile length from Hampton Roads into creek to Queen Street bridge.<br><br>• 12' depth; 80' to 100' width; 0.6-mile length side channel connecting from main channel into Herberts (Sunset) Creek to Kecoughtan Road. | • Authorized project constructed.<br><br>• Authorized project constructed. | |
| Channel from Phoebus | • 12' depth; 150' width; 0.8-mile length from Hampton Roads to Phoebus waterfront. | • Authorized project constructed. | |
| Collection and Removal of Drift | • Collection and removal of floating debris in harbor. | • No construction facilities involved; maintenance activities only. | |
| Prevention of Obstructive and Injurious Deposits | • Prevention, detection, and prosecution of the deposit of waste, refuse, and other injurious materials into navigable waters. | • No construction facilities involved; maintenance activities only. | |

Table 4:1 (continued):

| Project | Authorized | Constructed | Not yet constructed |
|---|---|---|---|
| | | | |
| Related Projects:<br>• General | • In addition to Craney Island Dredged Material Area, the Corps of Engineers may place suitable dredged material in the following two open ocean sites; these sites have been approved by the Environmental Protection Agency. | | |
| • Dam Neck Dredged Material Area | • 10-square-mile area located about 3 miles east of Virginia Beach. | | |
| • Norfolk Dredged Material Area | • 50-square-mile area located about 17 miles east of mouth of Chesapeake Bay; unlimited useful life. | | |

(1) All depths refer to mean lower low water.
(2) The 350-foot width is based on the design for the 55-foot channel in General Design Memorandum 1, Norfolk Harbor and Channels, Virginia dated June 1986. The width needed for the inbound element will be determined during the Preconstruction Engineering and Design phase of the 50-foot inbound element, based on current requirements for inbound traffic.
(3) Please see anchorage designations for (F), (K-1), (K-2), etc., on National Ocean Service Nautical Charts (Appendix B, Table B-1).

- in some cases, the outbound element of the project has been constructed, while the inbound element has not been constructed;

- newly dredged navigation channels, as well as deepened channels, will require periodic maintenance dredging;

- three dredged material placement areas are listed -- the CIDMMA associated with the Norfolk Harbor and Channels project, the Dam Neck Dredged Material Area (a 10 square mile area located about 3 miles east of Virginia Beach), and the Norfolk Dredged Material Area (a 50 square mile area located about 17 miles east of the mouth of Chesapeake Bay); and

- navigation-related dredging has occurred for many decades in the Hampton Roads area, and it will continue as long as commercial navigation and military uses of the area are taking place.

Authorized Projects Not Yet Constructed

As can be seen from Table 4-1, a large number of projects or associated elements thereof have not yet been constructed. To provide some level of information related to the necessary dredging for deepening and widening channels, Table 4-2 summarizes the volume of dredged material for initial construction and increased annual maintenance (U.S. Army Corps of Engineers, February, 2000, pp. II-45 to II-50). Additionally, the placement areas for construction and maintenance dredging are identified (see Note 2 in the table). Further, the project elements have been grouped under categories such as "55-Foot Outbound Element". These combinations are used to demonstrate a certain progression of events. For example, it is assumed that the order of construction would be the 50-foot inbound element to complete the 50-foot channel system, then the 55-foot outbound element, and finally the 55-foot inbound element to complete the full-width 55-foot channel system. In addition, since the Channel to Newport News was dredged to a width of 800 feet during the construction of the 50-foot outbound element, it is assumed that no additional width is needed for implementation of a 50-foot full-width channel. This assumption will be confirmed during subsequent analyses. In addition, the same assumption of an 800-foot channel width applies to the 55-foot outbound element for the Channel to Newport News. The Elizabeth River Southern Branch Channels and the Deferred Anchorages are independent of this sequence and may occur at any time before, during, or after the sequence. Additional information on the elements is in the following paragraphs (U.S. Army Corps of Engineers, February, 2000, pp. II-51 to II-58).

The first grouping of elements in Table 4-2 relate to providing a viable inbound and outbound 50-foot navigation system for deep-draft containerized vessels. The outbound element of the Thimble Shoal Channel has been previously dredged to 50 feet over a 650-foot width. Accordingly, it would be necessary to dredge the inbound element to 50 feet over a width of 350 feet to attain the full-authorized 1,000-foot width. The Norfolk Harbor Reach of the Norfolk Harbor Channel would be deepened from 45

Table 4-2: Corps of Engineers Project Dredging Elements Not Yet Constructed (1)
(U.S. Army Corps of Engineers, February, 2000, pp. II-45 to II-50)

| Project | Estimated volume of dredged material for initial construction (1,000 cubic yards) | Estimated cycle for maintenance (years) | Estimated volume of dredged material for increased annual maintenance (1,000 cubic yards) | Placement area (2) | Reference document |
|---|---|---|---|---|---|
| 50' Inbound Element (Full-Width Channels): | | | | | General Design Memorandum 1, Norfolk Harbor and Channels, Virginia dated June 1986. (3) |
| • Thimble Shoal Channel: Construct to 50' depth; 350' width. (3) | 2,613 | 3 | (5) | Dam Neck | |
| • Norfolk Harbor Channel: Construct to 50' depth; 150' to 350' width. (3) | 1,228 | 1 | (5) | Dam Neck | |
| • Channel to Newport News. (4) | -- | -- | -- | -- | |
| • Total | 3,841 | | (5) | | |
| 55' Outbound Element: | | | | | Supplemental Engineering Report to General Design Memorandum 1, (cont'd) |
| • Atlantic Ocean Channel: Construct to recommended 60' depth; 650' width. | 9,600 | 5 | 100 | Dam Neck | |
| • Thimble Shoal Channel: Construct to authorized 55' depth; 650' width. | 7,400 | 3 | 21 | Dam Neck | |

Table 4:2 (continued):

| Project | Estimated volume of dredged material for initial construction (1,000 cubic yards) | Estimated cycle for maintenance (years) | Estimated volume of dredged material for increased annual maintenance (1,000 cubic yards) | Placement area (2) | Reference document |
|---|---|---|---|---|---|
| 55' Outbound Element (cont'd): | | | | | (cont'd) |
| • Norfolk Harbor Channel: Construct to authorized 55' depth; 650' to authorized 800' width. | 4,300 | 1 | 179 | Dam Neck | Norfolk Harbor and Channels, Virginia dated September 1989. (6) |
| • Channel to Newport News: Construct to authorized 55' depth; authorized 800' width. | 4,500 | 4 | 24 | Dam Neck | |
| • I-64 Bridge-Tunnel anchorage (F): Construct to authorized 55' depth; recommended 1,500' swinging radius. (10) | 1,500 | 4 | 20 | Dam Neck | |
| • Sewells Point easternmost anchorage (K-1): Construct to recommended 1,500' swinging radius. (10) | 3,200 | 4 | 28 | Dam Neck | |
| • Total | 30,500 | | 372 | | |

Table 4:2 (continued):

| Project | Estimated volume of dredged material for initial construction (1,000 cubic yards) | Estimated cycle for maintenance (years) | Estimated volume of dredged material for increased annual maintenance (1,000 cubic yards) | Placement area (2) | Reference document |
|---|---|---|---|---|---|
| 55' Inbound Element (Full-Width Channels): | | | | | General Design Memorandum 1, Norfolk Harbor and Channels, Virginia dated June 1986. (7) |
| • Atlantic Ocean Channel: Construct to authorized 60' depth; 650' width. (7) | 9,093 | 5 | 100 | Dam Neck | |
| • Thimble Shoal Channel: Construct from 50' to authorized 55' depth; 350' width. (7) | 2,993 | 3 | 12 | Dam Neck | |
| • Norfolk Harbor Channel: Construct from 50' to authorized 55' depth; 150' to 350' width. (7) | 3,974 | 1 | 97 | Dam Neck | |
| • Channel to Newport News. (8) | -- | -- | -- | -- | |
| • Total | 16,060 | | 209 | | |

Table 4:2 (continued):

| Project | Estimated volume of dredged material for initial construction (1,000 cubic yards) | Estimated cycle for maintenance (years) | Estimated volume of dredged material for increased annual maintenance (1,000 cubic yards) | Placement area (2) | Reference document |
|---|---|---|---|---|---|
| | | | | | |
| Elizabeth River Channel and Southern Branch Channel: | | | | | Plan of Action for Engineering and Design for Elizabeth River and Southern Branch 45-Foot and 40-Foot Improvements dated May 1988. (9) |
| • Port Norfolk, Town Point, Lower, and Middle Reaches: Construct to authorized 45' depth; authorized 375' to 750' widths. | 4,210 | 5 | 33 | Craney Island | |
| • Upper Reach: Construct to authorized 40' depth; authorized 250' to 500' widths. | 2,350 | 3 | 34 | Craney Island | |
| Deferred Anchorages: | | | | | Review Report on Channel to Newport News, Norfolk Harbor, (cont'd) |
| • Sewells Point westernmost anchorage (K-2): Construct to authorized 45' depth; authorized 1,200' swinging radius. (10) | 2,000 | 6 | 3 | Dam Neck | |

Table 4:2 (continued):

| Project | Estimated volume of dredged material for initial construction (1,000 cubic yards) | Estimated cycle for maintenance (years) | Estimated volume of dredged material for increased annual maintenance (1,000 cubic yards) | Placement area (2) | Reference document |
|---|---|---|---|---|---|
| | | | | | |
| Deferred Anchorages (cont'd): • Newport News anchorages (I-1 and I-2): Construct to authorized 45' depth; authorized 1,200' swinging radius each. (10) | 3,300 | 6 | 3 | Dam Neck | (cont'd) and Thimble Shoal Channel, Virginia dated March 1965. |

(1) All depths refer to mean lower low water. Construction of turning basins, if authorized, is included as part of respective channel segment work.

(2) This is based on the most recently approved plan for the Norfolk Harbor project deepening, as contained in the 1989 Supplemental Engineering Report. All dredged material from deepening and widening work downstream (north) of Lamberts Point would be placed in the Dam Neck Dredged Material Area. Maintenance material from inside (west of) the Hampton Roads Bridge-Tunnel would continue to be placed at Craney Island, as would all material from improvements and maintenance upstream (south) of Lamberts Point. Consideration would be given to placing beach quality sand on area beaches under authority of Section 145 of the WRDA 76, as modified by Section 933 of the WRDA 86. Should there be an increase in Craney Island capacity for any reason, consideration would be given to placing some of the dredged material in Craney Island, which would result in a significant reduction in project cost.

(3) This is based on widths associated with the 50-foot inbound element, which brings the channel to full width. Design widths for 50-foot full-width channels will be evaluated during the Preconstruction Engineering and Design phase of the 50-foot inbound element.

Table 4:2 (continued):

(4) This channel was already dredged to the full authorized width of 800 feet during the 50-foot outbound element construction. Additional channel width has not been determined to be necessary at this time.
(5) Based on experience with maintenance of the 50-foot outbound element, a significant increase in annual maintenance following the construction of these elements is not anticipated.
(6) This document recommended that all material from subsequent improvements to the 55-foot channel system should be placed in the Dam Neck Dredged Material Area.
(7) As with the 50-foot inbound element, the 55-foot inbound element would bring the 55-foot channel system to full width. Actual widths would need to be reevaluated during the Preconstruction Engineering and Design phase for this element.
(8) This channel would have already been dredged to the full authorized width of 800 feet during the 55-foot outbound element construction. Additional channel width has not been determined necessary at this time.
(9) There has been no approved document for the Elizabeth River Channel or the Southern Branch Channel elements, subsequent to the feasibility report; however, estimates for new work and maintenance were refined during the Preconstruction Engineering and Design investigations performed through 1994.
(10) Please see anchorage designations for (F), (K-1), (K-2), etc., on National Ocean Service Nautical Charts (Appendix B, Table B-1).

feet to 50 feet over the remaining 350-foot width to provide the full width of 1,000 feet; further, the actual width needed for inbound-outbound traffic at the 50-foot depth for the Norfolk Harbor Reach will be evaluated during a subsequent detailed study. The portion of the Craney Island Reach not already at 50 feet, a section of channel 150 feet wide, would also be considered during the detailed study (U.S. Army Corps of Engineers, February, 2000, p. II-51). The 50-foot inbound Norfolk Harbor Channel deepening project was scheduled to be dredged in 2003 (U.S. Army Corps of Engineers, May 28, 2003).

The second grouping in Table 4-2, the 55-foot outbound elements, includes several components. The increase from a 50-foot depth is necessary to accommodate large bulk coal carriers leaving the Port of Hampton Roads with maximum drafts exceeding 50 feet. Anchorage improvements would also be needed to accommodate these large vessels. The Atlantic Ocean Channel would be dredged to a depth of 60 feet over a width of 650 feet for a distance of about 11.1 miles. The 60-foot depth is needed to allow increased under-keel safety clearance due to sea conditions in the open ocean. The Thimble Shoal Channel would be deepened to 55 feet over the 650-foot width of the existing 50-foot outbound element. The Entrance Reach of the Norfolk Harbor Channel would be dredged to 55 feet over the 1,000-foot width of the existing channel. The Norfolk Harbor Reach of the Norfolk Harbor Channel would be dredged to a depth of 55 feet over a width of 650 feet to match the width of the existing 50-foot outbound element. In addition, the first 4,000 feet downstream from Lamberts Point would be deepened to 55 feet over the full-authorized width of 800 feet. The remaining portion of the Craney Island Reach would be deepened to the same depth over a 650-foot width to mirror the footprint of the existing outbound element. The Channel to Newport News would be deepened to 55 feet over its recommended 1,500-foot swinging radius, and the easternmost anchorage at Sewells Point (K-1) would be expanded from a 1,200-foot to its recommended 1,500-foot swinging radius (U.S. Army Corps of Engineers, February, 2000, pp. II-52 to II-53).

The 55-foot inbound element grouping in Table 4-2 would complement the 55-foot outbound element and would be required for large deep-draft vessels, such as fully-loaded supercontainer ships, inbound to the Port. Based on the assumption that the outbound element of the Atlantic Ocean Channel has already been constructed to a 60-foot depth over a 650-foot width, it would be necessary to dredge the inbound element to 60 feet over the remaining 650 feet to attain the full-recommended 1,300-foot width. In addition, the inbound element of the Thimble Shoal Channel would be deepened from 50 to 55 feet over the remaining 350-foot width to attain the full-authorized 1,000-foot width. The Norfolk Harbor Reach of the Norfolk Harbor Channel would be deepened from 50 feet to 55 feet over the remaining 350-foot width to provide the full width of 1,000 feet. The portion of the Craney Island Reach not already at 55 feet, a section of channel 150 feet wide, would also be deepened. The Channel to Newport News would have already been constructed to a depth of 55 feet over its full-authorized width of 800 feet during the construction of the 55-foot outbound element. As with the 50-foot inbound element, the actual dimensions needed to accommodate future inbound-outbound traffic within each of these channels would be evaluated during a subsequent

study for the 55-foot inbound element (U.S. Army Corps of Engineers, February, 2000, pp. II-55).

The Elizabeth River Channel and Southern Branch Channel grouping in Table 4-2 involves deepening the existing channel from 40 feet to the authorized depth of 45 feet, and it combines portions of the Elizabeth River Channel (the Port Norfolk and Town Point Reaches) and the Southern Branch Channel (the Lower and Middle Reaches). The second involves deepening the existing channel from 35 feet to the authorized depth of 40 feet in the Upper Reach of the Southern Branch. Further, a new turning basin, 40 feet deep and 800 feet square, would be constructed in the Upper Reach (U.S. Army Corps of Engineers, February, 2000, pp. II-56).

The final grouping in Table 4-2 involves "deferred anchorages". Three anchorages were previously constructed in Hampton Roads to a depth of 40 feet. Construction to their authorized depth of 45 feet was deferred until a need was determined. Two of the anchorages (I-1 and I-2) are located near the upstream terminus of the Channel to Newport News opposite the Newport News Point. The third is the westernmost (K-2) of the two anchorages located opposite Sewells Point. All three have been constructed to a depth of 40 feet over a 1,200-foot swinging radius and are authorized to a depth of 45 feet. These anchorage improvements, although deferred, have not been deauthorized and might be needed at some future time (U.S. Army Corps of Engineers, February, 2000, pp. II-57).

Maintenance Dredging

Table 4-3 provides a summary of the Corps of Engineers' maintenance dredging activities for the constructed projects/elements of projects in the Port of Hampton Roads area; the data are meant to provide a general picture of the maintenance and usage of the various navigation projects (U.S. Army Corps of Engineers, February, 2000, pp. II-17 to II-22). The actual maintenance dredging requirements and schedules are subject to changes due to navigation conditions; shoaling; Congressional actions; budget constraints within the Norfolk District or imposed by higher authority; and delays as a result of local sponsors, regulatory agencies, placement sites, and engineering, legal and contracting issues. Some observations that can be drawn from Table 4-3 include:

- when considering the dates of the last dredging and the dredging cycles, it can be noted that maintenance dredging will essentially be a continuous operation in the Hampton Roads area;

- the CIDMMA is used as the placement area for maintenance dredging conducted on the Norfolk Harbor and Channels project; further, it is used for several other projects such as the Channel to Newport News, the Atlantic Intracoastal Waterway, Lafayette River, Bennetts Creek, Newport News Creek, and Hampton Creek.

Table 4-3: Corps of Engineers Project Maintenance (1) (U.S. Army Corps of Engineers, February, 2000, pp. II-17 to II-22)

| Project | Date last dredged (Federal fiscal year) | Estimated cycle (years) (2) | Average volume per cycle (cubic yards) (2) | Placement area |
|---|---|---|---|---|
| | | | | |
| Thimble Shoal Channel | 1996 | 3 | 400,000 | Dam Neck Dredged Material Area |
| | | | | |
| Norfolk Harbor Project: | | | | |
| • Norfolk Harbor Channel | | | | |
| • Entrance Reach | 1988 | 20+ | Has not required maintenance since improved in 1988. | Craney Island Dredged Material Area |
| • Norfolk Harbor Reach and Craney Island Reach | 1999 | 1 | 1,000,000 | Craney Island Dredged Material Area |
| • Elizabeth River Channel | 1998 | 5 | 400,000 | Craney Island Dredged Material Area |
| • Southern Branch of Elizabeth River | | | | |
| • Lower Reach and Middle Reach | 1998 | 5 | (3) | Craney Island Dredged Material Area |
| • Upper Reach (4) | 1998 | 3 | 100,000 | Craney Island Dredged Material Area |
| • Eastern Branch of Elizabeth River | 1989 | 20+ | (5) | Craney Island Dredged Material Area |

Table 4:3 (continued):

| Project | Date last dredged (Federal fiscal year) | Estimated cycle (years) (2) | Average volume per cycle (cubic yards) (2) | Placement area |
|---|---|---|---|---|
| | | | | |
| • Western Branch of Elizabeth River | 1986 | 20+ | (5) | Craney Island Dredged Material Area |
| • Scotts Creek | 1932 | Has not required maintenance since initial construction in 1932. | (6) | -- |
| • Anchorages | | | | |
| • I-64 Bridge-Tunnel | 1999 | 6 | 80,000 | Craney Island Dredged Material Area |
| • Sewells Point | 1995 | 4 | 600,000 | Craney Island Dredged Material Area |
| • Lamberts Point | 1960 | (6) | (6) | -- |
| • Pinners Point | 1929 | (6) | (6) | -- |
| • Craney Island Dredged Material Area | -- | -- | -- | -- |
| | | | | |
| Channel to Newport News: | | | | |
| • Channel | 1999 | 4 | 150,000 | Craney Island Dredged Material Area |

Table 4:3 (continued):

| Project | Date last dredged (Federal fiscal year) | Estimated cycle (years) (2) | Average volume per cycle (cubic yards) (2) | Placement area |
|---|---|---|---|---|
| | | | | |
| • Anchorages | 1996 | 4 | 400,000 | Craney Island Dredged Material Area |
| | | | | |
| Atlantic Intracoastal Waterway: | | | | |
| • Albemarle and Chesapeake Canal Route (7) | 1992 | 20+ | (5) | Craney Island Dredged Material Area |
| • Dismal Swamp Canal Route (7) | 1979 | 20+ | (5) | Craney Island Dredged Material Area |
| | | | | |
| Lynnhaven Inlet | 1997 | 3 | 180,000 | Suitable material used to nourish nearby beaches; remaining material placed in upland confined area just inside inlet. |
| | | | | |
| Little River (Creek) (8) | -- | -- | -- | -- |
| | | | | |
| Willoughby Channel | 1994 | 20+ | (5) | Material used to nourish nearby beaches. |

Table 4:3 (continued):

| Project | Date last dredged (Federal fiscal year) | Estimated cycle (years) (2) | Average volume per cycle (cubic yards) (2) | Placement area |
|---|---|---|---|---|
| Lafayette River | 1993 | 20+ | (5) | Craney Island Dredged Material Area |
| Channel to Nansemond Ordnance Depot (9) | -- | (6) | (6) | -- |
| Bennetts Creek | 1998 | 3 | 20,000 | Craney Island Dredged Material Area |
| Nansemond River (10) | 1994 | 5 | 20,000 | Upland confined area adjacent to mouth of Western Branch. |
| Newport News Creek | 1998 | 8 | 50,000 | Suitable material used to nourish nearby beaches; remaining material placed in Craney Island Dredged Material Area. |
| Hampton Creek | 1997 | 8 | 100,000 | Craney Island Dredged Material Area |

Table 4:3 (continued):

| Project | Date last dredged (Federal fiscal year) | Estimated cycle (years) (2) | Average volume per cycle (cubic yards) (2) | Placement area |
|---|---|---|---|---|
| | | | | |
| Channel from Phoebus | 1944 | Has not required maintenance since last maintenance dredging in 1944. | (6) | -- |
| | | | | |
| Collection and Removal of Drift | -- | -- | -- | -- |
| | | | | |
| Prevention of Obstructive and Injurious Deposits | -- | -- | -- | -- |
| | | | | |
| Related Projects: | | | | |
| • Dam Neck Dredged Material Area | -- | -- | -- | -- |
| • Norfolk Dredged Material Area | -- | -- | -- | -- |

(1) Maintenance of turning basins is included as part of respective channel segment work.
(2) Subject to change due to many factors as discussed in the introductory text preceding this table.
(3) The Elizabeth River Channel and the Lower and the Middle Reaches of the Southern Branch are maintained as one segment.
(4) The 250-foot-wide portion of channel farthest upstream was improved during Fiscal Years 1980 and 1981 and has since not been maintained.
(5) There is a long interval between maintenance cycles; an average volume has not been established.
(6) This feature is no longer maintained.
(7) This refers only to the portion of the route downstream from the locks, either in the Southern Branch or Deep Creek.
(8) This project is maintained by the Navy.
(9) The authorized project was constructed; however, the project is no longer required, and maintenance has been discontinued.

Table 4:3 (continued):

(10) No maintenance dredging is performed on the main channel at this time since depths are adequate for the recreational craft and small commercial seafood boats that use the waterway. However, the Western Branch channel is maintained about every 5 years.

Detailed information on those projects with maintenance dredging using the CIDMMA is available elsewhere (U.S. Army Corps of Engineers, February, 2000, pp. II-24 to II-35, and II-37 to II-41).

## NAVIGATION MANAGEMENT PLAN FOR THE PORT OF HAMPTON ROADS

The U.S. Army Corps of Engineers published a Navigation Management Plan (NMP) for the Port of Hampton Roads in February, 2000. To facilitate the movement of military personnel and various goods and products to and from several marine terminals, strategically located navigation channels must be developed and maintained. Several Federally maintained deep-draft navigation channels serve the port facilities with maximum depths up to 50 feet mean lower low water (m.l.l.w.). Further, several channel deepening and anchorage projects with depths up to 55 feet have been authorized but have not yet been constructed. Long-term planning for future navigation and related needs of the Port of Hampton Roads is essential to provide for the future economic and infrastructure development and growth, and the competitiveness of the Port (U.S. Army Corps of Engineers, February, 2000, p. I-2).

The general purposes of the NMP are to provide a long-range strategy for improvements to the Port's navigation features and to ensure that these navigation features effectively accommodate future development and growth, particularly regarding changing containerization practices. The comprehensive and coordinated NMP was developed via the collaborative efforts of the Corps of Engineers, the Virginia Port Authority, and numerous other stakeholder groups and individuals. In fact, over 400 stakeholders were involved to varying extents in preparing the NMP, including Federal, state, regional, and local government agencies; large and small port-related businesses; professional groups; environmental organizations; and local universities. A smaller group of about 70 stakeholders served as principal advisors during the 3-year period the NMP was being formulated. They also reviewed and approved the NMP. In addition, these stakeholders have the responsibility of updating the NMP periodically -- every 3 to 5 years -- to ensure that the information contained therein remains viable and useful. Detailed listings of the various stakeholder groups and persons are available elsewhere (U.S. Army Corps of Engineers, February, 2000, pp. II-33 to II-38, and F-1 to F-32). Three public workshops and other stakeholder meetings were held from 1997 to 1999. The group of 70 stakeholders was directly involved in identifying and prioritizing the problems, needs, concerns, and opportunities associated with the use and development of the Port.

### Problems, Needs, Concerns, and Opportunities

Table 4-4 contains a non-prioritized list of specific problems, needs, concerns, and opportunities identified during the development of the NMP (U.S. Army Corps of Engineers, February, 2000, pp. IV-6 to IV-9). Descriptive information on each listed item is in the NMP (U.S. Army Corps of Engineers, February, 2000, pp. IV-10 to IV-24).

Table 4-4: Identified Problems, Needs, Concerns, and Opportunities (U.S. Army Corps of Engineers, February, 2000, pp. IV-6 to IV-9)

I. Anchorages

A. Sewells Point: Need to deepen the westernmost anchorage opposite Sewells Point (K-2) from 40 feet to the authorized depth of 45 feet (6)

B. Sewells Point: Need to increase the swinging radius in the easternmost, 45-foot-deep anchorage opposite Sewells Point (K-1) from the authorized radius of 1,200 feet to the recommended radius of 1,500 feet (6)

C. Sewells Point: Need to make broader use of the anchorages opposite Sewells Point (K-1 and K-2) (6)

D. Lamberts Point: Need to make broader use of the anchorages opposite Lamberts Point (H-1) (6)

E. Newport News: Need to deepen both anchorages opposite Newport News (I-1 and I-2) from 40 feet to the authorized depth of 45 feet (6)

F. Hampton Roads Bridge-Tunnel: Need to deepen the 1,500-foot swinging radius anchorage (F) just west of the Hampton Roads Bridge-Tunnel from 50 feet to the authorized depth of 55 feet (6)

G. Need additional anchorages

II. Channels

A. Depths

1. Norfolk Harbor Channel: Need to deepen the inbound lane from 45 feet to 50 feet to Lamberts Point (1)
2. Norfolk Harbor Channel: Need to deepen the inbound lane from 45 feet to the authorized depth of 55 feet to Lamberts Point (2)
3. Norfolk Harbor Channel: Need to deepen the outbound lane from 50 feet to the authorized depth of 55 feet to Lamberts Point (3)
4. Elizabeth River Channel: Need to deepen from 40 feet to the authorized depth of 45 feet from Lamberts Point to the junction of the Eastern and Southern Branch Channels
5. Southern Branch Channel: Need to deepen from 40 feet to the authorized depth of 45 feet to the Norfolk Southern Railroad bridge
6. Southern Branch Channel: Need to deepen from 35 feet to the authorized depth of 40 feet to the Gilmerton Bridge
7. Channel to Newport News: Need to deepen the inbound lane from 50 feet to the authorized depth of 55 feet (4)
8. Channel to Newport News: Need to deepen the outbound lane from 50 feet to the authorized depth of 55 feet (5)

Table 4:4 (continued):

B. Widths
   1. Need to deepen the entire easternmost anchorage area opposite Sewells Point (K-1) and a small section of channel to 50 feet to provide easier transit between the Norfolk Harbor Channel and the Channel to Newport News; in addition, the K-1 anchorage would need to be relocated (6)
   2. Need to deepen the entire easternmost anchorage area opposite Sewells Point (K-1) and a small section of channel to 55 feet to provide easier transit between the Norfolk Harbor Channel and the Channel to Newport News; in addition, the K-1 anchorage would need to be relocated (6)

C. Maintenance dredging: Continued and timely maintenance of port channels

D. Crossings
   1. Bridges
   2. Tunnels
   3. Utility crossings

E. Multiple-use conflicts: Potential conflicts between recreational, commercial, and military uses

F. Navigation aids
   1. Better channel markings
   2. More lighted buoys

G. Obstructions
   1. Derelict vessels, sunken barges, etc.
   2. Debris and drift material
   3. Docked boats that obstruct view of navigation channel

III. Dredged Material Placement Areas
   A. Need to extend life of Craney Island Dredged Material Area and/or locate alternative future placement sites
   B. Use of Craney Island Dredged Material Area for port development

IV. Environmental Concerns
   A. Contaminated areas along rivers and on river bottoms
   B. Deep channel effects on currents and depths in the vicinity of the Norfolk Naval Base
   C. Water quality
   D. Wetlands

Table 4:4 (continued):

V. Funding

VI. Landside Concerns
- A. Receiving, storage, and transfer facilities
- B. Intermodal facilities that may impact navigation
- C. Land for future development
- D. Police and fire protection
- E. Productive workforce
- F. Impact of port growth on the host cities

VII. Navigation Information
- A. Depths
- B. Tides
- C. Currents
- D. Waves
- E. Weather
- F. Waves
- G. Weather

VIII. Rules and Regulations
- A. Dredging permits
- B. Unnecessary and burdensome

IX. Supplemental Facilities
- A. Turning basins
- B. Piers and wharves
- C. Berthing and mooring areas
- D. Additional dolphins for commercial vessels at Great Bridge Lock
- E. Recreational boating facilities

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(1) This segment of channel also requires the deepening of the inbound lane of the Thimble Shoal Channel from 45 feet to 50 feet.

(2) This segment of channel also requires the deepening of the inbound lane of the Thimble Shoal Channel from 45 feet to the authorized depth of 55 feet and the Atlantic Ocean Channel to the recommended depth of 60 feet.

(3) This segment of channel also requires the deepening of the outbound lane of the Thimble Shoal Channel from 50 feet to the authorized depth of 55 feet and the Atlantic Ocean Channel to the recommended depth of 60 feet.

Table 4:4 (continued):

(4) This segment of channel also requires the deepening of a portion of the inbound lane of the Norfolk Harbor Channel from 45 feet to the authorized depth of 55 feet, the inbound lane of the Thimble Shoal Channel from 45 feet to the authorized depth of 55 feet, and the Atlantic Ocean Channel to the recommended depth of 60 feet.
(5) This segment of channel also requires the deepening of a portion of the outbound lane of the Norfolk Harbor Channel from 50 feet to the authorized depth of 55 feet, the outbound lane of the Thimble Shoal Channel from 50 feet to the authorized depth of 55 feet, and the Atlantic Ocean Channel to the recommended depth of 60 feet.
(6) Please see anchorage designations for (F), (K-1), (K-2), etc., on National Ocean Service Nautical Charts (Appendix B, Table B-1).

Information related to seven of the listed items is presented below; these items are relevant for this cumulative effects study.

- Need to Extend the Life of the CIDMMA and/or Locate Alternative Future Placement Sites (Item III.A in Table 4-4)

  "It is imperative that the Hampton Roads maritime interests implement a practical and feasible long-range solution for placement of dredged material. It is important to plan for and implement suitable, well placed, environmentally acceptable, and economically viable dredged material placement areas to ensure the effective and efficient maintenance of the Port. The channels and other navigation features in Hampton Roads must be appropriately maintained if the area's nationally vital commercial and military functions are to continue. To meet the future dredged material placement needs, consideration would have to be given to the expansion of the CIDMMA and/or finding, acquiring, and developing alternative sites. The provision of adequate future areas will require addressing concerns such as environmental issues, wetlands, and competing land uses" (U.S. Army Corps of Engineers, February, 2000, pp. IV-16).

- Use of the CIDMMA for Port Development (Item III.B in Table 4-4)

  "Port interests have long recognized the outstanding potential available to make use of part of the CIDMMA for future development. Its location, adjacent to deepwater channels, presents exceptional advantages for Port use. The Virginia General Assembly has authorized the Craney Island Study Commission, which is comprised of representatives from the VPA, the City of Portsmouth, the Hampton Roads Maritime Association, and the Army Corps of Engineers, to examine current use and future expansion of the CIDMMA and recommend appropriate future use of the area. The potential expansion of the facility could provide areas for development of an additional container facility to accommodate future growth while providing for the future efficient and cost-effective placement of dredged material from adjacent channels" (U.S. Army Corps of Engineers, February, 2000, pp. IV-16 and IV-17).

- Contaminated Areas Along Rivers and on River Bottoms (Item IV.A in Table 4-4)

  "Many years of industrial and commercial use have resulted in contaminants located along the shores of the harbor and in bottom sediments. The worst of these areas are located within the Elizabeth River Basin, specifically its Southern Branch. However, there may be other problem areas within the Port, that are outside the scope of the Elizabeth River Basin study" (U.S. Army Corps of Engineers, February, 2000, p. IV-17).

- Deep Channel Effects on Currents and Depths in the Vicinity of the Norfolk Naval Base (Item IV.B in Table 4-4)

"Concern was expressed with the impacts, if any, of adjacent deep-draft channels on the currents and depths in the vicinity of the Naval Base" (U.S. Army Corps of Engineers, February, 2000, p. IV-17).

- Water Quality (Item IV.C in Table 4-4)

"Several concerns were expressed regarding the improvement of water quality within the Port. These concerns are as follows: (1) facilities should be provided for proper disposal of on-board waste, especially with respect to recreational boats and marinas; (2) the direct pumping of bilge water into the harbor should be eliminated; (3) container facilities should be designed to include elements that reduce or eliminate untreated stormwater runoff, provide adequate containment areas for liquid and gas containers, and provide elements to eliminate possible contamination during transfer; (4) bulk cargo storage facilities should be designed to reduce emissions of dust and debris into air, water, and soil; (5) eliminate and/or control what is commonly referred to as "prop" dredging; and (6) provide for the proper handling of contaminated dredged material" (U.S. Army Corps of Engineers, February, 2000, pp. IV-17 and IV-18).

- Wetlands (Item IV.D in Table 4-4)

"Concerns have been expressed regarding the filling and draining of wetlands of the waterways of Hampton Roads over many years. This type of wetland alteration and destruction has likely reduced the diversity of fish and wildlife in the area and served to reduce water quality. Restoration of these wetlands would benefit fish and wildlife resources, improve water quality, and generally make the area more aesthetically pleasing" (U.S. Army Corps of Engineers, February, 2000, p. IV-18).

- Multiple-Use Conflicts (Item II.E in Table 4-4)

"The various uses of the waterways in the Hampton Roads area can, at times, be incompatible with each other. Since waterways are limited in space and, as more users and uses are introduced in the water, demand and competition for space increases and conflicts may occur. Use conflicts may result in boating accidents, user complaints, disturbances of wildlife and wildlife habitat, water quality degradation, or boat wake erosion of wetlands and/or private waterfront property. The need exists for improved waterway use management in the Hampton Roads area and for increased awareness of existing concerns by localities, resource management agencies, and the state legislature" (U.S. Army Corps of Engineers, February, 2000, pp. IV-14 and IV-15).

Prioritization of Items

Prioritization of the items in Table 4-4 was then accomplished by the group of 70 stakeholders. The group considered the following alphabetized list of 18 factors in determining prioritized scores (U.S. Army Corps of Engineers, February, 2000, pp. IV-24 and IV-25): (1) benefits; (2) business -- attraction and location of new domestic and foreign business; (3) commerce; (4) competitiveness of the Port; (5) congestion, delays, and losses; (6) costs; (7) dredging cost efficiency; (8) economic impacts; (9) efficiency/productivity; (10) environmental quality; (11) fiscal impact on host cities; (12) growth of Port; (13) landside development; (14) mega ship operation; (15) military importance; (16) safety; (17) seasonal pleasure boat operation; and (18) vessel traffic.

Based upon the results of this Prioritization process, further consideration was then given to the "top 15" prioritized items from Table 4-4. The "top 15" are listed in Table 4-5 (U.S. Army Corps of Engineers, February, 2000, pp. V-2 and V-3). The "top 15" prioritized items can be considered in relation to the relative probability of occurrence of RFFAs by the Norfolk District of the Corps, and others as appropriate. Additional summary information related to the description of each item; the relevant proposed action to address the item; the expected accomplishments if the action is implemented, along with the anticipated economic costs and benefits, and the possible environmental impacts; and the division of various responsibilities by federal, state, and local entities, is available for each of the 15 items (U.S. Army Corps of Engineers, February, 2000, pp. V-3 to V-76).

The following observations can be made regarding the "top 15" prioritized items listed in Table 4-5:

- continued maintenance dredging of existing channels is the top priority item;
- 8 of the items involve dredging to deepen existing channels, and 2 are related to deepening anchorage areas;
- extending the life of the CIDMMA, and use of the CIDMMA for port development are numbers 3 and 4 in the 15-item list;
- water quality is the single environmental issue included in the list; and
- the funding item on the list relates to the ever-present concern that there is rarely sufficient money to meet all the needs for port operations and development, thus expenditures in relation to prioritized items will help to insure that available funds are used efficiently and effectively.

Table 4-5: Prioritized Concerns Selected for Evaluation (U.S. Army Corps of Engineers, February, 2000, pp. V-2 and V-3)

| Concern | Priority ranking |
|---|---|
| Maintenance dredging: Continued and timely maintenance of port channels | 1 |
| Norfolk Harbor Channel: Need to deepen the outbound lane from 50 feet to the authorized depth of 55 feet to Lamberts Point | 2 |
| Need to extend life of Craney Island Dredged Material Area and/or locate alternative future placement sites | 3 |
| Use of Craney Island Dredged Material Area for port development | 4 |
| Norfolk Harbor Channel: Need to deepen the inbound lane from 45 feet to 50 feet to Lamberts Point | 5 |
| Elizabeth River Channel: Need to deepen from 40 feet to the authorized depth of 45 feet from Lamberts Point to the junction of the Eastern and Southern Branch Channels | 6 |
| Norfolk Harbor Channel: Need to deepen the inbound lane from 45 feet to the authorized depth of 55 feet to Lamberts Point | 7 (tie) |
| Funding | 7 (tie) |
| Channel to Newport News: Need to deepen the outbound lane from 50 feet to the authorized depth of 55 feet | 9 |
| Southern Branch Channel: Need to deepen from 40 feet to the authorized depth of 45 feet to the Norfolk Southern Railroad bridge | 10 (tie) |
| Need to deepen the entire easternmost anchorage area opposite Sewells Point (K-1) and a small section of channel to 50 feet to provide easier transit between the Norfolk Harbor Channel and the Channel to Newport News; in addition, the K-1 anchorage would need to be relocated (1) | 10 (tie) |
| Southern Branch Channel: Need to deepen from 35 feet to the authorized depth of 40 feet to the Gilmerton Bridge | 12 |
| Water quality | 13 |

Table 4:5 (continued):

| Concern | Priority ranking |
|---|---|
| Channel to Newport News: Need to deepen the inbound lane from 50 feet to the authorized depth of 55 feet | 14 |
| Need to deepen the entire easternmost anchorage area opposite Sewells Point (K-1) and a small section of channel to 55 feet to provide easier transit between the Norfolk Harbor Channel and the Channel to Newport News; in addition, the K-1 anchorage would need to be relocated (1) | 15 |

(1) Please see anchorage designations for (K-1), (K-2), etc., on National Ocean Service Nautical Charts (Appendix B, Table B-1).

Implementation Strategy

The February, 2000, NMP also includes an implementation strategy for the "top 15" items as listed in Table 4-5. The strategy was developed by the group of 70 stakeholders as described above. The following 8 decision criteria were considered in the formulation of the strategy (U.S. Army Corps of Engineers, February, 2000, p. VI-1): (1) priority/preference/acceptability; (2) costs; (3) benefits; (4) efficiency (cost-effectiveness); (5) environmental impacts (beneficial and adverse); (6) completeness/compatibility; (7) effectiveness (alleviation of problems and/or achievement of opportunities); and (8) funding/cost-sharing capabilities.

Table 4-6 summarizes the implementation strategy developed by the stakeholders (U.S. Army Corps of Engineers, February, 2000, p. VI-18 to VI-20). New construction for channel elements includes the various channel deepening considerations for the Norfolk Harbor Channel, the Channel to Newport News, the approach channels, the Elizabeth River Channel, the Southern Branch Channel, and the widening of the turning area at the Sewells Point Anchorage. Other new construction elements include the extension of the life of the CIDMMA. Ongoing strategic elements include maintenance dredging, funding, and water quality. The new construction elements associated with extending the useful life and port development of the CIDMMA and the ongoing strategic elements would be accomplished concurrently with the implementation of the channel elements of the NMP (U.S. Army Corps of Engineers, February, 2000, p. VI-3). As can be seen from Table 4-6 the timing of RFFAs is inferred by the "order of implementation" column. Additional details on each element in Table 4-6 are available elsewhere (U.S. Army Corps of Engineers, February, 2000, pp. VI-4 to VI-17). To illustrate the ongoing nature of the element on water quality, it should be noted that the report on the Elizabeth River Ecological Restoration Program was issued in June, 2001 (U.S. Army Corps of Engineers, June, 2001).

Finally, a built-in feature of the NMP is a procedure for periodically updating the Plan, including the methodology for adding current pertinent data to ensure information in the Plan remains viable and useful in the future. Such updates are perceived as necessary due to anticipated changes in the patterns of Port usage, the initiation of new projects, and the accumulation of trends information related to the quality and quantity of environmental and natural resources. Subject to the availability of funds, it has been proposed that the NMP be completely reviewed and updated, as appropriate, every 5 to 6 years, and that an abbreviated review be conducted every 2 to 3 years, primarily to ensure that listed points of contact and other rapidly changing information are as accurate as possible (U.S. Army Corps of Engineers, February, 2000, p. I-42).

WATER-RELATED LAWS, REGULATIONS, AND PROGRAMS

A large number of Federal and state laws, regulations and programs relate to the aquatic environment, particularly with regard to water quality and aquatic ecology. Further, such institutional requirements have existed in the past, are currently in

Table 4-6: Long-Term Planning Strategy Summary (1) (U.S. Army Corps of Engineers, February, 2000, pp. VI-18 to VI-20)

| Element | Order of implementation | Circle "A" priority | Current status | Future action required | Time frame for accomplishing future action required (2) |
|---|---|---|---|---|---|
| Inbound channels to 50-foot depth | 1 | 5 | In PED (3) | Complete PED and construct | Short term |
| Widening turn at Sewells Point (K-1) anchorage to 50-foot depth (4) | 2 | 10 (tie) | N/A | Obtain formal local sponsor support and funding for PED | Short term |
| Outbound channels to to 55-foot depth | 3 | 2 and 9 | Authorized for construction | Obtain formal local sponsor support and funding for PED | Mid term |
| Widening turn at Sewells Point (K-1) anchorage to 55-foot depth (4) | 4 | 15 | N/A | Obtain formal local sponsor support and funding for PED | Mid term |

Table 4:6 (continued):

| Element | Order of implementation | Circle "A" priority | Current status | Future action required | Time frame for accomplishing future action required (2) |
|---|---|---|---|---|---|
| Elizabeth River and Southern Branch Channels to 45-foot depth | 5 | 6 and 10 (tie) | Authorized for construction | Obtain formal local sponsor support and funding for PED | Long term |
| Southern Branch Channel (Upper Reach) to 40-foot depth | 6 | 12 | Authorized for construction | Obtain formal local sponsor support for completion of PED | Long term |
| Inbound channels to 55-foot depth | 7 | 7 (tie) and 14 | Authorized for construction | Complete PED | Long term |
| Extend life of Craney Island Dredged Material Area | Concurrent with channel elements | 3 | Feasibility report underway | Complete feasibility report and initiate PED | Mid term |

Table 4:6 (continued):

| Element | Order of implementation | Circle "A" priority | Current status | Future action required | Time frame for accomplishing future action required (2) |
|---|---|---|---|---|---|
| Port development of Craney Island Dredged Material Area | Concurrent with channel elements | 4 | Feasibility report underway | Complete feasibility report and initiate PED | Mid term |
| Maintenance dredging | Ongoing | 1 | Ongoing | Obtain sufficient and timely funding | Ongoing |
| Funding | Ongoing | 7 (tie) | Ongoing | Keep decision maker informed of needs and requirements | Ongoing |
| Water quality | Ongoing | 13 | Ongoing | Ensure rules and regulations are clearly defined and adequately enforced | Ongoing |

(1) All depths refer to mean lower low water.
(2) Short term 1 to 3 years; mid term 3 to 10 years; long term over 10 years.
(3) PED stands for Preconstruction Engineering and Design Phase.
(4) Please see anchorage designations for (K-1), etc., on National Ocean Service Nautical Charts (Appendix B, Table B-1).

operation, and are anticipated to extend into the future. This section summarizes various laws and permits, along with management goals for the James River.

Pertinent Federal and State Laws

As shown in Table 4-7, several Federal and state laws and regulations are applicable to the variety of activities in the Hampton Roads area (U.S. Army Corps of Engineers, February, 2000, pp. D-1 and D-2). Many of the laws and regulations include permit programs administered by a variety of Federal and state agencies. It is anticipated that these programs will continue and thus they should be considered as RFFAs. Examples of these programs in the Hampton Roads area are described in the following paragraphs.

Permit Programs

The U.S. Army Corps of Engineers Regulatory Program includes both Section 10 and Section 404 permits. Section 10 of the Rivers and Harbors Act of 1899 requires a permit prior to the accomplishment of any work in or over navigable waters of the United States, or that affects the course, location, condition, or capacity of such waters. Typical activities requiring Section 10 permits include (1) construction of piers, wharves, bulkheads, dolphins, marinas, ramps, floats, intake structures, and cable or pipeline crossings; and (2) dredging and excavation. Section 404 of the Clean Water Act requires a permit prior to discharging dredged or fill material into the waters of the United States. Typical activities requiring Section 404 permits include (1) depositing of fill or dredged material in waters of the United States or adjacent wetlands; (2) site development fill for residential, commercial, or recreational developments; (3) construction of revetments, groins, breakwaters, levees, dams, dikes, and weirs; and (4) placement of riprap and road fills. Persons, firms, or agencies (including Federal, state, and local governmental agencies) planning to work in navigable waters of the United States, or dump or place dredged or fill material in waters of the United States, must first obtain a Section 10 or Section 404 permit (U.S. Army Corps of Engineers, February, 2000, pp. D-3 and D-4). Table 4-8 summarizes three types of permits which may be used by the Corps in the Hampton Roads area (U.S. Army Corps of Engineers, February, 2000, pp. D-5 to D-7).

The Habitat Management Division of the Virginia Marine Resources Commission operates a shoreline permit program that encompasses subaqueous habitat preservation and the protection and preservation of tidal wetlands and coastal primary sand dunes. The evaluation of proposed shoreline projects requires the balanced considerations of often complex environmental, socio-political, and economic factors. For example, recent difficult decisions have been required for new marina development, particularly in localities without local zoning, and for proposed marina expansions which conflict with shellfish growing areas. The permits issued by the Habitat Management Division are of three types: (1) subaqueous or bottomlands, (2) tidal wetlands, and (3) coastal primary sand dunes. The process relies on a single Virginia joint local/state/Federal permit application. The review portion of the process takes into

Table 4-7: Federal and State Laws and Regulations Applicable to the Hampton Roads Area (U.S. Army Corps of Engineers, February, 2000, pp. D-1 and D-2)

**FEDERAL**

- Title 14, United States Code, Coast Guard
- Title 15, United States Code, Commerce and Trade
- Title 19, United States Code, Customs and Duties
- Title 33, United States Code, Navigation and Navigable Waters
- Title 46, United States Code, Shipping
- Federal Water Pollution Control Act (Clean Water Act)--33 United States Code Sections 1251 to 1376
- Rivers and Harbors Act of 1899 (Protection of Navigable Waters and of Harbor and River Improvements Generally)--33 United States Code Sections 401 to 467e
- National Environmental Policy Act (NEPA)--42 United States Code Sections 4321 to 4347
- Fish and Wildlife Coordination Act--16 United States Code Sections 661 to 666c
- Oil Pollution Act of 1990--33 United States Code Sections 2701 to 2761
- Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), amended by Superfund Amendments and Reauthorization Act of 1986 (SARA)--42 United States Code Sections 9601 to 9675
- Coastal Zone Management Act of 1972--16 United States Code Sections 1451 to 1464
- Marine Protection, Research and Sanctuaries Act of 1972 (Ocean Dumping Act)--33 United States Code Sections 1401 to 1445
- Magnuson-Stevens Fishery Conservation and Management Act--16 United States Code Sections 1801 to 1883

Table 4:7 (continued):

- Endangered Species Act--16 United States Code Sections 1531 to 1544
- Marine Mammal Protection Act--31 United States Code Sections 1361 to 1421
- Coastal Wetlands Planning, Protection and Restoration Act--16 United States Code Sections 3951 to 3956

**STATE**

- Code of Virginia Title 28.2 Fisheries and Habitat of the Tidal Waters
  - Chapter 12 Submerged Lands, Sections 28.2-1200 to 28.2-1213
  - Chapter 13 Wetlands, Sections 28.2-1300 to 28.2-1320
  - Chapter 14 Coastal Primary Sand Dunes and Beaches, Sections 28.2-1400 to 28.2-1420
- Code of Virginia Title 62.1--Waters of the State, Ports and Harbors
- Virginia Administrative Code Title 9, Environment
  - Virginia Water Protection Permit (VWPP) Regulation--9 VAC 25-210-10 et seq.
  - Chesapeake Bay Preservation Area Designation and Management Regulations--9 VAC 10-20-10 et seq.
  - Virginia Pollutant Discharge Elimination System (VPDES) Permit Regulation--9 VAC 25-31-10 et seq.

Table 4-8: Types of Permits Under the Regulatory Program of the U.S. Army Corps of Engineers (U.S. Army Corps of Engineers, February, 2000, pp. D-5 to D-7)

| Type of Permit | Explanation |
|---|---|
| Individual | Requires public interest review of an individual application. The permit decision is generally based on the outcome of a public interest-balancing process, where the benefits of the project are balanced against the detriments. A permit will be granted unless the proposal is found to be contrary to the public interest. |
| Nationwide | A form of a general permit that authorizes a category of activities meeting specific conditions. The following types are potentially applicable in the Hampton Roads area:<br><br>• Nationwide 3: Repair, rehabilitation, or replacement of a structure or fill that was previously authorized and currently serviceable. The structure or fill must not be significantly changed.<br>• Nationwide 12: Utility lines placed across a waterway. Discharge of bedding and backfill material is permitted if bottom contours are not changed.<br>• Nationwide 18 and/or 19: Single projects of less than 10 cubic yards of fill. These permits allow up to 25 cubic yards of either fill or excavation provided that notification is given to the Corps prior to any work being undertaken.<br>• Nationwide 13: Bank stabilization projects less than 500 feet long containing less than an average of 1 cubic yard of material per running foot. The activity must be necessary for erosion protection and may not exceed the minimum amount needed for erosion protection. Fill is not to be placed in wetland areas or in a manner that impairs water flow. Materials free of waste metal products and unsightly debris must be used and the activity must be a single, complete project.<br>• Nationwide 14: Minor road crossing fills (temporary or permanent) that place less than 200 cubic yards of fill below the ordinary high water mark. The crossing must be bridged or culverted to prevent restriction of high flows. The fill placed in waters of the United States is limited to no more than one third of an acre. |

Table 4-8 (continued):

| | |
|---|---|
| Regional | Regional permits are used for a general category of activities when: (1) the activities are similar in nature and cause minimal environmental impact (both individually and cumulatively), and (2) the regional permit reduces duplication of regulatory control by state and Federal agencies. The following types are potentially applicable in the Hampton Roads area:<br><br>• Regional Permit 15: Allows the maintenance dredging of existing ditches in navigable waters in order to maintain drainage from upland areas with notification to the Corps.<br>• Abbreviated Standard Permit 18: Allows for expedited review of projects determined to have minimal environmental consequence after submittal of a Joint Permit Application and proper notice procedures.<br>• Regional Permit 19: Allows for work such as utility lines, aerial transmission lines, maintenance dredging of previously authorized projects, or bulkhead and/or riprap with associated backfill, provided that a Joint Permit Application is submitted and proper authorization is received from the state and/or local permitting agencies. This regional permit is specifically acknowledged by the Corps.<br>• Regional Permit 40: Allows the removal of sediment and debris to prevent the loss of property or reduce flooding and/or erosion or maintenance dredging of serviceable impoundments, including stormwater management facilities, flood control structures, public lakes, and ponds in order to reestablish their original design contours or capacity. This permit requires notification to the Corps prior to any work and written verification that the project complies with the conditions of the subject permit. |

account various local, state, and Federal statues governing the disturbance or alteration of environmental resources. The Virginia Marine Resources Commission plays a central role as an information clearinghouse for all three levels of review. Specific applications receive independent review by local wetland boards, the Virginia Marine Resources Commission, the Virginia Department of Environmental Quality, and the Corps of Engineers (U.S. Army Corps of Engineers, February, 2000, pp. D-7 to D-10).

The Virginia Department of Environmental Quality (DEQ) issues a Virginia Water Protection Permit (VWPP) for an activity requiring a Clean Water Act Section 401 certification if it has determined that the proposed activity is consistent with the provisions of the Act and will protect in-stream beneficial uses. The preservation of in-stream flows for purposes of the protection of navigation; fish and wildlife resources and habitat; and recreation, cultural, and aesthetic values; and the maintenance of waste assimilation capacity all represent beneficial uses of Virginia's waters. Prior to the issuance of a VWPP, the Virginia DEQ shall consult with, and give full consideration to the written recommendations of, the following agencies: (1) the Department of Game and Inland Fisheries, (2) the Department of Conservation and Recreation, (3) the Virginia Marine Resources Commission, (4) the Department of Health, (5) the Department of Agriculture and Consumer Services, and (5) any other interested and affected agencies. Such consultation shall include the need for balancing in-stream uses with off-stream uses. Projects that require Federal permits for discharge of dredged material or fill in a waterway or wetland (Section 404), work or construction in a navigable waterway (Section 10), or a water withdrawal will be reviewed by the Virginia DEQ for issuance of a VWPP. Without the VWPP (formerly called the 401 Certification), the Federal permits will not be issued (U.S. Army Corps of Engineers, February, 2000, pp. D-11 to D-12).

Management Programs

In 1988, the Chesapeake Bay Preservation Act (CBPA) was enacted by the Virginia General Assembly. The focus of the CBPA is on reducing nonpoint source pollution that could occur in Chesapeake Bay or its tributaries. Water quality improvement and correction is encouraged by requiring wise resource management practices in the use and development of environmentally sensitive land features. Such practices stress the concept that land can be used and developed in ways that minimize impact on water quality. Pertinent counties, cities, and towns are encouraged to incorporate general water quality protection measures into their comprehensive plans, zoning ordinances, and subdivision ordinances. The CBPA also established the Chesapeake Bay Local Assistance Board to provide information and promulgate regulations that establish criteria for use by local governments to determine the ecological and geographic extent of special areas for protection. The Board also promulgates regulations containing criteria for use by local governments in granting, denying, or modifying requests to rezone, subdivide, or use and develop land in these areas (U.S. Army Corps of Engineers, February, 2000, pp. D-17 to D-23).

Finally, nutrient and sediment reduction goals have been established as part of the water quality management strategy for the James River. For example, the goals are as follows (Virginia Secretary of Natural Resources, et al., 2000, p. 4):

- Achieve a 9% sediment reduction from the levels that existed in 1985 for the entire basin by the year 2010.

- For all areas draining directly to the tidal fresh portion of the James, Biological Nutrient Removal (BNR) implementation at point sources and an equivalent reduction in nonpoint sources by 2010. This would result in a 32% nitrogen and 39% phosphorus reduction, based on model simulation, in loading to the River from the levels that existed in 1985.

- The net nutrient loadings to the lower estuary from all areas should not be allowed to increase and should be capped at 1996 levels. Growth in load corning from areas directly adjacent to the lower estuary should not exceed the reduced load coming from the tidal fresh portion of the river. The resulting zero net increase in loading to the lower estuary will prevent any degradation relative to current water quality conditions.

If the above goals are met, the following improvements would occur to aquatic resources: (1) SAV growth in areas of the tidal fresh James River previously identified by VIMS as historic SAV beds; and (2) substantial reductions in chlorophyll levels throughout the Hampton Roads area (Virginia Secretary of Natural Resources, et al., 2000, p. 4). Finally, the overall "vision" for the James River is for an ecologically, aesthetically and economically vibrant River, characterized by: (1) all waters meeting the Federal Clean Water Act goals of "fishable and swimmable" with no waters impaired as the result of biological, chemical or physical deterioration due to human activities; and (2) restoration of critical shelter and spawning habitat to provide for resurgence and maintenance of numerous ecologically and economically important species of finfish and shellfish (shad, herring, menhaden, oysters, crabs, rockfish, among others) (Virginia Secretary of Natural Resources, et al., 2000, p. 7)

OTHER EXISTING AND CONTINUING PROJECTS

Numerous marine terminals, industrial and governmental projects and activities exist in the vicinity of the CIDMMA; the majority in the following non-exhaustive list occur along the western shoreline of Norfolk and the shorelines of the Elizabeth River and its tributaries. The projects and activities include (U.S. Army Corps of Engineers, December 4, 2003):

- Arthur B. Sandler
- Bill Chandler
- Braint Capps
- City of Hampton -- Hampton Creek

- City of Norfolk -- Nauticus
- Colonna's Shipyard -- Colonna's Shipyard Marine
- David Powell, et al.
- Dominion Terminals
- Elizabeth River Terminals
- Marine Hydraulic International
- Metro Machine Corporation
- Moon Engineering Company
- Navy Fuel Terminal
- Newport News Shipyard
- Norfolk and Southern Corporation
- NORSHIPCO
- Pier IX Terminal
- Corp.
- Portsmouth Yacht Club
- PreCon Marine, Inc.
- Solite Corporation
- TARMACK, America
- United Winner Metals
- US Coast Guard -- ISC Portsmouth
- Virginia Port Authority -- Portsmouth Marine Terminals, Newport News Marine Terminals, and Norfolk International Terminals

One project from the above list will be highlighted because it is located in close proximity to the CIDMMA; namely, the Navy Fuel Terminal. The Craney Island Fuel Terminal of the U.S. Navy is located on 1100 acres to the immediate south of the CIDMMA. The operations, which originated in 1918, have evolved over time. The Terminal is currently the Navy's largest fuel facility in the United States. Both underground storage tanks (USTs) and aboveground storage tanks (ASTs) are used at the Terminal to store jet and diesel fuel. The four groups of USTs include three groups of concrete tanks built in 1942 and one group of steel tanks built in 1953. One of these USTs is a confirmed leaking tank that was cleaned and abandoned in 1989. Consequently, free product remains in the ground around the tank and the site is identified officially as a Defense Environmental Restoration Account (DERA) site. The Virginia Department of Environmental Quality (VDEQ) requires recovery of this free product to preclude contamination of ground water and seepage into State waters (U.S. Navy, undated). The free product is being recovered from the surface of the ground water via a skimmer tubing system. Fuel-contaminated soil is being treated via operation of a 15-acre biological treatment cell that is bermed on all sides, and has sumps for the collection of irrigation and rainwater. Beneath a 12-18 inch layer of contaminated soil is a sand layer, followed by a polyethylene liner, another sand layer, a geogrid liner, and finally, a compacted clay base. After the fuel-contaminated soil is added to the cell, it is tilled, fertilized, and irrigated on a regular schedule until the treatment objectives are met (U.S. Navy, undated).

# CHAPTER 5

# CURRENT PROJECTS AND ACTIONS

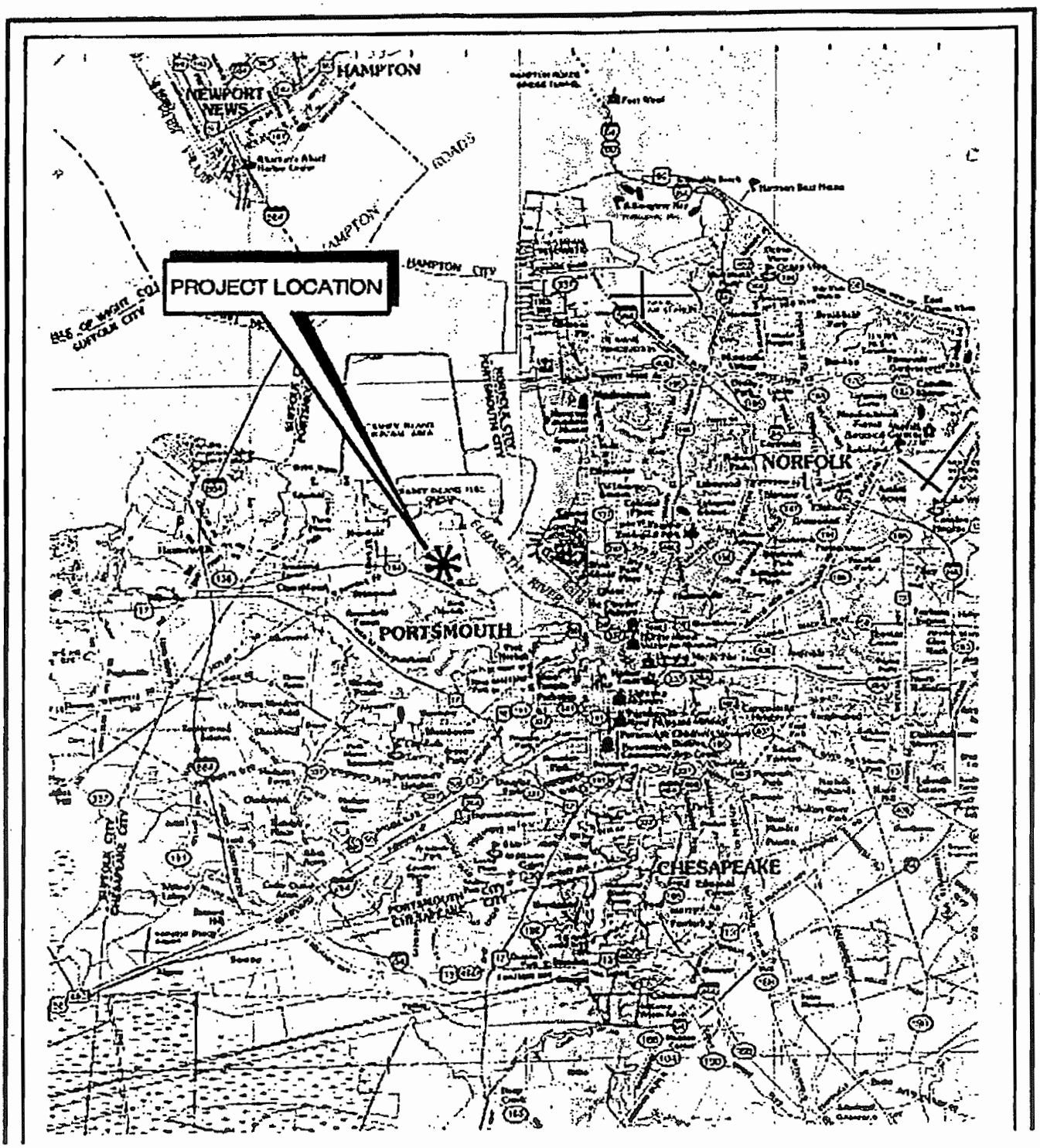
This chapter summarizes information on three current projects and actions that relate to the operation and/or expansion of the CIDMMA; further, they could also contribute to cumulative effects on specific resources such as water quality and aquatic ecology. Accordingly, this chapter encompasses a portion of Step 4 in the 11-step CEA methodology. Projects and actions addressed herein include a permitted marine terminal to the south of the CIDMMA, the authorized Elizabeth River Ecological Restoration Program which is in the design phase, and the Pinner's Point Flyover highway project that is under construction. Information is included on the anticipated adverse and beneficial impacts of each project or program.

## MARINE TERMINAL TO THE SOUTH OF THE CIDMMA

### Introduction

The Regulatory Program of the Norfolk District of the U.S. Army Corps of Engineers recently authorized a permit to APM Terminals Virginia, Inc. to construct and operate a privately owned marine container terminal along the Elizabeth River in the City of Portsmouth, Virginia. The APM Terminals property is an approximate 576-acre parcel located along the west bank of the Elizabeth River, immediately north of the Western Freeway and about 1.0 mile south of the existing United States Coast Guard facility. As shown in Figure 5-1, the property is located about 1.6 miles south of the CIDMMA (U.S. Army Corps of Engineers, May 28, 2003). The proposed terminal will include 4,000 feet of berthing facilities along the Elizabeth River, an approximate 300-acre marine container facility adjacent to the berthing facilities, and road and rail infrastructure to access the terminal. Waterborne access to the facility will occur via the Craney Island Reach, which currently provides deep-water access for vessel traffic utilizing numerous existing terminal facilities located on the Elizabeth River (U.S. Army Corps of Engineers, May 28, 2003).

Containerized cargo growth in the Hampton Roads area is expected to continue for some time. As a result, the Virginia Port Authority predicts the existing marine container facilities in the Hampton Roads area will run out of capacity by 2008. The current APM Terminal facility in Portsmouth, Virginia, is operating at capacity. Accordingly, the purpose of the new facility is to provide a modern, deep-water access, privately owned and operated marine container terminal in an existing commercial port community on the Atlantic Coast. The terminal will serve APM Terminals' growing local Hampton Roads and Midwest containerized freight customer markets (U.S. Army Corps of Engineers, May 28, 2003).




2.4 MILES 1.2 0 MILES 2.4 MILES

SCALE 1 INCH = 2.4 MILES

Figure 5-1: Project Vicinity Map – APM Terminal (U.S. Army Corps of Engineers, May 28, 2003)

Project Features

Specific features of the on-site plan for the APM Terminal include (U.S. Army Corps of Engineers, May 28, 2003):

- developed terminal area -- 291.2 acres
- wharf length -- 4,000 feet
- wharf footprint -- 9.6 acres
- open water fill -- 2.07 acres
- wetland and mudland fill -- 6.88 acres of forested non-tidal wetlands, 6.95 acres of tidal vegetated wetlands, and 10.15 acres of tidal mudflat -- total of 23.98 acres
- dredging of one-way approach channel to berthing area to occur from February, 2004, to June, 2006
- on-land site preparation work to occur from September, 2004, to September, 2006
- the target date for the opening of the terminal is Spring, 2007

An approach channel to the berthing facilities will be required; accordingly, the plan provides a 600 foot wide, 3,962 foot long, one-way approach channel in the Elizabeth River. The approach channel is flared at both the east end adjoining the Craney Island Reach and the west end adjoining the 600 foot wide vessel berthing area. The berthing area is approximately 4,500 feet from Craney Island Reach. The proposed dredge depths will provide (-50+2) feet MLLW at the toe of slope along the approach channel and within the berthing area. A 200 foot wide strip within the berthing area immediately adjacent to the channelward side of the wharf footprint will be dredged to (-55+2) feet MLLW in order to facilitate container loading and unloading during low tide cycles while vessels are berthed (U.S. Army Corps of Engineers, May 28, 2003).

The approach channel dredging will disturb approximately 189 acres of river bottom. Dredge volumes are on the order of 10.3 million cubic yards (CY). Approximately 30% or 3.1 million CY of the dredge material will be a sandy silt composition, and the remaining 70% or 7.2 million CY is primarily clayey with some organic content. Some of the dredged materials will contain contaminants such as cadmium and polychlorinated biphenyls (PCBs). The dredged material will be directly disposed via pipeline to the CIDMMA. Under current conditions, the CIDMMA is estimated to last until 2029 based on projected total inflows of about 100 mcy. If all the APM Terminal material is placed at the site, the CIDMMA capacity will be reached in 2025 (U.S. Army Corps of Engineers, May 28, 2003).

The key environmental impacts which are anticipated from the construction and operation of the APM Terminal, and which are related to this cumulative effects study for the CIDMMA, are summarized in the following subsections and bulleted points. These points are based on the "bottom-line" summaries of impacts as contained in the Environmental Assessment (EA) for the Terminal (U.S. Army Corps of Engineers, May 28, 2003, pp. 5-20). Supporting details are in the EA and its related reports.

Project Impacts on Physical Resources

The anticipated impacts of the APM Terminal on physical resources include the following:

- Substrate Conditions -- Only minimal adverse effects are anticipated because dredged material disposal in the CIDMMA will isolate metals and organic contaminants from the natural environment. In fact, polluted sediment removal from the Elizabeth River may have a beneficial effect. Based on sediment transport modeling, the secondary impact associated with re-suspension of sediments and releases of contaminants and their transport out of the dredge area is also expected to be minimal.

- Water Quality Impacts of Dredging -- The proposed dredge plan has been developed in a manner to minimize both the short term and long term effects of the suspended sediment plume. This project proposes the use of suction cutter head dredging equipment that minimizes turbidity plumes compared to the typical clamshell dredge. The sediment that is disturbed by the cutterhead dredge remains primarily in the lower portion of the water column. The Elizabeth River system adjacent to the project site recovers rapidly; dredge-induced suspended sediment concentrations decrease to less than 5 mg/l within 2 days following the termination of dredging operations. Therefore, minimal dredging impacts on water quality are anticipated.

- Water Quality Impacts of Storm Water -- Several State agencies administer regulations designed to protect water quality from storm water impacts, such as the VPDES program (VDEQ), Virginia's Storm water Management Regulations (VDCR), and the Chesapeake Bay Preservation Act (Chesapeake Bay Local Assistance Department [CBLAD]). Accordingly, storm water quality is a major regulatory issue that will require comprehensive planning during all phases of the project. Regulatory requirements will be met and environmental impacts avoided by a comprehensive storm water management plan that provides appropriate best management practice (BMP) technology and is designed to achieve a high level of treatment for the facility. Therefore, minimal storm water impacts on water quality are anticipated.

- Hydrology -- A modeling investigation was used to evaluate ambient current circulation patterns in the Elizabeth River to determine the freshwater flushing capacity of the Elizabeth River and Lake Kingman resulting from storm water

runoff from the marine container terminal. Both hydrodynamic and water quality modeling was accomplished. The modeling effort revealed that post-dredge ambient currents at the project site would remain very weak, averaging less than 0.02 m/sec. While there was a slight reduction in current velocity at the project location due to the deepening of the area, the magnitudes of the pre-dredging and post-dredging currents were so small that minor changes in these small currents were insignificant. The hydrodynamic results were then used in the water quality model to investigate the effect of increased runoff from the developed marine container terminal on the salinity structure in the Elizabeth River adjacent to the project site. A 25-year storm event was used as the design storm for these simulations. It was found that freshwater runoff from the project site associated with a 25-year storm event will have a short-term effect on the salinity concentration in the area immediately adjacent to the project site and no effect on areas of the Elizabeth River outside of this immediate area. Accordingly, no significant adverse effects to hydrology are anticipated.

- Groundwater Resources -- There are no designated sole source aquifers or wellhead protection areas associated with the project property. The APM Terminal project itself will not withdraw any groundwater for its use, nor is APM's use of the property the type of use that would be expected to have any impact on groundwater quality. Therefore, no significant adverse impacts on groundwater resources are anticipated.

- Soil and Mineral Resources -- The APM Terminal site is Portsmouth's largest undeveloped tract of land under a single private ownership on the Elizabeth River. Approximately 300 acres of the site will be converted from existing agricultural fields to developed area. Although this project represents a loss of agricultural soil, the City of Portsmouth's Comprehensive Plan has determined that the property is best suited for uses involving deep-water port facilities. Therefore, although this is a large loss of agricultural land, no significant impacts are anticipated.

- Air Quality -- The project area is designated as a maintenance/attainment area for ozone and it is in attainment of all other National Ambient Air Quality Standards (NAAQS). The trucks, trains, and ship traffic associated with the APM marine container terminal are not anticipated to have significant impacts on air quality nor will they degrade the areas ability to meet maintenance/attainment limits for ozone. The ship-to-shore cranes that unload and load container cargo to and from the vessels at existing APM Terminals are diesel-powered. All of the ship-to-shore cranes at the new APM Terminal facility will be electric-powered and will not generate emissions that would normally otherwise be produced by diesel-powered cranes. This project has been analyzed for conformity applicability pursuant to regulations implementing Section 176(c) of the Clean Air Act. It has been determined that the activities proposed under this permit will not exceed de minimis levels of direct emissions of a criteria pollutant or its precursors. Therefore, only minimal adverse effects are anticipated.

Project Impacts on Biological Resources

The anticipated impacts of the APM Terminal on biological resources includes the following:

- Threatened and Endangered Species -- No federally listed or state-listed threatened or endangered species have been reported for the project land area. Five federally listed turtle species appear seasonally in the lower Chesapeake Bay; they include the loggerhead, Kemp's Ridley, leatherback, Atlantic hawksbill, and the Atlantic Green Sea turtle. The loggerhead and Kemp's Ridley are also state-listed. No adverse impacts are expected on the sea turtles since dredging will be via hydraulic pipeline dredging which is not known to impact sea turtles.

- Fish and Invertebrates -- Benthic Habitat -- The benthic habitat in the Elizabeth River is currently marginal relative to quality. Specific sampling in the area to be dredged for the APM Terminal project revealed no living organisms, only shell fragments and darkened, oxygen-poor sediments. Short-term impacts to benthic resources associated with localized sedimentation during dredging operations have been evaluated. The modeling of sediment transport during dredge operations suggest that weak current velocities combined with the method of dredging will minimize sediment transport out of the dredge area. Long-term impacts to benthic resources are conversion of shallow water habitat to deep-water habitat. The largest potential impact to the benthic assemblages will be the direct loss of shallow water habitat. The area adjacent to the APM Terminal property is shallow (0 to 10 feet) in areas that have not been previously impacted by dredging. This area (approximately 100 acres) will be converted from shallow-water to deep-water habitat. A benthic survey in the vicinity of the proposed marine terminal and the access channel was conducted in July, 2003. Sampling was conducted at 10 stations as shown in Figure 5-2; five stations were in shallow water (denoted by S) and five were in deeper water (denoted by D) (U.S. Army Corps of Engineers, November, 2003, p. 13). Shallow water depths ranged from 1.2 to 5.0 meters, while the deeper depths ranged from 6.4 to 18.1 meters (Scott and Lianso, 2003). The B-IBI values for the shallow stations ranged from 1.00 to 2.67, and for the deeper stations ranged from 1.67 to 2.67. Values of less than 2.0 were classified as severely degraded, 2.0 to 2.6 were degraded, and 2.6 to less than 3.0 were marginal. Out of the 10 stations, six were severely degraded, two were degraded, and two were marginal. Accordingly, all 10 sites within the study area displayed signs of benthic community degradation. The degradation was due to low abundance and biomass within the benthic community and to the high percentage of pollution-indicative species. Therefore, the dredging will impact benthic habitat which is currently too polluted to support a healthy benthos (U.S. Army Corps of Engineers, November, 2003, p. 14). Finally, there is concern that much of the sediment in the Elizabeth River is contaminated with chemicals and metals. Constituent analysis of the sediment samples revealed areas of elevated priority pollutant metals and PCB's within the proposed dredge area. The dredging of the sediments during construction will

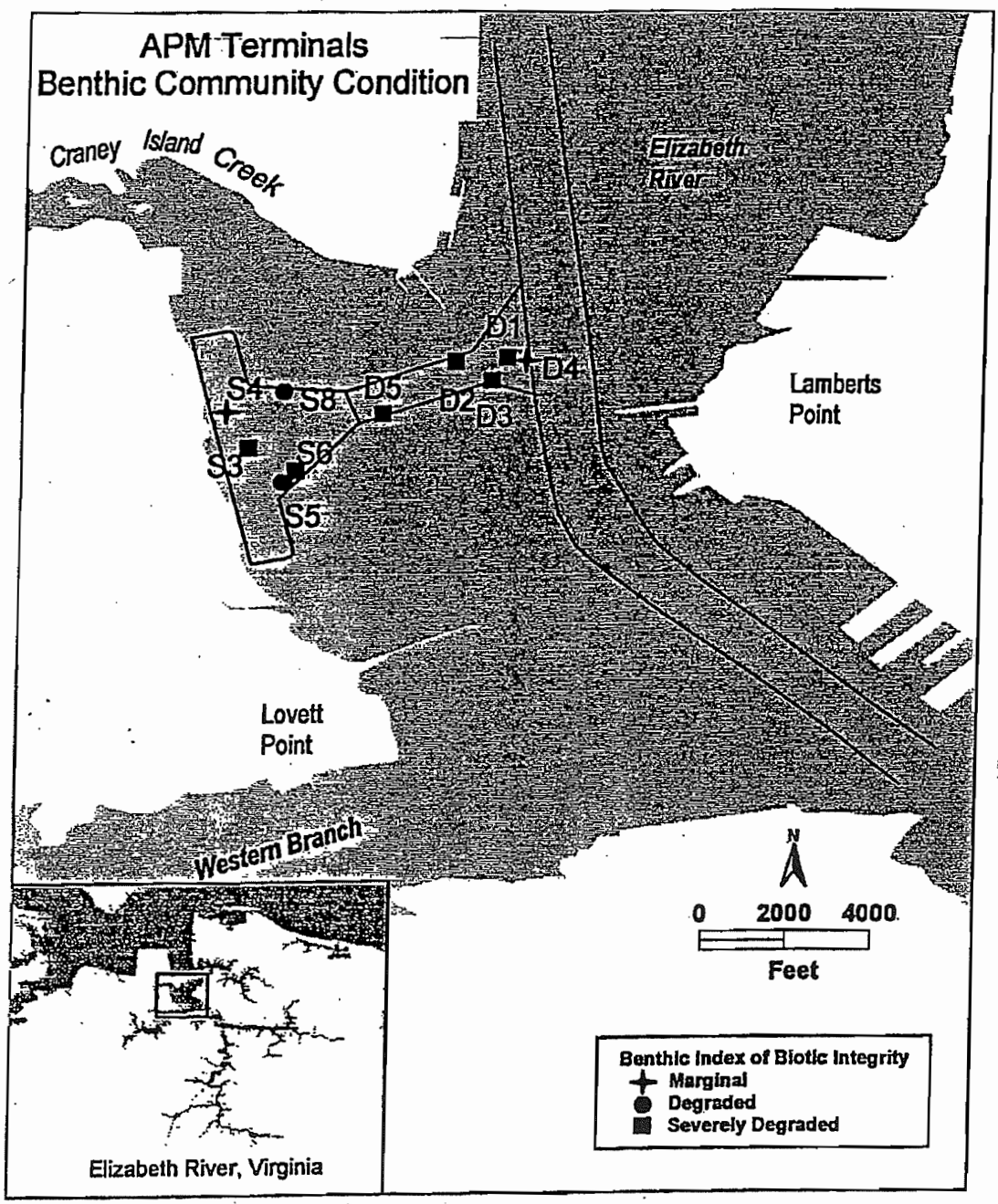



Figure 5-2: Benthic Community Condition Near the APM Terminals Property (U.S. Army Corps of Engineers, November, 2003, p. 13)

remove these polluted sediments from the Elizabeth River bottom thereby exposing healthier sediment in which organisms can recolonize. Accordingly, based on these considerations, it can be concluded that no significant adverse effects are anticipated to the benthic habitat.

- Fish and Invertebrates -- Essential Fish Habitat -- The National Marine Fisheries Service (NMFS) has defined essential fish habitats (EFHs) for 12 fish species which inhabit the lower Chesapeake Bay area during their life cycle. These species each have a designated Fishery Management Plan. The EFHs encompass requirements for the egg, larval, juvenile, and adult stages of the species. As demonstrated by a sediment transport model applied to the area to be dredged for the APM Terminal, short-term increases in turbidity and settlement associated with dredging may be detrimental to sensitive eggs, , and juvenile life stages in the localized area. Some effect on adult resident and seasonal finfish with the Elizabeth River may occur, however, the increase in suspended sediment associated with the dredging activities is on the order of background concentrations in the Elizabeth River, and within the natural short-term variability of background concentrations. Accordingly, assessment of the APM Terminal project has led to a preliminary determination that it will not have a substantial adverse effect on EFH and therefore expanded EFH consultation with the NMFS is not required. No significant adverse impacts on fish species are anticipated.

- Terrestrial Ecosystems -- The majority of the non-wetland areas present at the site are comprised of active and fallow farm fields, a portion of which will be converted into the terminal yard. The pine dominated forests found in the southern portions of the site may be impacted under the proposed mitigation plan by converting these areas to a non-tidal wetland community and replacing monotypic stands of pine with a more diverse assemblage of desirable wetland tree species. Alternatively, this pine forest may be left undisturbed and mitigation accomplished through a donation to an in-lieu fund or mitigation bank. The mature upland hardwood communities found within the western portions of the site will remain largely intact with the exception of the required linear features associated with road and rail access. Site planning has minimized these impacts by aligning infrastructure adjacent to existing facilities. Minor encroachments into existing forested areas will occur along existing roadways to provide necessary ingress and egress for both road and rail traffic utilizing the facility. The development of the facility will most notably affect current open space areas associated with active farm fields and the tidal shoreline along the Elizabeth River. Species dependant on these habitats will be eliminated. However, considering all of these changes in a collective manner, it can be concluded that no significant adverse effects are anticipated.

- Wetlands and Vegetated Shallows -- Tidal fringe wetlands along the Elizabeth River shoreline at the APM Terminal property represent areas most heavily

impacted by the project and include a scattered distribution of salt marsh cordgrass (*Spartina alterniflora)* populations on an otherwise nonvegetated sandy beach or mud flat community. The overall functional capacity for several functions (e.g. tidal surge attenuation, tidal nutrient and organic carbon exchange, sediment deposition, and wildlife habitat functions) is limited by the lack of connectivity among *Spartina* populations, the relatively small surface area in comparison with other tidal fringe systems (e.g. Craney Island Creek), and the lower relative biomass and plant density. Impacts to tidal wetlands are necessary for the proposed water-dependent facility and will be mitigated onsite. Approximately 6.95 acres of tidal vegetated wetlands will be impacted of the 29 acres of marsh on the property. Only 5 acres along the edges of the approximately 112 acre non-tidal forested, mineral flat wetland will be impacted. The rest of the forested wetland area will be preserved through conservation deed restriction. Another 1.88 acres of forested wetlands in the headwater drainages will be filled for a total of 6.88 acres of forested wetland impact. These impacts, along with those on tidal vegetated wetlands, will be fully mitigated as described later. Accordingly, no significant adverse impacts to tidal and non-tidal wetlands are anticipated.

- Mudflats -- Approximately 12 acres of tidal mudflats are located along the Elizabeth River shoreline. They may be utilized by burrowing species and as foraging areas for shore birds. Mudflat areas located landward of the proposed bulkhead line will be filled in association with the construction of the marine terminal. Those mudflat areas located channelward of the bulkhead line will be converted to deep-water habitat in association with the required dredging operation. The functional replacement of the 10.1 acres of mudflats lost has been incorporated into the overall mitigation plan to be described later. Accordingly, no significant adverse effects are anticipated.

Other Project Impacts

No significant adverse effects are anticipated to occur on cultural resources or the socioeconomic environment (land use; vessels, rail, and road traffic; noise; recreational and commercial fisheries; water-related recreation and aesthetics; and environmental justice.

Summary of Mitigation

The following mitigation perspectives and plans have been developed for the APM Terminal (U.S. Army Corps of Engineers, May 28, 2003, p. 22; and U.S. Army Corps of Engineers, November, 2003, pp. 14-15 and 28-29):

- Mitigation for dredging impacts will be provided by enhancements in water quality resulting from the project. Careful project design, elimination of uncontrolled agricultural runoff, enhanced storm water management, the removal of polluted sediments from the river bottom, and onsite wetland creation will all serve to

mitigate impacts associated with project development. These measures should result in improved water quality thereby contributing to the overall recovery of the health of the Elizabeth River and its benthic community.

- Impacts to non-tidal forested wetlands are necessary to accommodate the infrastructure required to support of project's overall purpose and need. These impacts represent the least damaging practicable alternative and are proposed to be fully mitigated. Impacts to the 6.88 acres of forested wetland will be compensated for at a 2:1 ratio for a requirement of 13.76 acres of forested wetlands. APM Terminals has agreed to make a $759,552 in -lieu fee payment into an appropriate trust fund or a forested wetland mitigation bank. The dollar amount is commensurate with the existing Virginia Wetlands Trust Fund valuation of $55,200/acre.

- Impacts to tidal wetlands and mudflat will be mitigated on-site. The proposed creation of 17.1 acres of salt marsh is based on a 1:1 creation ratio for 6.95 acres of tidal marsh impact and a 1:1 creation ratio for 10.1 acres of tidal mudflat impact.

- Impacts to 189 acres of benthos are necessary as a result of the dredging of berthing area and access channels. Long-term impacts to benthic resources are expressed as the conversion of shallow water habitat to deep-water habitat. This conversion is not expected to be significant since sampling in the vicinity of the project area has shown the benthos to be severely to marginally degraded. Mitigation for impacts resulting from the dredging of benthic habitat can be accomplished by the remediation of contaminated sediments within the Elizabeth River. APM Terminals has agreed to pay $50,000 per acre of new work dredging (100 acres) to support sediment remediation efforts in other polluted sections of the river. The $5,000,000 proposed to mitigate for dredging impacts should more than compensate for the short-term and long-term effects of the proposed dredging. ATM Terminals has proposed to contribute the $5,000,000 to the proposed Elizabeth River Trust or other appropriate in-lieu fee fund for the purpose of sediment remediation.

- In addition to the above mitigation for impacts to benthic resources, impacts associated with the filling of 2.07 acres of open water and benthic habitat will also be compensated for. Oyster reef construction has also been proposed to provide additional benefits to benthic habitat and to mitigate the potential impacts resulting from increased turbidity on existing oyster reefs in the area. The construction of a three-dimensional oyster reef is estimated at $100,000/acre and the seeding would cost approximately $50,000/acre. APM is proposing a $300,000 in-lieu fee contribution to the proposed Elizabeth River Trust Fund, or other appropriate in-lieu fee trust fund, for the creation of 2 acres of three-dimensional oyster reef including associated seeding with disease resistant oysters. APM will also deploy a sediment curtain or similar protective device to

protect the Craney Creek Oyster Reef from the effects of increased sedimentation that may result from dredging operations.

## ELIZABETH RIVER ECOLOGICAL RESTORATION PROGRAM

### Introduction

The Elizabeth River basin lies within the Southside Hampton Roads area of southeastern Virginia. As shown in Figure 5-3, it encompasses all or portions of the cites of Chesapeake, Portsmouth, Norfolk, and Virginia Beach, Virginia (U.S. Army Corps of Engineers, June, 2001, p. 19). The River itself is approximately 20 miles in length and has a total drainage area of about 300 square miles (Elizabeth River = approximately 164 square miles; Dismal Swamp = approximately 240 square miles, of which about half drains into the Elizabeth River). The River has three main branches, the Western, Eastern, and Southern. Less than 10% of the Elizabeth River basin remains undeveloped. As can be seen from Figures 5-3 and 5-4, the Elizabeth River flows northward and empties into the Hampton Roads area of the lower Chesapeake Bay, along with the James River and Nansemond River (U.S. Army Corps of Engineers, June, 2001, pp. 16, 17, and 19). The Elizabeth River discharges into the Hampton Roads area just to east of Craney Island.

At the current time, there is an existing deep draft navigation project in the Southern Branch of the Elizabeth River that varies from 35 to 40 feet in depth and is tied to the existing 40-foot, 45-foot and 50-foot outbound channels in Norfolk Harbor along the main stem of the Elizabeth River. Urban, industrial, and residential areas are located in a blended fashion along the Elizabeth River and its branches. More than 13,000 vessels, with a mix ranging from freighters and cargo ships to fishing boats and cabin cruisers use the Elizabeth River annually, many while navigating the Atlantic Intracoastal Waterway (U.S. Army Corps of Engineers, June, 2001).

### Identified Problems and Issues

Industrialization and development along the Elizabeth River, and in the entire basin, for 300 years has had detrimental effects on the ecological health of the estuarine-riverine system and the aquatic organisms that inhabit the River. Creosote plants, shipyards, dry-docks, oil terminals, and coal-loading operations that have or continue to line the River's banks have combined with urban stormwater runoff to contribute to the contamination of both water and sediment quality. Chemical pollutants, both organic and inorganic, from these sources have collected in the sediments and reached harmful levels. Health problems in fish including fin rot, tumors, cataracts, and other abnormalities have all been linked to high levels of pollutants. The pollutants of primary concern are heavy metals and polynuclear aromatic hydrocarbons (PAHs). Heavy metals have their origin in shipyards and stormwater runoff, while PAHs come from petroleum products, coal, the incomplete combustion of fossil fuels, creosote, and stormwater runoff (U.S. Army Corps of Engineers, June, 2001, p. A-3).

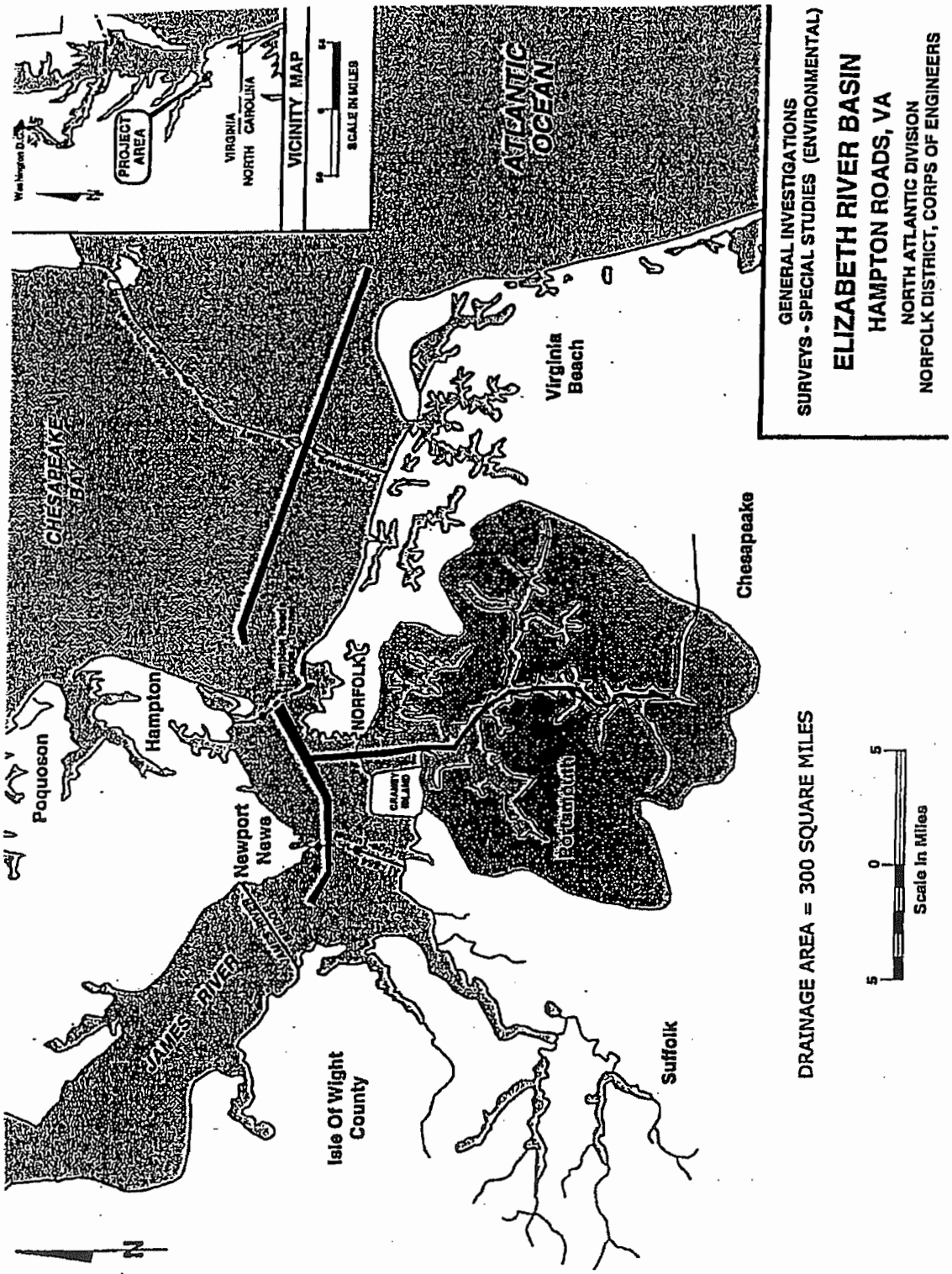



Figure 5-3: Elizabeth River Basin, Hampton Roads, Virginia (U.S. Army Corps of Engineers, June, 2001, p. 19)

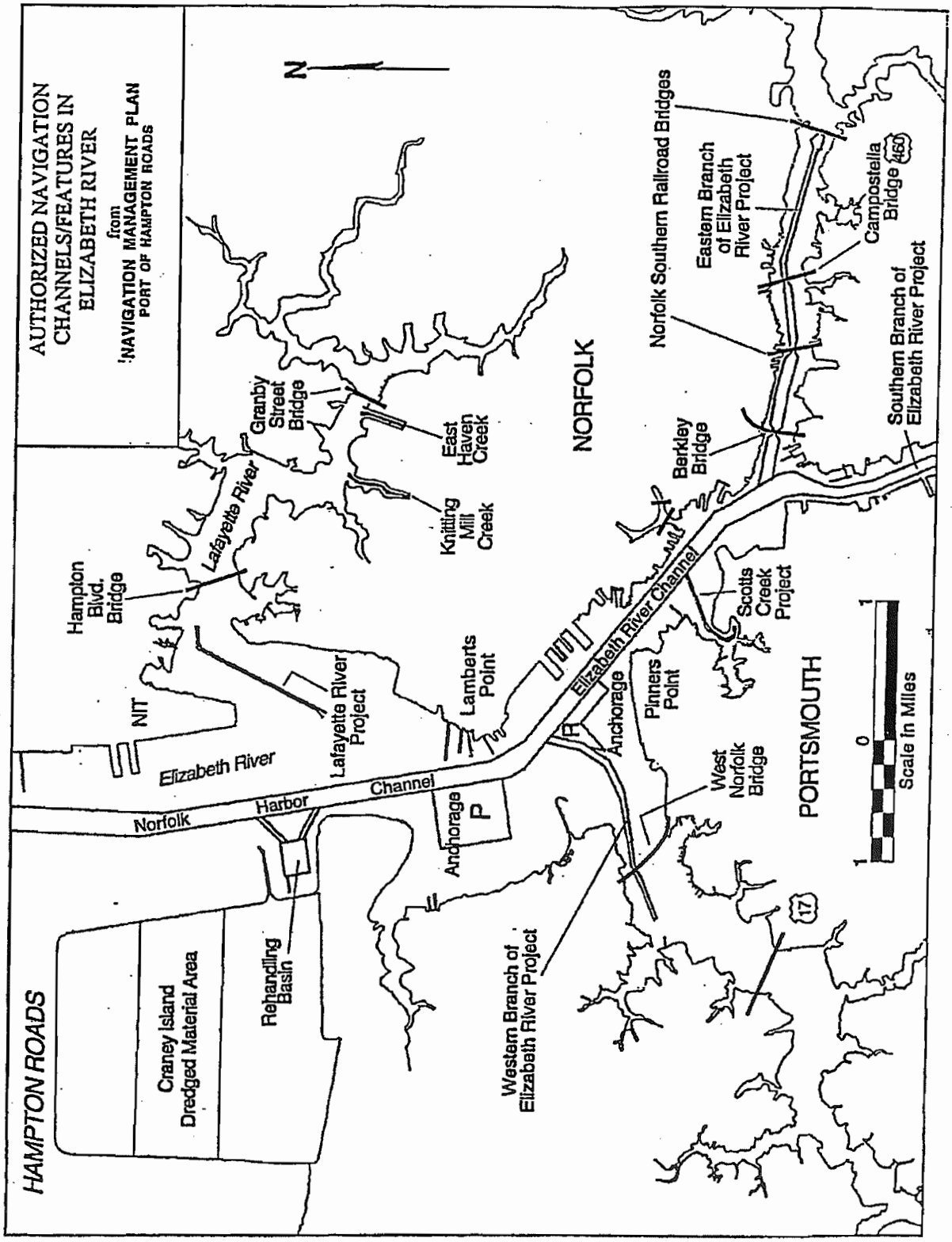



Figure 5-4: Authorized Navigation Channels and Features in the Elizabeth River (U.S. Army Corps of Engineers, June, 2001, pp. 16-17)

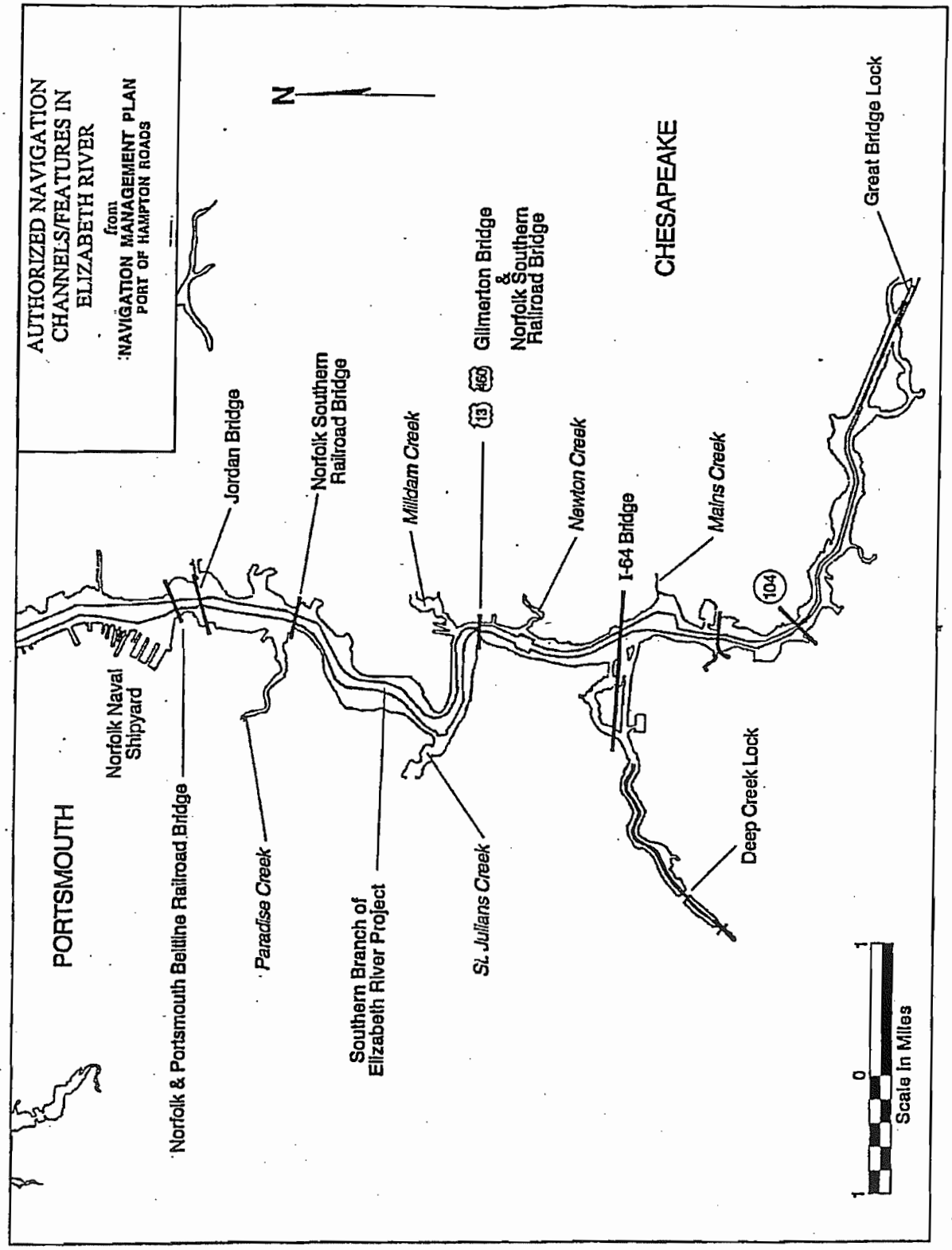



Figure 5-4 (continued):

Sediment contaminant concentrations in certain areas in the Elizabeth River are much higher than those found elsewhere in the Chesapeake Bay area. Concentrations of various contaminants are orders of magnitude above the PELs (Probable Effects Levels) and ERMs (Effects Range Median), and the sediment quality screening criteria used by the National Oceanic and Atmospheric Administration (NOAA), thus posing a significant risk to aquatic organisms. These concentrations and criteria indicate levels of contamination at which adverse ecological impacts are frequently observed (U.S. Army Corps of Engineers, June, 2001, p. EA-4).

Historically, tidal wetlands within the Elizabeth River watershed have suffered significant losses from dredging, filling, and urban development. Over 50% of the wetlands were lost in the time period from 1944-1977. Additionally, the Elizabeth River's 350-mile shoreline has experienced extensive loss of wetlands and "vegetated buffers", natural areas that mix trees, shrubs and wetland grasses. Vegetated buffers provide habitat, absorb runoff, trap sediments and filter pollutants. The vegetation also stabilizes the shoreline, takes up potentially harmful nutrients, improves aesthetics, improves air quality and controls flooding. These losses of habitat and sediment quality degradation from pollution have led to significant impacts to the biota of the Elizabeth River that have compromised its value as a riverine-estuarine system (U.S. Army Corps of Engineers, June, 2001, p. EA-4).

Because of the water and sediment quality issues and wetland losses in the Elizabeth River basin, in 1993 the Elizabeth River was designated by the Chesapeake Bay Program as one of three 'Regions of Concern" within the Chesapeake Bay area. A Region of Concern denotes an area where contaminants pose the greatest threat to natural resources.

To respond to the environmental needs in the Elizabeth River basin, and to restore the River to its highest practical level, the Norfolk District of the Corps of Engineers has partnered with several state agencies, local cities, and an environmental non-governmental organization (ENGO) to develop an Ecological Restoration Program. The partners included the Commonwealth of Virginia; the cities of Chesapeake, Norfolk, Portsmouth, and Virginia Beach; and the Elizabeth River Project (a non-profit organization with over 500 members). The Elizabeth River Project refers to a private organization that developed a partnership of citizens, industry, governments, military, and recreational interests (Ruddy, 2002).

Components of Program

Following careful study and evaluations, the Ecological Restoration Program was proposed in 2001. This cost-shared program, which is yet to be authorized, consists of two features; (1) sediment cleanup at one location (with possible cleanup at three additional locations); and (2) wetland restoration at eight locations.

Sediment cleanup (environmental dredging) is proposed for a location at Scuffletown Creek, with possible future locations at Scott's Creek, the former Eppinger

and Russell wood treatment facility on the Southern Branch, and the Campostello Bridge area of the Eastern Branch. These locations are shown in Figure 5-5 (U.S. Army Corps of Engineers, June, 2001, Plate EA-1). The Scuffletown Creek site is in a tributary to the Southern Branch of the Elizabeth River and is located on the east bank approximately two nautical miles from the Eastern Branch/Southern Branch confluence in the city of Chesapeake and immediately south of the Jordan Bridge. Approximately 60,270 yards of contaminated sediments will be dredged from Scuffletown Creek in order to achieve a cleanup level that will sustain and restore aquatic life, including bottom dwelling organisms, crabs, shellfish, and finfish. The dredged material will be transported via barges and/or trucks to a regulated landfill for permanent placement, or to a temporary placement area for treatment, and then to the regulated landfill. Up to 50% of the dredged material may need treatment. Details on the disposal of the dredged material are still to be developed; however, no permanent placement will occur in the CIDMMA.

The second feature of the Ecological Restoration Program involves the restoration of eight wetland sites at various locations along the Elizabeth River. Restoration will involve either removal of fill material to attain intertidal salt marsh elevations, grading and planting, and/or depositing clean fill material, building an elevation for intertidal salt marsh, grading, and planting. Detailed information on the activities and impacts at the eight sites is in Table 5-1 (U.S. Army Corps of Engineers, June, 2001, pp. 143 and EA-33). The sites are also shown on Figure 5-5. The restored sites will range from 0.33 to 7.0 acres in size, with an overall improved functional quality. Exotic or disturbed site plants of low wildlife value, such as *Phragmites australis,* will be removed and the wetlands will be vegetated with higher quality native vegetation, including *Spartina* sp., *Baccharis halimifolia,* and *Iva frutescens.* The combination of these eight sites will add ecological benefits over a broad geographic area in the Elizabeth River watershed.

Additional details on both the sediment cleanup and wetland restoration projects are available elsewhere (U.S. Army Corps of Engineers, June, 2001). In addition, follow-on feasibility studies are anticipated for the three additional sites for sediment cleanup. These studies may occur over the next decade.

Impacts of Ecological Restoration Program

While the overall environmental effects (impacts) of both components of the Ecological Restoration Program are expected to be beneficial, some short-term adverse effects are anticipated during the dredging and construction phases. For example, sediment restoration involves environmental dredging, transport of dredged material by barge or truck, permanent placement in a dredged material placement site, and/or temporary placement, treatment, and permanent placement in a regulated landfill. Sediment restoration will result in improved bottom community abundance and diversity, reduced fish cancers, and reduced bottom sediment contaminants and toxicity. Further, improvements in downstream water quality should occur. Wetland restoration involves either removal of fill material to attain intertidal salt marsh

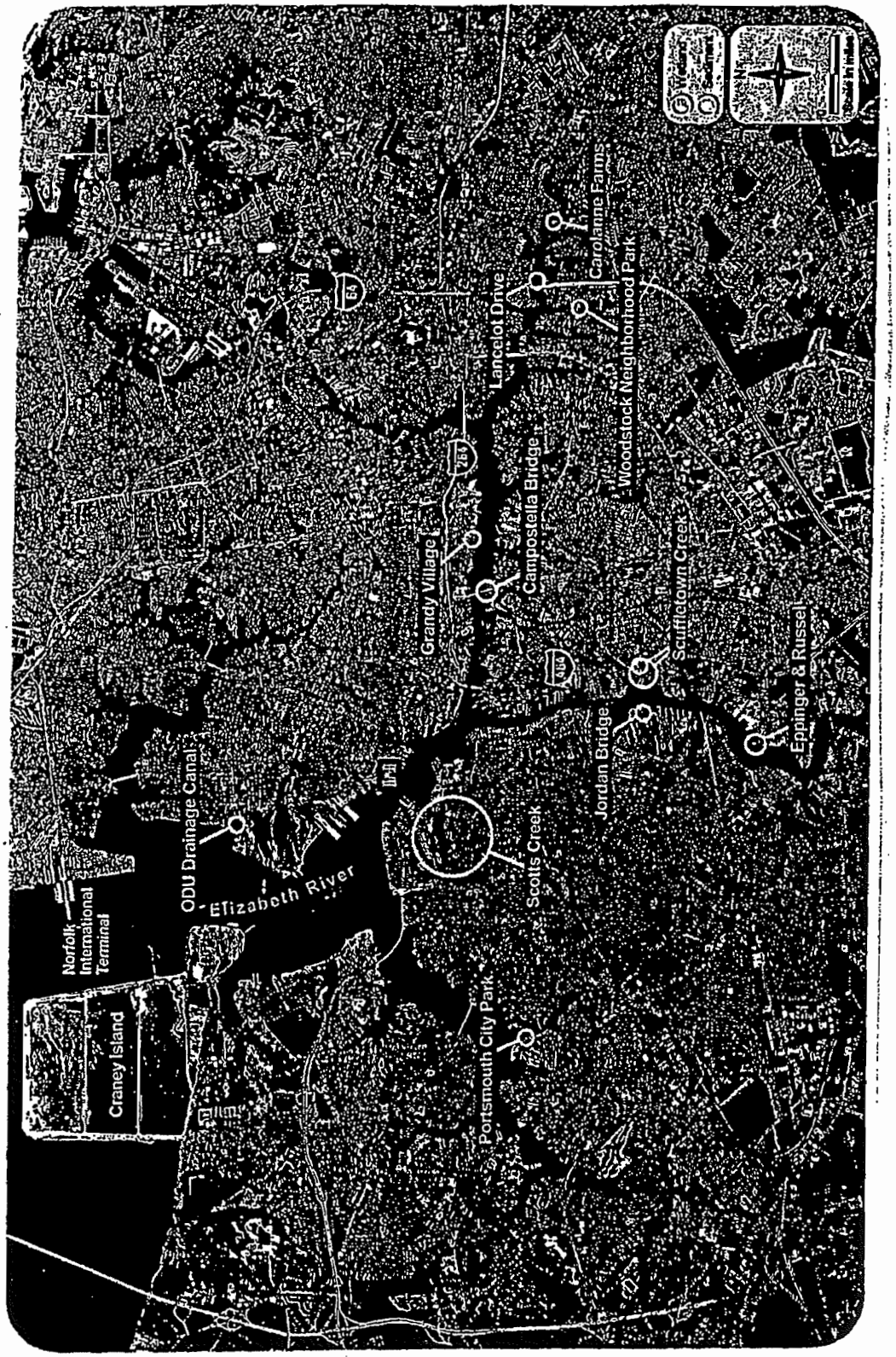



Figure 5-5: Sediment and Wetland Restoration Sites in Elizabeth River Ecological Restoration Program (U.S. Army Corps of Engineers, June, 2001, Plate EA-1)

Table 5-1: Wetland Restoration Projects in the Elizabeth River Ecological Restoration Program (U.S. Army Corps of Engineers, June, 2001, pp. 143 and EA-33)

| Site/City | Original/Restored Acres | Activities |
|---|---|---|
| 1. Scuffletown Creek<br><br>Chesapeake | 0.08/0.33 | Grading and removal of upland fill material from historical wetland; some high marsh areas (saltbush and common reed) will be converted to emergent marsh areas (Spartina sp.) |
| 2. East of Chesterfield Heights<br><br>Norfolk | 2.90/7.00 | Grading and removal of upland fill material from historical wetland; some high marsh areas (*Phragmites* sp. - common reed) will be converted to emergent marsh areas (Spartina sp.) |
| 3. West of Old Dominion University (ODU Drainage Canal) Norfolk | 0.03/0.60 | Conversion of approx. 1.2 ac of intertidal and shallow water habitat to 1.2 ac of Spartina sp. Marsh; area degraded due to high stormwater sediment input |
| 4. Portsmouth City Park<br><br>Portsmouth | 0.16/0.85 | Grading and removal of upland fill material from historical wetland; minor conversion of emergent marsh to shallow tidal gut (500 square feet) to provide tidal exchange to restored marsh |
| 5. Northwest side Jordan Bridge<br><br>Portsmouth | 0.095/1.20 | Conversion of approx. 1.2 ac of intertidal and shallow water habitat to 1.2 ac of Spartina sp. Marsh; area degraded due to high stormwater sediment input |
| 6. Woodstock Neighborhood Park Virginia Beach | 0.11/1.60 | Conversion of approx. 1.6 ac of shallow water habitat in man-made borrow pit to 1.6 ac of Spartina sp. marsh |
| 7. I-64 Crossing of E. Branch (Lancelot Drive/Avalon Hills) Virginia Beach | 1.30/5.40 | Grading and removal of (dredged) fill material from historical wetland; some higher marsh species (common reed) will be converted to emergent marsh species (Spartina sp.) |
| 8. Carolanne Farm Park<br><br>Virginia Beach | 0.022/1.22 | Grading and removal of upland fill material; minor conversion of emergent marsh to shallow tidal gut (250 square feet) to provide tidal exchange to restored marsh |
| | Total = 4.7/18.2 | |

elevations, grading, and planting; and/or depositing clean fill material, building an elevation for intertidal salt marsh, grading, and planting. In higher wave energy environments, protective features such as rock sills will be constructed. Wetland construction will result in the creation and/or restoration of approximately 18 acres of wetland habitat, 3 acres of riparian buffer habitat, and 1 acre of tidal creeks. These wetlands and restored adjoining areas will provide needed fish and wildlife habitat, and water quality benefits in a largely urban river setting where natural areas are extremely scarce (U.S. Army Corps of Engineers, June, 2001, Syllabus)

Table 5-2 provides a brief summary of the effects of both wetland restoration and environmental dredging (sediment cleanup) on six environmental resources in the Elizabeth River basin (U.S. Army Corps of Engineers, June, 2001, p. EA-49). Further details related to these effects are in the interim final feasibility report and related environmental assessment (U.S. Army Corps of Engineers, June, 2001, pp. EA-51 to EA-55). All six of the types of effects in Table 5-2 have relevance to the CEA study of the eastward expansion of the CIDMMA.

In the Final Report of the U.S. Fish and Wildlife Service's review of the Ecological Restoration Program, the following paragraphs were used to summarize the biological effects of the Program (U.S. Army Corps of Engineers, June, 2001, pp. EA-Appendix 1-17 to EA-Appendix 1-18):

> "Most of the biological effects of this project are positive. Impacts to water quality and upland, wetland, and shallow water fish and wildlife habitats are short-term and very limited compared to the long-term benefits derived from the habitat restoration and sediment remediation measures expected to be employed in this project. The results of the HEP analysis and the wetland functional assessment suggest that the proposed restoration projects will make a substantive environmental improvement.
>
> Temporary local effects to water quality are expected during all restoration and remediation activities. Sediments will be released to the water column during the dredging of contaminated bottom sediments at Scuffletown Creek, excavation activities at previously filled wetlands, and the placement of fill materials in shallow water areas to create the elevations necessary for intertidal wetland development. Efforts will be made to minimize the resuspension and transport of sediments during construction activities. The long-term benefits of the project to water quality in the Elizabeth River basin are expected to greatly exceed the temporary impacts. The wetland restoration projects will result in improved water quality by increasing the wetland acreage available to filter sediments and contaminants from stormwater runoff and non-point source discharges. The sediment remediation project at Scuffletown Creek will eliminate a source of contaminants that is currently contributing to the decline of water quality in the watershed and potentially causing acute and chronic toxicity to ecological receptors.

Table 5-2: Environmental Effects of Sediment Cleanup and Wetlands Restoration (U.S. Army Corps of Engineers, June, 2001, p. EA-49)

| | Wetland Restoration | Environmental Dredging |
|---|---|---|
| Air Pollution | Minor effects. CAA Conformity determination concluded air emissions safely below final rule's *deminimus* levels. | Minor effects. CAA Conformity determination concluded air emissions safely below final rule's *deminimus* levels. |
| Noise Pollution | Some short-term negative impacts to local wildlife on sites with some wetlands present. Possible short-term impacts to people living near certain sites. No long-term negative effects. | Possible short-term impacts to citizens using public city park near mouth of Scuffletown Creek. Effect should be very minimal. No long-term negative effects. |
| Water Quality | Possible erosion of sediments during construction phase will be mitigated using BMPs and placement of temporary timber matting and stone as needed. | BMPs will be employed to minimize impacts. Dredging may take place during the day with a monitor and transport scows will be watertight. Any increases in turbidity due to suspended sediments will be short-lived. |
| Destruction of Manmade and/or Natural Resources | No manmade structures will be effected, certain facilities (hiking trails, boat launches, benches) will be improved or have improved access/aesthetics due to project. Natural resources will be enhanced by the project. | No manmade resources will be negative effected. Local benthos will be removed by the dredging, but the area should repopulate quickly. Long-term effects should increase species diversity and abundance. |
| Wetlands | Loss of approx. 1.4 acre mudflats and 1 acre shallow water adjacent to stormwater input.<br>Gain of approx. 13 acres emergent salt marsh and 5 acres of high marsh (saltbush). | Removal of contaminated sediments from shallow water areas. Long term improvement in bottom community health. |
| Essential Fish Habitat (EFH) | No EFH would be adversely effected by the project. | Short-term decrease in food supply due to removal of local benthos by dredging. Suspended sediments will be minor and localized in a relatively secluded portion of the river. EFH will be enhanced from reduced sediment contamination which will result in increased abundance & diversity of benthic invertebrate food items for fish, and reduced incident of fish cancers, tumors, and abnormalities. |

Notes: CAA = Clean Air Act; BMP = best management practice

In many of the wetland restoration projects, habitat that is currently in the form of upland, degraded high marsh dominated by *Phragmites,* and shallow water habitat, will be converted to low saltmarsh containing *Spartina* sp. Most of the upland sites and degraded high marsh sites, with the possible exception of Woodstock Neighborhood Park, are fill areas that historically supported emergent saltmarsh. The shallow water habitat that currently dominates the ODU drainage canal site receives large inputs of sediment laden stormwater runoff and is expected to be degraded due to the presence of runoff-derived contaminants. Creation of an emergent wetland at the mouth of the canal will provide water quality and habitat benefits that do not currently exist. Shallow water habitat that will be converted to wetland through filling at the Jordan Bridge is most likely contaminated with industrial contaminants from nearby wood treating facilities. The creation of wetlands at the Jordan Bridge will provide a net benefit to the local aquatic community by covering contaminated sediments and increasing the runoff filtering capacity of the embayment. Approximately 250 square feet of emergent marsh at Carolanne Farms will be excavated to establish a tidal connection between the restored marsh and nearby marshes. However, the project will result in a net increase of 1 acre of tidal emergent wetland".

In conclusion ----- "The Elizabeth River Environmental Restoration Project will improve fish and wildlife habitat value within the Elizabeth River watershed by: (1) creating, improving, and enhancing wetland and upland areas that are breeding, nursery, and foraging habitats for fish and wildlife; and (2) reducing the threat to biological resources at certain locations where sediment contamination exists. The Service therefore concurs with Norfolk District's recommended plan of implementing sediment cleanup in Scuffletown Creek and wetland restoration at eight sites described earlier in this report. Because the environmental impacts of the project are overwhelmingly beneficial and more than offset the minor and temporary impacts from construction activities, the Service also concurs with Norfolk District's Finding of No Significant Impact."

Summary of Environmental Assessment

The environmental assessment of the above-identified effects of the Ecological Restoration Program was concluded with the preparation of Finding of No Significant Impact (FONSI). The concluding statements listed below are in the FONSI (U.S. Army Corps of Engineers, June, 2001, front pages of EA):

- "Some bottom dwelling organisms and their habitat will be disturbed and/or lost with construction. Existing communities are already disturbed so some minor losses during construction are more than compensated by enhanced opportunities to feed, spawn, and inhabit clean bottom sediments and restored wetlands following restoration. Therefore, there will be an overall improvement in environmental quality in the river.

- Shellfish resources will not be impacted adversely by construction of the project. Commercially exploitable benthic resources (clams and oysters) are

not present in the project areas of the Elizabeth River. Essential Fish habitat (EFH) would not be adversely affected by project activities. Precautions will be taken to prevent adverse impacts to finfish resources. There will be both short-term and long-term benefits to EFH from habitat restoration associated with sediment cleanup and wetland restoration including improved abundance and diversity of habitat and food sources, both of which are currently seriously degraded in the river system.

- There will be some conversion of one wetland type to another associated with wetland restoration. Wetland restoration involves construction of approximately eighteen (18) acres of intertidal wetlands. Fifteen (15) acres will be constructed by excavating upland fill materials located in prior wetlands. Approximately 1.8 acres of mud flats and shallow water at the receiving ends of major stormwater outfalls will be converted to vegetated intertidal wetlands. There will be a conversion from *Phragmites* sp. (common reed) dominated wetlands to *Spartina alterniflora* dominated wetlands at several sites. Rubble filled wetlands will be restored to their former state.

- Due to the dynamic environment of the study area, aquatic organisms are constantly adapting to changes caused by the natural forces of winds, waves, currents, and tides. In addition, there are man-induced disturbances such as boat traffic, which routinely cause resuspension of sediments in the river. Immediate water quality impacts caused by construction for wetland restoration and sediment removal would be temporary and short-lived and are not expected to exceed natural or man-induced disturbances. No significant long-term adverse effects are anticipated. Projects have been developed consistent with the Clean Water Act, Section 404(b)(1) Guidelines.

- The conclusions of this assessment are based on an evaluation of the effects that the proposed action would have on the total ecosystem including the land, air, and water resources of the Elizabeth River watershed. Implementing the preferred alternative that includes sediment cleanup at Scuffletown Creek and wetland restoration at eight sites in the river would not have a significant adverse impact on the environment. Conversely, these restoration projects are expected to contribute significantly to environmental quality improvements. Design features and best management practices have been incorporated into the project which would minimize adverse impacts to existing riparian, wetland, open water, and benthic habitat. The effect of the proposed action would not be environmentally controversial."

Complementary and continuing environmental actions by non-Corps entities are also occurring within the Elizabeth River basin. For example, Table 5-3 includes a tabulated list of such actions (U.S. Army Corps of Engineers, June, 2001, pp. 93-94). Of particular note is the monitoring of water and sediment quality. Further, site-related monitoring of the construction activities and early years of wetland restoration will also be done by the Corps and related partners. Such monitoring data will be useful in

Table 5-3: Complementary Actions of Others in the Elizabeth River Basin (U.S. Army Corps of Engineers, June, 2001, pp. 93-94).

| Action | Sponsors/Proponents | Accomplishments |
|---|---|---|
| Derelict Vessel Inventory and Removal | • Commonwealth of Virginia, Virginia Marine Resources Commission<br>• Cities<br>• Elizabeth River Project | • 145 abandoned vessels inventoried<br>• 28% (40) removed to date<br>• $100,000 funded annually |
| Monitoring of River Trends | • Commonwealth of Virginia, Dept. of Environmental Quality<br>• Elizabeth River Project | Intensive monitoring program implemented in 1998 tracks trends in water quality, sediment quality, and living resources (approx. $450,000 funded annually). |
| Leadership of Community Wide Implementation of Watershed Action Plan | • Elizabeth River Project<br>• Cities in Watershed<br>• Businesses/Industries<br>• Government<br>• Citizens | • Fosters partnership of business, government and citizen interests to implement Watershed Action Plan adopted by state in 1996<br>• River Star Program (over 60 businesses and industries have committed to pollution prevention and/or habitat enhancement)<br>• Restoration results since 1996 include 32 acres of wetlands and wildlife habitat restored; 16,000 oysters grown; 25 River Star habitat projects completed; 48,143 native plants installed at restoration sites |
| Urban Stormwater Solutions Workshop and Charrette | Elizabeth River Project and participants | Participants identified storm water problems and worked on solutions, including financing. |
| Wetland Restoration Projects | • Elizabeth River Project<br>• City of Norfolk<br>• City of Chesapeake | Completed:<br>Birdsong Wetland – Norfolk<br>Pescara Creek – Norfolk<br>Design Underway:<br>Southgate Plaza – Chesapeake – will treat urban stormwater from a 250-acre drainage area |
| Oyster Reef Restoration | • Chesapeake Bay Program<br>• VMRC<br>• Rotary Club | Since 1999, 20 acres of oyster reefs and grounds have been restored throughout the river where no productive reefs have existed for decades. |
| Water Quality Improvements | • River Stars<br>• DEQ, point source regulation<br>• Industry compliance | • By 2000, 60 organizations, including some of Virginia's largest corporations participating in programs to reduce polluted runoff: number one source of new pollution in the Elizabeth.<br>• Dissolved oxygen shows improving trends with very few values below the standard since 1996.<br>• Nutrient levels generally decreasing.<br>• Dissolved metals significantly lower than historical data suggested. |
| National Priorities List (NPL) Cleanup Actions under "Superfund" | • Atlantic Wood Industries, Inc.<br>• Norfolk Naval Ship Yard<br>• EPA<br>• DEQ | • Response actions include Remedial Investigations and cleanup activities both on land and in the S. Branch of the Elizabeth R. |

evaluating the effectiveness of the Program, and in considering cumulative effects and potential adaptive management measures.

## PINNER'S POINT FLYOVER

### Introduction

The Western Freeway Flyover, also called the Pinner's Point Flyover or Connector, is under construction by the VDOT. The Connector, which is located about 4 miles to the south of the CIDMMA, consists of a limited access highway to link Route 58, Martin Luther King Freeway, to Route 164, the Western Freeway, in Portsmouth, Virginia (Geer, 2000). The project will begin at the east end of the West Norfolk Bridge, with a six lane, offshore bridge 355 feet north of Bayview Blvd. The roadway continues eastward for 2,600 feet to an interchange with Route 58. Scott Creek and the mouth of the Western Branch of the Elizabeth River will be subject to aquatic impacts during the construction phase of the project. For example, impacts to the wetlands and waters of Scott Creek will total approximately 0.14 acres mainly to scrub-shrub wetlands located near Quebec Street. Dredging for construction access will occur at the mouth of the Western Branch and will involve about 8.14 acres of subaqueous bottom.

### Summary of Impacts

A specific impact study that was conducted for the Pinner's Point Connector involved a field study of EFH in the area, and the consideration of the effects on the EFH (Geer, 2000). As part of the study, eight species with designated EFHs were observed in the potentially affected areas, although very few of these species were directly captured in the impact area. The eight species included red drum, bluefish, black sea bass, windowpane, summer flounder, red hake, butterfish, and squid.

The construction in and around Scott Creek will only affect upper marsh and fringing wetlands. Impacts to the eight species and their EFHs will be minimal. The dredging to be performed near the mouth of the Western Branch will be performed by clamshell or dragline. The dredged material itself will be disposed at the CIDMMA. However, the dredging process will cause localized and short-term increases in turbidity. Nonetheless, the impact area has primarily a sand to mud bottom with little vegetation and scattered shell. It is heavily commercialized and frequented by recreational fishermen. Of the species with EFH in this area of the Elizabeth River and Western Branch, only summer flounder and red hake were found at or near the site in any frequency. All eight species are migratory and highly mobile. Increased turbidity may simply displace juvenile and adult fishes. However, due to the low catch rates, it is unlikely the Pinner's Point Connector project will cause any lasting effects on the species' health or abundance (Geer, 2000).

# CHAPTER 6

# PROPOSED PROJECTS AND POTENTIAL FUTURE PROJECTS

This chapter summarizes information on two projects and actions that relate to the operation and/or expansion of the CIDMMA; further, they could also contribute to cumulative effects on specific resources such as water quality and aquatic ecology. Accordingly, this chapter encompasses a portion of Step 4 in the 11-step CEA methodology. The two proposed projects and actions addressed herein include the Craney Island Terminal by the Virginia Port Authority, and the Third Crossing of the Hampton Roads area by the Virginia Department of Transportation. Brief information is also included on three potential future projects -- pre-authorization Norfolk District studies, the midtown tunnel project, and the Virginia intermodal transportation center. Information is included on the anticipated adverse and beneficial impacts of the two proposed projects and actions.

## CRANEY ISLAND TERMINAL

### Introduction

The Virginia Port Authority (VPA) has proposed the development of a new marine terminal facility on 580 to 600 acres of new land created by the eastward expansion of the CIDMMA. This facility, to be referred to hereafter as the Craney Island Terminal, is proposed as a means of meeting cargo throughput growth utilizing various commercial ports in the Hampton Roads area. If the proposed terminal is built, it will aid in helping the VPA continue its historically significant contribution to Virginia's economy. The purpose of the container terminal at Craney Island will be to provide the VPA with sufficient capacity to meet the containerized cargo forecast for the Hampton Roads area and continuing long-term cargo growth anticipated during the 2050 planning horizon. Specific details related to the need for the facility are available elsewhere (Virginia Port Authority, 2003, Part I, pp. 1-6). This facility is still needed even though APM Terminals, Inc., has procured a permit to build a facility on the Elizabeth River about 2 miles south of the CIDMMA. The Craney Island Terminal is needed by 2011 (or by 2016 if the APM Terminal is completed on schedule).

One reason basic to the need for a new marine terminal is to accommodate increasing sizes of container ships. The increasing sizes of ships are illustrated by the following comparative statistics (Bray and Knott, 2000):

- Panamax vessels (first generation primarily used in the last 10 to 20 years, with some expected usage in the future) -- capacity of 4000 TEU's (twenty foot equivalent units), 900 feet long and 105 feet wide, 40 feet of draft, and 13-wide rows of containers

- Post-Panamax vessels (second generation primarily used in the last 5 to 10 years and expected to be used for some years into the future) -- capacity of 7000

TEU's, 1150 feet long and 140 feet wide, 47 feet of draft, and 17-wide rows of containers

- Suez-class vessels (third generation with expected usage for several decades in the future) -- capacity of 10,000 to 12,000 TEU's, 1150(+) feet long and 185(+) feet wide, 47(+) feet of draft, and 22-wide rows of containers

Some preliminary design features and provisions of the Craney Island Terminal include the following (Bray and Knott, 2000):

- accommodate Suez-class container ships
- cranes with 22-wide outreach will be provided
- deep water berths for the container ships
- an on-site intermodal container transfer facility (from ships to trains)
- direct access for trucks and cars to the Third Crossing project of VDOT
- rail access corridor for trains in the medians of I-664 and Route 164 (Western Freeway)
- four phases of construction to meet future cargo needs

Description of Proposed Terminal

Four phases are currently planned for the development of the Craney Island Terminal. Key features of the phases are (Bray and Knott, 2000):

- Phase I (to be completed by 2016) -- initial construction -- will involve development of about 220 acres, including 3,000 linear feet of wharf, 6 cranes for Suez-class container ships (22-wide outreach), an on-terminal intermodal rail loading facility, and will be able to handle an annual throughput capacity of 1.0 million TEU's

- Phases II, III, and IV (to be completed by 2050) -- intermediate and build-out construction -- will involve approximately 130 acres in development for each phase, including an additional 1,800 linear feet of wharf for each

The completion of Phase IV (the ultimate build-out) would provide a Terminal which includes the following characteristics (Bray and Knott, 2000) -- development of approximately 600 acres, including 8,400 linear feet of wharf, 15 cranes for Suez-class container ships (22-wide outreach), an on-terminal intermodal rail loading facility, and an annual throughput capacity of 2.5 million TEU's.

Table 6-1 lists the key components for each of the four phases (Virginia Port Authority, 2003, Part II, p. 6). Figure 6-1 displays a conceptual drawing of the 220-acre Phase I development (to be completed in the 2011 to 2016 time frame), while Figure 6-2 does similarly for the Phase IV build-out configuration (Virginia Port Authority, 2003, Part I, pp. 5 and 6). Completion of Phase II will be required in the 2020 to 2025 timeframe. The Phase IV completion (totaling about 580 to 600 acres) is expected by about 2050, with Phase III to occur sometime between 2025 and 2050. Each phase is expected to involve two-to-three-year construction periods. Detailed planning and construction scheduling for the Craney Island Terminal is still in progress.

One attractive feature of the Craney Island Terminal location is its proximity to major highway, railroad, and deep navigation channels. Several highway projects proposed by the Virginia Department of Transportation (VDOT) within the Hampton Roads area will improve the overall Port's capacity to serve local and inland cargo destinations. These include the proposed Hampton Roads Third Harbor Crossing, the I-564 Connector in Norfolk, and the Pinners Point Interchange in Portsmouth. While these projects are not specifically intended to enhance the proposed Craney Island Terminal, their location and timing is very advantageous in light of The Port of Virginia's growth forecast (Virginia Port Authority, 2003, Part II, p. 1). Coordination with VDOT relative to the land transportation needs of the proposed Craney Island Terminal is already underway.

The proposed Third Crossing would facilitate truck and automobile access to the proposed port. Access points to the Craney Island Terminal would connect with VDOT's proposed roadway crossing of Craney Island (the CIDMMA), located along the eastern edge of the current limits of Craney Island. Even without the Third Crossing, VDOT's proposed Craney Island Connector highway (I-564) would connect Craney Island to the existing VA Route 164 freeway, from which the existing interstate highway system can be accessed. Rail access to the Craney Island Terminal would be accomplished through a VDOT rail corridor development project that would connect the port facility to both the Norfolk Southern and CSX railways in the vicinity of the Hampton Roads Airport in Suffolk. A final rail corridor and tie-in point has not been determined. However, it is currently envisioned that, to the maximum extent practicable, the rail corridor would be located within the cleared right-of-way (ROW) of VDOT's connector highway from Craney Island to VA Route 164, and within the ROWs of existing highways VA Route 164 and I-664. This new rail corridor would provide rail access to port facilities proposed in Portsmouth by VPA and APM Terminals, as well as to the Craney Island Fuel Depot and businesses that may have need of the rail access (Virginia Port Authority, 2003, Part II, pp. 2-3).

Finally, vessel access to the proposed Craney Island Terminal would be via the existing Norfolk Harbor Reach and Craney Island Reach navigation channels. As part of the proposed CIDMMA eastward expansion and other proposed harbor channel improvements, all dredging activities needed for port development and operation would be completed. These dredging activities, including the area between the navigation channel and proposed wharf, would be completed regardless of port development and

Table 6-1: Components of Phases of Craney Island Terminal Development (Virginia Port Authority, 2003, Part II, p. 6)

| COMPONENTS | PHASE I | PHASE II | PHASE III | PHASE IV |
|---|---|---|---|---|
| Cranes | 8 @ 100 ft | 12 @ 100 ft | 16 @ 100 ft | 20 @ 100 ft |
| Wharf (ft) | 3,000 | 4,800 | 6,600 | 8,400 |
| Strad Storage | 5,376 TGS<br>(10,752 TEU @ 2 high)<br>(16,128 TEU @ 3 high) | 9,984 TGS<br>(19,968 TEU @ 2 high)<br>(29,952 TEU @ 3 high) | 15,744 TGS<br>(31,488 TEU @ 2 high)<br>(47,232 TEU @ 3 high) | 19,584 TGS<br>(39,168 TEU @ 2 high)<br>(58,752 TEU @ 3 high) |
| Grounded Reefer Storage | 232 TGS<br>(464 40ft cont. @ 2 high)<br>(696 40ft cont. @ 3 high) | 324 TGS<br>(648 40ft cont. @ 2 high)<br>(972 40ft cont. @ 3 high) | 349 TGS<br>(698 40ft cont. @ 2 high)<br>(1,047 40ft cont. @ 3 high) | 575 TGS<br>(1,150 40ft cont. @ 2 high)<br>(1,725 40ft cont. @ 3 high) |
| Transfer Zone Slots | 46 | 61 | 96 | 144 |
| Empty Storage | 0 | 2,800 TGS<br>(11,200 TEU @ 4 high)<br>(16,800 TEU @ 6 high) | 2,800 TGS<br>(11,200 TEU @ 4 high)<br>(16,800 TEU @ 6 high) | 2,800 TGS<br>(11,200 TEU @ 4 high)<br>(16,800 TEU @ 6 high) |
| Wheeled Slots | 722 | 722 | 1,841 | 2,329 |
| Inbound Lanes | 13 | 13 | 13 | 26 |
| Outbound Lanes | 6 | 6 | 6 | 12 |
| Loading/Unloading Track (ft) | 10,900 | 16,160 | 16,160 | 16,160 |
| Runaround Track (ft) | 5,400 | 10,690 | 10,690 | 16,160 |
| Storage Track (ft) | 22,800 | 37,830 | 37,830 | 37,830 |

Note: The data for a phase are cumulative

Figure 6-1: Conceptual Drawing of Phase I Development of Craney Island Terminal (Virginia Port Authority, 2003, Part II, p. 5)

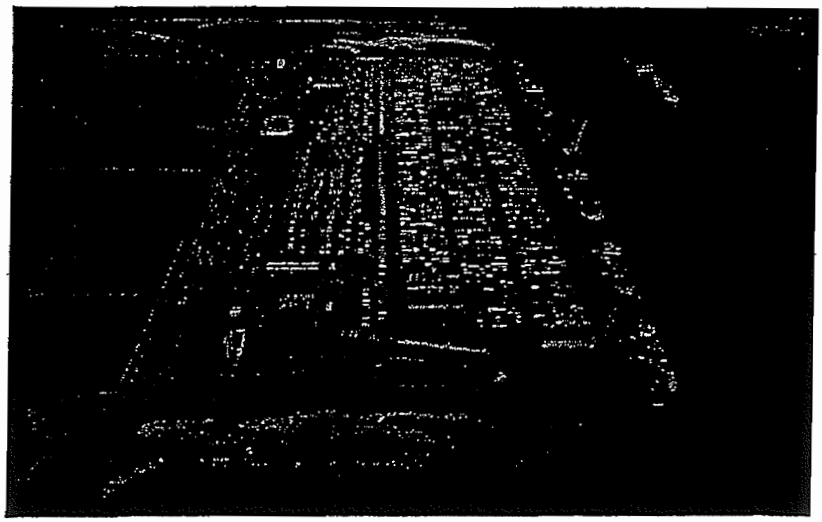


Figure 6-2: Conceptual Drawing of Phase IV Development of Craney Island Terminal (Virginia Port Authority, 2003, Part II, p. 6)

would provide 55-foot deep inbound and outbound channels to accommodate deep draft ships (Virginia Port Authority, 2003, p. 3).

Environmental Impact Analysis

Part III of a recent draft document related to the potential environmental impacts of the construction and operation of the proposed Craney Island Terminal addressed 18 categories of impacts. These categories included impacts on water quality, air quality, protected species and critical habitat, aquatic biota, wetlands and subaqueous bottom sanctuaries and refuges, transportation, utilities, waste management, land use, noise, visual and aesthetic resources, recreational and commercial use of waters, economics, environmental justice, public safety, historic and archeological resources, and secondary growth. The following bulleted items summarize the impacts of the Craney Island Terminal on the 18 environmental categories noted above.

- Water Quality -- Construction -- Construction for each of the four phases would involve grading, excavation, trenching, and landscaping. The primary water quality concern from land-based construction is erosion of disturbed lands and transport of sediment into the Norfolk Harbor. Water quality impacts from construction would be mitigated by erosion and sediment controls and best management practices (BMPs) implemented at the site, in accordance with state regulations. An erosion and sediment control plan (ESCP) would be developed; this plan will specify measures that will be used such as silt fencing, temporary sedimentation ponds, rip rap, vegetative stabilization, etc. All construction activities at the proposed facility that disturb more than 5 acres would also require a Virginia Pollution Discharge Elimination System (VPDES) permit to discharge stormwater, in accordance with Virginia DEQ regulations and the Clean Water Act. This would require the development of a Stormwater Pollution Prevention Plan (SWP3) that identifies potential sources of pollution and management practices to control those sources (Virginia Port Authority, 2003, Part III, pp. 1-2 and 1-3).

- Water Quality -- Stormwater Runoff -- During terminal operation, stormwater runoff can contain contaminants originating from vehicular traffic, mechanical equipment, container storage areas, and maintenance areas. Primary contaminants of concern include phosphorus, nitrogen, sediment, oil and grease (O&G), and metals. An assessment of stormwater quality issues at the proposed facility indicates that water quality impacts would be mitigated by comprehensive stormwater quality management planning and the implementation of both structural and non-structural BMPs, in accordance with state regulations (Virginia Port Authority, 2003, Part III, pp. 1-3 to 1-9). For example, a Virginia Pollutant Discharge Elimination System (VPDES) permit would be required to discharge stormwater runoff. VPA has initiated several special projects aimed at improving stormwater quality, including the installation of manufactured stormwater

treatment devices in selected areas, a current study to evaluate the effectiveness of those devices, and a current study to identify sources of metals at three existing container terminals. The results of these efforts will aid stormwater management planning for the Craney Island Terminal (Virginia Port Authority, 2003, Part III, p. 1-3). The VPDES permit would also require the development of a facility-wide SWP3. Further, the Chesapeake Bay Preservation Act requires an erosion and sediment control plan. In summary, stormwater quality is a significant regulatory issue that will require comprehensive planning. Regulatory requirements will be met by a comprehensive stormwater management plan that provides appropriate BMP technology and is designed to achieve a high level of treatment for the Craney Island Terminal.

- Water Quality -- Accidental Spills -- Various types of petroleum-based oils and hazardous materials will be used, transported, and stored at the Craney Island Terminal. Because the Terminal is likely to have more than 1,320 gallons of above-ground oil storage, a Spill Prevention, Control, and Countermeasures Plan (SPCCP) will be required under Federal regulations related to oil spill contingency planning (40 CFR 112). At full buildout, the Craney Island Terminal will increase shipping traffic in the Hampton Roads area by about 19 vessel calls per week. This would represent a maximum increase in shipping traffic of about 20 percent from the baseline value of 5,000 vessel calls per year reported in 2000. Although the increased traffic also nominally increases the risk of a marine spill, the new facility is not expected to increase the risk of an oil or hazardous material spill in the harbor to unacceptable levels. In the unlikely event of a spill, the U.S. Coast Guard (USCG) will respond in accordance with the National Oil and Hazardous Substances Pollution Contingency Plan, the Regional Contingency Plan of the USCG Regional Response Team III, and the Captain of the Port (COTP) Virginia Coastal Area Contingency Plan. Regarding refueling of ships, no fuel will be transferred from the Terminal; such refueling will occur via barges (Virginia Port Authority, 2003, Part III, pp. 1-9 to 1-11).

- Water Quality -- Ship Operations -- No discharges of wastewater, bilgewater, or other wastes to the Norfolk Harbor would be permitted from ships at the proposed VPA Terminal. Similarly, the Terminal would not accept wastewater or bilge water from the ships to the sanitary sewer (Virginia Port Authority, 2003, Part III, p. 1-11).

- Air Quality -- The Craney Island Terminal is located in the Hampton Roads Air Quality Control Region. The Hampton Roads area within the Region is currently designated a maintenance area under the one-hour ozone standard and an attainment area for all other criteria pollutants. Based on historical monitoring data, the Hampton Roads area is expected to be designated as a nonattainment area with respect to the new 8-hour ozone NAAQS. Future redesignation of the Hampton Roads area to nonattainment status is anticipated to occur in the 2004-2005 timeframe. Because of the status for ozone, a conformity analysis was conducted via the preparation of pertinent precursor pollutant emission

inventories. The Regional inventory for 2008 was 208.5 tons/day (76,102 tons/year) of volatile organic chemicals (VOCs) and 227.2 tons/day (82,928 tons/year) of nitrogen oxides ($NO_x$). Inventories beyond 2008 are not available. Emission sources for the operational activities at the Craney Island Terminal include marine vessels, heavy-duty diesel trucks, privately owned vehicles, switch locomotives, line-haul locomotives and some container handling equipment. The inventories were developed based on standard methodologies. The inventories for the Phase I condition in 2016 were 0.3 tons/day (82.8 tons/year) for VOCs, and 3.9 tons/day (1047 tons/year) for $NO_x$. For the 2050 build-out conditions, the comparable inventories were 0.9 tons/day (206.2 tons/year) for VOCs and 10.1 tons/day (2642 tons/year) for $NO_x$. The annual estimates reflect emissions corresponding to annual activity projections (marine vessel calls per year, truck trips per year, etc.) The daily emissions values are based on peak daily estimates of Terminal related activity. Because the precursor emissions for the Terminal exceed a 100-ton/year threshold, several approaches can be used to assure compliance with maintenance area requirements. For example, the Terminal emissions can be "offset" by obtaining emissions reductions within the Hampton Roads ozone maintenance area; or they can be incorporated into an approved SIP (state implementation plan) for the maintenance area. The process of developing a new SIP for the Hampton Roads ozone maintenance area is expected to occur in 2005-2007. Coordination between the VPA and appropriate state and local agencies will occur to demonstrate that the Craney Island Terminal will conform with future SIPs (Virginia Port Authority, 2003, Part III, pp. 2-1 to 2-12).

- Protected Species and Critical Habitat -- Coordination with pertinent federal and state agencies has led to the identification of 14 species of potential concern; these species are listed in Table 6-2 (Virginia Port Authority, 2003, Part III, p. 3-2). Critical habitat has not been designated for any of these species. The key federal agencies include the U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS). The key state agencies are the Virginia Department of Game and Inland Fisheries (VDGIF) and the Virginia Department of Conservation and Recreation (VDCR). One species of particular relevance is the piping plover, which has been found on the CIDMMA, particularly in the western portion. Development of the Terminal will occur on the eastern edge of the CIDMMA where no nest sites have been documented, thereby reducing the probability of any impacts to piping plovers. Phase I of port construction would commence as soon as the eastward expansion to support this area is complete; therefore, no nesting or feeing habitat are anticipated to be impacted during the initial phase. After Phase I is in operation, it is unlikely that the piping plover would colonize the adjacent expansion area due to the high degree of mechanical and human disturbance associated with operation of the port facility. Therefore, ultimate build-out of the Terminal is not expected to

Table 6-2: Species of Potential Concern Identified Through Coordination with Agencies (Virginia Port Authority, 2003, Part III, p. 3-2).

| Common Name | Scientific Name | Status |
|---|---|---|
| Piping plover | *Charadrius melodus melodus* | FT |
| Least tern | *Sterna antillarum* | SS |
| Black-necked stilt | *Himantopus mexicanus* | NS |
| Wilson's Plover | *Charadrius wilsonia wilsonia* | SE |
| Yellow-crowned night-heron | *Nyctanassa violacea violacea* | SS |
| Great blue heron | *Ardea antillarum* | NS |
| Green heron | *Butorides virescens* | NS |
| Northern diamond-backed terrapin | *Malaclemys terrapin terrapin* | FS |
| Atlantic sturgeon | *Acipenser oxrhynchus* | SS |
| *Loggerhead sea turtle | *(Caretta caretta)* | FT, SE |
| *Kemp's Ridley sea turtle | *(Lepidochelys kempii)* | FE, SE |
| * Bald eagle | *Haliaeetus leucocephalus* | FT, SE |
| * Peregrine falcon | *Falco peregrinus* | SE |
| *Atlantic bottlenose dolphin | *Tursipos truncates* | Depleted |

FE= Federally endangered, FT= Federally threatened, FS=Federal Species of Concern
SE=State endangered, ST=State threatened, SS=State special concern
NS= No status

*These species have been identified in the literature as occurring or having potential to occur in the project vicinity. It is anticipated that these species will be identified by the agencies during project reviews.

impact piping plover habitat. Further, as these birds are highly mobile and can easily avoid construction activities, no accidental takings during the construction process would be expected. In summary for all of the listed species in Table 6-2, no impacts to federally- or state-listed endangered or threatened species, species of concern, or other species cited by the state agencies are anticipated from development and operation of the Craney Island Terminal. However, agency coordination will continue as project details are developed; this coordination will help to ensure that impacts to these species are avoided (Virginia Port Authority, 2003, Part III, pp. 3-1 to 3-9).

- Aquatic Biota -- Existing estuarine and marine essential fish habitat (EFH) within the vicinity of the Craney Island Terminal would be subject to minimal impacts as a result of port development and operation. Some reasons for the anticipated minimal impacts include the use of manmade structures at the Terminal to provide shoreline stabilization and protect against wave-induced erosion, operational spill prevention and response plans, and the use of BMPs for stormwater. No impacts to submerged aquatic vegetation (SAV) are anticipated since the nearest SAV beds are over 4 miles north of the CIDMMA. Finally, impacts on benthos are not anticipated due to their poor existing quality and the fact that necessary nearby dredging will be done by the U.S. Army Corps of Engineers as part of harbor improvement activities (Virginia Port Authority, 2003, Part III, pp. 4-1 to 4-4).

- Wetlands -- No impacts on wetlands are anticipated within the Craney Island Terminal footprint since the port facility will be constructed on a recently developed dredged material containment cell. Also, no wetlands occur between the Terminal and the nearby Craney Island Reach; therefore, dredging activities required to provide access to the Terminal would not impact wetlands. Impacts to wetlands from access roads to the Craney Island Terminal, and a rail corridor to connect the Terminal to both the Norfolk Southern and CSX railway, are expected to be minimal. Usage of existing cleared right-of-way, and coordination with VDOT relative to the rail corridor would help to minimize such impacts. Although not specifically developed, the following potential mitigation measures could be used to compensate for wetland impacts from the port facility; if the detailed facility design indicates that such impacts could occur. The measures include: implementation of best management practices (BMPs) during clearing and construction (e.g., erosion control, stormwater runoff control, etc.); implementation of construction techniques that minimize impacts, e.g., slope steepening (minimizes footprint area); proper installation and use of drainage and crossing structures to minimize impacts to existing wetland hydrology, e.g., to avoid connection of currently isolated wetlands; acquisition and development of management plans for existing, off-site wetlands for conservation easements/areas, including restoration of degraded wetlands; and creation and management plan development of off-site wetlands for conservation easements/areas (Virginia Port Authority, 2003, Part III, pp. 5-1 to 5-6).

- Mudflats -- No specific impacts to mudflats are expected from construction and operation of the Craney Island Terminal (Virginia Port Authority, 2003, Part III, p. 5-6).

- Subaqueous Bottom -- As part of the CIDMMA eastward expansion, all dredging activities needed for development and operation of the Craney Island Terminal, including the area between the navigation channel and proposed wharf, would be completed regardless of port development. Consequently, dredging impacts to the subaqueous bottom would not be attributable to port development (Virginia Port Authority, 2003, Part III, p. 5-6).

- Sanctuaries and Refuges -- A total of four national wildlife refuges are located from 15 to 35 miles from the Craney Island Terminal. In addition, three state-maintained wildlife management areas and two state-operated natural area preserves are located from 10 to 36 miles away. One local wildlife preserve and one local nature preserve are 2.5 to 16 miles away. The nearest area, the Hoffler Creek Wildlife Preserve, located approximately 2.5 miles west of the proposed project area, consists of 142 acres of wetlands, dense forest, and a saltwater lake. Due to the separation distances, no impacts to sanctuaries and refuges are expected to occur (Virginia Port Authority, 2003, Part III, pp. 6-1 to 6-2).

- Transportation -- The Port of Hampton Roads is the second largest on the east coast in total tonnage of international waterborne commerce, with over 38 million short tons of cargo being handled in Hampton Roads in the year 2000. The number of commercial vessel calls at the Port from 1993 is shown in Table 6-3 (Virginia Port Authority, 2003, Part III, p. 7-7). Container traffic during the period 1993 to 2001, however, has steadily increased from 1,151, in 1993 to 1,729 in 2001, which translates to a 50 percent increase in overall container vessel traffic. Total one-way vessel traffic from commercial, military, commercial fishing and tugs at Hampton Roads is estimated at 6,000 trips per year. A review of the commercial vessel traffic data shows that container traffic comprised approximately 70 percent of the total cargo vessel traffic in the year 2001. Data compiled in 1995 indicated that 27.7 percent of the freight (excluding coal) imported by the Port of Hampton Roads and 18.8 percent of the freight (excluding coal) exported by the Port was transported by rail. Accordingly, with the exception of imported coal, most domestic freight is moved into and out of the Hampton Roads area via truck (Virginia Port Authority, 2003, Part III, pp. 7-5 to 7-7).

- Transportation -- The analysis of surface transformation impacts from the Craney Island Terminal is based on the following assumptions (Virginia Port Authority, 2003, Part III, p. 7-8):

Table 6-3: Vessel Calls At Hampton Roads, 1993 - 2001 (Virginia Port Authority, 2003, Part III, p. 7-7)

| | 2001 | 2000 | 1999 | 1998 | 1997 | 1996 | 1995 | 1994 | 1993 |
|---|---|---|---|---|---|---|---|---|---|
| General Cargo | 86 | 101 | 64 | 107 | 142 | 128 | 132 | 164 | 209 |
| Container/RO RO | 1,729 | 1,867 | 1,548 | 1,588 | 1,446 | 1,431 | 1,454 | 1,257 | 1,151 |
| Lash | 0 | 0 | 0 | 0 | 0 | 1 | 10 | 24 | 29 |
| Coal | 259 | 298 | 454 | 469 | 500 | 540 | 485 | 423 | 446 |
| Bulk | 122 | 129 | 141 | 145 | 193 | 205 | 281 | 255 | 235 |
| Combo Cargo | 101 | 133 | 156 | 160 | 168 | 120 | 197 | 156 | 216 |
| Passenger | 6 | 5 | 6 | 2 | 4 | 3 | 4 | 9 | 10 |
| Tanker | 146 | 151 | 142 | 119 | 144 | 142 | 138 | 170 | 167 |
| All Other | 27 | 15 | 34 | 25 | 35 | 102 | 80 | 130 | 126 |
| TOTAL | 2,476 | 2,699 | 2,545 | 2,565 | 2,632 | 2,669 | 2,781 | 2,588 | 2,589 |

Note: RORO = rail-on-rail-off

Source: The Port of Hampton Roads Annual, 2002 (Hampton Roads Maritime Association)

(1) The Third Crossing, including the proposed Connector highway from VA Route 164 to the CIDMMA, would be completed prior to major construction activities associated with the Craney Island Terminal.

(2) Trucks traveling into and out of the region would continue to follow the existing routes through the major gateways.

(3) Programmed and planned improvements along the major interstate and State highways most traveled by trucks into and out of the Hampton Roads region would be completed.

(4) Approximately 63 percent of the container freight handled by the Craney Island Terminal would be transported by truck at the initiation of Phase I in 2016, declining to 40 percent by the projected build out in 2050.

(5) The new rail corridor, which will be a VDOT project, is in the planning stages and the route has not yet been finalized. However, it is currently envisioned, and this analysis assumes, that the route and ultimate tie-in point will follow the cleared right-of-ways for the Craney Island Connector highway and existing VA Route 164 and I-664 corridors to the maximum extent possible.

- Transportation -- Road Trip Generation -- To provide a basis for road trip generation, it was assumed that the Craney Island Terminal would have an annual throughput of 500,000 TEUs in 2016 (Phase I completion), and that it would increase to 1,960,175 TEUs in 2050 (build-out). An annual growth rate of 4.1% was used for the throughput. A TEU is defined as a "twenty-foot equivalent unit"; it is used to express the relative number of containers based on the equivalent length of a 20-foot container. For example, 100 containers of 20 feet in length is 100 TEUs, while 100 containers of 40 feet in length is 200 TEUs. The average daily truck trips would be 1,430 in 2016, and it would rise to 3,560 in 2050 (the average daily trips represent the total of truck arrivals and truck departures to and from the Terminal. The peak day truck trips would range from about 1,900 in 2016 to about 4,600 in 2050. The total daily trips (trucks and employee trips) to and from the Terminal would range from 2,075 in 2016 to 4,697 in 2050. Additional details on trip generation are available, along with projected increases in area traffic with and without the Craney Island Terminal (Virginia Port Authority, 2003, Part III, pp. 7-8 to 7-15). Table 6-4 illustrates the projected traffic volumes and levels of service with and without the proposed Craney Island Terminal in 2018 (Virginia Port Authority, 2003, Part III, p. 7-12). The roadways included are those in the transportation impact study area (TISA) that are reported to be used by trucks transporting freight into and out of the region. The higher the V/C ratio in Table 6-4 the greater the traffic congestion that can be anticipated. More specifically, when the V/C ratio is greater than 1.00, this denotes a "Level of Service" class "F" (breakdown); when the V/C is less than 0.33, the traffic conditions are free-flowing or stable. For V/C ratios between

Table 6-4: No Build and Proposed Action ADT and V/C Ratio (Virginia Port Authority, 2003, Part III, p. 7-12).

| | No-Build[1] | | | Proposed Action | | |
|---|---|---|---|---|---|---|
| | 2018 ADT | 2018 Pk Hr Per lane Vol.[2] | 2018 Pk Hr V/C[3] | 2018 ADT | 2018 Pk Hr Per lane Vol. | 2018 Pk Hr V/C |
| CROSSINGS | | | | | | |
| I-64 Hampton Roads Bridge Tunnel | 98,000 | 2,450 | 1.44 | 98,100 | 2,458 | 1.44 |
| I-664 Monitor Merrimac Memorial Bridge Tunnel | 143,000 | 1,788 | 0.90 | 143,000 | 1,788 | 0.90 |
| New Crossing (I-664 – VA 164 connection) | 75,000 | 1,875 | 0.96 | 77,000 | 2,065 | 0.97 |
| New Crossing (I-564 - VA 164 connection) | 89,000 | 2,225 | 1.13 | 89,250 | 2,230 | 1.13 |
| US 17 James River Bridge | 44,000 | 1,100 | 0.65 | 44,000 | 1,100 | 0.65 |
| Increase in # of trips from No-Build Alternative | -- | | | 2,350 | | |
| PENINSULA | | | | | | |
| I-64 (I-664 to Mercury Blvd.) | 163,000 | 2,038 | 0.91 | 164,000 | 2,050 | 0.91 |
| I-664 (I-64 – Downtown Newport News) | 136,000 | 1,700 | 0.67 | 137,000 | 1,713 | 0.76 |
| Jefferson Avenue (I-664 – Mercury Blvd.) | 33,000 | 550 | 0.63 | 33,000 | 550 | 0.63 |
| SOUTHSIDE | | | | | | |
| I-64 (I-564 – Rt. 44) | 171,000 | 2,850 | 1.31 | 171,250 | 2,140 | 0.98 |
| I-64 (I-464 – I-664) | 107,000 | 1,783 | 0.79 | 107,500 | 1,791 | 0.80 |
| VA 164 Connection | 39,000 | 975 | 0.53 | 40,000 | 1,000 | 0.54 |
| VA 164 Western Freeway (Coast Guard – Bay Blvd.) | 63,000 | 1,575 | 0.79 | 64,000 | 1,598 | 0.80 |
| Rt. 44 (Newtown Rd. – Witchduck Rd.) | 182,000 | 2,275 | 1.07 | 182,300 | 2,278 | 1.07 |
| Hampton Blvd. (Lafayette River – Midtown Tunnel) | 35,000 | 583 | 0.69 | 35,000 | 583 | 0.69 |
| I-264 Downtown Tunnel | 93,000 | 2,325 | 1.37 | 93,000 | 2,325 | 1.37 |
| US 58 Midtown Tunnel | 41,000 | 2,050 | 1.28 | 41,000 | 2,050 | 1.28 |
| US 460 | 32,400 | 540 | 0.28 | 32,692 | 543 | 0.28 |
| US 58 to North Carolina | 28,000 | 700 | 0.36 | 28,090 | 702 | 0.36 |
| US 17 to North Carolina | 15,875 | 794 | 0.41 | 15,935 | 797 | 0.41 |
| US 13 to North Carolina | 14,900 | 745 | 0.39 | 14,967 | 748 | 0.38 |
| VA 168 | 26,900 | 673 | 0.35 | 27,200 | 677 | 0.35 |

[1] Year 2018 No Build data is from Hampton Roads Crossing Study FEIS Table 4-2 data on Candidate Build Alternative 9.

[2] Peak Hour Per Land Volumes = (ADT/number of lanes) * .10

[3] V/C (volume-over-capacity) ratio calculated for conventional lanes of traffic only, does not include projected HOV traffic volumes. Range of per lane capacity = 1,600 – 2,250 for interstate facilities, Midtown Tunnel, James River Bridge and VA Route 164.

0.33 and 0.57 (Level of Service D), favorable traffic movements are on the verge of becoming unfavorable.

- Transportation -- Rail Traffic -- Assuming that the Craney Island Terminal is not built (i.e., the "no action" alternative), rail traffic would increase slightly above present conditions to accommodate the projected container increase. Assuming an estimated maximum annual throughput of about 2.3 million TEUs that could be accommodated by the existing VPA terminals (with planned improvements) and the planned APM Terminals, Inc., an average of about two additional train trips per day would be anticipated. This estimate assumes that an annual throughput of 2.3 million TEUs would be about 1.1 million TEUs more than current levels (based on the Port of Hampton Roads container forecast) and that 25 percent of the forecasted container increase is transported by rail (Virginia Port Authority, 2003, Part III, p. 7-15). (The train trips per day based on 1.1 million TEUs at the terminals, 25% being transported by train, and assuming that a train is capable of transporting 400 TEUs, would be 1.9. For 2.3 million TEUs, the train trips per day would be 3.9). Considering rail traffic to be generated by the Craney Island Terminal, the daily rail projections show an increase from 466 to 2,685 TEUs between initiation of Phase I (2016) and Build Out (2050) conditions. The train traffic projections assume that approximately 34 percent of the container freight handled by the Craney Island Terminal would be transported by rail at the initiation of Phase I in 2016, increasing to 50 percent by the projected Build Out in 2050. Continuing to use the estimate that one train is capable of transporting 400 TEUs, average train traffic would increase by 425 trains per year or by slightly more than one train per day (1.16) at the initiation of Phase I. The 2050 Build Out conditions at the Craney Island Terminal would result in an estimated 2,450 additional train trips per year, or approximately 2,000 more trips than for Phase I. This increase would generate an average of five to six train trips per day (from 1.16 to 6.71) above what is anticipated for Phase I. It is anticipated that the existing rail network will be able to accommodate this increase in rail traffic, particularly in view of the decrease in coal shipments attributable to a decline in the export of coal from the region to Europe and other countries (Virginia Port Authority, 2003, Part III, pp. 7-15 and 7-16).

- Transportation -- Navigation Traffic -- Based upon general forecasts for navigation traffic for the Port of Hampton Roads, and assuming a capacity of 2,500 to 5,000 TEUs per vessel, the Craney Island Terminal could accommodate an additional 572 vessel calls to the Port of Hampton Roads at initiation of Phase I in 2016. By the year 2050 under Build Out conditions, an additional 468 vessel calls are projected based on a capacity of 2,500 to 7,000 TEUs per vessel. Thus, it is projected that the Build Out configuration of the Craney Island terminal would generate 1,040 vessel calls per year. This represents a 60 percent increase in current (year 2001) container/rail-on-rail-off vessel traffic and a 17 percent increase in vessel traffic above current one-way total vessel traffic entering the Hampton Roads area. According to the Virginia Pilots Association, the anticipated increase in vessel traffic from 11 to 20 weekly calls under Phase I

and Build Out, respectively, could be accommodated and would not be expected to significantly affect safety in the harbor. In addition, the trends in recent years of reduced coal exports and larger cargo ship sizes are factors that should reduce cumulative effects on total vessel traffic in the Port of Hampton Roads (Virginia Port Authority, 2003, Part III, p. 7-17).

- Utilities -- The Craney Island Terminal will require utility services for water, wastewater disposal, power, and telecommunications. Insufficient utility infrastructure currently exists on the CIDMMA, so it will be necessary to add additional infrastructure to extend utilities (power line, phone/cable lines, water lines, sanitary sewer lines, etc.) from the nearby City of Portsmouth to the Terminal. All such utility work will have environmental permitting requirements to protect wetlands, endangered species, water quality, etc. There will be temporary construction impacts associated with the utility expansion. However, the City of Portsmouth can accommodate the water needs, the Hampton Roads Sanitation District can accommodate the wastewater flow and treatment needs, Dominion Virginia Power company can provide the electrical needs, Virginia Natural Gas can provide the natural gas needs, and private telecommunication companies can accommodate the associated telecommunication needs (Virginia Port Authority, 2003, Part III, pp. 8-1 to 8-2).

- Waste Management -- Solid Waste -- Although there are no current data for the quantities of solid waste that will be generated at the Craney Island Terminal, solid waste generated at existing port facilities is minimal and handled by the pertinent City or contract pick-up services. This solid waste consists of miscellaneous paper, office and maintenance facility materials. The City of Portsmouth is served by a regional landfill, a refuse-derived fuel plant, and recycling services, all provided by the Southeastern Public Service Authority (SPSA). Accordingly, the proposed Terminal will not significantly impact the area through generation of solid waste, as there are sufficient facilities to handle such waste (Virginia Port Authority, 2003, Part III, pp. 9-1 to 9-2).

- Waste Management -- Hazardous Waste and Materials -- The Craney Island Terminal is expected to handle some cargo (perhaps up to 3%) containing hazardous materials. The U.S. Department of Transportation (DOT) has established hazardous material guidelines regarding the handling and transportation of materials for cargo terminals. The DOT guidelines are issued under Title 49 Code of Federal Regulations (49 CFR). These guidelines include such items as the identification and classification of hazardous materials; the types and quantities of shipments allowed; and the appropriate labeling and handling of hazardous materials being transported (Virginia Port Authority, 2003, Part III, p. 9-2). Some hazardous wastes may be generated and stored at the Terminal, examples include used oil, oil filters, absorbent materials hydraulic fluids, or spent cleaning materials utilized for port-related equipment and vehicles. The Craney Island Terminal itself is expected to be classified as a "conditionally exempt small quantity generator" under the auspices of the

Resource Conservation and Recovery Act (RCRA). Requirements for such conditionally exempt generators will be met, including the capability for accomplishing effective cleanups of small spills. Further, in order to minimize the potential for environmental impacts related to hazardous materials and waste, the Craney Island Terminal will maintain compliance with all pertinent federal, state, and local regulations (Virginia Port Authority, 2003, Part III, pp. 9-3 to 9-6).

- Land Use -- The City of Portsmouth General Land Use Plan provides no designation for the future use of the active CIDMMA. The U.S. Army Corps of Engineers' 50-year plan is to continue to use the current limits of the CIDMMA for dredged material management. Moreover, the eastward expansion is not designated for any land use, since this area is presently under water. The City's Vision 2005 plan, however, designates the CIDMMA and areas bordering the Elizabeth River near it as the "Working Waterfront". The vision for this area is to maintain an active 'working waterfront' and encourage development of vacant tracts and redevelopment. The Craney Island Terminal and associated freight rail line is not anticipated to have any significant adverse impacts on adjacent land uses in the short-term during construction or in the long-term during Terminal operations. Use of the land as a container terminal, however, would likely have a positive, indirect effect on the local and regional economies (Virginia Port Authority, 2003, Part III, pp. 10-1 to 10-4).

- Noise -- Noise monitoring for existing conditions at the CIDMMA and the surrounding communities was conducted during March, 2002. Data were collected from seven monitoring points on the CIDMMA and three additional monitoring locations in the surrounding Edgefield and Merrifields residential communities of Portsmouth. Details on the monitoring survey and results are available elsewhere (Virginia Port Authority, 2003, Part III, pp. 11-2 to 11-5). Noise levels at the CIDMMA are affected during daytime hours by grade/fill operations. During these operational hours, the noise levels, expressed as Leq (the maximum 1-hour energy equivalent sound level), ranged from 43 dBA to 67 dBA. When activities ceased for the day, at about 6:00 p.m., noise levels dropped to a typical range of 35 dBA to about 55 dBA during the evening and early morning. Comparable noise levels for the three residential locations ranged from 42 to 64 dBA during the day, and 40 to 59 dBA during the night. The residential noise levels were affected by routine traffic during the daytime hours. Currently, there are no Commonwealth of Virginia noise limits or regulations. Further, the City of Portsmouth does not have a noise ordinance related to the acceptability of noise levels on various receiving land use categories.

- Noise -- Impacts of Craney Island Terminal -- The FHWA Traffic Noise Model (TNM) version 1.0b was used to model future noise levels for the Craney Island Terminal's Build Out configuration. Heavy trucks and background noise from general port operations were used as the noise sources in the modeling. According to the model, heavy trucks consist of all cargo vehicles with three or more axles, and with a general gross weight of more than 12,000 kg (25,400

lbs.). The TNM includes full-throttle noise emission levels for vehicles on upgrades and vehicles accelerating away from the traffic-control devices. The model combines these full-throttle noise emission levels with its internal speed computations to account for the full effect (noise emissions plus speed) of roadway grades and through traffic-control devices. The primary source of noise will be from the heavy truck traffic along the western perimeter of the Craney Island Terminal. In addition, a background noise 80-dBA source was added to simulate other activities on the Terminal. These Terminal noise sources include noise from cranes to load and offload container vessels, loaders to transfer containers to and from warehouses and onto trucks, rail cars, and miscellaneous vehicles and equipment to facilitate cargo movement. In addition to mechanical devices, movement of materials and equipment and backup beepers also emit noise. The noise input based on peak hourly truck traffic was based on 381 trucks per hour operating at a speed of 15 mph. The noise input based on trains was based on approximately six to seven (inbound or outbound) trains that would occur per day, with 3 locomotives per train. The train length would range between 5,000 and 7,000 feet. The trains would move at a rate of approximately 20 miles per hour on the mainline closer to the Terminal and slower within the yard. The closest sensitive noise receptor to the Craney Island Terminal is about 8,000 feet to the east across the Elizabeth River. The noise modeling results are presented in Table 6-5 (Virginia Port Authority, 2003, Part III, p. 11-7). The noise level results show that, under proposed Terminal Build Out conditions, noise levels from operations, heavy truck traffic, and trains will not adversely affect any sensitive receptors. This is due to the large distances (8,000 feet or more) between the proposed Terminal footprint and the closest sensitive receptors. Furthermore, no residential areas would be exposed to sound levels that approach the FHWA noise abatement criterion of 67 dBA for "Activity Category B". (Category B denotes that the peak hourly exterior Leq of equal to, or less than, 67 dBA, would be compatible with land uses such as picnic areas, recreation areas, playgrounds, active sports areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals). It should be noted that the current "background" noise levels in the vicinity of the CIDMMA are not included in Table 6-5, and perhaps they should be, particularly when considering that that current noise levels in the area are expected to increase from 2002 levels because of increased development. Further, modeled future noise levels show an increase in ambient noise levels along the eastern boundary of the CIDMMA directly adjacent to the Terminal (Virginia Port Authority, 2003, Part III, p. 11-8).

- Visual and Aesthetic Resources -- A survey of viewsheds in the vicinity of the Craney Island Terminal was conducted in March, 2002. The surrounding area includes numerous industrial activities as well as other Terminals. Therefore, due to the visual similarity of the Craney Island Terminal with other activities in the general area, no adverse visual impacts are anticipated (Virginia Port Authority, 2003, Part III, pp.12-1 to12-6).

Table 6-5: Noise Level Results (Virginia Port Authority, 2003, Part III, p. 11-7).

| Distance from Port Facility (feet) | Build Out Truck Traffic and Terminal Operations (dBA)* | | Trains (dBA)** |
|---|---|---|---|
| | *Over Land* | *Over Water* | |
| 100 | 66.7 | 71.0 | 82 |
| 500 | 53.4 | 59.8 | 69 |
| 1,000 | 46.4 | 54.1 | 62.2 |
| 2,000 | 39.9 | 47.9 | 55.9 |
| 4,000 | 36.0 | 41.1 | 52.4 |
| 6,000 | 31.5 | 36.9 | 47.7 |
| 8,000 | 28.1 | 33.7 | 44.3 |

* Traffic Noise Model results.
** Train noise levels were calculated using a noise level of 87 dBA at 50 feet (Parsons Brinckerhoff, 1998) that dissipates at a rate of 3 to 6 dBA for every doubling of distance.

- Recreational and Commercial Use of Waters -- Commercial use of the Hampton Roads area includes both commercial shipping and fishing. Issues related to commercial shipping were addressed in the transportation topics addressed above. Regarding commercial fishing, the Elizabeth River and waters surrounding the Craney Island Terminal produce commercially important species, including blue crab and Atlantic croaker. A moderate amount of commercial fishing, including the use of gill nets, occurs in the area adjacent to the proposed Terminal for spot, croaker, and striped bass. Blue crabs are harvested for the local seafood market and are exported from the Chesapeake Bay area as well. As part of the CIDMMA eastward expansion and other proposed harbor channel improvements, all dredging activities needed for the Terminal development and operation would be completed. Commercial crabbers who currently use areas near the CIDMMA that would be dredged would have to relocate regardless of port development. Nevertheless, some localized impacts on commercial fishing may still occur due to port operations since ship maneuvering and access areas for the Craney Island Terminal would no longer be fished. In particular, some local gill netting activities may have to be relocated outside of ship maneuvering and access areas. However, overall, commercial fishing in the Hampton Roads area would continue, and it should be minimally affected by the projected increases in commercial ship activity in the area. Finally, recreational boating in the Hampton Roads area would be expected to grow commensurate with the projected population growth in the region. An increase in commercial shipping may result in increased conflicts between commercial vessels and recreational boats in the Craney Island Reach of the Hampton Roads area between the Craney Island Terminal and the mouth of the Elizabeth River. These potential conflicts would likely result in the voluntary displacement of recreational boaters to other locations in the Hampton Roads area as they seek less congested areas, especially in the case of recreational boaters traveling across the Craney Island Reach and the Norfolk Harbor Reach to arrive at their destinations (Virginia Port Authority, 2003, Part III, pp. 13-1 to 13-5).

- Economics -- In the short-term, construction of the Craney Island Terminal will result in the employment of approximately 15,000 individuals during all four phases of construction. Earnings from employment during all four phases are estimated at approximately $500 million. Expenditures for materials, equipment and labor will generate approximately $212 million in total output to the local and regional economy. In the long term (by 2050), operation of the Terminal would have a positive impact on the City of Portsmouth and the region by generating approximately 570 direct jobs and slightly more than 3,900 indirect jobs in the region. It is anticipated that some of the indirect jobs may be new positions. It is anticipated that increased revenue and activity from operation of the Terminal would also provide for continued employment of individuals already working in sectors of the local and regional economy that presently benefit from Port activity in the Hampton Roads region. It is anticipated that direct and indirect employment generated by the Craney Island Terminal in 2050 will provide earnings of $172 million, or an average of $38,600 per worker. Operation of the

Craney Island Terminal under full Build Out is anticipated to provide approximately $900 million of output to the local and regional economy. Additional details on the economic impacts of the Craney Island Terminal are available elsewhere (Virginia Port Authority, 2003, Part III, pp. 14-1 to 14-7).

- Environmental Justice -- The Craney Island Terminal will not have a disproportionately high and adverse effect on minority communities. The Terminal is located within a portion of the City of Portsmouth with a minority population much less than the overall minority population for the City, and a lower minority population than the Norfolk-Virginia Beach-Newport News MSA (Metropolitan Statistical Area). The City of Portsmouth has a much higher percentage of residents in poverty and has a significantly lower median household income than both the Norfolk-Virginia Beach-Newport News MSA and the Commonwealth. However, based upon the analysis conducted, it was determined that activities associated with the Craney Island Terminal would not have significant adverse impacts on low-income communities within the City of Portsmouth. Finally, the access roads servicing the Terminal will be sited entirely within the expansion area and the CIDMMA, and the proposed rail corridors providing access to the Terminal will likely be located within existing VDOT right-of-ways; therefore, the road and rail corridors should not displace minority or low-income residents. Additional details regarding the environmental justice analysis are available elsewhere (Virginia Port Authority, 2003, Part III, pp. 15-1 to 15-5).

- Public Safety -- Emergency planning for the Hampton Roads area is coordinated at federal, state, and local levels. Region III of the Federal Emergency Management Agency (FEMA) works in partnership with the State of Virginia's emergency management agencies to prepare for and respond to disasters. The Virginia Department of Emergency Management (VDEM) is a state agency that works closely with local government emergency managers, other state agencies, voluntary organizations and federal agencies to ensure a comprehensive, efficient and effective response to emergencies and disasters throughout Virginia. The Hampton Roads Planning District Commission (HRPDC) serves as a resource to support local and regional strategies that will complement existing emergency management programs in cities and counties throughout the Hampton Roads area. Further, the Portsmouth Office of Emergency Management is responsible for the Emergency Preparedness program for the City of Portsmouth. Portsmouth has emergency preparedness plans in place for numerous situations including hurricanes, family disaster, terrorism, and emergency medical dispatching. The development and operation of the Craney Island Terminal is not anticipated to adversely affect, or to be affected by, various elements of public safety in the Hampton Roads area. Additional details related to public safety are available elsewhere (Virginia Port Authority, 2003, Part III, pp. 16-1 to 16-4).

- Historic and Archeological Resources -- Section 106 of the National Historic Preservation Act (NHPA) (16 U.S.C. 470f) indicates that the area of potential

effect for a project is the geographic area or areas within which an undertaking (project) may cause changes in the character or use of historic properties, if any such properties exist (36 CFR § 800.2). In Virginia, the Director of the Virginia Department of Historic Resources (VDHR) functions as the State Historic Preservation Officer (SHPO), and is responsible for conducting reviews of projects involving federal action to assure their compliance with Section 106. The SHPO designates cultural properties as archaeological and architectural resources. The VDHR was consulted regarding the location of previously recorded archaeological and architectural resources within the project area and within a one-mile radius of the Terminal. No archaeological or architectural historic resources were identified within the proposed port facility footprint. Also, no archaeological sites were identified within the one-mile radius of the proposed port facility. Further, several architectural resources were identified within a one-mile radius of the Terminal; however, none of the properties would be directly impacted by development of the Terminal. Finally, an extensive cultural resources survey was conducted during VDOT's Third Crossing study. This study, based on background research and field evaluations, concluded that the CIDMMA connector highway would not impact cultural resources eligible for inclusion or listed on the National Register of Historic Places. Therefore, it can be assumed that construction of the rail spur within the VDOT CIDMMA connector highway ROW would likewise not impact cultural resources eligible for inclusion or listed on the National Register of Historic Places. From the CIDMMA connector highway, the proposed rail spur would continue west within the existing VA Route 164 ROW. When constructed in the late 1980's, the VA Route 164 freeway was designed to support eastbound and westbound rail corridors within the median. No reports are on file with VDHR for cultural resource investigations associated with construction of the VA Route 164 freeway in Portsmouth. VDOT was also unable to locate information regarding any cultural resource investigations completed for the VA Route 164 freeway. Accordingly, if present, archaeological resources within the VA Route 164 median would likely have already been impacted by road construction. At the intersection of VA Route 164 and I-664, the proposed rail corridor would continue south within the I-664 ROW to connect with the Norfolk Southern and CSX railways. This portion of I-664 was also evaluated in VDOT's Third Crossing Final EIS. Based on the results of the intensive cultural resources survey, one possibly significant archaeological site and a previously recorded cemetery lie adjacent to I-664. Based on the current conceptual engineering design, these sites would be avoided and impacts would not occur. In summary, no temporary or permanent impacts to cultural resources are anticipated from construction of the proposed port facility, access roads, or rail corridors. However, prior to final design of the Craney Island Terminal, access roads, and rail corridor, the SHPO would be consulted to determine additional information needs regarding historic resources in the project vicinity (Virginia Port Authority, 2003, Part III, pp. 17-1 to 17-3).

- Secondary Growth -- Operation of the Craney Island Terminal is not anticipated to have a significant adverse affect on population growth or associated

residential development, as most jobs that would be created at the Terminal, or at other businesses indirectly benefiting from the action, are expected to be filled by workers already living in the region. A beneficial effect on commercial and industrial development, however, is anticipated, as new businesses or expanded businesses that would serve the Terminal are likely to be located at existing facilities or on redeveloped sites. This development would benefit the region in the short-term through the generation of construction jobs related to new construction or facility renovation work. In the long-term, the region will benefit from increased employment, the purchase of goods and services, and the tax revenues generated by this development (Virginia Port Authority, 2003, Part III, pp. 18-1 to 18-4).

## THIRD CROSSING OF THE HAMPTON ROADS AREA

### Introduction

Due to continuing congestion problems at the Hampton Roads Bridge-Tunnel portion of I-64, the VDOT initiated a study of a potential "Third Crossing" of the area in 1993. The Coordinating Committee for the Third Crossing included the Federal Highway Administration, Federal Transit Authority, Virginia Department of Rail and Public Transportation, VDOT, Hampton Roads Metropolitan Planning Organization, local public officials, regulatory and environmental agency representatives, including the Norfolk District of the U.S. Army Corps of Engineers, and transit commissions, rail providers, port operators, and military bases (U.S. Army Corps of Engineers, February, 2000, pp. I-16 and I-17).

The VDOT, in cooperation with the Federal Highway Administration (FHWA), is now proposing to construct a new bridge tunnel crossing of the Hampton Roads area in southeastern Virginia. The study area for this Third Crossing is depicted in Figure 6-3 (Federal Highway Administration and Virginia Department of Transportation, 2001, p. S-3). The other two crossings of the Hampton Roads area are the Monitor-Merrimac Memorial Bridge Tunnel, and the Hampton Roads Bridge Tunnel. The Third Crossing study was initiated in 1993, with a Draft EIS issued in October, 1999, and a Final EIS released in March, 2001 (Federal Highway Administration and Virginia Department of Transportation, 1999 and 2001).

Three categories of needs were basic to the Third Crossing study (Federal Highway Administration and Virginia Department of Transportation, 2001, p. S-7):

- The combination of the decreasing performance of the transportation system and increasing pressures due to growth in population and employment emphasizes the need to develop intermodal alternatives that can work together to improve accessibility, mobility, and goods movement in the Hampton Roads area.

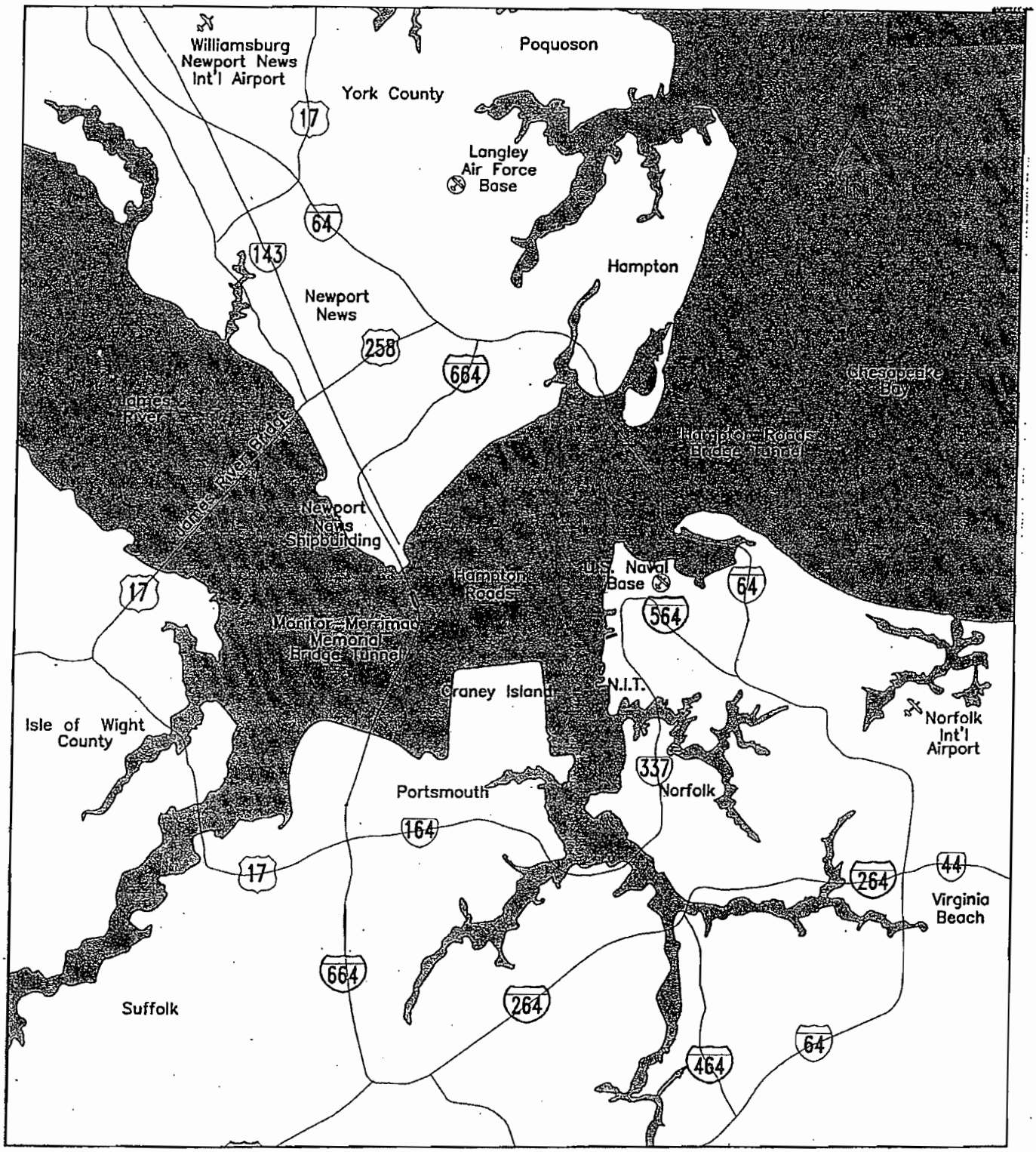



Figure 6-3: Hampton Roads Study Area for Third Crossing (Federal Highway Administration and Virginia Department of Transportation, 2001, p. S-3)

- There is a need to address the decreasing performance of the transportation system in a manner that will positively contribute to the most cost effective utilization of transportation investments that have already been made in the region.

- Of equal importance in planning for transportation needs in the Hampton Roads area is environmental protection and enhancement.

Based upon these needs, the purpose of the proposed Third Crossing is "...to improve accessibility, mobility, and goods movement in the Hampton Roads metropolitan area to help relieve the congestion that occurs at the existing I-64 Hampton Roads Bridge Tunnel" (Federal Highway Administration and Virginia Department of Transportation, 2001, p. S-7).

Preferred Alternative

A range of alternatives were evaluated during the study, with four alternatives presented in the Draft EIS -- the no-build alternative, Candidate Build Alternative (CBA) 1, CBA 2, and CBA 9. The locations of the CBAs are depicted in Figure 6-4 (Federal Highway Administration and Virginia Department of Transportation, 2001, p. S-11). Based upon several decision factors and public input, CBA 9 has been identified by the Virginia Commonwealth Transportation Board as the preferred alternative. Specific features of CBA 9 are summarized as follows (Federal Highway Administration and Virginia Department of Transportation, 2001, pp. S-13 and S-14).

> CBA 9 would provide a new crossing parallel to the I-664 Monitor Merrimac Memorial Bridge Tunnel with a connection from the new bridge tunnel to Norfolk and Portsmouth. On the Peninsula, CBA 9 begins at the I-54 interchange in Hampton and would widen I-664 to the I-64/I-264 interchange in Chesapeake. CBA 9 includes a new interchange near the south approach structure of the Monitor Merrimac Memorial Bridge Tunnel connecting to a new roadway and bridge tunnel extending from I-664 to I-564 in Norfolk. This interchange would provide access to both the existing Monitor Merrimac Memorial Bridge Tunnel as well as the new parallel bridge tunnel. CBA 9 also includes a connection along the east side of Craney Island (the CIDMMA) to VA 164 (Western Freeway) in Portsmouth. A paralleling, three-tube tunnel typical section to the west of the existing I-664 Monitor Merrimac Memorial Bridge Tunnel would cross Hampton Roads. Two of the tubes would carry two lanes each of eastbound vehicular traffic. The third tube would be used for multimodal travel, and would be dimensioned to accommodate all multimodal possibilities: HOV, passenger rail and/or bus travel. Westbound vehicular traffic would use the four travel lanes in the existing I-664 tunnel tubes. A three-tube tunnel typical section would cross the entrance to the Elizabeth River and connect to Norfolk. Eastbound and westbound vehicular traffic would be carried in two of the tubes, while the third tube would be used for multimodal travel. Specific summary features of CBA 9 include:

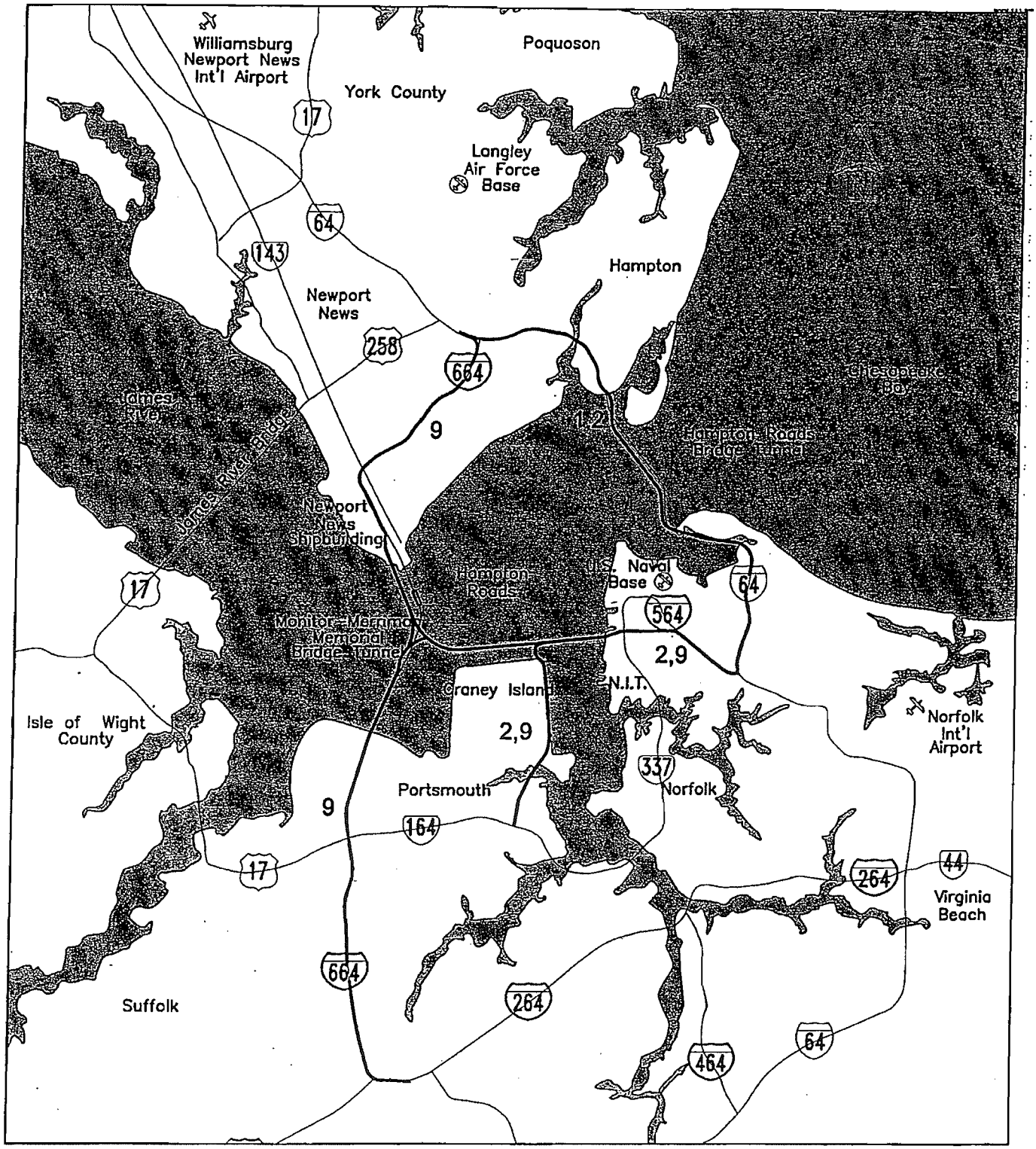



Figure 6-4: Locations of Candidate Build Alternatives for Third Crossing (Federal Highway Administration and Virginia Department of Transportation, 2001, p. S-11)

Termini: Peninsula, I-64 and I-664 interchange in Hampton.
Southside, I-64 and I-564 interchange in Norfolk;
I-64, I-664, and I-264 interchange in Chesapeake; and
VA 164 in Portsmouth

Design: Two bridge-tunnels with 4 conventional travel lanes, and 2 lanes for multimodal use. Widen I-664 on the Peninsula to 8 conventional travel lanes and 2 additional lanes for multimodal use. Widen I-664 on the Southside to 6 conventional travel lanes. New roadway from the interchange over the water south of the Monitor Merrimac Memorial Bridge Tunnel to I-564 in Norfolk with 4 conventional travel lanes and 2 lanes for multimodal use. Widen I-564 in Norfolk to 8 conventional travel lanes and 2 additional lanes for multimodal use. New roadway to VA 164 in Portsmouth with 4 conventional travel lanes (this roadway would be along the eastern edge of the CIDMMA).

Accommodated Modes: SOV, HOV, trucks, buses, passenger rail

Two potential tunnel designs are under consideration for CBA 9; they include a steel tube design and a concrete tube design. Figure 6-5 shows the typical cross-sections for the two designs (Federal Highway Administration and Virginia Department of Transportation, 2001, p. S-12). Summary features of the two designs are as follows (Federal Highway Administration and Virginia Department of Transportation, 2001, p. S-10):

> The steel tube design, which is similar to the existing I-664 tunnel, is based on a generally circular tube section that provides space above and below the travelway for ventilation. The ventilation is handled with a fully transverse system. Fresh air is supplied from ducts under the traffic, passed through the travelway, and exhausted in ducts above the ceiling. The overall height of the circular, steel tube section is 12.1 meters (40 feet). The concrete tube design offers some advantages over the steel tube design due to its smaller outside dimensions. The concrete tube design is rectangular in section and employs a jet air longitudinal ventilation system that supplies fresh air from one end of the tunnel and pumps it longitudinally in accordance to traffic movements, prevailing winds, and climatic conditions. The overall height of the concrete tube section is 9.1 meters (30 feet). The reduced height decreases the area and volume of dredging required for the tunnel, thereby reducing excavation costs and habitat impacts.

The segments and construction sequence for CBA 9 are as follows (Federal Highway Administration and Virginia Department of Transportation, 2001, p. S-21):

- A new bridge tunnel and roadway from existing Monitor Merrimac Memorial Bridge Tunnel to I-564 in Norfolk with 4 conventional travel lanes and 2 lanes for multimodal use. Widen I-564 in Norfolk to 8 conventional travel lanes and 2 multimodal use lanes.

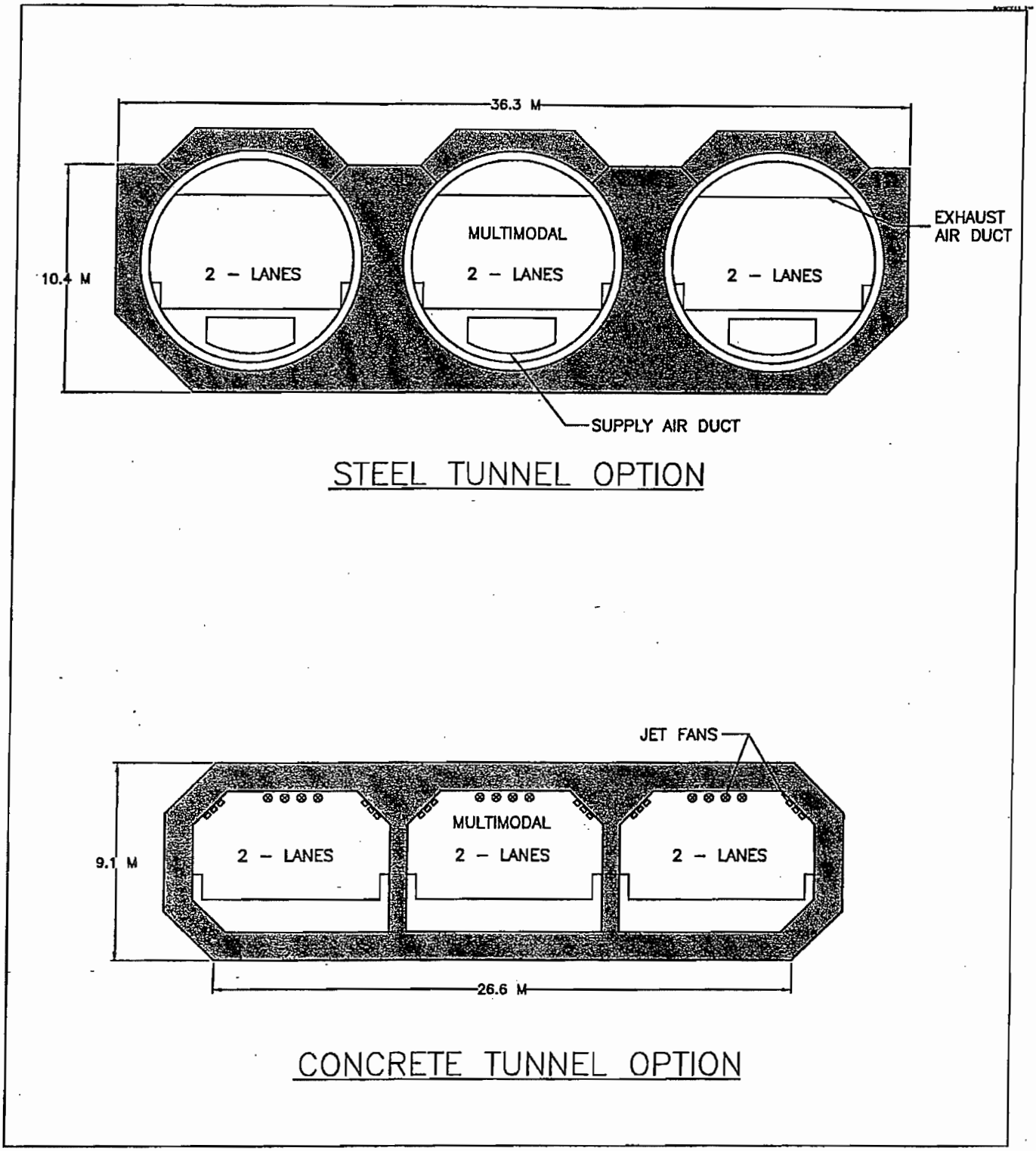



Figure 6-5: Typical Sections of Optional Tunnel Designs (Federal Highway Administration and Virginia Department of Transportation, 2001, p. S-12)

- A new bridge tunnel parallel to existing I-664 Monitor Merrimac Memorial Bridge Tunnel with two tubes of the tunnel carrying 4 conventional travel lanes and one tube carrying 2 multimodal use lanes.

- A 4-lane connection from the new facility, just east of Craney Island (the CIDMMA), running south to VA 164 in Portsmouth.

- Widen I-664 on the Peninsula to 8 conventional travel lanes and 2 additional lanes for multimodal use.

- Widen I-664 on the Southside to 6 conventional travel lanes.

The general time schedule required for CBA 9, once funding has been established, is as follows (Federal Highway Administration and Virginia Department of Transportation, 2001, p. 42): Preliminary Engineering -- 5 years; Right-of-way -- 6 years; and Construction -- 17 years. Due to some overlap, the total time from funding to the completion of construction would be 21 years.

Conditions of Aquatic Resources

Aquatic resources are an important concern relative to cumulative effects issues associated with the expansion of the CIDMMA. The Hampton Roads area itself is formed by the confluence of the James River, the Elizabeth River, and the Nansemond River. In turn, the Hampton Roads area discharges into the southern portion of Chesapeake Bay. Summary information on the conditions of water resources and aquatic ecology in the Hampton Roads area is as follows (Federal Highway Administration and Virginia Department of Transportation, 2001, pp. 94-95):

- The surface waters typically are heavily influenced by urban development. The State has listed those waterbodies that do not meet the numeric and narrative water quality standards that were adopted to protect water quality. The following monitored water bodies in the Hampton Roads area do not meet the water quality standards: Nansemond River, Shingle Creek, Elizabeth River, Eastern Branch Elizabeth River, Southern Branch Elizabeth River, and the Lafayette River.

- There are no surface waters in the study area designated as Outstanding State Resource Waters.

- There are no public surface water supplies that would be affected by the Third Crossing.

- There are no federal or state listed Wild and Scenic Rivers that would be affected by the Third Crossing.

- Sediment quality in the Hampton Roads area has been measured by the U.S. Environmental Protection Agency (EPA), and the Virginia Department of Environmental Quality (DEQ). Measured components include numerous metals, pesticides, and organic substances. The levels of these contaminants are compared to values called "Effect Range - Median: (ER-M)" given by the National Oceanic and Atmospheric Administration. ER-M is the concentration above which adverse biological effects are frequently or always observed or predicted among aquatic species tested. Neither EPA's monitoring (1985-1989) nor DEQ's monitoring (1989-1993) found sediments exceeding the ER-M concentrations.

- There are no designated sole-source aquifers in the study area regulated by Section 1424(e) of the Safe Drinking Water Act of 1974, as amended in 1986 (SDWA). In addition, there are no wellhead protection areas in the study area regulated by Section 1428 of the SDWA.

Regarding aquatic species, four categories were noted in the Final EIS -- fish, submerged aquatic vegetation, benthos, and other flora and fauna. Summary information on each category is as follows (Federal Highway Administration and Virginia Department of Transportation, 2001, pp. 96-101):

- Common anadromous species found in the Hampton Roads area and other estuarine waters in the study area include: alewife; blueback herring; shad; striped bass; and white perch. The alewife, blueback herring, and shad species have spawning and nursery areas upstream in the James River and other coastal tributaries and use the Hampton Roads area for passage between upstream and coastal habitats. The onset of alewife spawning migrations is typically from early to mid-March through April. The primary spawning runs of blueback herring begin in early April about three to four weeks after the peak alewife runs. Spawning runs for American shad typically begin in mid-February to early March, peak during April, and are over by early June. Hickory shad spawning runs may precede American shad runs and typically begin during March and April. Striped bass and white perch also have spawning and nursery areas upstream in the James River and other coastal tributaries. Striped bass occur year-round in the Hampton Roads area, while white perch typically are found in the area only during March and April. More detailed information on all of the fish species that occur in the Hampton Roads area is available in the natural resources technical appendix in the Final EIS.

- Eelgrass is the species of submerged aquatic vegetation (SAV) found in the Hampton Roads area. Several eelgrass beds are found along the southern coasts of Newport News and Hampton. No such beds are in the vicinity of the CIDMMA.

- Three commercially important benthic species found in the Hampton Roads area are the hard clam (*Mercenaria mercenaria*), the blue crab (*Callinectes sapidus*), and the oyster (*Crassostrea virginica*). Hard clams constitute a major fishery in

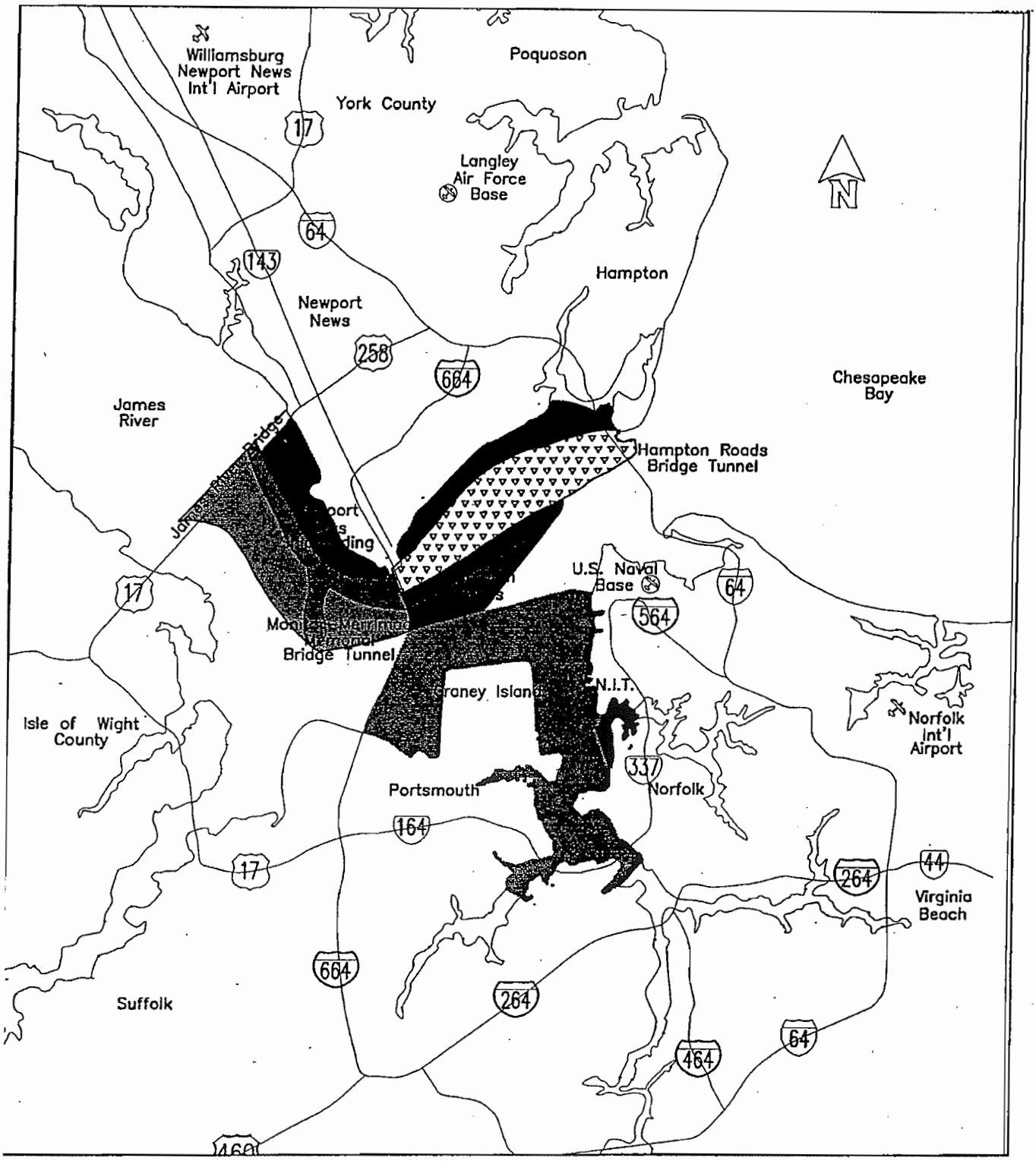



Figure 6-6: Clam Densities in the Hampton Roads Area (Federal Highway Administration and Virginia Department of Transportation, 2001, p. 99)

the Hampton Roads area during the summer. Clams are capable of living in a variety of sediment types, but higher abundances are found in coarse-grained sediments. As shown in Figure 6-6, mean population densities of hard clams vary throughout the Hampton Roads area (Federal Highway Administration and Virginia Department of Transportation, 2001, p. 99). The highest density area is located within and on the sides of the shipping channel. This area contains 32,000 to 37,000 clams per hectare (13,000 to 15,000 clams per acre). The lowest density area is around Craney Island (the CIDMMA) and the mouth of the Elizabeth River. This area contains 0 to 1,200 clams per hectare (0 to 500 clams per acre). More detailed information on the benthic species in the Hampton Roads area is available in the natural resources technical appendix in the Final EIS.

- As shown in Figure 6-7, the blue crab requires a variety of habitats to complete its life cycle (Federal Highway Administration and Virginia Department of Transportation, 2001, p. 100). Trawl surveys have shown that except for some low-density areas, blue crab is absent from the Hampton Roads area and the James River during January and February. Beginning in March, the blue crab is found in the Hampton Roads area, and by April is found in good numbers in the James River. Overwintering blue crabs, predominantly mature females, are found in the lower Chesapeake Bay generally in basin areas deeper than 9 meters. Mature and nearly mature females also may be found in the deeper portions of rivers. SAV beds are important nursery habitat for blue crabs. Because of concern for the blue crab population, a blue crab management area has been established in the Hampton Roads area, between the Hampton Roads Bridge Tunnel and the Monitor Merrimac Memorial Bridge Tunnel, within which dredging for crabs is not allowed. Finally, as shown in Figure 6-7, the immediate area around the CIDMMA is not a spawning area; however, high populations of blue crab can be found in the summer.

- Oysters are generally found in relatively shallow areas that have adequate substrate for attachment. Although they once were an important commercial fishery, harvestable oyster populations have dropped to their lowest level in history. The oyster's reproductive success, however, is considered to be still in a healthy range and management plans have been developed with the goal of preserving oyster stocks while maintaining a viable fishery. The only harvestable oyster population left in the study area is located upstream of the James River Bridge.

- Phytoplankton and zooplankton are parts of the aquatic food chain in the Hampton Roads area. Specific phytoplankton and zooplankton species that occur in the Hampton Roads area are listed in the natural resources technical appendix of the Final EIS.

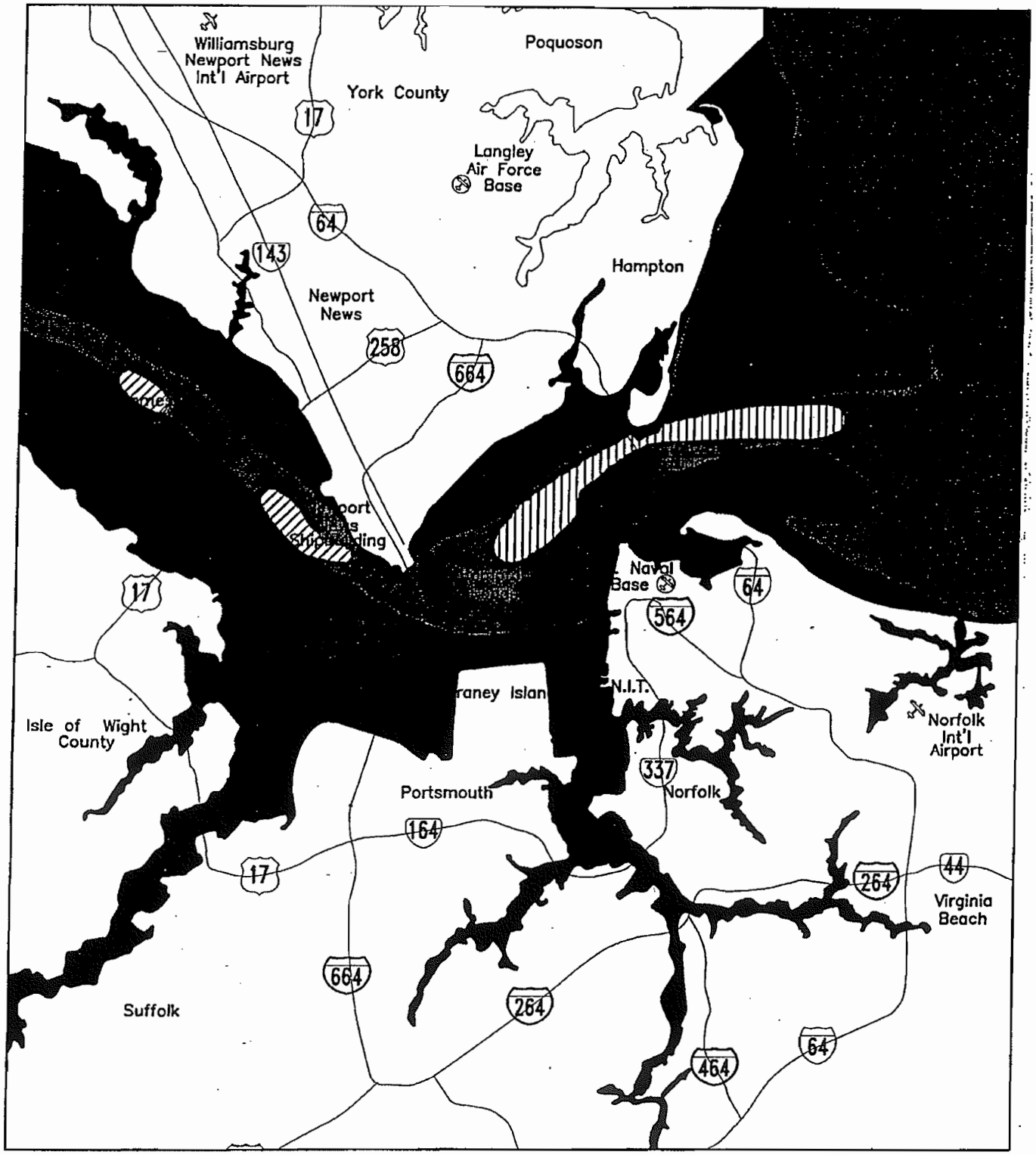



Figure 6-7: Blue Crab Habitat Areas in the Hampton Roads Area (Federal Highway Administration and Virginia Department of Transportation, 2001, p. 100)

Summary of Environmental Consequences

Table 6-6 includes a comparative summary of the environmental consequences of CBA 1, CBA 2, and CBA 9 (Federal Highway Administration and Virginia Department of Transportation, 2001, pp. S-17 to S-19). Of particular relevance are the consequences displayed for CBA 9.

Following are brief summaries of the methodologies used and the findings related to the environmental impacts of CBA 9 (Federal Highway Administration and Virginia Department of Transportation, 2001, pp. 149-27). It should be noted that some of the findings summarized below are not in Table 6-6.

- The visual impact analysis was based on the FHWA's 1990 methodology for visual impact assessment of highway projects. Views from CBA 9 were considered along with views of CBA 9. Viewers from CBA 9 include commuters, local residents, and visitors to the area. CBA 9 would create additional views of the Hampton Roads area and the cityscape in areas where the road is elevated. Computer simulations were used to depict CBA 9 following its construction. The impacts of views of CBA 9 are predicted to be generally low due to the presence of I-64 or I-664 in the foreground as well as the visually eclectic nature of the Hampton Roads area. In this context, "low impact" means that the view of CBA 9 will produce a low impact because a view of the facility is partially obstructed; the visual resources in the viewshed are of minimal quality; there are other sources of visual intrusions in the viewshed; and/or there is little or no visual contrast between the CBA 9 and the existing landscape unit.

- Air pollution emissions are primarily associated with motor vehicles using the roadway system. A microscale analysis was performed to predict the effects of carbon monoxide (CO) changes to local air quality from CBA 9; then, the results were compared to the National Ambient Air Quality Standard (NAAQS) for CO. Motor vehicle emission rates were based on EPA's Mobile 5a model, adjusted for various time periods to 2018 (the design year). Traffic forecasts for the various periods were used to determine the total emissions. Further, a "worst-case" approach was used for nearly all meteorological conditions. Air quality modeling was done for the peak one-hour condition; the model used was CAL3QHC. None of the predicted CO concentrations at five receptor locations, for the time periods examined, exceeded the one-hour NAAQS of 35 ppm. The highest predicted one-hour concentration for CBA 9 was 8.5 ppm, and this concentration included a background level of 6.0 ppm. Further, the predicted concentrations did not exceed the 8-hour NAAQS of 9 ppm. Accordingly, regarding possible exceedances of the one-hour and 8-hour standards for CO, none would be anticipated. Therefore, no mitigation measures are required.

- Regarding air quality impacts, a mesoscale or "regional" analysis was performed for CBA 9 because the Third Crossing study area is listed as a maintenance area for ozone ($O_3$). The regional analysis yields predictions of the generation of

Table 6-6: Summary of Environmental Consequences of Third Crossing[1] (Federal Highway Administration and Virginia Department of Transportation, 2001, pp. S-17 to S-19)

| Issue | | CBA 1 | CBA 2 | CBA 9 |
|---|---|---|---|---|
| Relocations | # Residental Units | 128 | 128 | 38 |
| | # Businesses | 8 | 10 | 8 |
| | # Churches | 0 | 0 | 1 |
| | # Community Facilities | 0 | 0 | 1 |
| | # Government Bldg's | 0 | 1 | 1 |
| | # Utilities | 2 | 2 | 0 |
| | # Total Relocations | 138 | 141 | 49 |
| Environmental Justice | Relocations<br># Residences Occupied by Minorities | 42 | 42 | 36 |
| | # Residences Occupied by Persons of Low-Income | 16 | 16 | 14 |
| Air Quality | # Exceedances NAAQS 1-hour & 8-hour criteria for CO | 0 | 0 | 0 |
| Noise | # Residences Approach or Exceed NAC (Absolute Impact) | 554 | 539 | 187 |
| | Existing along Alternative | 368 | 373 | 66 |
| | No-Build along Alternative | 388 | 394 | 110 |
| | # Residences with Substantial Increase (Relative Impact) | 11 | 11 | 25 |
| | # Residences with both Absolute and Relative Impacts | 43 | 43 | 27 |
| | Environmental Justice<br># Residences Occupied by Minorities w/Absolute Impacts | 178 | 155 | 176 |
| | # Residences Occupied by Persons of Low Income w/Absolute Impacts | 82 | 72 | 51 |
| Protected Species Federally Listed | Loggerhead Sea Turtle and Kemp's Ridley Sea Turtle | No adverse impact due to time of year restrictions on dredging | No adverse impact due to time of year restrictions on dredging | No adverse impact due to time of year restrictions on dredging |
| | Piping Plover | No Adverse Impact | No Adverse Impact | No Adverse Impact |
| State Listed | Dismal Swamp Shrew | No Adverse Impact | No Adverse Impact | No Adverse Impact |
| | Peregrine Falcon | No Adverse Impact | No Adverse Impact | No Adverse Impact |
| | Canebrake Rattlesnake | No Adverse Impact | No Adverse Impact | No Adverse Impact |
| Marine Mammals | Atlantic Bottlenose Dolphin and Harbor Porpoise | Highly mobile species, impacts not expected | Highly mobile species, impacts not expected | Highly mobile species, impacts not expected |

1. The No-Build is defined as the 2018 regional transportation plan. Projects included in the plan will require social and environmental impacts.

Table 6-6 (continued):

| Issue | | CBA 1 | CBA 2 | CBA 9 |
|---|---|---|---|---|
| Water Quality | Estimated Length of Waterbodies Crossed | | | |
| | Bridge Tunnel | 5,750 meters (18,860 feet) | 9,300 meters (30,505 feet) | 14,750 meters (48,380 feet) |
| | Bridged | 3,285 meters (10,775 feet) | 3,310 meters (10,855 feet) | 185 meters (595 feet) |
| | Culverted | 205 meters (665 feet) | 920 meters 3,010 feet | 1,650 meters (5,410 feet |
| | Impacts to Public Water Supply or Wellhead Protection Area? | No | No | No |
| | Impact Sole Source Aquifer? | No | No | No |
| Aquatic Resources | Benthic Habitat Impacted[2] | 29-32 hectares (72-79 acres) | 50-55 hectares (124-136 acres) | 47-51 hectares (116-126 acres) |
| | Benthic Habitat Created by the Island and Tunnel Armor Stone[3] | 30-34 hectares (74-84 acres) | 49-56 hectares (121-138 acres) | 44-49 hectares (108-121 acres) |
| Wetlands | Direct (Encroachment) | 0.56 hectares (1.40 acres) | 3.38 hectares (8.40 acres) | 4.55 hectares (11.29 acres)[4] |
| | Indirect (Bridged) | 0.90 hectares (2.22 acres) | 2.00 hectares (4.95 acres) | 1.45 hectares (3.58 acres) |
| | Function/Value Assessment for Wetland Encroachments | | | |
| | Low | | 1.26 hectares (3.13 acres) | 2.96 hectares (7.35 acres) |
| | Moderate to Low | 0.06 hectares (0.16 acres) | 1.38 hectares (3.43 acres) | 1.33 hectares (3.31 acres) |
| | Moderate | 0.46 hectares (1.14 acres) | 0.70 hectares (1.74 acres) | 0.25 hectares (0.63 acres) |
| | Moderate to High | 0.04 hectares (0.10 acres) | 0.04 hectares (0.10 acres) | |

1. The No-Build is defined as the 2018 regional transportation plan. Projects included in the plan will require social and environmental impacts.
2. Range represents the difference between the concrete and the steel tunnel typical sections (see Section V.B).
3. In addition to the tunnel armor stone, the estimate for habitat area created by tunnels also includes the sediments which will settle after construction and reestablish as natural habitat for benthic species.
4. Of the 11.29 acres of wetlands directly impacted, 3.4 acres will be permitted for the I-564 Intermodal Connector project.

Table 6-6 (continued):

| Issue | | CBA 1 | CBA 2 | CBA 9 |
|---|---|---|---|---|
| Historic Resources | # NRHP Listed Sites | 1 | 1 | 0 |
| | # NRHP Considered Eligible Historic Districts | 1 | 1 | 0 |
| | Total # "Adverse Effect" | 2 | 2 | 0 |
| Section 4(f) Resources | Use of Publicly Owned Park, Recreation Area, Wildlife or Waterfowl Refuge? | No | No | No |
| | Use of National Register listed, eligible, or considered eligible lands | 2 | 2 | 0 |
| Hazardous Waste Sites | Total # of Potential Properties | 7 | 12 | 23 |
| Farmlands | Substantial Impacts to Prime, Unique, Statewide Important Soils? | No | No | No |
| | Area of Prime Farmland Soils within Alternative | 0.9 hectares (2.3 acres) | 6.1 hectares (15.2 acres) | 47.2 hectares (116.6 acres) |

1. The No-Build is defined as the 2018 regional transportation plan. Projects included in the plan will require social and environmental impacts.

precursors to $O_3$ in the area. Various time periods to 2018 were used in the analysis. Precursors to $O_3$ include volatile organic compounds (VOCs) and nitrogen oxides (NOx). The mesoscale analysis consisted of comparing emission inventories for VOCs and $NO_x$ for the base year (1990), 2005, and 2018 under both the build CBA 9 and no-build alternative. The inventories were reduced with CBA 9, thus the Third Crossing would not worsen the $O_3$ problem in the study area; in fact, the problem could be lessened. Accordingly, no mitigation measures are required.

- Noise impact prediction and assessment was based on the use of the 1998 FHWA-approved Traffic Noise Model (TNM). The TNM is a PC-computer implementation of a three-dimensional mathematical model and includes a new vehicle noise emissions database in one-third-octave bands. The new database incorporates slow-speed and accelerating vehicles, bus and motorcycle data, vehicles on grade, and vehicles on different pavement types. The noise from potential light rail transit (LRT) trains was based on assumptions in guidance by the Federal Transit Administration. Noise levels were predicted for a large number of land-based sites; however, no predictions were made for CBA 9 in the vicinity of the CIDMMA, or along the connector road running to the south toward Highway 164. For purposes of assessment, the FHWA's noise abatement criteria (NAC) were used along with the identification of the number of residential dwelling units that would be exposed to noise levels greater than the NAC (referred to as absolute impact). Further, consideration was given to the number of dwelling units subject to project-related noise level increases of 10 dBA or more above existing levels (referred to as a substantial increase or relative impact). Similar analyses were done for the number of dwelling units (residences) occupied by minorities or low-income persons. Data on the resultant numbers of residences are in the summary table on environmental consequences (Table 6-6). To help mitigate these impacts, 16 on-land noise barriers placed at strategic locations, and subjected to cost-effectiveness criteria, have been included in the design of CBA 9. No barriers are in the vicinity of the CIDMMA. Finally, an analysis was made of ground-borne vibrations in the vicinity of CBA 9. The analysis indicated that no impacts would occur due to such vibrations.

- There is the potential for the federally listed Loggerhead sea turtle and Kemp's Ridley sea turtle to occur in the waters of the Hampton Roads area. Dredging related to construction of CBA 9 will be prohibited during the May to November time frame. A biological assessment (BA) for these sea turtles was completed and provided to the National Marine Fisheries Service (NMFS). NMFS responded to the BA as follows (Federal Highway Administration and Virginia Department of Transportation, 2001, p. 186):

> "Based upon the location of this project, the proposed time of year restrictions for hopper dredging, and the distribution of listed species in the project area, the proposed Hampton Roads Crossing Study is not likely to

adversely affect endangered or threatened sea turtles".... "No further consultation pursuant to Section 7 of the Endangered Species Act of 1973, as amended, is required."

- The piping plover, a federally listed bird species, may occur in the vicinity of CBA 9 near the CIDMMA. As currently proposed, CBA 9 will pass in to the north of the CIDMMA shoreline. Piping plovers have generally nested along the western edge of CIDMMA or inland on the island; observations of nesting pairs have only identified one piping plover nest on the northern shore. Piping plovers nesting on the western edge of the island and inland on the island would not be within the viewshed of the project. Lighting on the proposed facility will be directed onto the facility. Fugitive light will be limited to a small footprint near the facility. Because of the distance between the new facility and the areas on the CIDMMA (western and northern shores) historically utilized by piping plovers, fugitive light from the facility light will not illuminate historically preferred piping plover habitat. Based on this information, along with other ecological information on the piping plover species, CBA 9 is not expected to adversely affect piping plovers because it will not directly use piping plover habitat or induce land use changes on the CIDMMA that would destroy piping plovers or their habitat; will not serve as a substantial attractor to predators that might effect piping plover breeding success; will not interdict piping plover access to the island; and will not induce additional recreational use, foot or motorized traffic on the CIDMMA. A BA for the piping plover has been submitted to the U.S. Fish and Wildlife Service (USFWS). Continued coordination is planned with the USFWS as CBA 9 moves into the final design stage.

- The Dismal Swamp shrew, Peregrine falcon, and canebrake rattlesnake are state-listed species that occur in the Hampton Roads area. However, due to their habitat requirements, CBA 9 is not expected to cause adverse impacts on these species.

- Atlantic bottlenose dolphins and harbor porpoises have been sighted during certain times of the year in the Hampton Roads area; with the porpoises less likely to occur. These species are highly mobile and intelligent, thus they would be expected to avoid the construction zone for CBA 9. Accordingly, no adverse impacts are anticipated.

- Surface water and sediment samples were collected in a special study focused on the crossing locations of CBA 1, CBA 2, and CBA 9. Three water-sampling locations were used for CBA 9, along with 30 sediment-sampling locations. Eight metals were detected in the three surface water stations -- arsenic, copper, lead, nickel, selenium, silver, thallium, and zinc. Four metals including lead, nickel, selenium, and silver exceeded applicable water quality standards or criteria. Both the surface and bottom samples had exceedances. Fecal coliform were detected but did not exceed water quality standards. Twelve metals were detected in the sediments at stations located along CBA 9, including arsenic, beryllium,

chromium, copper, lead, mercury, nickel, selenium, thallium, tributyl tin, and zinc. Arsenic, chromium, copper, lead, nickel, thallium, and zinc were detected the most frequently at 19 of 20 stations sampled. Eight SVOCs (semivolatile organic compounds) were detected in the sediments including benzo (a) anthracene, benzo (a) pyrene, benzo (b) fluoranthene, benzo (k) fluoranthene, chrysene, fluoranthene, phenanthrene, and pyrene. With the exception of phenanthrene, all the SVOCs were detected at one station (C9 BLS 19). Phenanthrene was detected at one station (C9 BLS 01). In addition, heptachlor was detected once at station C9 BLS 08. All metals were below the low effects value for applicable sediment quality benchmarks with the exception of arsenic, silver, and zinc. However, these three metals had detected concentrations that were less than the benchmark. All the SVOCs were above the median effects value.

- Regarding impacts on water quality, an extensive monitoring program was conducted during the construction of the I-664 Monitor Merrimac Memorial Bridge Tunnel in 1992. The monitoring results indicated that: (1) total suspended solids violations were associated with atypical events and were transient; (2) dissolved oxygen violations occurred during the summer months when low levels were observed throughout the Hampton Roads Harbor; (3) concentrations of organic and metal contaminants were negligible and no patterns could be related to proximity to dredging and filling activities; and (4) no ecologically significant effects on water quality were noted. It is anticipated that these results would be applicable to the construction phase for CBA 9.

- The major water body crossed by CBA 9 is the Hampton Roads area and mouth of the Elizabeth River. This bridge-tunnel crossing will be 48,380 feet (14,750 m.) long, and will be primarily comprised of a tunnel. The quantity of material to be dredged for CBA 9 includes the following components (note that a decision has yet to be made on the concrete versus steel design for the tunnel): (1) Hampton Roads area -- 876,000 $m^3$ (6 lane concrete tunnel) to 1,189,000 $m^3$ (6 lane steel tunnel); (2) Elizabeth River area -- 1,718,000 $m^3$ (6 lane concrete tunnel) to 2,214,000 $m^3$ (6 lane steel tunnel); and (3) excavation of islands in the Elizabeth River area -- 7,700 $m^3$. The potential water quality and aquatic impacts of dredging include the generation of suspended solids/turbidity and the resultant degradation of surface water quality and sediment quality; elimination of benthic populations within the dredging zone; and, deposition of dredge-induced suspended sediment on benthic populations downstream of the dredging zone. The water quality impacts are expected to be site-specific and have a short duration; this is because of the transient nature of dredging itself. The final selection of the dredging equipment, and the method of dredging, will occur during the final design stage. The dredged material may likely be disposed of to the CIDMMA; another option is in the ocean disposal site.

- Large quantities of fill material will be required for the CBA 9 tunnel and associated islands. For example, the quantities will include:

(1) Hampton Roads area -- 6 lane concrete tunnel -- 192,000 $m^3$ of common backfill; 86,000 $m^3$ of armor rock; and 54,000 $m^3$ of locking stone;

(2) Hampton Roads area -- 6 lane steel tunnel -- 327,000 $m^3$ of common backfill; 104,000 $m^3$ of armor rock; and 92,000 $m^3$ of locking stone;

(3) Hampton Roads area -- islands -- 567,000 $m^3$ of common backfill; 188,000 $m^3$ of armor rock; and 595,000 $m^3$ of "type C" stone

(4) Elizabeth River area -- 6 lane concrete tunnel -- 198,000 $m^3$ of common backfill; 89,000 $m^3$ of armor rock; and 56,000 $m^3$ of locking stone

(5) Elizabeth River area -- 6 lane steel tunnel -- 342,000 $m^3$ of common backfill; 109,000 $m^3$ of armor rock; and 96,000 $m^3$ of locking stone

(6) Elizabeth River area -- islands -- 279,000 $m^3$ of common backfill; 147,000 $m^3$ of armor rock; and 187,000 $m^3$ of type C stone

- A three-dimensional hydrodynamic and sedimentation model, HYSED-3D, was used by the Virginia Institute of Marine Science (VIMS) to simulate the tide, current, and salinity fields of the James River in the Hampton Roads area. In addition, the model was used to simulate sedimentation in the lower James River as part of a study to assess the environmental effects of bridge-tunnel construction for the Third Crossing. No discernible change in simulated tidal heights was noted at any of the nine tide stations selected for comparison of the Base Case with CBA 9. Changes in tidal current time histories were predicted at four of the seven current stations selected for comparison. Determination of the tidal prism (volume of flood or ebb flow entering an enclosed region) was deemed important for the Elizabeth River, a tidal basin with only a single seaward entrance and no measurable freshwater inflow. A reduction in tidal prism is normally associated with a reduction in the flushing ability of a tidal basin. The model results indicated that eddy motion decreases and residual water volumes passing through the transect are reduced as a result of CBA 9. This happens primarily during apogean-neap tides when eddy development is most pronounced. This finding suggests that residual circulation may be affected, at least within the Elizabeth River entrance region. Further, only minimal changes were predicted in the salinity profiles in the study area. Finally, only minor changes in sedimentation patterns are expected from the construction of CBA 9.

- No direct public water supply impacts would be associated with CBA 9; further, there are no groundwater aquifers in the study area that are used for public drinking water supplies.

- Regarding fish resources in the Hampton Roads area, in the freshwater systems there are no fish species particularly sensitive to temporary impacts due to noise or turbidity caused by construction activity. Therefore, construction should not

affect populations of freshwater fish species. In addition, construction in the larger estuarine systems would be spread out over two or three years and would impact only a small percentage of the migratory patterns of anadromous or marine fish species.

- There are no SAV beds located within the footprint of CBA 9.

- Proposed dredging and fill activity would have both temporary and permanent impacts to the existing benthic populations within the designated dredge areas. However, the benthic macroinvertebrate community present, which includes both opportunistic and equilibrium species, is expected to promote recolonization by opportunistic species. Table 6-7 gives the estimated areal extent of benthic habitat removed in hectares during the dredging and filling activities for CBA 9 (Federal Highway Administration and Virginia Department of Transportation, 2001, p. 211). Note that approximately nine percent more habitat is lost in construction of the steel tunnel versus the concrete tunnel. Oyster reef establishment or restoration could serve as mitigation for the benthic habitat impacts associated with the construction of CBA 9.

- Based upon the range of clam densities in the corridor for CBA 9, and considering the differences in the areas required for dredging for a concrete tube tunnel versus a steel tube tunnel, the potential hardshell clam losses would range from 137,000 to 435,000 for the concrete tube tunnel, and from 148,000 to 473,000 for the steel tube tunnel. These numbers are less than 1% of the known populations in the Hampton Roads area; further, clam populations will likely become reestablished following construction.

- The blue crab uses a variety of habitats throughout the year within the Hampton Roads area. Blue crab spawning and early development will not be affected by CBA 9 because these activities take place outside of the Hampton Roads area. Dredging for the bridges and tunnels would have little affect on blue crab during the summer when crabs are moving through the Hampton Roads area because blue crabs are a mobile species. During the winter, dredging could have an impact on the small number of male crabs that use the bottom areas in the Hampton Roads area for hibernation. Turbidity associated with dredging is unlikely to affect blue crabs because they encounter natural turbidity throughout the Hampton Roads area. The area to the north of the CIDMMA and the mouth of the Elizabeth River is a blue crab pot and peeler pot location in the spring and summer months, and any dredging during that time will result in the displacement of watermen's pots.

- Temporary local short-term impacts to phytoplankton, macro-algae, and zooplankton in the immediate vicinity of CBA 9 may occur due to increases in turbidity. However, these impacts will not have an adverse effect on the overall functioning of the ecosystem.

Table 6-7: Benthic Habitat Impact and Creation (Federal Highway Administration and Virginia Department of Transportation, 2001, p. 211)

| CBA[2] | Island and Tunnel Location | Benthic Habitat Impacted | | Habitat Created by Armor Stone[3,4] | | Net Habitat Impacted | |
|---|---|---|---|---|---|---|---|
| | | Hectares | Acres | Hectares | Acres | Hectares | Acres |
| CBA 9 | | | | | | | |
| Concrete Tunnel | Hampton Roads Islands | 14 | 35 | 7 | 17 | | |
| | Hampton Roads Tunnel | 9 | 22 | 15 | 37 | | |
| | Elizabeth River Island | 6 | 15 | 2 | 5 | | |
| | Elizabeth River Tunnel | 18 | 44 | 20 | 49 | | |
| | **Total** | **47** | **116** | **44** | **108** | **3** | **8** |
| Steel Tunnel | Hampton Roads Islands | 14 | 35 | 7 | 17 | | |
| | Hampton Roads Tunnel | 11 | 27 | 17 | 42 | | |
| | Elizabeth River Island | 6 | 15 | 2 | 5 | | |
| | Elizabeth River Tunnel | 20 | 49 | 23 | 57 | | |
| | **Total** | **51** | **126** | **49** | **121** | **2** | **5** |

1. Habitat impact and creation estimates are rounded to the nearest hectare/acre
2. The No-Build is defined as the 2018 regional transportation plan. Projects included in the plan do not include a crossing of Hampton Roads.
3. All armor stone quantities represent surface areas of armor stone below water level (elev. = 0)
4. Tunnel estimates include armor stone as well as reestablished substrate

- Table 6-8 provides a summary of the total wetland impacts of CBA 9 (Federal Highway Administration and Virginia Department of Transportation, 2001, p. 223). Detailed information on the locations of individual impacted wetlands is in the Final EIS. The wetland types listed in Table 6-8 include the following: E2EM -- estuarine intertidal irregularly flooded persistent emergent wetland; PEM-- palustrine seasonally or temporarily saturated or flooded persistent or nonpersistent emergent wetland; PFO -- palustrine seasonally or temporarily saturated broad leaved deciduous/needle leaved evergreen forested wetland; PSS -- palustrine temporarily flooded broad leaved deciduous shrub-shrub wetland or deciduous/dead shrub-shrub wetland; and E2RB -- estuarine intertidal regularly flooded artificial (excavated) rock bottom canal wetland. Placement of fill in a wetland is considered an encroachment and a permanent wetland impact. Construction of a bridge over a wetland would generally avoid permanent impacts to wetlands although there could be minimal permanent impacts and also some temporary impacts during construction. Indirect impacts may result from road construction or long-term roadway operation. These indirect impacts can affect wetlands by changing the vegetation community, erosion and sediment deposition, or altering water regimes and water quality. However, new highway construction in Virginia must include stormwater management systems. Such systems would prevent sediment and pollutants from reaching wetlands by improving the water quality of runoff from most storms during the year (2-year storm events or less). Regarding CBA 9, a total of 11.29 acres of wetlands will be impacted by encroachment, with an additional 3.58 acres impacted by indirect means. None of the impacted wetlands are in the vicinity of the CIDMMA.

- A functions and values assessment of the potentially impacted wetlands was made through usage of the Wetland Evaluation Technique (WET), version 2.0. The following functions and values were evaluated for each of the freshwater wetlands: groundwater recharge/discharge, floodflow alteration, sediment stabilization, sediment/toxicant/nutrient retention, production export, wildlife diversity/abundance, aquatic diversity/abundance, and recreation and uniqueness/heritage. The estuarine wetlands were not evaluated for groundwater recharge/discharge and floodflow alteration, due to differences in the hydrological functions they provide. The ratings for each function and value for each wetland were assigned based on field observations and the WET methodology. Then, best professional judgment was used to ascertain the overall likelihood for each wetland to perform the various functions. Regarding the encroachment of CBA 9 on wetlands, a total of 11.29 acres are involved. Categorization of these wetlands revealed that 7.35 acres had a low likelihood of performing the various functions, 3.31 acres had a moderate to low likelihood, and 0.63 acres had a high likelihood. No wetlands impacted by encroachment were in the moderate to high likelihood category. Accordingly, the wetland encroachment acreage from CBA 9 will not significantly degrade or lead to the further degradation of waterbodies in the project area. Of the 11.3 acres of wetland encroachment, many are encroachments on small (<0.6 acre) relatively low functioning, isolated wetlands.

Table 6-8: Summary of Wetland Impacts[1] (Federal Highway Administration and Virginia Department of Transportation, 2001, p. 223)

| Wetland Type | CBA 1 | | CBA 2 | | CBA 9 | |
|---|---|---|---|---|---|---|
| | Direct (Encroach) | Indirect (Bridged) | Direct (Encroach) | Indirect (Bridged) | Direct (Encroach) | Indirect (Bridged) |
| E2EM | | | | | | |
| Hectares | 0.36 | 0.59 | 1.69 | 1.41 | 1.32 | 1.17 |
| Acres | 0.90 | 1.46 | 4.17 | 3.49 | 3.27 | 2.88 |
| PEM | | | | | | |
| Hectares | | 0.31 | 0.60 | 0.43 | 0.77 | 0.12 |
| Acres | | 0.76 | 1.49 | 1.06 | 1.91 | 0.30 |
| PFO | | | | | | |
| Hectares | | | 0.74 | | 2.17 | |
| Acres | | | 1.85 | | 5.41 | |
| PSS | | | | | | |
| Hectares | | | | 0.16 | 0.12 | 0.16 |
| Acres | | | | 0.40 | 0.31 | 0.40 |
| E2RB | | | | | | |
| Hectares | | | 0.16 | | 0.16 | |
| Acres | | | 0.39 | | 0.39 | |
| Compensation Site | | | | | | |
| Hectares | 0.20 | | 0.20 | | | |
| Acres | 0.50 | | 0.50 | | | |
| Total | | | | | | |
| Hectares | 0.56 | 0.90 | 3.38 | 2.00 | 4.55 | 1.45 |
| Acres | 1.40 | 2.22 | 8.40 | 4.95 | 11.29 | 3.58 |

1. The No-Build is defined as the 2018 regional transportation plan. Projects included in the plan may impact wetlands.

Large wetland systems present in the project area were avoided or the alignment was located to minimize encroachments.

- The remaining summary impact issues in Table 6-6 (historic resources, Section 4(f) resources, hazardous waste sites, and farmlands) are self-explanatory. These issues are not addressed further herein because they are not specifically related to the cumulative effects assessment study for the eastward expansion of the CIDMMA.

PRE-AUTHORIZATION NORFOLK DISTRICT STUDIES

Pre-authorization studies by the Norfolk District of the Corps can be used as indicators of RFFAs. Each of the completed studies or the planned study will involve cost sharing by local sponsors. For example, five Section 933 studies have been found to be economically justified. "Section 933" refers to Section 933 of the Water Resources Development Act (WRDA) of 1986, and it includes Section 207 of WRDA 1992. These sections provide the opportunity for beneficial uses of beach-quality dredged material through a cost-shared placement operation in conjunction with dredging operations at Federally authorized navigation projects. The five economically justified Section 933 studies are based on construction of the 55-foot outbound element of the authorized Norfolk Harbor and Channels project. Prior to construction of the 55-foot outbound element, the beaches resulting in the five economically justified Section 933 studies would need to be reevaluated, if placement of sand were still supported by non-Federal interests. Following is summary information on the features of the five projects (U.S. Army Corps of Engineers, February, 2000, pp. III-1 to III-4):

- Sandbridge Beach, Virginia Beach -- The 1990 report concluded that the added cost of dredging approximately 1.1 million cubic yards of sand from the Thimble Shoal Channel, or approximately 1.2 million cubic yards of sand from the Atlantic Ocean Channel, for use at Sandbridge Beach between the Naval Fleet Anti-Air Warfare Training Center at Dam Neck and Back Bay National Wildlife Refuge, to construct a berm approximately 5 miles long and 100 feet wide, would be justified by the benefits associated with the placement of sand.

- Virginia Beach Resort Strip, Virginia Beach -- The 1989 report concluded that the added cost of the placement of 1.1 million cubic yards of sand from the Atlantic Ocean Channel, or 1.0 million cubic yards of sand from the Thimble Shoal Channel, on the resort beach between Rudee Inlet and 49th Street, for beach nourishment purposes, would be economically justified.

- Ocean Park Beach, Virginia Beach -- The 1990 report concluded that the added cost of placing 408,000 cubic yards of sand dredged from the Thimble Shoal Channel on the beach at Ocean Park, between the Chesapeake Bay Bridge-Tunnel and Lynnhaven Inlet, to construct a berm approximately 11,000 feet long and 125 feet wide, would be justified by the benefits associated with the placement.

- Central Ocean View Beach, Norfolk -- The 1991 report concluded that the added cost of placing 60,000 cubic yards of sand dredged from the Thimble Shoal Channel on the beach at Central Ocean View, between Warwick Street and the eastern boundary of Community Beach, to construct a berm approximately 2,340 feet long and 125 feet wide, would be economically justified.

- Willoughby Spit Area, Norfolk -- The 1990 report concluded that the added cost of placing 386,000 cubic yards of sand dredged from the Thimble Shoal Channel on the beach at Willoughby Spit, between Mason Creek Road and the terminal groin at the end of Lea View Avenue, to construct a berm approximately 13,500 feet long and 125 feet wide, would be justified by the benefits.

Another pre-authorization study, completed in 1998, was focused on a Dredging Master Plan for the City of Norfolk. The Plan was developed under the authority of Section 22 of the WRDA 1974. The Plan, which addresses dredging for navigation, storm drainage, and in-town reservoir maintenance, was based on the accomplishment of the following tasks: (1) identification and description of the existing and potential dredging areas; (2) identification and description of the criteria, methods, and locations used for disposal of dredged material; (3) definition and examination of partnering opportunities such as combining dredging jobs (piggybacking) in the interest of reducing mobilization and demobilization costs; (4) identification and description of the major factors used in determining dredging costs; (5) identification of criteria for the prioritization of dredging projects; (6) development of a 5-year prioritized dredging schedule; and (7) identification and discussion of potential Federal and state programs/funding sources for "new work" and/or periodic maintenance (U.S. Army Corps of Engineers, February, 2000, pp. III-4 and III-5).

Finally, a potential study includes the development of an environmental restoration plan for the Lynnhaven River Basin. The 50 square-mile, shallow water Basin is located in Virginia Beach on the south shore of the Chesapeake Bay, just west of Cape Henry and 10 miles east of Norfolk. The total water surface area is approximately 10 square miles, and there are 100 miles of shoreline within the Basin. The waters in the Basin are brackish and subject to the action of tides. The Basin was once a highly productive ecosystem known worldwide for the famous Lynnhaven oyster. However, widespread residential and commercial development has gradually degraded the environmental resources. Loss of wetlands and forested buffers have resulted in increased sedimentation and degraded water quality. This, in turn, has caused loss of habitat for submerged aquatic vegetation, shellfisheries (oysters), and finfish/crab spawning and juvenile rearing areas.

A reconnaissance study for the Lynnhaven River Basin was authorized by a resolution adopted on May 6, 1998, by the Committee on Transportation and Infrastructure, U.S. House of Representatives. The study will evaluate alternatives to improve the environmental quality of the Lynnhaven River Basin by restoring wetlands, submerged aquatic vegetation, and fisheries. Stabilizing eroding shorelines with wetland fringes, using wetlands for stormwater treatment, and improving submerged bottom by

dredging or other methods of decontamination will also be evaluated (U.S. Army Corps of Engineers, February, 2000, pp. III-9 and III-10).

MIDTOWN TUNNEL PROJECT

The VDOT is planning a second tunnel to be located under the Elizabeth River immediately adjacent to the existing Midtown Tunnel, which connects the Cities of Portsmouth and Norfolk. The tunnel project is being considered for possible public-private partnership. A Final EIS for the project was completed by the Federal Highway Administration in 1996. However, the Midtown Tunnel project is not currently on the VDOT's schedule (U.S. Army Corps of Engineers, February, 2000, p. I-17).

VIRGINIA INTERMODAL TRANSPORTATION CENTER

The Virginia Intermodal Partnership Project addresses the need to ensure that the Port of Hampton Roads will be able to meet the demands of increases in container cargo within the next decade by creating a partnered state-of-the-art intermodal transportation center (ITC). The project will be based on a long-term partnership between the Department of Defense and the commercial intermodal industry. The Department of Defense would contribute the land, facilities, equipment, and partial funding, while other agencies and commercial interests would contribute other assets. The ITC would join Norfolk International Terminal, Airport Operations at the Oceana Naval Air Station, rail access through Norfolk Southern, and access to I-64, all linked within a four square mile area. Although there has been no comprehensive implementation plan developed to date, the project remains an important economic initiative for the region that is being developed by the U.S. Navy in cooperation with the Port of Hampton Roads, the City of Norfolk, and Norfolk Southern Corporation (U.S. Army Corps of Engineers, February, 2000, pp. I-18).

# CHAPTER 7

# DELINEATION OF CUMULATIVE EFFECTS

This chapter provides an integrated perspective on the cumulative effects of multiple projects and actions in the CIDMMA area on pertinent resources, ecosystems and human communities. Steps 8 and 9 of the 11-step methodology are included herein. Table 7-1 identifies the contributing actions addressed in this chapter. Further, a matrix display of connections between the actions and various resources, ecosystems, and human communities is included in Table 7-2. The majority of the chapter includes summaries of the key impacts from navigation improvements in the vicinity of the eastward expansion of the CIDMMA, the expansion cell construction and operation, the proposed marine terminal to be located on the expansion cell, and other projects and actions as identified in Chapters 4 through 6. The anticipated impacts from navigation improvements in the vicinity of the eastern expansion of the CIDMMA, the expansion cell construction and operation, and the development and operation of the Craney Island Terminal, were delineated by the NEPA Technical Committee working in collaboration with the Corps on this feasibility study (U.S. Army Corps of Engineers, August 26, 2002). Brief statements related to these anticipated impacts and associated mitigation measures are organized by the above three categories of actions. Summary information on selected direct impacts of the eastward expansion of the CIDMMA is included along with the more qualitative information. The selected information is from the Planning Aid Report (PAR) prepared by the U.S. Fish and Wildlife Service (Ruddy, 2002), a specific research project on impacts on dominant benthic species (Seitz and Lipcius, 2002), and a hydrodynamic modeling study (Boon, et al., 2002). The final section includes some observations on the relative importance of the cumulative effects.

## IMPACTS FROM NAVIGATION IMPROVEMENTS

The anticipated impacts related to dredging associated with deepening the inbound lanes of the Norfolk Harbor Channel and the Craney Island Channel from -45.0 feet to -50.0 feet include the following:

- Geology -- Creation of slope instability in the Channels and in the entrance and egress zones for the Craney Island Terminal, and alteration of bottom topography, particularly in the entrance and egress zones. Mitigation would include the provision of slope stability for channel side slopes via proper design and careful dredging; no mitigation is proposed for the alteration of bottom topography.

Table 7-1: Past, Present, and Reasonably Foreseeable Future Actions Contributing to Cumulative Effects

| Action | Past | Present | Future | Chapter with Detailed Information |
|---|---|---|---|---|
| CIDMMA | | | | |
| • Continuing use of existing 3 cells (1) | X | X | X | 2 |
| • Eastward expansion (2) | | | X (M) | 2, 7 |
| PostAuthorization Norfolk District Projects | | | | |
| • Navigation channel deepening and anchorages - constructed (3) | X | | | 4 |
| • Navigation channel deepening and anchorages - not yet constructed (4) | | X | X | 4 |
| • Maintenance dredging (5) | X | X | X | 4 |
| Navigation Planning - channel deepening and maintenance dredging (6) | | | X (H) | 4 |
| Water-related laws, regulations, and programs (7) | X | X | X | 4 |
| Other existing and continuing projects in the area (8) | X | X | X | 4 |
| APM Terminals (new marine terminal) (9) | | X | X | 5 |
| Elizabeth River Ecological Restoration Program | | | | |
| • Sediment cleanup (10) | | X | X | 5 |
| • Wetland restoration (11) | | X | X | 5 |
| Pinner's Point Flyover (highway bridge and connector) (12) | | X | X | 5 |
| Craney Island Terminal (Virginia Port Authority) (13) | | | X (M) | 6 |
| Third Crossing of Hampton Roads Area (Virginia Department of Transportation) (14) | | | X (M) | 6 |
| Pre-Authorization Norfolk District Studies (five on beneficial uses of beach-quality dredged material, and one on a City dredging and water management plan) (15) | | | X (L) | 6 |
| Midtown Tunnel Project (Virginia Department of Transportation) (16) | | | X (L) | 6 |
| Virginia Intermodal Transportation Center (17) | | | X (L) | 6 |

Notes: The actions are numbered (1) through (17). Past denotes actions from mid-1950s to 1999; present denotes actions in general time period from 2000 to 2005; and Table 7-1: (continued)

future denotes actions from 2006 to 2050. In the future column, H denotes high likelihood of occurrence, M denotes medium, and L denotes low. No “occurrence code” indicates the continuation of a past and/or present action.

Table 7-2: Connections Between Affected Resources, Ecosystems, and Human Communities, and the Major Affecting Actions

| Affected Resources, Ecosystems, and Human Communities | Major Affecting Actions (numbered actions are from Table 7-1) |
|---|---|
| Geology | 2 |
| Water Quality | 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 13, 14, 16 |
| Hydrodynamics | 1, 2, 3, 4, 6, 8, 9, 13, 14, 16 |
| Air Quality | 2, 9, 13, 14, 16 |
| Noise | 2, 8, 9, 12, 13, 14, 16 |
| Biological Resources (including benthic habitat) | 1, 2, 3, 4, 5, 6, 8, 9, 10, 12, 13, 14, 16 |
| Protected Species and Critical Habitat | 1, 2, 3, 4, 5, 6, 8, 9, 10, 11, 12, 13, 14, 16 |
| Recreation (including Boating and Fishing) | 1, 2, 3, 4, 5, 6, 8, 9, 10, 12, 13, 14, 16 |
| Aesthetics | 1, 2, 3, 4, 5, 6, 8, 9, 10, 12, 13, 14, 16 |
| Cultural Resources | 1 |
| Socioeconomics | 1, 2, 3, 4, 5, 6, 8, 9, 10, 12, 13, 14, 15, 16 |

- Water quality -- Short term and localized increases in turbidity will occur during the dredging operations, along with depressed dissolved oxygen levels due to releases of organic materials into the water column. If the sediments are contaminated, potential releases of toxic levels of trace materials, along with synthetic organic contaminants, could occur during sediment movement. Mitigation for turbidity increases will involve the use of a hydraulic cutterhead or hopper dredge to minimize and localize the generation of turbidity and settleable solids. Elevated contaminant levels in the sediment are not anticipated since the channels have been subjected to both initial dredging and maintenance dredging. Pre-dredging testing of the sediments will be used to ascertain sediment contamination and develop appropriate mitigation measures.

- Hydrodynamics -- Three-dimensional hydrodynamic modeling was conducted for the areas near the CIDMMA. The base condition for the modeling included deepening the local navigation channel to 50 feet, and the provision of Terminal access/egress. The modeling results indicated that there would be no significant effects to water circulation, sedimentation, salinity, currents, and tidal flushing from the Elizabeth River with an eastward expansion of the CIDMMA. As part of the modeling study, several directional expansion scenarios were evaluated, and the eastward expansion demonstrated the least effects (U.S. Army Corps of Engineers, undated).

- Air Quality -- Air pollutant emissions from diesel-powered dredges could cause localized exceedances of the federal and State of Virginia ambient air quality standards for $NO_2$, the 8-hour CO standard, and the $PM_{10}$ standards. The State's 24-hour $SO_2$ standard may also be exceeded. Mitigation measures that could be used to reduce emissions include either, or a combination of, increased usage of low sulfur fuels for diesel dredges, and electrification of diesel-powered dredges. Further, a conformity analysis for air quality compliance with pertinent ambient standards will be conducted to determine potential required mitigation measures.

- Noise -- Noise impacts from diesel or electric-powered dredges will be localized in the specific area being dredged. In addition, dredging activities will occur at sufficient distances from sensitive receptors such as protected bird species and human residential areas; thus, no excessive and out-of-character noise levels will be experienced. Therefore, no specific noise mitigation measures will be required.

- Biological Resources -- There will be a loss of benthic infauna from dredging associated with deepening the inbound channels, and from preparing the ship access/egress areas to and from the Terminal. Some natural recovery of benthic infauna is expected to occur over a 5-year period; however, periodic maintenance dredging will not facilitate complete recovery. Planning is currently underway to develop appropriate off-site and out-of-kind mitigation for the losses and changes in the benthic community structure (see the synopsis of potential

mitigation alternatives contained in the biological resources portion of the expansion cell construction and operation section).

- Protected Species and Critical Habitat -- The dredging activities could impact five species of threatened or endangered sea turtles that may infrequently be found in or near the areas to be dredged. Section 7 coordination with the National Marine Fisheries Service (NMFS), under the auspices of the Endangered Species Act, will be accomplished. Further, mitigation will include the selected use of dredging equipment and sea turtle exclusion devices, where appropriate, and dredge operation controls such as seasonal restrictions to avoid or minimize sea turtle impacts.

- Recreation -- Some local area conflicts may arise with recreational boating activities, and potential reductions in recreational fishing in the harbor area may occur. To mitigate for reductions in fishing, artificial fish reefs could be added in the harbor area and the lower Chesapeake Bay.

- Aesthetics -- Navigation improvements will cause minimal visual impacts because dredging activities, commercial navigation traffic, and recreational boating are typical throughout the Hampton Roads area. No mitigation measures are required.

- Cultural Resources -- No historical/cultural resources have been identified in the areas to be dredged, thus no impacts to such resources are anticipated. No mitigation measures are required.

- Socio-economics -- Minor beneficial impacts on the local and regional economy will occur from dredging-related employment. No mitigation measures are required.

IMPACTS FROM EXPANSION CELL CONSTRUCTION AND OPERATION

The anticipated impacts related to the construction and operation of the eastward expansion cell at the CIDMMA include the following:

- Geology -- Creation of slope instability in the expansion cell containment dikes, and alteration of bottom topography in the cell area and particularly at the base of the dikes. Mitigation would include the provision of slope stability by proper dike design and the use of appropriately sequenced construction methods; no mitigation is proposed for the alteration of bottom topography.

- Water Quality -- If the sediments (dredge materials) placed in the eastward expansion area are contaminated, potential releases of toxic levels of trace materials, along with synthetic organic contaminants, could occur during sediment movement. Another potential impact is related to liquid effluent releases from the confined material expansion cell itself, and the associated

consequences on water quality in the area around the CIDMMA. Elevated contaminant levels in the sediment are not anticipated since the channels have been subjected to both initial dredging and maintenance dredging. Pre-dredging testing of the sediments will be used to ascertain sediment contamination. Regarding the effluent from the expansion cell, it will be pumped through the existing three cells of the CIDMMA, with its subsequent discharge to the west of the CIDMMA. The final effluent will be monitored for appropriate contaminants, and cell retention times will be adjusted as appropriate. Possible mitigation measures for any locally adverse water quality impacts could include the provision of nearby water quality benefits via oyster reef restoration or wetlands restoration.

- Hydrodynamics -- Three-dimensional hydrodynamic modeling was conducted for the areas near the CIDMMA. The modeling results indicated that there would be no significant effects to water circulation, sedimentation, salinity, currents, and tidal flushing from the Elizabeth River with an eastward expansion of the CIDMMA. As part of the modeling study, several directional expansion scenarios were evaluated, and the eastward expansion demonstrated the least effects. Accordingly, no specific mitigation measures are required.

- Air Quality -- Air pollutant emissions from earth-moving equipment and related construction equipment, along with selected dredging for the eastward expansion and containment dikes could cause localized exceedances of the federal and State of Virginia ambient air quality standards for $NO_2$, the 8-hour CO standard, and the $PM_{10}$ standards. The State's 24-hour $SO_2$ standard may also be exceeded. Mitigation measures that could be used to reduce emissions include either, or a combination of, watering to reduce construction dusts, increased usage of low sulfur fuels for diesel dredges, and electrification of diesel-powered dredges. Further, a conformity analysis for air quality compliance with pertinent ambient standards will be conducted to determine potential required mitigation measures.

- Noise -- Noise impacts from construction activities associated with the 580-acre eastward expansion will be localized in the specific construction area subjected to construction equipment and/or dredging. In addition, construction activities will occur at sufficient distances (e.g., greater than 1 mile away) from sensitive receptors such as protected bird species and human residential areas; thus, no excessive and out-of-character noise levels will be experienced. Therefore, no specific noise mitigation measures will be required.

- Biological Resources -- There will be a loss of approximately 600 acres of estuarine bottom habitat used by fish, shellfish, crabs, and bottom dwelling organisms. In addition, a loss of about 600 acres of open water above the estuarine bottom habitat will also occur. Regarding fish impacts, the area currently serves as a migratory pathway and a limited feeding area. The area also serves as a migratory pathway for crabs; however, it does not function as a

nursery area. Based on the Benthic Index of Biotic Integrity, the area to be inundated is generally poor quality and exhibits degraded conditions. No commercially valuable species, such as clams and oysters, are in the inundation area. In addition to the habitat loss, the biological productivity of the benthic macrofauna and meiofauna in the inundation area will be lost, along with the zooplankton productivity in the water column. Mitigation of the loss of about 600 acres of open water will partially occur since the widening and deepening of adjacent berthing areas for the Terminal will provide an equivalent cross-sectional area of open water. Off-site and out-of-kind mitigation is being developed to mitigate the effects of bottom habitat loss and open water effects to finfish, crabs, and bottom-dwelling organisms. Mitigation alternatives will compensate for lost functional values; examples of possible alternatives include: oyster habitat restoration, SAV restoration, wetland restoration, clam sanctuary development, sediment cleanup, riparian buffers/conservation areas, bird management, bird nesting islands, shoreline stabilization, and artificial fish reefs.

- Protected Species and Critical Habitat -- Construction activities involving dredging, dike construction, and filling could potentially impact certain protected species or their habitat. Federally protected species include five species of sea turtles and two bird species (piping plover and least tern). Section 7 consultation with NMFS and the U.S. Fish and Wildlife Service (USFWS), under the auspices of the Endangered Species Act, will be accomplished. Further, mitigation will include the selected use of dredging equipment, sea turtle exclusion devices, where appropriate, and dredge operation controls such as seasonal restrictions, to avoid or minimize sea turtle impacts. Upland activities will be carefully coordinated to avoid impacts to the endangered/threatened birds and their habitat. Buffer areas near nesting species will be identified, and bird habitat development and improvement opportunities will be considered.

- Recreation -- The permanent loss of 600 acres of open water will displace recreational boating activities in the general area. Further, potential reductions in recreational fishing in the harbor area may occur. To mitigate for reductions in fishing, artificial fish reefs could be added in the harbor area and the lower Chesapeake Bay.

- Aesthetics -- The approximate 600 acres of current open water would be replaced by a dredged material placement area that would require continuing construction work until the expansion cell is completed. The visual impacts are expected to be minimal because dredged material placement is routinely done at the CIDMMA. Further, because dredging activities, commercial navigation traffic, and recreational boating are typical throughout the Hampton Roads area, only minimal visual impacts are expected. Thus, no mitigation measures will be required.

- Cultural Resources -- No historical/cultural resources have been identified in the approximate 600 acres to be filled, thus no impacts to such resources are anticipated. No mitigation measures are required.

- Utilities -- Utilities include water supply, wastewater collection and treatment systems, energy, and telecommunications. These utilities are already in place for the existing 3-cell CIDMMA. Some minor upgrades may be required to provide services to the eastward expansion cell. Therefore, no mitigation measures are required.

- Socio-economics -- Minor beneficial impacts on the local and regional economy will occur from the expansion cell construction and operation; therefore, no mitigation measures will be required. However, loss of the approximate 600 acres of benthic habitat may cause the displacement of commercial crabbers that periodically use the area. Mitigation for the displacement could be provided by enhancing other standing stocks of crabs (e.g., enhance SAV crab nursery areas).

- Environmental Justice -- No adverse impacts are anticipated since the eastward expansion of the CIDMMA is within a portion of Portsmouth, Virginia, with a minority and low-income population much less than overall minority and low-income population in the city.

- Secondary Growth -- The anticipated population growth and associated increase in infrastructure needs will be addressed in association with the development and operation of the Craney Island Terminal.

Planning Aid Report - Key Impacts

Following is the abstracted summary of the key environmental impacts of the proposed eastward expansion of the CIDMMA; this summary is from the PAR prepared by the U.S. Fish and Wildlife Service (Ruddy, 2002):

> The most obvious and significant impact of the eastward expansion of the CIDMMA is the loss of approximately 580 acres of estuarine, open-water habitat. Since the habitat is of medium value and relatively abundant in Chesapeake Bay, it has been classified Resource Category 3 under the Service's mitigation policy. The mitigation goal for this category is "no net loss of habitat value while minimizing loss of in-kind habitat value". Thus, to the extent that in-kind habitat losses cannot be avoided or minimized after appropriate mitigation planning efforts, substitute habitats should be created or enhanced (out-of-kind replacement) to compensate for the project habitat losses. The Service, currently, is participating in the Corps' project mitigation process, which is seeking to develop a conceptual plan to compensate for the habitat loss caused by the eastward expansion. Potential compensatory actions, which are being considered, include: restoring oyster grounds, restoring beds of submerged

aquatic vegetation (SAV), restoring wetlands, decontaminating toxic hot spots in the Elizabeth River, preserving/enhancing riparian lands, stabilizing eroding shoreline habitats, creating/managing a hard clam broodstock sanctuary, removing blockages to potential anadromous fish spawning areas, improving bird habitat on the CIDMMA or elsewhere, installing measures to improve the quality of urban stormwater runoff, and creating artificial fish reefs.

Besides the direct loss of estuarine habitat caused by the eastern expansion, there may be other impacts to adjacent habitats. The potential effect on the circulation of the lower James River (the Hampton Roads area) and the Elizabeth River was evaluated in a three-dimensional hydrodynamic modeling study. The study investigated potential effects on water surface elevation, current magnitude, surface and bottom salinity, bottom sedimentation potential, and Elizabeth River flushing. It found that the eastward expansion caused no significant effects on the circulation of the lower James River or Elizabeth River. The hydrodynamic model was verified and appeared capable of detecting any substantive effects. In fact, it did detect some important effects with the northward expansion and some lesser effects with the westward expansion alternatives. The lack of any notable effects on the Elizabeth River circulation with the eastward expansion appears to be due to the assumed dredging for the new port berthing area. This dredging would increase the river's cross sectional area to a degree that it would offset and slightly exceed the decrease caused by the filling.

The habitat in the dredged area to the immediate east of the eastward expansion will be modified. This will occur due to dredging to enable ships to enter the proposed main terminal. The water depth will be significantly increased from 3-4 m. to approximately 16 m. This may alter the fish use of the area by potentially favoring pelagic adults in lieu of smaller juveniles. Crab harvesting activities would be precluded. The resident benthic invertebrate community in the dredged area will be eliminated for a time until a new assemblage repopulates. The repopulation typically, would occur over a time frame extending from a few months to a year or so. However, the character of the new benthic habitat may be altered. One potential concern is that sediment scouring and deposition associated with ship propeller wash could reduce the habitat suitability. If there will be a need for maintenance dredging of this access area, this could result in additional periodic impacts to the benthic community.

The operation of a new port facility on the expanded filled area could affect bird usage of the existing CIDMMA. The port could foster the presence of potential predators such as rats, raccoons, and gulls. Ground nesting birds such as the least tern would be particularly vulnerable to these predators. The lights, noise, and associated human activity from the port could also have some effect, although birds may be able to acclimate to these potential disturbances.

Finally, it is worth noting that no specific reference was made to cumulative effects in the PAR.

Impact on Dominant Benthic Species

The Norfolk District of the U.S. Army Corps of Engineers funded the Virginia Institute of Marine Science (VIMS) to conduct a study of the impact of the eastward expansion of the CIDMMA on the abundance, biomass, and diversity of benthic bivalve species (clams). The basis for the study was the hypothesis that by filling approximately 580 acres of deep-water mud habitat, a substantial percentage reduction would occur in the available soft-sediment habitat where dominant bivalve species occur. Furthermore, studies in shallow tributaries of Chesapeake Bay indicate that benthic biomass in shallow expanses often exceeds that in deep-water habitats, thus suggesting that if any habitat must be altered, the modification of deep-water habitats would be least destructive to benthic community structure. Consequently, an alternative hypothesis relevant to the CIDMMA expansion is that the filling of some deep-water habitat will have minimal impact upon total benthic biomass in this portion of the ecosystem because it is relatively inconsequential when compared with that in adjoining shallower soft-bottom habitats. Accordingly, an extensive comparative study was conducted to quantify the abundance, biomass, and diversity of dominant benthic bivalves in both deep and shallow soft sediments of the area to the east of the CIDMMA and the nearby Lafayette River system. Bivalves were chosen because they are dominant and representative members of the benthic community (Seitz and Lipcius, 2002).

Detailed information related to benthic sampling sites east of the CIDMMA and in the Lafayette River system, along with the sampling methodology and analyses is available elsewhere (Seitz and Lipcius, 2002). Sampling was accomplished at 41 deep sites (greater than 4 feet deep) in the CIDMMA area (Craney Island area), 40 other deep sites (Deep zones) in the general area of the CIDMMA and Lafayette River system, and 40 shallow (less than 4 feet deep) subtidal sites (Shallow zone) in the area. Water temperature, salinity, and dissolved oxygen were also assessed at the majority of the sites. Impact assessment was accomplished by using density and biomass estimates, respectively, from each stratum (i.e., CIDMMA, deep, and shallow) and the area of habitat that was encompassed in each stratum. Based on these data, the overall abundance and standing stock, respectively, for each of those habitats was generated, and then the potential loss of biomass due to the eastward expansion of the CIDMMA was estimated as a percentage of the abundance and biomass of the entire CIDMMA-Lafayette River system. From the abundance and biomass loss estimates, estimates for mitigation options were developed (Seitz and Lipcius, 2002).

The following conclusions were generated from this VIMS study (Seitz and Lipcius, 2002):

- The area of the CIDMMA eastward expansion had significantly lower bivalve density, diversity, and abundance than the adjacent deep-water habitats or shallow-water habitats in the Craney Island-Lafayette River (CI-LR) system.

Bivalve density was significantly lower in the 'Craney Island' and 'Deep' zones than in the 'Shallow' zone. Indeed, bivalve density in shallow-water habitats was nearly 10-fold higher than that in the area to the east of the CIDMMA. Diversity in terms of species richness was lowest in the 'Craney Island' zone, which was significantly lower than that in 'Deep' habitats. Only four species of bivalves were collected in the 'Craney Island' zone, whereas seven species were collected in the adjacent deep habitats, and nine species were in the shallow zones.

- The CIDMMA eastward expansion zone also had significantly lower mean bivalve biomass than the shallow-water habitats in the CI-LR system. Biomass in the 'Deep' zone was lower than in the shallow-water habitats, and higher but not significantly different from that in the 'Craney Island' zone. Since bivalve density in shallow-water habitats was nearly 10-fold higher than that in the Craney Island expansion area, and the mean bivalve size was larger, the resultant biomass was much greater. The clams that comprised the biomass in the shallow zone were typically large individuals of *Macoma balthica* and *Tagelus plebeius*. Although some *Tagelus* and *Mercenaria* were present in the 'Craney Island' zone, they were usually smaller individuals (juveniles) with low biomass.

- Within the CI-LR system, it was estimated that there were approximately 445 million bivalves. Of these, only about 5% (19 of 445 million) resided within the CIDMMA eastward expansion area. Bivalve biomass within the expansion area also constituted a small fraction of the biomass within the general area. Within the CI-LR system, it was estimated that total bivalve biomass was approximately 37,986 kg AFDW (ash free dry weight). Of the total biomass, only about 0.56% (215 of 37,986 kg) was represented in the CIDMMA expansion area. Because of this extremely low bivalve biomass and because the bivalves were very small juveniles, the CIDMMA expansion area is not likely to be a significant feeding ground for the blue crab or demersal fish.

- Given the high bivalve abundance, biomass, and diversity in shallow-water habitats, it was recommended that mitigation efforts focus on enhancement of these productive habitats, particularly integrated salt marshes and shallow oyster reefs. Using the more liberal estimate of loss of bivalve abundance in the CIDMMA expansion area, 18.8 million bivalves would need to be replaced, whereas using bivalve biomass, 215 kg would need replacement. Therefore, shallow-water habitats should be restored in mitigation efforts for the potential loss of the benthic community in the CIDMMA eastward expansion. Using this approach, then approximately 60 acres would be needed to reclaim 18.8 million bivalves, or 7.5 acres for 215 kg of bivalve biomass. Furthermore, given the estimates of higher bivalve densities in subtidal marsh habitats compared to other shallow-water habitats, it was proposed that marsh habitats be created and oyster reefs be restored in the

adjoining shallows of the coastal marsh zone to produce an integrated landscape approach to mitigation.

Hydrodynamic Impacts

A three-dimensional hydrodynamic modeling study of various directional expansions of the CIDMMA was conducted by the Virginia Institute of Marine Science (VIMS). The model used was the VIMS three-dimensional Hydrodynamic Eutrophication Model (HEM-3D) developed in 1996. It had been previously calibrated for the Hampton Roads area, and had been used in tidal front research, larval transport studies, and the VDOT's Third Crossing study (Boon, et al., 2002). The purpose of the CIDMMA-related study was to determine the nature and extent of the physical changes that may occur in the estuarine environment of the Hampton Roads area, including the waters of the lower James River and a major tributary, the Elizabeth River, due to the implementation of various directional expansion designs. The physical impacts that were evaluated for specific locations included changes to the tidal range and phase, the strength and direction of tidal and tidally-averaged currents, salinity or salinity structure, circulation and flushing ability (for contaminants), and sedimentation potential.

The flushing ability refers to the capacity of the hydrodynamic system to flush water from a given area and replace it with different water. This is measured by the volume of the tidal prism; that is, the volume of water due to the tide that enters and leaves the area during a tidal cycle. The sedimentation potential is defined as the percent of time that the bottom shear stress is less than the critical shear stress for deposition. If suspended sediment is available, a higher sedimentation potential implies that more sediment deposition will occur in areas where the sedimentation potential is higher. The erosion potential was not reported, although both erosion and deposition would need to be modeled to predict net sedimentation rates (U.S. Army Corps of Engineers, undated).

The geographical area that was modeled is shown in Figure 7-1 (U.S. Army Corps of Engineers, undated, p.2). The computation grid used was based on the 370 m by 370 m grid used in the VDOT study of the Hampton Roads Third Crossing. It was modified to have higher resolution inside and around the mouth of the Elizabeth River as shown in Figure 7-2 (U.S. Army Corps of Engineers, undated, p. 3). The study itself was conducted in three phases: (1) model calibration and verification for the Elizabeth River based on a data set assembled for the study; (2) model testing of four CIDMMA expansion options using *single variable runs* (using a single variable, tidal range, for model input); (3) model testing of two expansion options using *historical runs* (using multiple variables in real time for model input). The expansion option designs were evaluated for both area-wide and local hydrodynamic changes through simulation comparisons with a Base Case condition (Boon, et al., 2002). The model results were compared with data using a number of statistical and graphical approaches including time series at specific stations, calculation of "rms" errors and mean errors, and plots of measured vs. predicted currents that were interpreted for phase and magnitude comparisons. Both tidal and residual effects were compared with data in addition to

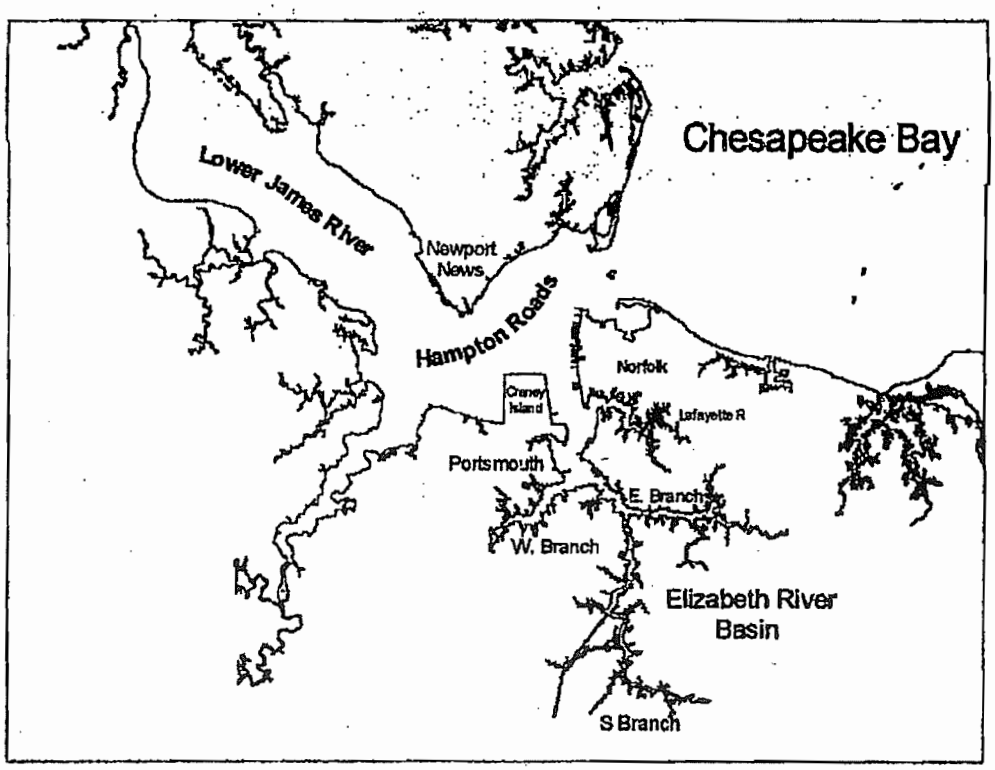



Figure 7-1: The Study Area for Hydrodynamic Modeling (U.S. Army Corps of Engineers, undated, p.2)

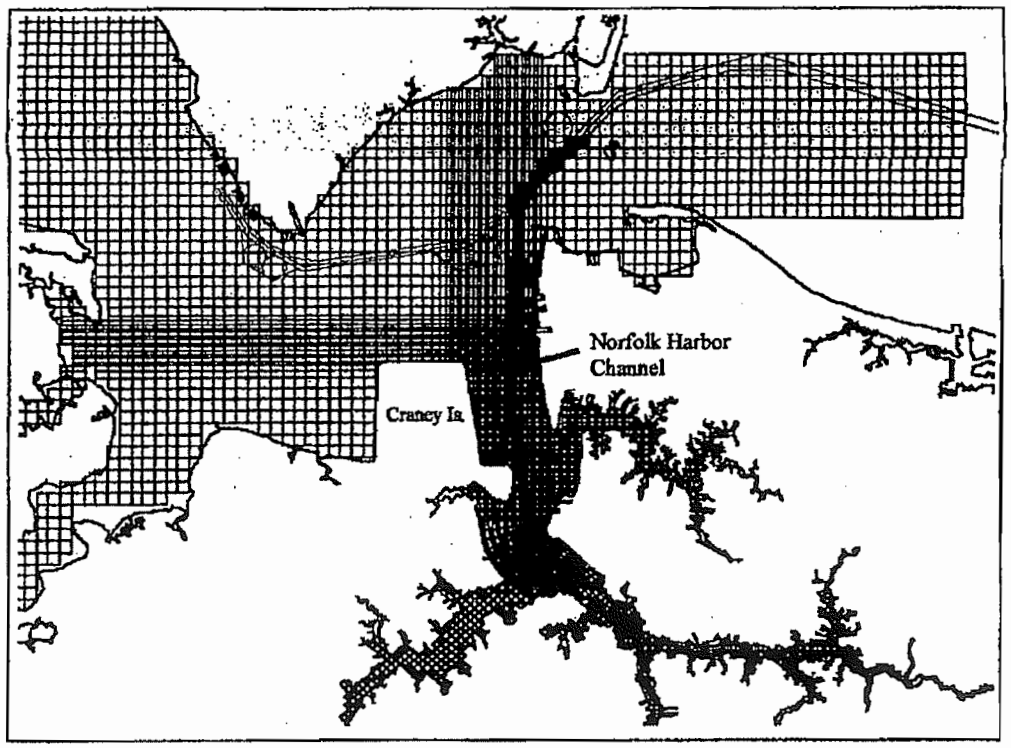



Figure 7-2: Dual-scale Model Grid and Norfolk Harbor Channel (U.S. Army Corps of Engineers, undated, p.3)

water surface elevations and currents; salinity distributions were compared with measured data with good results (U.S. Army Corps of Engineers, undated).

The key modeling results are summarized as follows, with more detailed information included in the study report (Boon, et al., 2002). The key results were as follows:

- Of the four expansion designs tested in the single variable runs, area-wide analysis revealed that the northward expansion (Option 6) and northeast expansion (Option 9) produced noticeably greater percentile changes in water surface elevation, current magnitude, salinity, and bottom sedimentation potential. Westward expansion (Option 5) produced a lesser degree of change. The eastward expansion (Option 7) produced only minor changes in the immediate vicinity of the CIDMMA. Additional information on these options is in Appendix B of this report.

- Local analysis revealed no appreciable changes in flushing ability in either the Elizabeth River Basin or the Lafayette River for any of the options tested.

- Historical runs tested two expansion options: Option 7 (eastward expansion) and Option 7/5a (combined eastward and westward expansion). As in the single variable runs, little change was noted in historical run comparisons for Option 7. Changes noted for Option 7/5a were slightly greater than those noted for Option 7, but were less than those noted for Option 5 (westward expansion) in the single variable runs. Streamlining of the footprint in expansion design 5a is considered to be responsible for the latter result.

A systematic review of the modeling study and its findings has been conducted by the Norfolk District. While the study was considered to have been appropriately conducted, several limitations were noted as follows (U.S. Army Corps of Engineers, undated):

- While the physical processes compared among scenarios are important to understanding the effects of modifications to the CIDMMA, sediment transport and sedimentation and erosion were not explicitly modeled. Therefore, there are no specific predictions of sedimentation rates and net erosion or deposition.

- It is not clear from the information available whether the navigation channels are sufficiently resolved by the horizontal scale of the grid. This may not be an important issue depending on the steepness of the sides of the channels.

- Water temperature and heat were not modeled, thus it is assumed that the justification for this is that salinity has a much greater effect on density differences and, therefore, stratification, as well as density effects on circulation patterns.

## IMPACTS FROM MARINE TERMINAL DEVELOPMENT AND OPERATION

The typical environmental impacts of the development and operation of a port facility include the following (after Davis, et al., 1990):

- water-related impacts caused by dredging; dredged material disposal; construction of piers, breakwaters, and other waterside structures; alteration of harbor ship traffic patterns; ship discharges; spills; port operations discharges; and runoff water from the port area

- land-related impacts caused by excavation for rock or aggregate fill; wetland filling and process disruption; loss of useable uplands to expanding waterfront/industrial areas; noise from the port facility and associated operations; localized dust and other airborne emissions; related roadway and railway traffic increases due to the movement of goods; handling and disposal of solid and hazardous waste from the port facility; and visual intrusions

- air-related impacts from fugitive emissions; and gases and particulates from container ships, trains, trucks, and personal vehicles

- socio-cultural impacts due to relocations of people, changes in lifestyle, changes in employment patterns, and increased needs for infrastructure and related community services

More specific impacts to aquatic systems from dredging and dredged material disposal activities for port development and maintenance can include short- and long-term consequences as follows: degradation of marine resources such as beaches, estuaries, coral reefs, and fisheries; resuspension and settlement of sediments; partitioning of toxic contaminants and reintroduction to the water column; contaminant uptake by and accumulation in fish and shellfish; increased turbidity causing decrease in light penetration and associated photosynthetic activity; short-term depletions of dissolved oxygen levels; modified bathymetry causing changes in circulation, possible saltwater intrusion to groundwater and inland surface water; altered species diversity and structure of benthic communities, and fluctuations in water chemistry; changes in shoreline structure; and loss of habitat and fisheries resources (World Bank, 1991, p. 186).

Further, the World Bank has noted that maintenance dredging performed in approach channels and harbor basins to maintain depth and width and ensure safe access for large vessels can be a special environmental concern (World Bank, 1991, p. 187). The dredged materials from maintenance dredging typically present a greater disposal problem than deeper sediments removed during construction dredging, since surficial sediments are composed of recently deposited materials that may be contaminated. These younger sediments usually contain natural and anthropogenic contaminants and can arrive from atmospheric fallout, erosion of local land surface and channel banks, fallout from biological activity in the water column, sediment transport

from inland waters, point source dischargers, and surface runoff from the surrounding area.

The specific anticipated impacts related to the construction and operation of the 580 acres Craney Island Terminal by the VPA include the following:

- Geology -- No significant geological impacts are anticipated since the Terminal will be built on top of the eastward expansion of the CIDMMA.

- Water Quality -- Terminal operations could possibly create adverse water quality impacts as a result of spills from container ships, refueling of ships, stormwater runoff from the Terminal land area, and sediment suspension from ship traffic. Regarding direct spills from container ships, there is a low likelihood for this to occur since the transported goods are in large containers. However, if such spills should take place, the U.S. Coast Guard, in coordination with other Federal and state agencies, would invoke existing spill response plans. Regarding the direct refueling of container ships while they are docked at the Terminal, no such fuel transfers will occur. Ship refueling from barges will be used and it must be in accordance with U.S. Coast Guard regulations. Stormwater runoff from the Terminal land area will be discharged into the Elizabeth River and related harbor area; however, a designed stormwater runoff system will be used to reduce the potential for unrestricted runoff. In addition, a stormwater pollution prevention plan will be implemented at the Terminal; the plan, which will include a variety of best management practices, will be in compliance with Virginia Stormwater Management regulations. Finally, sediment suspension from ship traffic will be minimized since the navigation channels and access/egress channels to/from the Terminal are designed to provide sufficient clearance and thus minimize sediment suspension.

- Hydrodynamics -- Three-dimensional hydrodynamic modeling was conducted for the areas near the CIDMMA. The modeling results indicated that there would be no significant effects to water circulation, sedimentation, salinity, currents, and tidal flushing from the Elizabeth River with an eastward expansion of the CIDMMA. As part of the modeling study, several directional expansion scenarios were evaluated, and the eastward expansion demonstrated the least effects. Further, no hydrodynamic effects are expected from the Craney Island Terminal. No specific mitigation measures are required.

- Air Quality -- Air pollutant emissions from Terminal operations are expected to be above the threshold levels prescribed by the general conformity regulation of 100 tons/yr for $NO_x$ for Phase I in 2016, and for both VOCs and $NO_x$ for the Build-Out condition in 2050. Further, some emissions will occur during construction activities associated with Terminal facilities. In addition, substantial pollutant emissions can be associated with the large container ships. Mitigation for the ship-related emissions will involve reducing operational emissions by the use of distillate oil in maneuvering vessels and the use of clean fuels for on-dock

equipment. Mitigation measures for construction practices will include the use of watering to reduce construction dusts, and the use of low sulfur fuels for diesel-powered equipment. Regarding the long-term emissions from Terminal operations, a new State Implementation Plan (SIP) for the Hampton Roads ozone maintenance area is expected in the 2005-2007 time frame. At that point, it will be necessary to demonstrate that the Terminal will be in compliance with the SIP. If not, further mitigation measures may be required, including the potential purchase of Emission Reduction Credits from other sources in the Hampton Roads region.

- Noise -- Noise emissions from construction activities associated with Terminal development will be localized in the specific area subjected to construction equipment. Noise emissions from operations will include noise from the ships and tugs, transfers of containers from the ships to intermediate storage areas or directly to trucks or trains, general truck and rail traffic, and intermodal yard operations. Cumulative noise levels will occur due to the proximity of the sources to each other. The noise will occur at sufficient distances (e.g., greater than 1 mile away) from sensitive receptors such as protected bird species and human residential areas; thus, no excessive and out-of-character noise levels will be experienced since there are several other marine terminals across the harbor in Norfolk. Therefore, no specific noise mitigation measures will be required.

- Biological Resources -- Terminal operations will increase the potential for toxic spills, and will generate surface runoff into the immediate harbor area. As noted in conjunction with water quality, a stormwater runoff system will be designed to reduce the potential for unrestricted runoff. Another potential impact is related to the introduction and proliferation of exotic species into the aqueous environment. To mitigate for such exotic species, the National Invasive Species Act of 1996 and associated Virginia regulations (4 VAC 20-395) require foreign vessels to file a Ballast Water Control Report with the Virginia Marine Resources Commission, and to exchange ballast water 200 nautical miles from shore.

- Protected Species and Critical Habitat -- Development and operational activities at the Terminal could possibly impact the use of the existing CIDMMA by piping plover and least terns. Further, increased container ship traffic in the area to the immediate east of the eastward expansion cell could potentially affect sea turtles, but their mobility should allow them to avoid ships or seek foraging areas away from the Terminal berthing area. Mitigation measures will be identified via Section 7 consultation with NMFS and the USFWS under the auspices of the Endangered Species Act. Specifically, upland activities will be carefully coordinated to avoid impacts to any endangered/threatened birds and their habitat. Bird habitat development and improvement opportunities will also be considered.

- Recreation -- The permanent loss of 600 acres of open water from the eastward expansion cell will displace recreational boating activities in the general area.

Further, potential reductions in recreational fishing in the harbor area may occur due to Terminal construction activities and the presence of container ships. To mitigate for reductions in fishing, artificial fish reefs could be added in the harbor area and the lower Chesapeake Bay.

- Aesthetics -- The approximate 600 acres of current open water would be replaced by a dredged material placement area that would require continuing construction work until the expansion cell is completed. Then, the Terminal would be developed and its usage by container ships would ensue. The visual impacts are expected to be minimal because commercial navigation traffic and terminal unloading and loading operations are common throughout the Hampton Roads area. Mitigation measures which will be used at the Terminal include vegetation and landscaping measures, coupled with the painting of buildings, which would help Terminal facilities blend into the surrounding viewscape.

- Cultural Resources -- No historical/cultural resources have been identified in the approximate 600 acres to be filled, nor in the adjacent berthing area for the Terminal, thus no impacts to such resources are anticipated. No mitigation measures are required.

- Utilities -- Utilities include water supply, wastewater collection and treatment systems, energy, and telecommunications. These utilities are already in place for the existing 3-cell CIDMMA, and they will be upgraded to provide services to the eastward expansion cell. Further provisions of additional capacities will be required for Terminal development and operation. For example, at full Build-Out (2050) the water supply requirements are estimated to be about 70,000 gallons per day. Lesser quantities of water will be required during the first three phases. The City of Portsmouth has been contacted and can supply the required demand. Reduction of these water supply requirements will be promoted via the implementation of methods to minimize water consumption and optimize efficient use of the new supplies and reclaimed water. Detailed requirements for wastewater systems, energy, and telecommunications will be developed during the design process for the Terminal, with mitigation measures incorporated as appropriate.

- Ground Transportation -- Trucks which have either on-loaded or off-loaded materials and goods at the intermodal area at the Terminal will use existing or planned interstate transportation routes. Existing routes include I-64 and I-564, while the Third Crossing of the Hampton Roads area represents a planned route. Local access to and egress from the Terminal is planned for the Third Crossing, thus trucks will be able to access major highways without traversing residential areas. Further, railway traffic to and from the Terminal will not cause significant effects on the existing or planned railway network. At Terminal Build-out (2050), only 5 to 6 additional trains would occur per day. Therefore, no mitigation measures are required. The existing or planned interstate highways and railway

network will have sufficient capacities to accommodate the anticipated daily numbers of trucks and trains.

- Vessel Transportation -- The annual number of container ships using the Terminal will total 572 by 2016 (the first year of operation of the Terminal). By 2050 (the full Build-Out), an additional 468 ships would use the Terminal; thus the total would be 1040 ships annually. Coordination will occur with the U.S. Coast Guard and the Virginia Pilots Association to maintain safe and efficient Terminal usage.

- Socioeconomics -- Revenue generated by terminal construction activities will provide benefit to the local communities via increases of sales tax revenue, sale of goods, etc. Employment of approximately 15,000 people will occur during the four phases of construction. Regarding the long-term, approximately 570 direct jobs will be created at the Terminal facility along with 3,900 indirect jobs in the region. Under full Build-Out (2050), it is estimated that $900 million of annual output will be added to the local economy. No mitigation is required.

- Environmental Justice -- No adverse impacts are anticipated since the eastward expansion of the CIDMMA and the Terminal location is within a portion of Portsmouth, Virginia, with a minority and low-income population much less than overall minority and low-income population in the city. Further, any new required highways and railways will be located within existing VDOT rights-of-way.

- Public Safety -- Because of the relatively isolated location of the Terminal, the associated facilities will require state-of-the art protection measures and security. Accordingly, the VPA will implement and upgrade fire protection services as necessary and include storage tanks with foam injection systems. Security staff will also be employed as necessary.

- Secondary Growth -- Development and operation of the Terminal has the potential to cause population growth in the Hampton Roads area, probably in Portsmouth, as well as new residential development. Increases in local and regional traffic would be expected. While not a direct mitigation measure, population growth will probably be minimized because jobs at the Terminal will likely be filled by people already living in the area. New or expanded businesses will be located at existing facilities or on redeveloped sites. Development would benefit the region in the short-term with construction jobs and in the long-term with increased employment, purchases of goods and services, and tax revenues. Regarding local and regional traffic increases, project-related vehicles will use existing or planned major interstate transportation routes. Trucks will be able to access major highways without going through residential areas.

## IMPACTS FROM OTHER ACTIONS

As shown in Tables 7-1 and 7-2, multiple past and present actions have occurred or are occurring in the Hampton Roads area and the Elizabeth River basin. Further, continuations of past and present actions are anticipated in the future, along with several new initiatives. Summary information on the impacts of these past, present, and future action is contained in Chapters 2, 4, 5, and 6, as appropriate.

## OBSERVATIONS ON THE CUMULATIVE EFFECTS

As depicted in Table 7-2, multiple actions have contributed to, and are expected to continue to contribute to, cumulative effects on specific resources, ecosystems, and human communities in the Hampton Roads area. Regarding the significance of the cumulative effects, particular attention is directed toward adverse effects on water quality, biological resources (including benthic habitat), and protected species and critical habitat, and beneficial effects on socioeconomics.

# CHAPTER 8

# MITIGATION OF CUMULATIVE EFFECTS

This chapter addresses mitigation options as they relate to cumulative effects as described in Chapter 7. Mitigation is related to Steps 10 and 11 in the 11-step CEA methodology (Council on Environmental Quality, 1997). It is stressed that no specific mitigation plan for cumulative effects has been addressed by the Norfolk District. Rather, attention has been given to identifying mitigation options for the direct effects of the eastward expansion of the CIDMMA. However, because cumulative effects can occur on the same resources and ecosystems subject to expansion cell-related direct effects, the potential mitigation options identified to date could be considered by collaborating agencies in a program focused on cumulative effects mitigation. This chapter includes the following sections -- a summary of identified mitigation options, a brief summary of the concept of habitat equivalency analysis (a tool for delineating compensatory restoration), and a discussion of possible compensatory mitigation for the direct effects of the CIDMMA eastward expansion.

## SUMMARY OF IDENTIFIED MITIGATION OPTIONS

Appendix A of this report includes information on several meetings of the NEPA Technical Committee and its associated Mitigation Subcommittee. Some of the meetings were focused on mitigation options that could be used for the loss of nearshore, shallow, open water habitat. Some potential mitigation measures include, but are not limited to, oyster bed restoration, SAV restoration, sediment cleanup in the Elizabeth River, wetland restoration/conservation, riparian buffers, and several others. The Mitigation Subcommittee has focused on mitigating the direct effects associated with the loss of about 580 acres of bottom area and open water habitat located just to the east of the CIDMMA. The advantages and limitations of several mitigation options were discussed; following are some brief key points that were made regarding various options:

(1) Oyster Bed Restoration -- improves benthic diversity and habitat; provides water column benefits; replaces benthic components lost -- although they may be a different species composition;

(2) SAV Restoration -- improves benthic habitat and diversity; provides nursery areas for finfish and shellfish;

(3) Wetland Restoration -- provides fisheries habitat and invertebrates habitat; are losing fish habitat with expansion; different than what is lost; good juvenile use;

(4) Sediment Clean-Up -- does not address losses to water-column -- only to the bottom;

(5) Conservation Areas -- it was generally agreed that it is not in-kind related; mostly water quality benefits and habitat for wildlife;

(6) Shore-Stabilization -- minimal in-kind relatedness; actually prevents more open water from being created; habitat components (wetlands, SAVs, etc.) can be designed into these projects;

(7) Fish Habitat Enhancement through Dam Removal or Fish Ladders -- only a limited number of species benefit from this option;

(8) Clam Management Sanctuary -- enhances bottom habitat and benthos;

(9) Bird Management Plan at Craney Island -- there is minimal in-kind relatedness;

(10) Storm Water Retrofit -- a water quality issue -- not a habitat; there is minimal in-kind relatedness;

(11) Nesting Islands -- building islands results in loss of bottom; there is minimal in-kind relatedness; and

(12) Artificial Reefs -- fish habitat; epifaunal organisms attach to reef structure; enhances benthic productivity; does not address water column effects.

Discussions have also been held on candidate locations where mitigation options could be implemented, and a preliminary "benefits scoring analysis" has been conducted for the options. The scoring analysis included the consideration of the functional attributes of the options, their "in-kind relatedness", and their "effectiveness to influence a large geographical area over time". Two additional scoring factors for the options have been discussed -- publicly recognized value and risk/success. Publicly recognized value was defined as "the publicly recognized importance of the resource value contributed by the mitigation option that may be reflected in adopted plans such as national or international agreements, or other action plans of public agencies or private groups". Risk/success was defined as "the likelihood of success based upon previous implementation of the mitigation option and consistent production of anticipated benefits".

In conclusion, while the mitigation options addressed by the Mitigation Subcommittee are focused on the direct effects of the eastward expansion on about 580 acres of bottom area and open water habitat, the same types of options could also be used in a mitigation program for the cumulative effects of multiple projects in the study area.

## HEA METHOD

Habitat equivalency analysis (HEA) refers to a methodology developed by the National Oceanic and Atmospheric Administration (NOAA) to determine compensation for natural resources damaged as a result of discharges of oil, releases of hazardous substances, or physical injury resulting from vessel groundings. The concept basic to the HEA methodology is that...."the public can be compensated for past losses of habitat resources through habitat replacement projects providing additional resources of the same type" (Damage Assessment and Restoration Program, 2000). The HEA methodology has been used for vessel groundings, spills, and hazardous waste sites. Habitats involved in these analyses have included seagrasses, coral reefs, tidal wetlands, salmon streams, and estuarine soft-bottom sediments. The methodology has been used in the Corps' feasibility study to determine compensatory mitigation for the eastward expansion of the CIDMMA. Additional details on the HEA and simplified examples of its usage are available elsewhere (Damage Assessment and Restoration Program, 2000).

## COMPENSATORY RESTORATION

The eastward expansion of the CIDMMA involves the filling of 580 acres of an estuarine area near the mouth of the Elizabeth River. Filling will affect two biological habitats, the benthic community and the overlying water column (Charles H. Peterson and Associates, 2003). The HEA methodology was used to determine the level of compensatory restoration for the two affected habitats. The restoration was based on accounting for the loss of community benthic services and for the loss of water column services. An underlying assumption was that the provision of ecosystem services typically relates closely to production. Two types of compensatory restoration measures were analyzed; namely, construction of functional oyster reef habitat and the restoration of salt marsh habitat. The production benefits for these two types of habitat were also included in the HEA methodology.

Table 8-1 summarizes the estimated annual loss of benthic macrofauna and meiofauna production from the eastward expansion of the CIDMMA (Charles H. Peterson and Associates, 2003, p. 20). Detailed information on the assumptions and bases for the data in Table 8-1 is available elsewhere, as are the specific reference citations included in the table (Charles H. Peterson and Associates, 2003). As can be seen from Table 8-1 the total benthic invertebrate production lost from the 580 acres of filling ranges from 13,112 to 33,652 kg/yr.

Table 8-2 summarizes the total loss in annual zooplankton production in the water column overlying the 580 acres of benthic habitat (Charles H. Peterson and Associates, 2003, p. 21). Again, detailed information on the assumptions and bases for the data in Table 8-2 is available elsewhere, as are the specific reference citations

Table 8-1: Estimated Loss of Benthic Invertebrate Production from Filling 580 Acres at Craney Island Near the Mouth of the Elizabeth River (VA) (Charles H. Peterson and Associates, 2003, p. 20)

| | |
|---|---|
| Macrofauna | |
| Average macrofaunal (0.5 mm mesh) biomass from summer samplings of Craney Island footprint (Dauer 2000, 2002) in | |
| Yr 1999 (mean of 7 samples) | 0.962 g AFDW $m^{-2}$ |
| Yr 2001 (mean of 3 samples) | 0.899 g AFDW $m^{-2}$ |
| Mean biomass | 0.931 g AFDW $m^{-2}$ |
| P:B ratios for macrofauna of temperate estuary | |
| Howe and Leatham (1984) polychaetes – Del Bay | 7.5 |
| Steimle (1985) polychaetes – NY Bight | 3.0 |
| Diaz and Schaffner (1990) polychaetes – Ches Bay | 4.9 |
| Baird and Ulanowicz (1989) dep feeders – Ches Bay | 7.7 |
| Estimated range of annual production of macrofauna | 2.79-7.17 g AFDW $yr^{-1}$ |
| Total macrofaunal loss annually for 580 acres (4046.86 $m^2$/acre) | 6,556-16,826 kg $yr^{-1}$ |
| Meiofauna (Production in sediments of estuaries about equal to macrofauna: Knox 2001) | 6,556-16,826 kg $yr^{-1}$ |
| Total benthic invertebrate production lost from 580 acres of fill at Craney Island | 13,112-33,652 kg $yr^{-1}$ |

Table 8-2: Estimation of Quantitative Annual Loss of Zooplankton Production from Filling 580 Acres at Craney Island in the Elizabeth River (Charles H. Peterson and Associates, 2003, p. 21)

| | |
|---|---|
| Mean monthly macrozooplankton biomass (dry wt) at ELI2 3 km up the Elizabeth River from Craney Island averaged over 12 months (Sharp 1995) | 6.84 mg $m^{-3}$ |
| Mean monthly macrozooplankton biomass (dry wt) at WBE1 10 km up the Elizabeth River from Craney Island averaged over 12 months (Sharp 1995) | 4.66 mg $m^{-3}$ |
| Mean monthly macrozooplankton biomass (AFDW) predicted by linear extrapolation for the Craney Island expansion site[a] | 7.86 mg $m^{-3}$ |
| Volume of water column lost (in $m^{-3}$) to Craney Island expansion (3.2 m deep x 580 acres x 4046.86 $m^2$/acre) – worst case maximum volume lost | 7,510,972 $m^3$ |
| Total loss of monthly average macrozooplankton biomass (in kg) | 59.04 kg |
| P:B ratios for estuarine macrozooplankton | |
| Heinle (1966) P:B ratio for *Acartia tonsa* in Chesapeake Bay based on summer peak abundance | 190 |
| Baird and Ulanowitz (1989) Chesapeake Bay based on summer peak abundance – ratio of total production to average biomass over 4 seasons[b] | 133 |
| Christian et al. (2002) – Neuse River mesohaline - average ratio of early and late summer seasons[c] | 112.5 |
| Roman and Zhang (unpubl., preliminary data for 1995-2000 for whole Chesapeake Bay – UM CES, Horn Point) | 42.6 |
| Estimated macrozooplankton production lost annually - 580 acres of fill at Craney Island (applying endpoints in range of P:B ratios)[d] | 2,515 – 11,217 kg |
| Estimated microzooplankton production lost annually[e] | 14,461 – 64,498 kg |
| Total loss in annual zooplankton production | 16,976 – 75,715 kg |

a- This extrapolated number includes conversion from dry wt to AFDW using 4.25 % ash wt (Salonon et al. 1976)
b- The 4 seasonal values reported were: Sp (45.6); Su (59.5); Fa (30.3); Wi (9.1)
c- The 2 seasonal values reported on a per yr basis were: June (153); Sept (72)
d- This range was created by using the low (42.6) and the high (190) values
e- Microzooplankton production was estimated applying the ratio of 5.75 micro to macro production in Baird and Ulanowicz (1989)

included in the table (Charles H. Peterson and Associates, 2003). As can be seen from Table 8-2, the total loss in zooplankton production ranges from 16,976 to 75,715 kg/yr.

Regarding the productivity of compensatory restoration options, Table 8-3 summarizes the projected annual production of benthic invertebrates per unit area of restored oyster reef habitat in the lower Chesapeake Bay area, and Table 8-4 does likewise for a salt marsh restoration project (Charles H. Peterson and Associates, 2003, pp. 22-23). Detailed information on the assumptions and bases for both tables, along with their specific reference citations, is available elsewhere (Charles H. Peterson and Associates, 2003). The production credit per acre for restored oyster reef habitat is 5,995 kg AFDW/year; and for restored salt marsh habitat, the compensation credit is 449.7 kg AFDW/year.

Finally, Table 8-5 summarizes the compensatory restoration requirements for the productivity losses incurred by the eastward expansion of the CIDMMA (Charles H. Peterson and Associates, 2003, p. 24). At this time, no specific decisions have been made regarding the mix of the restoration measures.

Table 8-3: Projected Annual Production of Benthic Invertebrates Per Unit Area of Restored Oyster Reef Habitat in the Lower Chesapeake Bay (Charles H. Peterson and Associates, 2003, p. 22)

| | |
|---|---|
| Biomass of oysters sustained on restored reefs near Fishermen's Island (O'Beirn et al. 1999) | 600 g AFDW $m^{-2}$ |
| P:B ratio for oysters on the reef | |
| Dame (1976) in Bahr and Lanier (1981) | 2.2 |
| Bahr and Lanier (1981) | 2.6 |
| Average (median) P:B ratio | 2.4 |
| Estimated production of oysters | 1,440 g AFDW $m^{-2}$ $yr^{-1}$ |
| Production of other reef macrofauna[a] | 338 g AFDW $m^{-2}$ $yr^{-1}$ |
| Estimated production of reef meiofauna[b] | 1,185 g AFDW $m^{-2}$ $yr^{-1}$ |
| Total annual production of benthic invertebrates estimated for Fishermen's Island oyster reefs per acre | 11,991 kg AFDW $yr^{-1}$ |
| Annual production credit per acre assumed for restored reefs near Craney Island[c] | 5,995 kg AFDW $yr^{-1}$ |

a- This is based upon demonstration in Bahr (1974) that oysters comprise 81 % of macrofaunal production
b- This is based upon assuming that meiofaunal production is two thirds of macrofaunal production on oyster reefs, which is the average of what Knox (2001) reports for hard-substrate and soft-bottom substrate
c- Because of uncertainty in recruitment and other factors, we reduce the production credit by 50 % relative to the successful restoration near Fishermen's Island, equivalent to assuming that only half of the reef restorations will be successful

Table 8-4: Computations of Scaling Production Benefits of Spartina Salt Marsh Restoration Project Measured at the Level of Herbivorous Invertebrate Production to Compensate for Zooplankton Production Loss in the Water Column After Expansion of Craney Island
This is based on Knib (2003) and pers. com. from Walter Priest (VIMS), Carolyn Currin (NOAA-Beaufort), and Kathy Boyer (Univ. of North Carolina) (Charles H. Peterson and Associates, 2003, p. 23)

| | |
|---|---|
| Annual above-ground production of vascular plants in the *Spartina* marsh (AFDW)[a] | 1113 g $m^{-2}$ |
| Marine invertebrate production derived from fungal consumption in detritivory pathway (AFDW) | 18.4 g $m^{-2}$ |
| Marine invertebrate production derived from bacterial consumption in detritivory pathway (AFDW) | 3.7 g $m^{-2}$ |
| Terrestrial invertebrate production entering estuarine food webs (20 % of insect herbivory) (AFDW) | 2.2 g $m^{-2}$ |
| Annual production of benthic microalgae in the salt marsh (dry weight) | 318 g $m^{-2}$ |
| Marine invertebrate production derived from direct herbivory on microalgae (AFDW)[b] | 32 g $m^{-2}$ |
| Total marine invertebrate production derived annually from above-ground production in the *Spartina* salt marsh (AFDW) | 56.3 g $m^{-2}$ |
| Annual below-ground production of vascular plants (AFDW) | 4452 g $m^{-2}$ |
| Amount of below-ground production entering food chains (AFDW) | 223 g $m^{-2}$ |
| Marine invertebrate production derived from below-ground detritus passing to bacteria and then to invertebrates (AFDW) | 2.2 g $m^{-2}$ |
| Total herbivorous production of marine invertebrates annually (AFDW) | 58.5 g $m^{-2}$ |
| Total production of herbivorous marine invertebrates per acre | 236.7 kg AFDW $yr^{-1}$ |
| Compensation credit for one acre of restored salt marsh[c] | 449.7 kg AFDW $yr^{-1}$ |

a- from Robblee (1973) for the Southern Branch of the Elizabeth River in dry wt and converted to AFDW by data on *Spartina* presented in Squiers and Good (1974), Smith et al. (1979), and Roman and Daiber (1984) showing ash content of 12.6, 13.7, and 10,8 % respectively (mean of 12.37 %)

b- ash content of microalgae is assumed to be trivial for these calculations

c- total credit is computed by doubling the credit estimated by energetics approach to account for export of organic materials to subtidal invertebrate production and provision of habitat for blue crabs and other consumers on the structured marsh: then the total is diminished by 5% to account for uncertainties and risks of marsh restoration

Table 8-5: Computations of Scaling of Oyster Reef and Spartina Salt Marsh Restoration Projects to Compensate for Benthic Invertebrate Production Losses After Expansion of Craney Island by 580 Acres (Charles H. Peterson and Associates, 2003, p. 24)

| | |
|---|---|
| Losses each year | |
| Benthic invertebrates | 13,112-33,652 kg |
| Zooplankton | 16,976-75,715 kg |
| Total | 30,088-109,367 kg |
| Annual benefits per acre of restoration | |
| Oyster reef | 5,995 kg per acre |
| Numbers of reef acres required for compensation[a] | 5.02 – 18.24 acres |
| Salt marsh | 449.7 kg per acre |
| Number of marsh acres required for compensation[a] | 66.9 – 243.2 acres |

a- These acreage figures reflect two scenarios, all restoration done by oyster reef or all done by salt marsh. In practice a mixture is contemplated.

Note: These computations assume a worst-case scenario of complete loss of water column habitat volume equal to the volume of fill. Initially dredging will remove a volume equal to the fill, thereby retaining water column volume constant, but with less in the photic zone. Calculations here do not include any compensation in zooplankton production for the expansion of deep water. Consequently, the lower end of the range of restoration estimates for zooplankton is far more likely to be close to what is needed to scale restoration.

# CHAPTER 9

## SUMMARY AND RECOMMENDATIONS

The Norfolk District of the U.S. Army Corps of Engineers is currently conducting a feasibility study to determine the need for and the federal interest in an eastward expansion of the Craney Island Dredged Material Management Area (CIDMMA) located in the Hampton Roads area near Norfolk, Virginia. Such an expansion would extend the useful life of the CIDMMA as a dredged material containment area. Secondly, once filled, it could provide additional acreage for the development of projected long-term berthing and landside port facilities adjacent to the Norfolk Harbor Channel. Thirdly, it could serve as a logistical and tactical area supporting deployment of national defense forces.

The feasibility study involves, among other things, an evaluation of the environmental impacts to about 600 acres of shallow bottom habitat eastward of the CIDMMA. Cumulative impacts from the current potential action, and other nearby past, present, and reasonably foreseeable future actions have been identified and assessed for the shallow bottom habitat and other pertinent resources, ecosystems, and human communities. Examples of other nearby projects include dredging of the inbound portion of the Norfolk Harbor Channel to a depth of 50 feet (by the Corps), construction and operation of a major marine terminal on the completed expansion cell (by the Virginia Port Authority), construction and operation of a second marine terminal about 1.5 to 2.0 miles south of the CIDMMA (by APM Terminals, Inc.), construction and use of a Third Crossing bridge tunnel project across the Hampton Roads area (by the Virginia Department of Transportation), and implementation of sediment cleanup and wetland restoration projects in the Elizabeth River Basin (by the Elizabeth River Ecological Restoration Program).

Cumulative impacts (effects) refer to the impacts (effects) on the environment that result from the incremental impact of the action (potential eastward expansion of the CIDMMA) when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts (effects) can result from individually minor but collectively significant actions taking place over a period of time (40 CFR 1508.7). The 11-step CEA methodology promulgated by the Council on Environmental Quality (CEQ) was utilized as the framework for the cumulative effects study described herein (Council on Environmental Quality, 1997). Steps 1-4 relate to scoping for cumulative effects, Steps 5-7 to describing the affected environment, and Steps 8-11 to determining the cumulative environmental consequences.

Chapter 2 of this report focuses on the CIDMMA and its expansion. It also includes Steps 2 and 3 (spatial and temporal boundaries) of the CEQ's 11-step methodology. Chapter 3 summarizes information on the affected environment, thus encompassing Steps 5 to 7 of the 11-step methodology. Chapters 4 to 6 highlight Step 4 of the methodology, with Chapter 4 focused on past, present and continuing projects

and actions; Chapter 5 on current actions under implementation; and Chapter 6 on proposed and possible future projects. Chapter 7 addresses the cumulative effects of the eastward expansion of the CIDMMA (Steps 1, 8, and 9) along with the contributing effects of other actions (Step 4). Specific information on the effects of other actions is also contained in Chapters 4 to 6. Chapter 8 highlights potential mitigation measures for the eastward expansion of the CIDMMA (Step 10). Finally, this chapter summarizes the study findings and recommendations; two of the recommendations relate to Steps 10 and 11.

## SUMMARY OF FINDINGS

A total of 17 types of actions have been identified as contributing to cumulative effects in the Hampton Roads area, including the Elizabeth River basin. These actions include those that have occurred since the mid-1950s, are now taking place, or are anticipated to occur in the future to the year 2050. The 17 types of actions include: (1) continuing use of the 3 existing cells at the CIDMMA; (2) an approximate 600-acre eastward expansion of the CIDMMA (the potential proposed action); (3) historical navigation channel deepening and provision of anchorages; (4) presently authorized channel deepening and anchorages (not yet constructed); (5) continuance of maintenance dredging for navigation; (6) planning for future channel deepening and maintenance dredging; (7) water-related laws, regulations, and programs; (8) other existing and continuing industrial and military projects and facilities in the local area; (9) a new marine terminal (APM Terminals, Inc.); (10) sediment cleanup and (11) wetland restoration components of the Elizabeth River Ecological Restoration Program; (12) Pinner's Point Flyover; (13) Craney Island Terminal (proposed by the Virginia Port Authority for construction on the eastward expansion area of the CIDMMA); (14) the Third Crossing of the Hampton Roads area (a bridge-tunnel connector); (15) pre-authorization studies by the Norfolk District of the Corps; (16) the Midtown Tunnel Project; and (17) the Virginia Intermodal Transportation Center. Table 7-1 delineates the respective time periods (past, present, and/or future) for the 17 actions.

The cumulative effects of these 17 types of actions have been addressed for water quality, hydrodynamics, air quality, noise, biological resources (including benthic habitat in the approximate 600-acre eastward expansion area for the CIDMMA), protected species and critical habitat, recreation (boating and fishing), aesthetics, cultural resources, and socioeconomics (including area traffic and environmental justice). Table 7-2 summarizes the connections between these resources ecosystems, and human communities and the major affecting actions from the 17 types of actions. In the absence of appropriate monitoring and mitigation efforts, potentially significant adverse cumulative effects could occur on water quality, benthic habitat, and protected species and critical habitat. Beneficial cumulative effects are anticipated for the socioeconomic conditions of the Hampton Roads area.

## RECOMMENDATIONS

Based on the above information, the following recommendations are made:

(1) As soon as more detailed information on the CIDMMA eastward expansion becomes available, Chapter 2 of this report should be updated as appropriate. Further, a more definitive composite timeline should be developed; this timeline should better define anticipated periods of construction and operation of the eastward expansion of the CIDMMA, as well as the various other relevant actions addressed in Chapters 4 through 6.

(2) Existing and continuing monitoring programs related to the Hampton Roads area and the Elizabeth River basin should be systematically identified and described relative to what is monitored, the monitoring frequency, the availability of the data, and the agencies responsible for the programs. The "monitoring focus" should be broad; i.e., it should include aquatic ecology, water quality, recreational usage of the area, navigation traffic, quantities of dredged material received by the CIDMMA, etc. This information could be placed in a separate companion report to this report, or it could be incorporated as a separate chapter and related appendices in this report. Further, it should be included in the subsequent Environmental Impact Statement (EIS). This recommendation is related to Step 10 in the CEQ methodology.

(3) Consideration should be given to establishing a Hampton Roads Area Environmental Management Committee. Multiple agencies and entities should be represented on the Committee. The Committee should meet on a periodic basis, review the monitoring information, and adapt practices or management strategies that may influence cumulative effects in the Hampton Roads area and the Elizabeth River basin. The Corps should probably take the lead on establishing this Committee. This concept is related to longer-term adaptive environmental management; further, it is being increasingly used by the Corps for large-scale projects. The overall concept and framework could be included in a separate chapter in this report, or it could be addressed as appropriate in a subsequent EIS. This recommendation is related Step 11 in the CEQ methodology.

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# APPENDIX A

# CUMULATIVE EFFECTS ISSUES IDENTIFIED IN SCOPING MEETINGS

## INTRODUCTION

The scoping process as delineated in the NEPA regulations of the Council on Environmental Quality has been used in the feasibility study of the eastward expansion of the CIDMMA. The process can include, but is not limited to, public meetings involving persons with various interests and technical/scientific expertise. Such meetings involving these different groups have occurred during the feasibility study. The groups include various stakeholders, a NEPA Technical Committee, and a Mitigation Subcommittee of the NEPA Technical Committee. A review of the minutes of these meetings revealed that cumulative effects issues were routinely addressed. This appendix summarizes the identified issues in these meetings.

## STAKEHOLDER MEETINGS

Cumulative effects (CEs) issues and concerns were articulated at several Craney Island Stakeholders Meetings and a Feasibility Scoping Meeting. For example, in the first Stakeholders Meeting held on August 12, 1999, the following CEs-related recommendations were made by one or more discussion groups (U.S. Army Corps of Engineers, August 21, 1999):

(1) There is a need to look at the big picture in an effort to find a synergistic blend of the various initiatives (e.g., the eastward expansion of the CIDMMA, and VDOT's Third Crossing of the Hampton Roads area).

(2) The proposed expansion of the CIDMMA should also consider, and be consistent with: (a) the Elizabeth River Restoration Program, and (b) 50 ft. inbound channel studies.

(3) Hydrodynamic modeling should be conducted on a fine enough scale to accurately model the entire James and Elizabeth River systems. The modeling effort should include (1) salinity studies, (2) sedimentation studies, and (3) flushing ability studies.

(4) Include combinations of planned or potential projects (VDOT's Third Crossing, 50-foot inbound channel, CIDMMA expansion, development across the river, etc.) in modeling efforts to accurately simulate potential impacts of the eastward expansion of the CIDMMA based on possible future scenarios.

In a Feasibility Scoping Meeting held on November 18, 1999, a specific discussion of cumulative environmental impacts was held. The following paragraph summarizes the discussion (U.S. Army Corps of Engineers, November 23, 1999):

> It was agreed by all parties that cumulative environmental impacts must be considered when evaluating a project. In the case of an eastward expansion of Craney Island, other probable projects including the Third Crossing of Hampton

Roads and the 50-foot inbound deepening need to be taken into consideration. In other words, projects cannot be evaluated individually. A status report on the Third Crossing was provided. Specifically, the District has reviewed the pre-draft EIS provided by VDOT and provided comments. The draft should be available in January/February 2000 with the final scheduled for late summer or early fall of 2000. The major environmental concern is the hydrodynamic impacts. Further, there is no firm construction schedule for the Third Crossing and the study of an expansion of the CIDMMA and the 50-foot inbound deepening may now all be proceeding concurrently. This will facilitate the hydrodynamic modeling effort. It was suggested that emphasis now be placed on meeting with VIMS and the Waterways Experiment Station to finalize the modeling strategy.

Continuing interest in CEs was also noted from the Stakeholders Meeting held on April 12, 2000. The Meeting included a presentation on hydrodynamic modeling in the Hampton Roads area. From a list of concerns related to the overall study, the following items related to CEs (U.S. Army Corps of Engineers, April 12, 2000):

(1) What about the influence of other projects that are in the planning stage?

(2) The impacts of the eastward expansion of the CIDMMA on other projects (existing and planned) should be discussed.

Finally, the minutes of the Stakeholders Meeting held on May 23, 2001, includes a list of questions, issues, and concerns. One suggestion was that the Corps and VDOT should more closely collaborate relative to the "Third Crossing" project (U.S. Army Corps of Engineers, May 23, 2001).

NEPA TECHNICAL COMMITTEE

A NEPA Technical Committee was formed in November, 2000, and it has met periodically since that time. During the first Committee meeting, held on November 27, 2000, the issue of other nearby projects in the planning stage was discussed. Three specific nearby projects were mentioned -- the Third Crossing of the Hampton Roads area (combination of bridge and tunnel), dredging of the Norfolk Harbor Inbound Channel to a depth of 50 feet, and the Elizabeth River Environmental Restoration Program focused on sediment cleanup and wetland restoration. All three projects represent either "present actions", or "reasonably foreseeable future actions", hence they should be addressed in a CEA study related to the eastward expansion of the CIDMMA (U.S. Army Corps of Engineers, November 27, 2000).

The second meeting of the NEPA Technical Committee occurred on May 15, 2001. It included a presentation on the three-dimensional numerical modeling study, and a broad-ranging discussion of a variety of issues. Three such issues have relevance to the CEs of hydrodynamic changes; they are (U.S. Army Corps of Engineers, May 15, 2001):

(1) The eddy effect in the vicinity of Hampton flats and the "plunging front" at Newport News Point is affected by both the north and northeast expansion alternatives. This is considered a serious effect since this phenomena is thought to be responsible for the trapping of oyster and clam larvae in the lower James River.

(2) What is the seasonal occurrence and distribution of sea turtles in the project area(s)? What are potential effects from dredging and/or construction?

(3) There are 3 or 4 major Hampton Roads Sanitation District (HRSD) outfalls in the lower James and adjoining Elizabeth River systems. The Nansemond wastewater treatment plant may be scheduled to expand. What effect would any hydrodynamic changes have on these discharges?

The third meeting of the NEPA Technical Committee occurred on August 21, 2001. This meeting, which was held at the Virginia Institute of Marine Science (VIMS), included several local natural resources experts. General discussions were held regarding concerns related to direct, indirect, and cumulative impacts on several natural resources and ecosystems. Examples of such natural resources in the vicinity of the CIDMMA eastward expansion include oysters, clams, fisheries, essential fish habitat (EFH), wetlands, and benthos (U.S. Army Corps of Engineers, August 21, 2001). In addition, it was noted that more information is needed on the status of the proposed Maersk Marine Container Terminal (also known as APM Terminals Virginia, Inc.) to be located just to the southeast of the CIDMMA.

The fourth meeting of the NEPA Technical Committee was held on October 24, 2001. A topic of discussion related to NEPA documents for the eastward expansion of the CIDMMA, and the proposed port facility development on the expansion area. Specifically, the following statements appeared in point number 7 in the minutes (U.S. Army Corps of Engineers, October 24, 2001):

> The Corps and VPA explained that the NEPA requirements would be fulfilled with the preparation of two NEPA documents. The Corps will prepare the NEPA document to cover construction of the cell(s) for dredged material containment and VPA will prepare the NEPA document to cover port facility development on the cell.

Other discussion at the fourth meeting suggested that a comprehensive EIS should be prepared (including both the expansion and port facility), otherwise a "piecemeal" approach would be utilized. Stated differently, it was suggested that the single EIS should be inclusive related to additional cells; development and operation of cells; construction of a port terminal, including cargo operations, supporting infrastructure, etc.; and defense utilization of the port. Implied in the discussion related to a comprehensive EIS was the need to address connected actions and cumulative actions, along with cumulative effects.

The fifth meeting of the NEPA Technical Committee occurred on April 3, 2002. The focus was on mitigation options that could be used for the loss of nearshore, shallow, open water habitat. Some potential mitigation measures include, but are not limited to, oyster restoration, SAV restoration, sediment cleanup in the Elizabeth River, wetland restoration/conservation, riparian buffers, and several others (U.S. Army Corps of Engineers, April 3, 2002). Such mitigation options could be used for direct, indirect, and cumulative effects. To more systematically address these measures, a Mitigation Subcommittee of the NEPA Technical Review Committee was established.

MITIGATION SUBCOMMITTEE

The first meeting of the Mitigation Subcommittee of the NEPA Technical Committee was held on June 21, 2002. During the meeting it was determined that the focus of the Subcommittee should be on mitigating the direct effects associated with the loss of about 580 acres of bottom area and open water habitat located just to the east of the CIDMMA. The advantages and limitations of several mitigation options were discussed; following are key points that were made regarding various options (U.S. Army Corps of Engineers, July 21, 2002):

(1) Oyster Reef Restoration -- improves benthic diversity and habitat; provides water column benefits; replaces benthic components lost -- although they may be a different species composition;

(2) SAV Restoration -- improves benthic habitat and diversity; provides nursery areas for finfish and shellfish;

(3) Wetland Restoration -- provides fisheries habitat and invertebrates habitat; are losing fish habitat with expansion; different than what is lost; good juvenile use;

(4) Sediment Clean-Up -- does not address losses to water-column -- only to the bottom;

(5) Conservation Areas -- it was generally agreed that it is not in-kind related; mostly water quality benefits and habitat for wildlife;

(6) Shore-Stabilization -- minimal in-kind relatedness; actually prevents more open water from being created; habitat components (wetlands, SAVs, etc.) can be designed into these projects;

(7) Fish Habitat Enhancement through Dam Removal or Fish Ladders -- only a limited number of species benefit from this option;

(8) Clam Management Sanctuary -- enhances bottom habitat and benthos;

(9) Bird Management Plan at Craney Island -- there is minimal in-kind relatedness;

(10) Storm Water Retrofit -- a water quality issue -- not a habitat; there is minimal in-kind relatedness;

(11) Nesting Islands -- building islands results in loss of bottom; there is minimal in-kind relatedness; and

(12) Artificial Reefs -- fish habitat; epifaunal organisms attach to reef structure; enhances benthic productivity; does not address water column effects.

The second meeting of the Mitigation Subcommittee was held on July 24, 2002. One topic that was discussed was related to "changes in flushing volumes" in the Elizabeth River due to the eastward expansion of the CIDMMA. Reviews of the existing and proposed cross-sections of the Elizabeth River in the vicinity of the eastward expansion demonstrated that there is no change in the cross-sectional area of the River because the dredging (widening and deepening of the channel) offsets the fill that takes place with the expansion. This offsetting widening and deepening of the channel will result in a no-net-loss of open water volume (U.S. Army Corps of Engineers, July 24, 2002). Further, discussions were held on candidate locations where mitigation options could be implemented, and a preliminary "benefits scoring analysis" was conducted for the options. The scoring analysis included the consideration of the functional attributes of the options, their "in-kind relatedness", and their "effectiveness to influence a large geographical area over time". All of the issues discussed at the second meeting are related to the CEA study.

The third meeting of the Mitigation Subcommittee was held on August 26, 2002 (U.S. Army Corps of Engineers, August 26, 2002). For a variety of reasons delineated during the discussion, a conceptual decision from the first meeting was re-confirmed. That decision was that "...on-site, in-kind mitigation (i.e., grading back waterfront property near Craney Island to create benthic habitat) is not practical or technically feasible. Off-site, out-of-kind mitigation is, therefore, the focus of this mitigation plan. The geographic region of consideration agreed upon by consensus is the Elizabeth River, Hampton Roads Harbor, and lower James River systems -- and the closer to the area of impact the better" (U.S. Army Corps of Engineers, June 21, 2002). In addition, the Subcommittee evaluated two additional scoring factors for the options -- publicly recognized value and risk/success. Publicly recognized value was defined as "the publicly recognized importance of the resource value contributed by the mitigation option that may be reflected in adopted plans such as national or international agreements, or other action plans of public agencies or private groups". Risk/success was defined as "the likelihood of success based upon previous implementation of the mitigation option and consistent production of anticipated benefits" (U.S. Army Corps of Engineers, August 26, 2002).

In conclusion, while the mitigation options addressed by the Mitigation Subcommittee are focused on the direct effects of the eastward expansion on about 580 acres of bottom area and open water habitat, the same types of options could also be used in a mitigation program for the cumulative effects of multiple projects in the study area.

## SUMMARY OF SCOPING MEETINGS

The feasibility study of the eastward expansion of the CIDMMA has included at least 12 public meetings involving persons and groups with various interests and expertise. The total includes four stakeholder meetings, five meetings of a NEPA Technical Committee, and four meetings of a Mitigation Subcommittee of the NEPA Technical Committee. These meetings included extensive discussions that are associated with the scoping process as delineated within the NEPA regulations of the Council on Environmental Quality. A central theme in many of the discussions related to the need for a CEA study. More specifically, the following items reflect the manner in which the issues related to cumulative effects were articulated:

- A comprehensive EIS should be prepared to address connected actions, cumulative actions, and cumulative effects. A piecemeal approach wherein multiple EISs are prepared without referring to other nearby actions would not provide the best approach from an environmental management perspective.

- The environmental effects of multiple current and future projects in the vicinity of the eastward expansion of the CIDMMA should be considered together. Examples of these other projects include dredging of the inbound portion of the Norfolk Harbor Channel to a depth of 50 feet (by the Corps), construction and operation of a major marine terminal on the completed expansion cell (by the Virginia Port Authority), construction and operation of a second marine terminal about 1.5 to 2.0 miles south of the CIDMMA (by APM Terminals, Inc.), construction and use of a Third Crossing bridge tunnel project (by the Virginia Department of Transportation), and implementation of sediment cleanup and wetland restoration projects in the Elizabeth River Basin (by the Elizabeth River Ecological Restoration Program).

- The environmental impact study of the eastward expansion of the CIDMMA should encompass the direct, indirect, and cumulative effects on specific resources such as, but not limited to, water quality, benthos, fisheries, protected species, birds, and wetlands.

- Hydrodynamic modeling should be used as a tool to explore the effects of single and multiple projects on various important hydrodynamic parameters in the Hampton Roads area.

- Mitigation measures for the direct effects of the eastward expansion of the CIDMMA should be developed. Such measures could also be utilized, in a

collaborative manner with other agencies and parties, to systematically provide opportunities for mitigating cumulative effects on specific resources and ecosystems.

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# APPENDIX B

# SITING ALTERNATIVES FOR DREDGED MATERIAL PLACEMENT AND VPA MARINE TERMINAL

## INTRODUCTION

A broad range of siting alternatives have been considered in association with the Craney Island feasibility study (Banton, 2003). Included in the range were off-site options for dredged material disposal (off-site relates to sites away from the existing CIDMMA); these options encompassed upland sites, beneficial uses of the material, creation/enhancement of islands, combined aquatic disposal facilities, deep holes, and ocean placement. However, the off-site options were eliminated due to various combinations of the following reasons: conflicting land uses, capacity issues, operational constraints, environmental concerns related to wetlands and protected species, hydrodynamic concerns, geotechnical constraints, potential environmental consequences of releases of contaminants from the dredged material, and impacts to commercial and recreational fisheries.

On-site options included a variety of expansion scenarios for the CIDMMA. These scenarios were also coupled with a proposal by the Virginia Port Authority (VPA) to develop and utilize a new marine terminal for large container ships.

## ALTERNATIVES REVIEW COMMITTEE

As part of the review and evaluation of on-site options, a Technical Review Committee was utilized. This Committee has reviewed alternatives for expanding the CIDMMA, as well as placement of the VPA's proposed new marine terminal. The Committee met 8 times between April 13, 2000, and January 8, 2001. Minutes of the meetings are available for seven of the eight meetings (U.S. Army Corps of Engineers -- April 13, 2000; May 24, 2000; July 20, 2000, August 15, 2000; September 6, 2000; November 13, 2000, and January 8, 2001). The minutes for the November 13, 2000, meeting were not available on the Internet.

Membership of the Alternatives Review Committee included representative units of the Corps in Norfolk, the consulting firm working for VPA, and the Virginia Department of Transportation (VDOT). A representative from the Virginia Pilots Association attended one meeting.

Over the period of meetings a total of 12 footprint options were considered. Table B-1 summarizes key features of each of the 12; conceptual drawings of each are available on the Craney Island eastward expansion web site (U.S. Army Corps of Engineers, December 2, 2003).

A variety of issues were addressed by the Alternatives Review Committee in their meetings. For example, the April 13, 2000, meeting highlighted terminal and port design features and criteria, and alternative locations for the terminal on expanded portions of the CIDMMA (U.S. Army Corps of Engineers, April 13, 2000). Expansion scenarios for the CIDMMA were addressed in the second meeting; these scenarios included eastward and northward expansion, and a combination of both (U.S. Army Corps of Engineers, May 24, 2000). The July 20, 2000, meeting was focused on expanding the

Table B-1: Comparative Features of Twelve Footprint Options (U.S. Army Corps of Engineers, December 2, 2003)

| Option | Location of New Dredged Material Placement Area | Location of New Third Crossing | Location of Proposed VPA Terminal |
|---|---|---|---|
| 1 | N and W (a) | N (b) | NE and E existing (c) |
| 2 | W (d) | N (b) | NE and E existing (c) |
| 3 | W (e) | N (f) | NE and E existing (c) |
| 4 | W (g) | N (f) | NE and E existing (c) |
| 5 | W (h) | N (f) | NE and E existing (c) |
| 6 | N (i) | N (j) | N (k) |
| 7 | E (l) | N (m) | E (n) |
| 8 | N and E (o) | N (p) | E (n) |
| 9 | N and E (q) | N (j) | N and E (r) |
| 10 | n.a. (s) | N (f) | NE and E existing (c) |
| 11 | N (i) | N (j) | NE and E existing (c) |
| 12 | N and E (q) | N (b) | N and E (r) |

Notes:
(a) 1770 acres north and west of existing CIDMMA
(b) Alternative 9 adjacent to north side of existing CIDMMA; includes connector to south along west side of proposed VPA Terminal
(c) Northeast and east side of the existing CIDMMA following build-up of area to accommodate terminal development; dredging to the east of the existing CIDMMA would be needed to accommodate ships using the terminal
(d) Further expansion of (1) to the west, total of 2500 acres expansion to north and west
(e) Reduced area of westward expansion compared to (a) and (d); expansion includes 700 acres
(f) Alternative 9 is north of CIDMMA, but not immediately adjacent to it; includes connector to south along west side of proposed VPA Terminal
(g) 1430 acres of westward expansion; no expansion to north
(h) 1013 acres westward expansion; no expansion to north
(i) 840 acres expansion of CIDMMA to the north of existing footprint
(j) Same as (b) except connector to south is along the east side of the existing CIDMMA
(k) On west side of the new northern expansion of CIDMMA
(l) CIDMMA is expanded to the east by 580 acres
(m) Same as (f) except connector to south is along the east side of the existing CIDMMA
(n) Terminal to be built on top of 580 acres eastward expansion of CIDMMA
(o) 1210 acre expansion to the north and east of existing CIDMMA

Table B-1: (continued)

(p) Alternative 9 moved 1400 ft. further to the north; connector to the south is along the east side of the existing CIDMMA
(q) 1710 acre expansion to the north and east of CIDMMA
(r) One terminal to be built on the west side of the northern expansion of CIDMMA (like Option 6), and the other on the eastward expansion of CIDMMA (like Option 7)
(s) Not applicable since there is no expansion of the footprint of CIDMMA

footprint options to include locating the terminal on the northeastern and eastern portion of the existing CIDMMA. Comparisons of the advantages and disadvantages of 8 footprint options were also made (U.S. Army Corps of Engineers, July 20, 2000).

The meeting of the Alternatives Review Committee on August 15, 2000, included further discussions of footprint options along with information relative to the logistics of turning vessels into terminals, and their related exit. The logistical concerns were summarized by the representative of the Virginia Pilots Association. Additional discussions were held regarding the needed rail/transportation corridor and its location related to the terminal (U.S. Army Corps of Engineers, August 15, 2000).

The Alternatives Review Cornmittee meeting on September 6, 2000, included persons from VDOT and their consultants involved with the study of a third crossing of the Hampton Roads area. The meeting included a presentation of 12 footprint options and a discussion of coordination needed between the Corps, the VPA, and VDOT (U.S. Army Corps of Engineers, September 6, 2000). The meeting on November 13, 2000, included continued discussions with VDOT and their consultants regarding the locational and design compatibilities between expansion of the CIDMMA, a new terminal facility, and the third crossing (U.S. Army Corps of Engineers, November 13, 2000).

The meeting on January 8, 2001, was focused on identifying four footprint options that would be incorporated in the Virginia Institute of Marine Science (VIMS) hydrodynamic modeling study. The selected options included numbers 5, 6, 7 (the locally preferred plan), and 9 (U.S. Army Corps of Engineers, January 8, 2001).

PREFERABLE ALTERNATIVE

As a result of the deliberations of the Alternatives Review Committee, input from various stakeholder groups, coordination with VPA and VDOT, and the hydrodynamic modeling study, several footprint options have been eliminated, and one option has been identified as preferable for further consideration. Table B-2 summarizes the status of the 12 footprint options and the reasons for their elimination or inclusion for further study (Banton, 2003). As shown in Table B-2, footprint options 1-5, 8-9, and 10-12 were eliminated from further consideration. Footprint options 6 and 9M (modified) were modeled and then eliminated. Footprint options 5M (modified) and 7 were modeled, with option 7 causing the least amount of change to the surrounding environment. Accordingly, footprint option 7 will be used in the CEA study; it is commonly referred to as the Eastward Expansion alternative (option).

Finally, several enhanced management alternatives were considered for the existing and potentially expanded CIDMMA. These alternatives included the use of interior strip drains, an expanded west berm, the west berm and interior strip drains, a west berm and port facility on an eastward expansion of the CIDMMA, and a west berm and eastward expansion with no port facility (Banton, 2003). Some of these

Table B-2: Status of Twelve Footprint Options (Banton, 2003)

| Option | Status | Rationale |
|---|---|---|
| 1 | Eliminated | • Not compatible with VDOT's Third Crossing<br>• Negative impacts to operation of existing CIDMMA<br>• Significant reduction in dredged material placement capacity of existing CIDMMA |
| 2 | Eliminated | • Same as 3 bullets for Option 1<br>• Significant environmental/social concerns |
| 3 | Eliminated | • Same as 3 bullets for Option 1 |
| 4 | Eliminated | • Same as for Option 2 |
| 5 | Eliminated | • Same as 3 bullets for Option 1 |
| 5M(a) | Modeled (b) | • Modeling results showed that footprint presented the second least amount of change on the surrounding environment<br>• Selected by Stakeholders for additional modeling |
| 6 | Modeled (b) and Eliminated | • Modeling results showed greater change with northward expansion |
| 7 | Modeled (c) | • Presented the least amount of change on the surrounding environment in both the single variable and historical modeling |
| 8 | Eliminated | • Same as 3 bullets for Option 1 |
| 9 | Eliminated | • Same as 3 bullets for Option 1 |
| 9M(d) | Modeled (b) and Eliminated | • Modeling results showed greater change with northward expansion |
| 10 | Eliminated | • Same as 3 bullets for Option 1 |
| 11 | Eliminated | • Same as 3 bullets for Option 1 |
| 12 | Eliminated | • Same as 3 bullets for Option 1 |

Notes: (a) Option 5 modified to omit VPA marine terminal; Third Crossing connector to south along east side of existing CIDMMA
(b) Modeled in VIMS single variable run
(c) Modeled in VIMS single variable run, and in VIMS historical runs (the historical runs also included an analysis of a 944 acre westward expansion of CIDMMA, and the 580 acre expansion to the east, along with a port facility on the completed 580 acres -- this analysis was selected by stakeholders to be addressed in the VIMS hydrodynamic modeling effort)
(d) No terminal on west side of northern expansion of CIDMMA; one terminal on the eastern expansion of CIDMMA

management alternatives (e.g., interior strip drains and a west berm) may be incorporated in the final proposal for the eastward expansion of the CIDMMA.

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# APPENDIX D

# HEA REPORTS (PETERSON, RUDDY, BUCHMAN)

# Scaling compensatory restorations for the Craney Island expansion project in the Elizabeth River estuary

## Final Report

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28 July 2003

### Introduction

Two viable and attractive restoration actions to compensate in large part for lost ecosystem services that will result from the filling of 580 acres of deep-water (average depth of 10 feet) habitat in the Elizabeth River estuary (VA) are the construction of functional oyster reef habitat and the restoration of salt marsh habitat. These benthic habitats play important roles in stimulating production of higher trophic levels in the estuarine system and each of these two benthic habitats is locally degraded, oyster reefs far more so than salt marshes. Both types of restoration have a history, both in the Chesapeake Bay and elsewhere in east-coast estuaries, thereby serving as a guide to efficient and effective restoration somewhere in the Virginia portion of the lower bay (e.g., Thayer et al. 1992, Lenihan and Peterson 1998, Luckenbach et al. 1998, O'Beirn et al. 1999, Mann 2000). Both oyster reef and salt marsh restoration projects were recently included in the mix of compensatory actions following the Chalk Point oil spill in the Patuxent River in the Maryland portion of the bay. Salt marsh habitat enhances production of the detritus-based food web of the estuary, while serving as a wildlife habitat and as a filter for many pollutants that would otherwise enter the estuary by storm-water run-off. Oyster reef restoration can play an important role in promoting recovery of a fishery resource, of water quality, and of a habitat once far more widespread in the bay (Rothschild et al. 1994). The loss of oysters has had significant economic and social repercussions on fishermen and their communities. Oysters at their historical levels of abundance also played a vital role in maintaining water quality by their filtration action. For example, Newell (1988) calculated that oysters around 1900 filtered a volume of water equivalent to the entire Chesapeake Bay every 3-4 days, whereas under today's depressed abundance it takes over a year for oysters to achieve that level of filtration.

Oyster reef restoration has been the focus of intense advocacy by scientists, managers, and the public in the Chesapeake Bay region and throughout the east coast of the United States (Burreson et al. 1999, Mann 2000, Jackson et al. 2001). This move towards extensive oyster reef restoration is motivated by the steep decline documented in this benthic habitat and by growing recognition of the importance of the ecosystem services generated by oyster reefs. Oyster reefs indeed provide several services to the ecosystem. Their filtration removes suspended inorganic and organic particles, thereby reducing turbidity. This filtration represents a type of biomanipulation that helps counter the negative impacts of eutrophication (Lenihan and Peterson 1998, Jackson et al. 2001). With reduction in turbidity, the consequent enhanced light penetration can allow SAV habitat to expand in depth range and in areal cover because these

rooted aquatic grasses are limited by light penetration. Such SAV expansion provides additional nursery habitat for fishes and crabs in the bay. Through their local production and deposition of feces and pseudofeces, oysters promote denitrification, thereby transforming nitrogen from a nutrient into an inert gas (Newell et al. 2002). Oyster reefs also serve as important habitat for crabs and demersal fishes, both through provision of structural refuges and also by promoting production of associated invertebrate prey organisms (Zimmerman et al. 1989, O'Beirn et al. 1999, Lenihan et al. 2001, Peterson et al. 2003). Oyster reefs along shorelines help serve as breakwaters, reducing shoreline and marsh habitat erosion.

**Injury requiring compensatory restoration**

The intended expansion of Craney Island involves filling of 580 acres of the estuary, eliminating now functioning habitats from the estuarine ecosystem in the Elizabeth River. This action will affect two biological habitats, the estuarine sea floor averaging 10-feet in depth and the overlying water column. A widely applied method (Habitat Equivalency Analysis) of quantifying injury in a way that allows scaling of a restoration project so as to compensate for the ecosystem services foregone is to estimate the loss and potential gain in production at an appropriate trophic level because provision of ecosystem services typically relates closely to production. Here we estimate annual loss in production of secondary producers in both the benthic habitat and the water column habitat. We use consistent methodology to likewise estimate annual secondary production benefits per acre of restoration of oyster reefs in this region of the Chesapeake Bay and per acre of salt marsh restoration. Thus compensatory mitigation can be calculated by mixing these two (or other) restoration projects at the spatial scale that provides expected benefits to match the loss.

***Loss of benthic community services***

Quantitative benthic sampling of abundances of macrobenthos (retained on a 0.5-mm sieve) are available from the footprint of the Craney Island expansion site from an intensive monitoring program using randomly situated samples in the Elizabeth River system in summers of 1999 and 2001 (Dauer 2000, 2002). In addition, targeted sampling of bivalve molluscs was conducted on 23-25 September 2002 in the area proposed for filling, in other nearby "deep-water" (around 10-ft in depth) areas, and in nearby "shallow-water" habitats in the Craney Island - Lafayette River estuarine system (Seitz and Lipcius 2003). Targeted sampling of benthic bivalves is an appropriate response to the importance of this taxon as prey for blue crabs (Boesch 1977, Virnstein 1977, Hines et al. 1990, Skilleter 1994), a valuable resource at presently depressed levels in the Chesapeake Bay.

We use the data on total macrobenthic biomass (Dauer 2000, 2002) along with published P:B rations appropriate for benthic macro-invertebrate taxa to estimate the annual production in the deep-water polyhaline mud habitat at the proposed Craney Island expansion site. To this production figure, we then must add a corresponding estimate of production of meiobenthos (nematodes, small polyhaetes, and harpacticoid copepods mostly). Lacking any meiobenthic sampling in the Craney Island footprint, we use the literature relationships between macro- and meiobenthic production to compute estimates of losses in meiobenthos. Although the benthic grab sampler used in the monitoring survey penetrates only to a depth of 7 cm, bivalve sampling

data in Seitz and Lipcius (2003) and their observations during that sampling (pers. com.) confirm that deeper-burrowing bivalves, polychaetes, and crustaceans were not present in numbers that would bias results based on sampling only to 7-cm depths. The 4 bivalve species present in the Craney Island footprint, *Aligena elevata, Tagelus plebeius, Macoma tenta*, and *Gemma gemma.*, were all comprised of very small individuals occupying shallow strata in the sediments (Seitz and Lipcius 2003).

The benthic sampling as part of Dauer's (2000, 2002) monitoring program for the Elizabeth River system contained 7 of its random samples in summer 1999 and 3 in summer 2001 within the footprint of the Craney Island expansion. Those samples (Table 1) yielded an average macrobenthic biomass of 0.962 in 1999 and 0.899 g AFDW $m^{-2}$ (Rieger 2003: Tables 1, 2). These biomass and the accompanying abundance data are lower than analogous means for the Lafayette River in those same data sets (Rieger 2003), but the biomass depressions (44 and 41% respectively for 1999 and 2001) are small. When all factors that contribute to the BIBI (benthic index of biotic integrity or "ecosystem health") are included, the footprint of the Craney Island expansion has a metric of 2.7, placing this site in the marginally degraded category. This 2-year average macrobenthic biomass is high enough to represent important production that is of value to demersal predators and to biogeochemical processing. The review by Knox (2001) suggests that P:B ratios for the macrobenthic community of temperate estuaries fall in the range of 0.6 to 1.6 with a general mean of 1.0. This review is, however, based largely on data for estuaries in northern Europe, a colder climate than that of the Chesapeake Bay. Diaz and Schaffner (1990) suggested higher P:B ratios for macrobenthic taxa in a more productive Chesapeake Bay: 5.7 for crustaceans; 4.9 for polychaetes; and 2.9 for mollusks. Because the macrobenthic samples of the Craney Island footprint sampled by Dauer are dominated by polychaetes, additional appropriate P:B ratios for the macrofauna of Chesapeake Bay include Howe and Leatham's (1984) 7.5 for polychaetes in Delaware Bay, Steimle's (1985) 3.0 for polychaetes in the New York Bight, and Baird and Ulanowicz's (1989) 7.7 for deposit feeders of Chesapeake Bay (Table 1). Using the extremes from these P:B ratios and applying them to the mean biomass of 1999 and 2001 (0.931 g AFDW $m^{-2}$) yields a range of estimated macrobenthic production of 2.79-7.17 g AFDW $m^{-2}$ $yr^{-1}$. This converts to a range of 11.29-29.02 kg $acre^{-1}$ $yr^{-1}$. For a loss of 580 acres for the proposed expansion of Craney Island, the permanent annual loss of macrobenthic production is thus estimated at 6,556-16,826 kg (Table 1).

To estimate the total loss of benthic production from filling 580 acres at Craney Point, we must also account for the production of the meiofaunal invertebrates, those animals small enough to pass through 0.5 mm mesh. This includes largely the nematodes, small polychaetes, and harpacticoid copepods. Like the macrofauna (e.g., Holland et al. 1980), the meiofauna serve as important prey for higher trophic levels, thereby serving to transfer energy and materials up the food web (Coull 1999). There are no in situ sampling data on which to base this estimate. Nevertheless, estuarine studies in which both macro- and meiofaunal sampling has taken place serve to provide viable estimates of the ratio of the two. Meiofauna in estuarine sediments are typically far more abundant than macrofauna, yet macrofaunal biomass is far greater than that of the meiofauna (Knox 2001). Because meiofauna have a higher P:B ratio than macrofauna the overall production of the two groups is roughly equal (Knox 2001: Table 6-17). Absent site-specific and even habitat-specific data on meiofaunal biomass in the Craney Island footprint, the best estimate of meiofaunal production is equal to that of macrofauna. That would result in a

doubling of the annual loss as estimated for macrofauna alone, or 13,112-33,652 kg annual loss in benthic invertebrate production summed over the entire 580 acres (Table 1).

### *Loss of water column services*

The filling of 580 acres of the mesohaline estuary during expansion of Craney Island permanently removes that acreage of estuarine water column at Craney Island. Hydrographic analyses suggest, however, that the dredging that produces that fill will maintain the total volume of water column habitat in the Elizabeth River (Seltzer, pers. com.). Here, we compute a production loss that assumes an absolute loss of water column habitat equal in volume to the fill at the expanded Craney Island site and thus we provide an estimate of the worst case scenario of complete loss of that full water column. As the dredged area itself gradually fills in through sediment deposition, there will indeed be a growing loss of water column habitat. In addition, the water column addition from dredging is deep water below the photic zone and the water column lost to filling at Craney Island includes 580 acres of photic zone. Consequently, because of the process of sedimentation in the dredged areas and the exchange of deep for shallower water column habitat, there will be an impact on production in the water column. We provide a maximum estimate of that impact.

The water column habitat provides ecosystem services in the form of phytoplankton production, which is in turn eaten by either zooplankton or benthic invertebrates. Fish and crabs can then consume these herbivorous invertebrates. They, in turn, represent the prey of shorebirds, wading birds, seabirds, large predatory fish, and marine mammals. Thus the entire food web of the estuary is affected by any loss of estuarine water column habitat. Measuring the quantitative loss to the food web in units that allow scaling of restoration is again best done by assessing productivity. In principle, this assessment could be achieved at the primary producer level (phytoplankton) or, alternatively, at the secondary producer (consumer) level. Because we have already computed the loss of secondary production of benthic invertebrates, it is appropriate to now compute the potential loss of secondary (herbivorous) production in the water column to complete both branches of the food web. Adding the loss of herbivore production on the bottom of the estuary to the loss of herbivore production in the water column represents the total loss of herbivorous animal production to the estuary. Consequently, assessing the loss of production of zooplankton (including gelatinous forms) and perhaps also partially phytoplanktivorous fishes, of which menhaden is the most important in this system, represents a way of including losses of production that remains in the pelagic (water-column) food chains. The compensatory restoration for the losses of secondary production in the water column can then be readily scaled to gains in secondary production from restoration of either salt marsh or oyster reef habitat (or some other alternative). Use of secondary production to do the scaling of restoration is especially appropriate because it can take into account the differing fates and transfer efficiencies of salt marsh and phytoplankton production (Kneib 2003).

The necessary figures that would allow scaling of the portion of primary production that goes to pelagic food chains are the annual production of zooplankton of all sizes (assuming that use of the Craney Island expansion site by menhaden and other partially phytoplanktivorous fishes is trivial). This approach assumes that the loss of water column leads directly to a proportionate loss of water column production of both phytoplankton and zooplankton, in other

words that photic zone habitat limits production not nutrients. That seems a reasonable assumption in such a eutrophied estuary as the Chesapeake Bay. Sharp (1995) sampled the macrozooplankton for 12 consecutive months at 5 sites in the Elizabeth River, including one at 13-m water depth opposite from Craney Island (ELI2) and another 7 km upstream on the Western Branch (WBE1). We use the mean monthly macrozooplankton biomass at these two sites to estimate mean monthly biomass at the site of the proposed Craney Island expansion centered 3 km further downstream from WBE1 (Sharp 1995). Specifically, a linear extrapolation of the difference in monthly mean macrozooplankton biomass from 4.66 mg dry wt at WBE1 to 6.84 at ELI2 for another 3 km to the center of the new fill area at Craney Island would yield a projected mean monthly biomass of zooplankton at the proposed fill site of 8.21 mg dry wt $m^{-3}$. To maintain comparable units, we convert this dry wt to AFDW using data on 3 macrozooplankters in Salonen et al. (1976), showing ash weights of 2.92, 5.16, and 4.66 %, averaging 4.25 %. Applying this correction coverts 8.21 mg dry wt to 7.86 mg AFDW $m^{-3}$ (Table 2). This estimation of zooplankton biomass at the Craney Island fill area assumes that no persistent local spike in zooplankton exists along this stretch of the river, such as that expected at the "null zone" boundary in the estuary. The zooplankton community was dominated by calanoid copepods, especially *Acartia tonsa*. Sharp's sampling was done vertically from the bottom to the surface, thereby averaging the entire water column at sites with depths of 13 m at ELI2 and 10 m at WBE1. Taking this biomass concentration and multiplying by the full volume of water column to be lost to the fill provides an estimate of the worst-case scenario of total loss of macrozooplankton biomass through the year at this site, namely 7.86 mg $m^{-3}$ x 580 acres x 4046.86 $m^2$ per acre x 3.2 m depth = 59.04 kg biomass (Table 2). Because we have used zooplankton data from Sharp's (1995) study, which was done in 1989-90, these numbers may not anticipate the future potential for the Elizabeth River to produce zooplankton. To the degree that clean-up of the river is successful in removing toxics that now limit zooplankton production, the loss of a certain volume of water column may imply more zooplankton production foregone in the future. The rate and degree of such improvement in water quality and system production are extremely hard to predict. In addition, we already greatly overestimate zooplankton loss by assuming that the water column is reduced in volume by the volume of the fill. Consequently, we did not attempt to enhance our impact estimates to account for potential improvement in water quality.

To convert this biomass lost to annual production lost requires application of an appropriate P:B ratio for macrozooplankton in the mesohaline regions of Cheapeake Bay. We reviewed the relevant data to establish a reasonable range for this P:B ratio (Table 2). Heinle (1966) published data for *Acartia tonsa*, the dominant macrozooplankter in this system that lead to a P:B ratio of 190 based only on the summer peak biomass, the most productive period. Baird and Ulanowicz (1989) used separate P:B ratios for zooplankton in each of the 4 seasons of the year: the ratio of the sum of seasonal production estimates to average biomass from this study yields a P:B estimate of 133 on a yearly basis. Christian et al. (2002) applied a zooplankton P:B ratio averaged over two summer seasons of 112.5 per yr for the mesohaline portion of the Neuse River estuary in North Carolina. Finally, Roman and Zhang (preliminary, unpub. data from UM CEES Horn Point) used a intense sampling effort to follow calanoid copepod cohort growth and mortality over the seasons, yielding an average P:B ratio of 42.6 from 1995-2000 for the entire Chesapeake Bay. We create a range of estimates of zooplankton production loss by choosing the lower (42.6) and upper (190) bounds of the P:B ratio. This computation transforms an estimated

average loss of 59.04 kg of macrozooplankton biomass to an estimated loss of production of 2,515 – 11,217 kg annually (Table 2).

To the estimate of maximal loss of macrozooplankton, we must add the contribution of microzooplankton to include the entire secondary production of the water column. Baird and Ulanowicz (1989) synthesize available data on both macro- and microzooplankton showing that annual production of microzooplankton is 5.75 times that of macrozooplankton. Using this relationship, we estimate an additional annual loss of between 14,461 and 64,498 kg of production of microzooplankton for the 580 acres of fill at the expansion of Craney Island, assuming no compensation by addition of deeper water column. Thus our worst-case scenario estimate of total zooplankton production loss is 16,1976 to 75,715 kg annually (Table 2). This computation is certain to represent a large overestimate of the actual loss because zooplankton use the entire water column as habitat so the exchange of some shallow water-column acreage for an initially equal volume of deeper water column would not be expected to induce a zooplankton loss anywhere near this maximum. Perhaps the most reasonable response to the uncertainty in actual impact on zooplankton would be to use a figure close to the lower end of this range (16,976 kg).

**Scaling oyster reef restoration to replace lost production of benthos**

The oyster reef functions of most relevance to compensate for lost ecosystem services following the Craney Island fill are the production of invertebrate prey organisms to transfer up the food chain to blue crabs, fishes, shorebirds, and other predators and the biogeochemical processing of organic matter, especially the water filtration achieved by the oysters and other reef-associated suspension feeders. The loss in the 10-ft deep subtidal benthos from filling to expand the Craney Island involves losses of both invertebrate prey provision and biogeochemical processing plus the contingent ecosystem services that follow (Seitz and Lipcius 2003). Although our scaling exercise is based upon herbivorous benthic invertebrates alone, that does not mean that the higher trophic levels do not also contribute to the loss of ecosystem services and to the benefits of restoration. They do. The assumption is that they scale proportionately to herbivore production so that replacing herbivore production also replaces the ecosystem services at higher trophic levels. This computation also assumes a bottom-up control of higher trophic level production by food availability, a reasonable assumption for the benthos of Chesapeake Bay (Marsh and Tenore 1990). Furthermore, this scaling exercise does not explicitly include the predators that benefit from these services, namely the blue crabs, demersal fishes like spot, croakers, flounders, and higher-level predators like shorebirds. However, they too are implicitly and fully included by restoration of their prey.

## *Methodological concerns*

Estimation of the quantitative benefits of oyster reef restoration so as to be able to scale this restoration action to match the level of loss of ecosystem services from fill operations requires knowledge of the habitat type chosen for the oyster reef restoration project. Specifically, reefs could be constructed on either the soft sediments of muddy sand or on firmer shell bottom. Experts (e.g., K. Paynter, pers. com.) strongly recommend selection of shell bottom to provide greater stability so that loss of reef matrix by sinking and burial is minimized.

Furthermore, a shell bottom is indicative of the presence of an historical oyster reef at that site, which implies greater likelihood of successful restoration. Nevertheless, the development of techniques of using a mesh or mat base to stabilize oyster cultch in the Cheapeake Bay program organized by the US Army Corps of Engineers (Mann, pers. com.) now allow successful shell cultch planting and oyster reef restoration on softer sediments. Knowing the benthic habitat to be used for the restoration can be important for calculation of the net enhancement in ecosystem services from oyster reef restoration because shell bottom and unconsolidated sedimentary bottom possess different benthic communities. These pre-existing benthic infaunal communities differ in initial density of benthic organisms and thus vary in the degree to which they will change after oyster reef habitat restoration has been achieved. Specifically, the shelly bottom provides substantial protection against predation for infaunal invertebrates (Castagna and Krauetter 1977) and therefore possesses higher densities of infaunal bivalve molluscs and some other macrobenthic taxa than a muddy sand habitat. Thus, the restoration of an oyster reef on shell bottom in the lower bay may not be expected to enhance abundances of infaunal bivalves, such as *Mercenaria mercenaria* because any enhancement around the perimeter of the reef merely compensate for losses from burial by shell of the existing shell bottom habitat. The calculations presented here assume use of either an unproductive sedimentary bottom using mesh stabilization techniques or a shell bottom area in which benthic production enhancements around the perimeter balance losses of the pre-existing benthic community. Otherwise, computation of net production gain could require inclusion of loss of production from those now buried invertebrates. When the constructed reef has a large perimeter relative to area, then there is tremendous augmentation of abundance, biomass, and production in that ecotone edge habitat surrounding the shell mounds (Grabowski, unpub.). That enhanced production around the margins of an oyster reef is stimulated by very high rates of organic subsidies from feces and pseudofeces deposition, a process of enhancement of benthic invertebrate production that is not restricted to the reef itself and the export of this organic food subsidy for benthic invertebrates is not otherwise incorporated in our computations except through balancing losses of burial.

A second challenge in estimating the enhancement of invertebrate production expected from restoring an area of oyster reef habitat in the lower Chesapeake Bay is choosing oyster population production figures that match the site-specific biology of this area. Previous calculations of production benefits expected from restoration of oyster reefs in the Chesapeake Bay were computed for the Patuxent River in Maryland, the site of the Chalk Point oil spill, but this projection was dependent on seeding the reef because natural recruitment is low to absent (Peterson et al. 2002). Literature data on the productivity of oysters are available for the lower Chesapeake Bay and we use them, but the present status of depleted populations in Chesapeake Bay renders some of this information of uncertain applicability. The greatest uncertainty in these projections of future production involves predicting the level of oyster recruitment that will occur through natural larval settlement on these Chesapeake Bay reefs. This is uncertain because the precipitous loss of adult oysters in the bay has lead to lower spawning stock biomass bay-wide and thus some limited ability to colonize all suitable benthic hard-bottom habitat (Rothschild et al. 1994, Mann 2000). If oyster recruitment is not sufficient to sustain reef structure in the face of bioerosion, then the entire reef habitat becomes unsustainable (P. Jensen, pers. com.). We take this limitation into account by choosing a standing stock biomass of oysters (and by implication a recruitment rate) that is about half of what is demonstrated by quantitative empirical observations of oyster success on restored reefs in the lower bay around

Fishermen's Island (O'Beirn et al. 1999). This reduction in expected oyster production may well be excessive, particularly if the mandate of the US ACE for performance standards and auditing leads to monitoring of restoration and periodic adaptive adjustments like addition of more shell substrate or more seed oysters. Furthermore, pairing of oyster reef and salt marsh restorations in carefully selected subestuaries where larval retention from adequate adult spawning stock is likely will enhance success. We do note that oyster mortality rates from diseases, especially MSX and Dermo, vary greatly among years as rainfall variation modifies salinity, thereby adding to uncertainty of oyster restoration success (Kennedy et al. 1996, Judy, pers. com.).

One could ask whether the restoration of oyster reefs in the lower bay might not be expected to provide other quantifiable ecosystem benefits that should be included as credits for the restoration actions (Mann 2000). The two of these that deserve consideration are the provision of fish habitat by the live oysters (Lenihan et al. 2001, Peterson et al. 2003) and the impacts of oyster filtration in reducing turbidity and thereby allowing expansion and recovery of SAV habitat (Jackson et al. 2001). The two primary mechanisms by which oyster reef habitat is assumed to augment fish production is by (1) enhancing recruitment and (2) providing spatial refuges and enhancing benthic prey production, which together allow higher fish production. Although our calculations do not explicitly include a contribution of enhanced recruitment or enhanced survival through additional reef refuges, both processes are implicitly included in our estimation of augmented transfer of energy production from enhanced abundances of invertebrate prey organisms on restored reefs to predators and scavengers higher up the food chain. To add another term for augmented fish and then bird production would represent double counting, since fish and bird production has been covered through their prey. The other oyster reef service that should be considered for inclusion as a credit, indirect enhancement of SAV habitat, would be difficult to quantify because of absence of adequate data. Nevertheless, it is not unreasonable to assume that the spatial scale of augmentation of suspension feeding through the Craney Island oyster reef restoration is so small that it would be unlikely to induce measurable and effective reductions in such a very turbid estuary. Turbidity reduction must be sufficient to surpass a threshold that allows adequate light to reach the estuarine seafloor to support growth of SAV plants. Orth (pers. com., VIMS) has been unable to demonstrate experimentally that similar additions of oyster suspension feeding were able to augment SAV along the western shoreline of the lower Chesapeake Bay. Furthermore, the circulation patterns in the areas most likely to be used for reef restoration to compensate for Craney Island impacts are on this western margin of the Chesapeake Bay, including mouths of both the James and Nansemond Rivers, where turbidity-laden flows are characteristic (Mann and Orth, pers. com.).

## *Methods*

To estimate the net gain in macroinvertebrate production from restoration of a unit area of oyster reef in the lower Chesapeake Bay, we use available information from O'Beirn et al. (1999) on biomass of oysters sustained on Fishermen's Island reef restorations in the lower Chesapeake Bay, estimate oyster production by using available P:B ratios from the literature (Bahr and Lanier 1981), and then estimate total macro-invertebrate production on the reef by adjusting for the proportion of total benthic invertebrate production achieved by the oysters, also based on available literature data. We then add an appropriate amount for meiofaunal production, based upon literature estimates of macro- to meio-faunal production (Knox 2001).

The standing stock biomass of oysters on the restored oyster reefs near Fishermen's Island quickly reached and maintained from 1997-1999 an average of about 600 g AFDW $m^{-2}$ (O'Beirn et al. 1999). This is consistent with standing stock biomass for natural oyster reefs in Georgia reported by Bahr (1974). Dame (1976) as reported in Bahr and Lanier (1981) showed that natural oyster reefs in South Carolina have a P:B ratio of 2.2 (using figures for meat weight and gross production in Kcal: see Bahr and Lanier 1981: Table A-2). Alternative methods of estimating P:B by measuring metabolic rates produce an estimated turn-over rate of biomass for oysters of 2.6 times annually (Bahr and Lanier 1981). These figures do not reveal much variation, so we chose to use the median (and mean) of 2.4 (Table 3). This P:B ratio was computed for natural oyster reefs from before the period of intense influence of the MSX and Dermo diseases. Because these diseases kill older oysters and older oysters grow less and have lower P:B ratios than younger ones, use of a P:B ratio of 2.4 probably results in an underestimate to some degree of oyster production under today's disease conditions. Applying a P:B ratio of 2.4 to a biomass of 600 g AFDW yields a production of oysters of 1,440 g AFDW $m^{-2}$ per year (Table 3).

To this estimate of oyster production, we must add estimates of production of the other herbivorous invertebrates on oyster reefs. These are of two types, macro-invertebrates and meiofauna. Bahr (1974) demonstrated that oysters alone account for 81% of the respiration (and thus the production) of macro-invertebrates on an oyster reef. Thus, we must add another 338 g AFDW $m^{-2}$ annually to account for the other macro-invertebrates of the oyster reef habitat. No study has evaluated the meiofaunal abundances or production on oyster reefs (Coull, Univ. South Carolina, pers. com.), so estimation of their contribution must occur with some substantial uncertainty. Because the oyster reef is a habitat composed of a surface composed of about half hard substrata and half sediments, it seems appropriate to use the general guidance from Knox (2001) for both rocky shores and sedimentary bottoms. Production of meiofauna on rocky intertidal bottoms accounts for 25 % and macrofauna 75% of total production. In contrast, meiofaunal equals macrofaunal production in sediments. Since an oyster reef contains both hard shell and sediments in about equal ratio, we chose to average the two meiofauna-to-macrofauna ratios from Knox (2001) and assume meiofaunal production on oyster reefs to equal two thirds of macrofaunal production or 1,185 g AFDW $m^{-2}$ $yr^{-1}$ (Table 3). Thus, the adoption of this ratio differs from the 50:50 split between meio- and macro-fauna that we assumed for soft-bottom habitats in estimating the loss of production term for filling of the benthic habitat. Augmenting total production by assuming that the meiofauna represent only two thirds as much production as the macrofauna may underestimate total invertebrate production on the reef (as well as around it) because feces and pseudofeces deposited on these reefs are a rich source of foods, especially for nematodes. Furthermore, construction of oyster reefs typically elevates a hard substratum up into the photic zone, depending on water depth and reef height, thereby enhancing primary production that includes especially macroalgal growth that provides important phytal habitat for meiofauna (especially harpacticoid copepods). Thus, the estimated benefits of oyster reef restoration may be low. Nevertheless, applying this assumed ratio of macro- to meiofaunal production augments oyster reef production by 1,185 g AFDW $m^{-2}$ per year. The total annual invertebrate production per $m^2$ of restored oyster reef at Fishermen's Island is thus computed to be 2,963 g AFDW. Using a conversion of 4046.86 $m^{-2}$ per acre, this converts to a total annual production of benthic invertebrates on an oyster reef at Fishermen's Island of 11,991 kg AFDW per year (Table 3). To account for uncertainty in success of oyster reef restoration, we further

assume that only half of the attempts at reef restoration will be successful and compute a production credit of 5,995 kg AFDW per year for an acre of restored oyster reef (Table 3).

Our calculations of the production credit for oyster reefs assume that the restored oyster reef is closed to oyster harvest. The ability to enforce such closures and the maintenance of restored oyster reef habitat as marine reserves depends on enforcement capability and public acceptance. The present oyster reef sanctuaries in the lower bay were not impacted by poachers during the years of 1997-1999 when the VIMS researchers were actively studying them, although more recent information suggests that without frequent presence of the research team, poaching may have increased (Luckenbach, pers. com.). Nevertheless, enhanced public education efforts describing the benefits of these oyster reef reserves may be an appropriate component of the compensatory restoration project to protect the restoration. Over longer time frames, as oyster stocks are rebuilt and disease resistance spreads (Burreson et al. 1999, Mann 2000), oyster reefs could again sustain controlled harvest by methods that do not degrade habitat structure, such as hand harvest (Lenihan and Peterson, unpub. data).

**Scaling salt marsh to replace lost production of pelagic secondary production**

Kneib (2003) provides a careful synthesis of data on salt marsh primary, secondary, and tertiary production, initially done for the purposes of scaling marsh restoration after the Mulberry Phosphate spill near Tampa, Florida. This review provides the necessary scaling framework to estimate production credit for potential Craney Point marsh restoration (Table 4). First, we need an estimate of net annual production of the *Spartina* and other vascular marsh plants in a Cheasapeake Bay salt marsh. Kneib's review implies a number of about 1 kg above-ground dry weight $m^{-2}$, but Robblee (1973) provides a more site-specific figure of about 1270 g dry wt $m^{-2}$ for a *Spartina* marsh in the Southern Branch of the Elizabeth River. We convert that figure to AFDW to match the units used in our other calculations by averaging data on ash contents in *Spartina* from Squiers and Good (1974), Smith et al. (1979), and Roman and Daiber (1984), yielding a figure of 12.37 % (Table 4). Thus 1270 g dry wt of *Spartina* converts to 1113 g AFDW. Second, we recognize that about 10 % of that is consumed directly by grasshoppers and other terrestrial insects and herbivores at about 10 % conversion efficiency (Kneib 2003). We assume that 20 % of this insect production makes its way into marine food webs, thereby providing 2.2 g AFDW of herbivorous production to marine predators (Table 4). The remaining 90 % not eaten by terrestrial herbivores enters a marine detrital pathway with 55 % conversion efficiency to fungi, resulting in an estimated 551 g dry weight $m^{-2}$ (1113 x 0.9 x .55) annually available to marine invertebrate consumers. Then if we assume that one third of this fungal production is consumed by herbivorous marine invertebrates at the standard ecological efficiency of 10 %, then the marsh vascular plant production would be expected to yield an additional annual production of 18.4 g AFDW weight $m^{-2}$ (551 x 0.33 x 0.1) of herbivorous marine invertebrates.

To this figure, we need also to add (Table 4) the marine invertebrate production that is derived from the two thirds of the original detritus that was not consumed as fungal biomass (551 x 0.67 = 367 g AFDW $m^{-2}$). This two thirds of the fungal production enters the sediment bacteria system, where much of it is respired but about 10% or 36.7 g AFDW $m^{-2}$) is converted to bacterial biomass available to herbivorous (detritivorous) marine invertebrates. That bacterial

biomass is in turn converted to marine invertebrate animal biomass with the standard ecological conversion efficiency of 10 %, providing another 3.7 g dry weight of herbivorous marine invertebrates via the bacterial food chains (Table 4). We further must account for the benthic microalgal production that occurs on the salt marsh. Kneib's (2003) review suggests that this production is about 25 % of the above-ground vascular plant production or 318 g dry weight $m^{-2}$ annually. Since the large majority of this material is grazed directly by marine herbivorous invertebrates without going through detrital food chains, this production is expected to yield at the standard 10 % conversion efficiency another 32 g dry weight $m^{-2}$ (or 32 g AFDW assuming trivially low ash content in microalgae) of herbivorous invertebrate production. The total of all four trophic pathways (Table 4) for marsh plant production is thus 56.3 g AFDW $m^{-2}$ (2.2 + 18.4 + 3.7 + 32). Kneib's synthesis assumes that none of the below-ground production of *Spartina* enters into detrital food chains. This assumption does not hold for marshes in which fiddler crabs or geese are active because they excavate sediments during burrowing and bring up below-ground detritus where bacterial colonization and consumption by detritivores occurs. For *Spartina* marshes, net annual below-ground production is about 4 times as high as above-ground production (K. Boyer, pers. com., Univ. North Carolina). Assuming that about 5% of this below-ground production or 223 g AFDW enters the detrital food chains (C. Currin, pers. com, NOAA-Beaufort), and that this is converted to bacterial biomass at 10 % efficiency and then to invertebrates at a subsequent 10 % efficiency, another 2.2 g dry weight $m^{-2}$ must be added to the total credit for restored salt marsh (Table 4). Consequently, if we assume that a restored salt marsh rapidly serves the full production and trophic transfer functions of a natural salt marsh habitat, then proper credit for restoration should be 58.5 g AFDW $m^{-2}$ of marine herbivores produced annually (Table 4). At 4,046.86 $m^2$ per acre, this would yield an annual credit of 236.7 kg of marine invertebrate herbivore production per acre of restored salt marsh.

To compute an annual compensation credit per acre of restored salt marsh, we depart from the model provided by Kneib (2003) at this point. Kneib (2003) actually measured abundances of tertiary producers (fishes and mobile crustaceans) on Sapelo Island salt marshes and applied P:B rations to the observed biomass values so as to compare this independently derived estimate of production to one generated by the trophic efficiency process used here. This comparison demonstrated tertiary production figures that were quite close to one another using the two independent estimation methods, 1.5 g dry weight $m^{-2}$ of fish and crustacean production in the "most likely" scenario based on empirical sampling and 4.7 g dry weight $m^{-2}$ of all tertiary producers based on the energetics conversion method adopted here. If the assumptions about trophic pathways and energetic conversion efficiencies were correct, the difference between these methods should have been substantially larger. That is because Kneib's direct sampling did not also include other tertiary consumers on the marsh, notably blue crabs, shorebirds, and marsh birds like rails and because it did not include enhanced production associated with export of organic carbon off the marsh and its conversion to benthic invertebrates and then tertiary consumers in subtidal habitats below the salt marsh. Seitz and Lipcius (unpub., pers. com.) report vastly elevated abundances of soft-sediment invertebrates in the shallow subtidal zones where salt marsh is present higher on shore than along shorelines lacking salt marsh. This transport to serve animal production elsewhere could easily represent much more than half of the total production at the herbivore trophic level driven by salt marsh production and should result in much larger departure in estimates from the two methods. Consequently, we double the annual production estimate for marine invertebrates to produce a restoration credit of 473.4 g

AFDW per acre of restored salt marsh. To account for risks and uncertainties in achieving full functionality of the restoration, we reduce this credit by 5 %, yielding a credit of 449.7 g AFDW per acre of restored salt marsh (Table 4).

**Results of scaling calculations**

### *Oyster reef*

Scaling calculations are done in a way that matches the estimated annual loss of herbivorous invertebrate (benthic plus zooplankton) production (30,088-109,367 kg AFDW) to the expected gain in herbivorous invertebrate production from restoration of oyster reef habitat in the lower bay. We assume that the reef is established by construction of a shell matrix on stable bottom, followed by emplacement of a surface veneer of seed oysters. We then assume that reef habitat is at least partly limiting to oyster production and that spawning stock biomass is adequate within the hydrodynamically defined basin so that oyster production on the reef becomes self-sustaining for the lifetime of the reef. We further assume that the reef will be successfully protected from fishing and that in the absence of dredge damage (Rothschild et al. 1994, Lenihan and Peterson 1998), the reef will be immortal, as generations of oysters produce shell matrix at a rate that keeps up with biological and chemical degradation of old oyster shell matrix. Finally, we assume that the restored reef is constructed in the summer of the year previous to when the filling occurs so that there is no need to apply discounting to compensate for time lags between loss of ecosystem services and their replacement.

The results of scaling an estimated annual loss of 30,088-109,367 kg AFDW of herbivorous invertebrate production from the fill of the Craney Island extension to restored oyster reef habitat produces an estimated need for a reef of 5.02 – 18.24 acres (Table 5). The relatively small reef size required for this restoration as compared to the 580 acres of fill is a consequence of the typically low biomass of deep-water soft-sediment benthic biota (about 1 g AFDW in the footprint of the fill site) and the concentrated high biomass and production on functional oyster reefs (about 600 g AFDW of oysters alone). Thus the ratio of standing stock macrofaunal biomass between these two habitats is 600 to 1. There are important uncertainties associated with this scaling projection, both ones that may make this an overestimate of acreage required and ones that may make this an underestimate. Because of uncertainty and the US ACE mandate for performance audits of their projects, monitoring of the success of restoration for Craney Point and adaptive management of the restorations as needed to provide necessary compensation represent an important component of the restoration process.

### *Salt marsh*

Scaling is done by using the metric of annual production of marine herbivorous invertebrates, just in the same way that the oyster reef habitat restoration was done. This metric provides a standard that allows anticipated loss from fill at Craney Island to be quantitatively matched to expected gain in marine invertebrate production in the salt marsh restoration. This allows direct comparability of the oyster reef and salt marsh restorations so any desired mix of the two habitats could be used. Herbivorous marine invertebrate production is not only a practical scalor to employ, but it is also most relevant to the important ecosystem function of both of these habitats, namely providing the food for transfer up the food chain to fishes, crabs,

and ultimately apex consumers like shorebirds, seabirds, and marine mammals. It should be noted that the food chains affected by loss of estuarine water column, which include zooplankton, zooplanktivorous fishes, and pelagic predatory fishes (like bluefish) and diving seabirds (like gulls, terns, and pelicans), and food chains affected by loss of subtidal soft-bottom benthos are not the same food chains that will likely be enhanced by the salt marsh. Salt marsh production enters demersal food chains, which involve benthic marine invertebrates, crabs, bottom-feeding fishes, and ducks, wading birds, and shorebirds. While restoration would not match lost herbivorous production in kind, it would match in quantity and lead to enhanced production of the higher trophic levels that also contain fish and bird taxa.

To compensate in full for an expected total annual loss of 30,088 – 109,367 kg AFDW in hrbivorous marine invertebrate production following the fill of 580 acres in the Lafayette River estuary, restoration of 66.9 – 243.2 acres of salt marsh would be required (Table 5). This computation assumes that marsh restoration has occurred and full marsh function has been restored prior to loss of the estuarine acreage. If that is not the case in practice, then the usual discount rate of 3 % annually must be provided for each year that passes between loss of estuarine habitat and provision of ecosystem services through the restored salt marsh. Note further that this salt marsh restoration scaling is computed to cover all the losses from both benthic invertebrates and zooplankton assuming no other restoration is done. Because the salt marsh is widely recognized as the most productive biological system known, with the possible exception of fertilized and managed sugar cane crops, the demonstration that it would take far more salt marsh than oyster reef acreage to compensate for the loss from filling to expand Craney Island may come as a surprise. However, the production of the salt marsh is high for vascular plants, which do not enter directly into marine herbivory food chains. The primary production of salt marsh grasses passes first through microbes and therefore leads to invertebrate animals after multiple losses of energy. The ultimate efficiency of conversion to herbivores is thus low. Nevertheless, it is clear that the salt marsh produces more herbivorous biomass of marine invertebrates per acre than the deep polyhaline mud benthos by a factor of about 9-20. We do not give credit for 80 % portion of the terrestrial herbivory production derived from vascular plants in the marsh, which includes benefits to grasshoppers and their avian consumers and we do not identify a quantitative credit for geese eating roots of marsh plants.

### *Pairing oyster reef and salt marsh restorations*

In practice, paired salt marsh-oyster reef restorations have substantial benefits because such projects do not place all hopes in a single type of restoration and because synergistic interactions on a landscape scale between the reef and marsh are likely to yield benefits that exceed those computed here for each habitat independently. For, example, Seitz and Lipcius as well as Diaz (VIMS, pers. com.) have observed substantially higher abundance and biomass of shallow subtidal benthos in areas with functional salt marshes as compared to areas without marsh habitat, implying effective transport of marsh production to stimulate food chains in deeper waters. In addition, many higher-level consumers like blue crabs benefit from the landscape-scale pairing of nearby reef and marsh habitats, allowing efficient movement between and sequential utilization of these benthic habitats as conditions (tide levels especially) change (Micheli and Peterson 1999). Designing the restoration to serve food and habitat needs for blue crabs is especially valuable given the current problems with the blue crab resource in the

Chesapeake Bay. Although we assume that the restored oyster reefs will be closed to oystering to allow them to become and remain self-sustaining, there is good reason to allow and encourage crab potting around the restoration. At current low abundances of oysters in the Chesapeake Bay, the intensity of crab predation on any remaining oysters may be sufficiently intense to inhibit normal oyster survivorship (Lipcius and Seitz, pers. com.). Oyster reef habitat helps provide erosion protection for the salt marsh by serving as a natural breakwater. In the face of increased sea-level rise, there is great risk of shoreline inundation and erosion. By pairing a living breakwater (the oyster reef) with a marsh shoreline, there is greater potential for combating sea-level rise. The oyster reef helps insulate against waves and can grow upwards with sea level, while the marsh traps sediment and allows deposition of sediments that may keep up with rising water levels. This process is hypothetical, but it illustrates a generic advantage of pairing the restorations: monitoring could be established in a fashion that produces fundamentally new knowledge about restoration by well-designed follow-up study. Such knowledge is itself a benefit of restoration. Consequently, the scaling analysis done here fails to include two additional benefits that are possible, positive synergies from oyster reef-marsh pairing and knowledge enhancement from study of the performance of the restorations.

Because of the critical importance of siting decisions in achieving the expected benefits of salt marsh and, especially, oyster reef habitat, we assume that siting decisions will be made in consultation with and following a thoughtful plan established by a group of scientific experts. There is obvious merit to locating the restorations close to where the loss occurs. Using proximity as a guide, the Nansemond River and the middle reaches of the Elizabeth River both possess stretches of shoreline where paired marsh-oyster reef restorations may be feasible. Toxicity in the upper reaches of the Elizabeth River may limit oyster success. In addition, these are both areas where sufficient spawning stock biomass of adult oysters and larval retention in water circulation may exist (see Mann 2000) to make oyster reefs self-sustaining and thereby solve the greatest impediment to restoration success. We also assume seeding of these reefs with one or more disease-resistant strains from the VIMS hatchery: with good larval retention, the potential for establishing and building up the genes for disease resistance increases with proper choice of restoration site. In essence, we envision a basin-scale plan for restoration that addresses the functionality of the system and includes adaptive management to modify restoration as needed to fulfill its promise for quantitative compensation. Numerous scientific experts on oyster reef restoration exist locally who have a history of productive, collaborative work: Roger Mann, Rom Lipcius, Rochelle Seitz, Mark Luckenbach, Gene Burreson, Stan Allen, and others comprise the majority of the world's brain trust on oyster reef restoration.

**Flexibility of restoration options**

Other alternative restoration actions could be conducted as a full or partial means of compensating for the loss of ecosystem services that will result from filling 580 acres for the Craney Island expansion. These additional options include some, such as SAV restoration, for which quantitative scaling could be conducted, perfectly analogous to the computations presented here for the other two benthic habitats, oyster reef and salt marsh. Other restoration actions that may be reasonable choices do not lend themselves as readily to scaling against the quantitative loss of ecosystem services in comparable units of secondary production. For example, sediment clean-up to remove or cap persisting deposits of toxics in the Elizabeth River

may be an attractive action to help compensate for loss of ecosystem services. This restoration would come closer to restoring the same suite of species that will be lost from the fill, as opposed to the alternative food chains that will be enhanced by marsh or oyster reef restoration. Such an action would indeed lead to enhanced production of any organisms that are limited in survival, growth, or reproduction by existing concentrations of environmental toxins in the estuarine floor. For example, Sharp (1995) speculated that the low concentrations and biomass values for macrozooplankton in the Elizabeth River are a consequence of high levels of toxics in the system. However, such an action would also enhance the quality of many organisms by reducing tissue toxin concentrations. That improvement in organism quality would not lend itself to direct quantitative scaling against loss in secondary production of quantities of biomass. That should not necessarily eliminate such an option from consideration, although other considerations may, such as whether the possible resuspension of toxics now buried may increase biological exposures instead of decreasing them and whether capping is a sustainable and reliable solution. Complete analysis of other such alternatives would need to include such concerns. Currently, there are efforts by Mike Buchman of NOAA to develop quantitative scaling approaches based on the IBI metric to serve as Habitat Equivalency Analyses on which to base restoration of sediment quality. This direction could prove fruitful to expand options for compensatory restoration near Craney Island. One potentially appealing option that combines multiple options to achieve compensatory mitigation is capping of toxic sediments by constructing an oyster reef on top of them. That could achieve two restorations simultaneously, but more importantly it could provide a means of enhancing the chances that the toxic sediment cap would persist indefinitely, covered by perhaps tons of dead and living oyster shell. An appropriate quantitative credit for capping of the toxic sediments would need to be developed through a scaling analysis to account for the sequestration of the toxic materials and inhibition of future biological exposures and food-chain transfers.

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Table 1. Estimated loss of benthic invertebrate production from filling 580 acres at Craney Island near the mouth of the Elizabeth River (VA).

| | |
|---|---|
| Macrofauna | |
| Average macrofaunal (0.5 mm mesh) biomass from summer samplings of Craney Island footprint (Dauer 2000, 2002) in | |
| Yr 1999 (mean of 7 samples) | 0.962 g AFDW $m^{-2}$ |
| Yr 2001 (mean of 3 samples) | 0.899 g AFDW $m^{-2}$ |
| Mean biomass | 0.931 g AFDW $m^{-2}$ |
| P:B ratios for macrofauna of temperate estuary | |
| Howe and Leatham (1984) polychaetes – Del Bay | 7.5 |
| Steimle (1985) polychaetes – NY Bight | 3.0 |
| Diaz and Schaffner (1990) polychaetes – Ches Bay | 4.9 |
| Baird and Ulanowicz (1989) dep feeders – Ches Bay | 7.7 |
| Estimated range of annual production of macrofauna | 2.79-7.17 g AFDW $yr^{-1}$ |
| Total macrofaunal loss annually for 580 acres (4046.86 $m^2$/acre) | 6,556-16,826 kg $yr^{-1}$ |
| Meiofauna (Production in sediments of estuaries about equal to macrofauna: Knox 2001) | 6,556-16,826 kg $yr^{-1}$ |
| Total benthic invertebrate production lost from 580 acres of fill at Craney Island | 13,112-33,652 kg $yr^{-1}$ |

Table 2. Estimation of quantitative annual loss of zooplankton production from filling 580 acres at Craney Island in the Elizabeth River

| | |
|---|---|
| Mean monthly macrozooplankton biomass (dry wt) at ELI2 3 km up the Elizabeth River from Craney Island averaged over 12 months (Sharp 1995) | 6.84 mg $m^{-3}$ |
| Mean monthly macrozooplankton biomass (dry wt) at WBE1 10 km up the Elizabeth River from Craney Island averaged over 12 months (Sharp 1995) | 4.66 mg $m^{-3}$ |
| Mean monthly macrozooplankton biomass (AFDW) predicted by linear extrapolation for the Craney Island expansion site[a] | 7.86 mg $m^{-3}$ |
| Volume of water column lost (in $m^{-3}$) to Craney Island expansion (3.2 m deep x 580 acres x 4046.86 $m^2$/acre) – worst case maximum volume lost | 7,510,972 $m^3$ |
| Total loss of monthly average macrozooplankton biomass (in kg) | 59.04 kg |
| P:B ratios for estuarine macrozooplankton | |
| Heinle (1966) P:B ratio for *Acartia tonsa* in Chesapeake Bay based on summer peak abundance | 190 |
| Baird and Ulanowitz (1989) Chesapeake Bay based on summer peak abundance – ratio of total production to average biomass over 4 seasons[b] | 133 |
| Christian et al. (2002) – Neuse River mesohaline - average ratio of early and late summer seasons[c] | 112.5 |
| Roman and Zhang (unpubl., preliminary data for 1995-2000 for whole Chesapeake Bay – UM CES, Horn Point) | 42.6 |
| Estimated macrozooplankton production lost annually - 580 acres of fill at Craney Island (applying endpoints in range of P:B ratios)[d] | 2,515 – 11,217 kg |
| Estimated microzooplankton production lost annually[e] | 14,461 – 64,498 kg |
| Total loss in annual zooplankton production | 16,976 – 75,715 kg |

a- This extrapolated number includes conversion from dry wt to AFDW using 4.25 % ash wt (Salonon et al. 1976)
b- The 4 seasonal values reported were: Sp (45.6); Su (59.5); Fa (30.3); Wi (9.1)
c- The 2 seasonal values reported on a per yr basis were: June (153); Sept (72)
d- This range was created by using the low (42.6) and the high (190) values
e- Microzooplankton production was estimated applying the ratio of 5.75 micro to macro production in Baird and Ulanowicz (1989)

Table 3. Projected annual production of benthic invertebrates per unit area of restored oyster reef habitat in the lower Chesapeake Bay.

| | |
|---|---|
| Biomass of oysters sustained on restored reefs near Fishermen's Island (O'Beirn et al. 1999) | 600 g AFDW $m^{-2}$ |
| P:B ratio for oysters on the reef | |
| Dame (1976) in Bahr and Lanier (1981) | 2.2 |
| Bahr and Lanier (1981) | 2.6 |
| Average (median) P:B ratio | 2.4 |
| Estimated production of oysters | 1,440 g AFDW $m^{-2}$ $yr^{-1}$ |
| Production of other reef macrofauna[a] | 338 g AFDW $m^{-2}$ $yr^{-1}$ |
| Estimated production of reef meiofauna[b] | 1,185 g AFDW $m^{-2}$ $yr^{-1}$ |
| Total annual production of benthic invertebrates estimated for Fishermen's Island oyster reefs per acre | 11,991 kg AFDW $yr^{-1}$ |
| Annual production credit per acre assumed for restored reefs near Craney Island[c] | 5,995 kg AFDW $yr^{-1}$ |

a- This is based upon demonstration in Bahr (1974) that oysters comprise 81 % of macrofaunal production
b- This is based upon assuming that meiofaunal production is two thirds of macrofaunal production on oyster reefs, which is the average of what Knox (2001) reports for hard-substrate and soft-bottom substrate
c- Because of uncertainty in recruitment and other factors, we reduce the production credit by 50 % relative to the successful restoration near Fishermen's Island, equivalent to assuming that only half of the reef restorations will be successful

Table 4. Computations of scaling production benefits of *Spartina* salt marsh restoration project measured at the level of herbivorous invertebrate production to compensate for zooplankton production loss in the water column after expansion of Craney Island. This is based on Kneib (2003) and pers. com. from Walter Priest (VIMS), Carolyn Currin (NOAA-Beaufort), and Kathy Boyer (Univ. of North Carolina)

| | |
|---|---|
| Annual above-ground production of vascular plants in the *Spartina* marsh (AFDW)[a] | 1113 g $m^{-2}$ |
| Marine invertebrate production derived from fungal consumption in detritivory pathway (AFDW) | 18.4 g $m^{-2}$ |
| Marine invertebrate production derived from bacterial consumption in detritivory pathway (AFDW) | 3.7 g $m^{-2}$ |
| Terrestrial invertebrate production entering estuarine food webs (20 % of insect herbivory) (AFDW) | 2.2 g $m^{-2}$ |
| Annual production of benthic microalgae in the salt marsh (dry weight) | 318 g $m^{-2}$ |
| Marine invertebrate production derived from direct herbivory on microalgae (AFDW)[b] | 32 g $m^{-2}$ |
| Total marine invertebrate production derived annually from above-ground production in the *Spartina* salt marsh (AFDW) | 56.3 g $m^{-2}$ |
| Annual below-ground production of vascular plants (AFDW) | 4452 g $m^{-2}$ |
| Amount of below-ground production entering food chains (AFDW) | 223 g $m^{-2}$ |
| Marine invertebrate production derived from below-ground detritus passing to bacteria and then to invertebrates (AFDW) | 2.2 g $m^{-2}$ |
| Total herbivorous production of marine invertebrates annually (AFDW) | 58.5 g $m^{-2}$ |
| Total production of herbivorous marine invertebrates per acre | 236.7 kg AFDW $yr^{-1}$ |
| Compensation credit for one acre of restored salt marsh[c] | 449.7 kg AFDW $yr^{-1}$ |

a- from Robblee (1973) for the Southern Branch of the Elizabeth River in dry wt and converted to AFDW by data on *Spartina* presented in Squiers and Good (1974), Smith et al. (1979), and Roman and Daiber (1984) showing ash content of 12.6, 13.7, and 10,8 % respectively (mean of 12.37 %)

b- ash content of microalgae is assumed to be trivial for these calculations

c- total credit is computed by doubling the credit estimated by energetics approach to account for export of organic materials to subtidal invertebrate production and provision of habitat for blue crabs and other consumers on the structured marsh: then the total is diminished by 5% to account for uncertainties and risks of marsh restoration

Table 5. Computations of scaling of oyster reef and *Spartina* salt marsh restoration projects to compensate for benthic invertebrate production losses after expansion of Craney Island by 580 acres. These computations assume a worst-case scenario of complete loss of water column habitat volume equal to the volume of fill. Initially dredging will remove a volume equal to the fill, thereby retaining water column volume constant, but with less in the photic zone. Calculations here do not include any compensation in zooplankton production for the expansion of deep water. Consequently, the lower end of the range of restoration estimates for zooplankton is far more likely to be close to what is needed to scale restoration.

| | |
|---|---|
| Losses each year | |
| Benthic invertebrates | 13,112-33,652 kg |
| Zooplankton | 16,976-75,715 kg |
| Total | 30,088-109,367 kg |
| Annual benefits per acre of restoration | |
| Oyster reef | 5,995 kg per acre |
| Numbers of reef acres required for compensation[a] | 5.02 – 18.24 acres |
| Salt marsh | 449.7 kg per acre |
| Number of marsh acres required for compensation[a] | 66.9 – 243.2 acres |

a- These acreage figures reflect two scenarios, all restoration done by oyster reef or all done by salt marsh. In practice a mixture is contemplated.

# Habitat Equivalency Analysis: An Overview of A Benthic Community Application.[†] Draft White Paper

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Habitat equivalency analysis (HEA) is a methodology used to determine compensation for natural resource injuries. The main concept underlying the method is that the public can be compensated for losses of natural resource habitats (owned in the public trust), and their use of those resources, through replacement of that habitat. The objective of such compensation projects is to provide additional habitat of the same type, and in as close of proximity to the lost habitats as feasible. This is referred to as in-place and in-kind compensation, and has the goal of replacing the services lost from the impacted habitat with those generated by the replacement habitat. HEA is a process that allows for proper scaling of the spatial extent of such projects in order to equalize the future benefits to be derived from compensation projects with the past and any potential on-going injuries. Natural resources trustees have used the HEA approach in scaling compensation projects for injuries due to oil spills, injuries to seagrasses, coral reefs, tidal wetlands, estuarine sediments, and salmon streams. The goal of this paper is to outline the basic application of HEA, and show how the HEA approach could be applied to address restoration of benthic river bottom as compensation for filling related to the Craney Island expansion.

For compensatory restoration actions, the scaling question to address is what scale of compensatory restoration will equate with the degree of interim and future losses of natural resources and services? The process of scaling essentially adjusts the size of the compensatory action so that the present discounted value of the project gains will exactly equal the present discounted value of losses (both past and future). There are two major scaling techniques: the valuation approach and the simplified service-to-service approach. HEA is an example of the service-to-service technique.

The implicit assumption of HEA is that the public is willing to accept a one-to-one tradeoff between a unit of lost habitat services with a unit of restoration habitat services. HEA does not necessarily assume a one-to-one trade-off in actual resources, but rather in the services they provide. This concept of services refers to the function a resource habitat provides for both humans and any wildlife inhabiting that habitat. For instance, a wetland provides on-site ecological services of primary production, food, refuge, nutrient cycling, and so

[†] Basic introductory material is derived from NOAA DARP, 21Mar 1995 as updated 4 Oct 2000.

on, while it may also provide on-site value to humans such as sediment stabilization and flood control. It also provides off-site services such as supporting fish which in turn provide for recreational/commercial fishing, storm protection, bird watching along a flyway, and so on.

Because of the inherent one-to-one tradeoff assumption, HEA is applicable so long as the services provided are comparable. Necessary conditions for the application of HEA include:

- A common metric can be resolved that defines the services lost, and that captures any significant differences in the qualities or quantities of service lost and provided by the restoration; and,
- The change in resources and services is independent of the overall changes in service levels.

These conditions involve issues such as the *capacity* of a habitat to provide services (on-site biophysical properties determine capacity), *opportunity* to supply services (as determined by the landscape context), *equity* in terms of who loses services and who gains, and *payoff* (the actual benefit flow). The choice of a metric to characterize services is key to HEA. On-site attributes (stem density, canopy structure, fish density etc.) are sometimes used as proxy for services, however, they are primarily indicators of *capacity*. An evaluation of the landscape ecological context is key to establishing the *opportunity* to provide off-site as well as properly balanced on-site services in compensation.

Because HEA deals with injuries and lost services within a temporal and well as spatial scale, and also incorporates time lags that may be involved in the creation of services at the compensation site, services are often expressed in terms of unit years. Also, HEA has typically been applied in situations where an impact has resulted in a decrease of services from a baseline level, but from which services may recover to some future level (not necessarily all the way to the former baseline though). Additionally, the compensation site may already be providing some diminished level of service as well. The goal of the compensation project is then to elevate this initial level of service to provide the additional service flow which then compensates for the losses. In this simplified perspective of HEA, there are the following basic parameters involved:

- **Injury Area:**
    - Baseline level of services at the injury site (i.e., prior to injury);
    - Initial reduction in service level from baseline;
    - The rate function of natural service recovery;
    - The maximum service level achieved through natural recovery; and,
    - The period for natural recovery.

- **Compensation Area:**
  - Initial level of services;
  - Rate function of service growth;
  - The maximum service flow anticipated (as percent of injury site baseline);
  - The maturity period for replacement services; and,
  - Compensation project's lifespan.
- **Discount Rate**
  - The annual real discount rate to be applied (3% is standard)

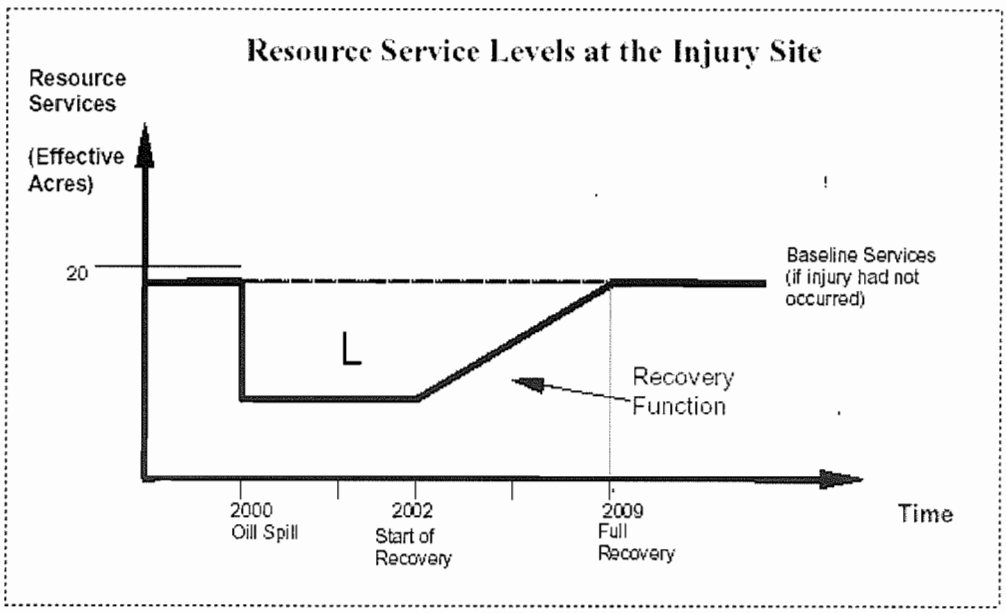


Figure 1: Illustration of assessment for a hypothetical oil spill occurring in 2000. Cumulative lost services are represented as the integrated area of the curve (L).

Figure 1 presents a graphical illustration of how these parameters are combined in determining the level of lost services for a hypothetical oil spill. In this example, it has been determined that the service provided by 20 acres of marsh is cut in half by the spill. A restoration action to rehabilitate the marsh and to replace injured plants takes place in 2002, after which, a linear recovery period of seven years is predicted, following which, full recovery to former service flow would be attained. The loss, shown as the integrated area L, would then be 55 acre-years of service flow. When the discount term (3%) is applied, this reduces to 50.84 acre-years.

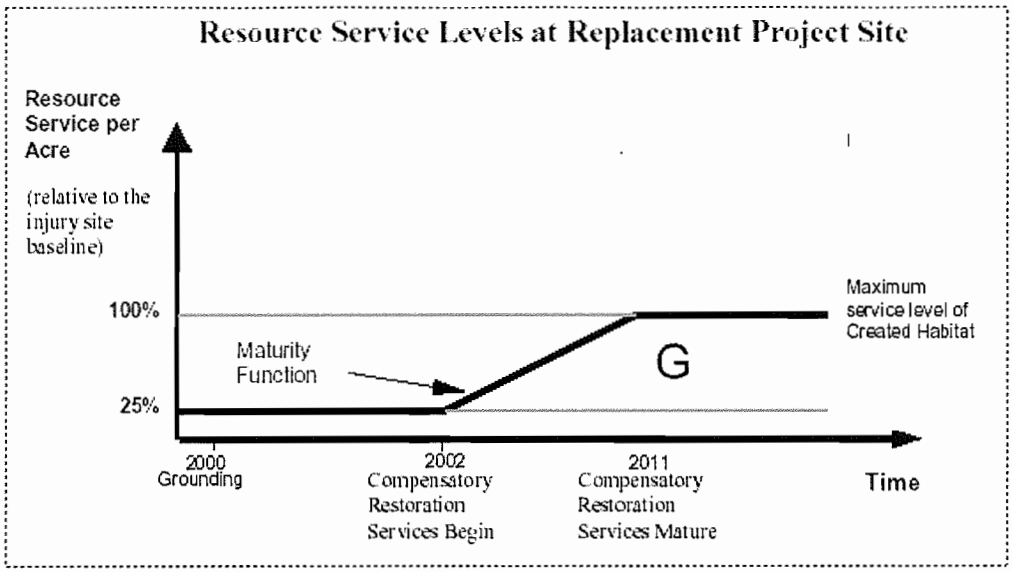


Figure 2: Illustration of assessment for a hypothetical oil spill occurring in 2000. Compensation services gained are represented as the integrated area of the curve (G).

Figure 2 illustrates how these basic parameters combine to assess the services supplied by a compensation action. The vertical axis measures the services per acre of a compensation site, *as a percent of the baseline services per acre of the injured site*. In this case, due to whatever reason, the compensation site provides only 25% of the baseline services the injured site had before the spill. An action taken in 2002 will linearly increase this service flow for nine years, at which time it reaches its maximum. The service flow gain is represented by the integrated area shown as G. Although this service flow continues on into perpetuity, it is calculable because of the application of the discount term. The present discounted, lifetime gains per acre of the compensation site are calculated as 21.32 acre-years. Thus 2.38 acres (50.84/21.32) would be required to offset the losses.

The Craney Island expansion project presents a specialized application of the HEA approach, in that the injury is a fill action that will last in perpetuity. The expansion project proposes to fill approximately 580 acres of benthic river bottom habitat at the mouth of the Elizabeth River. This action simplifies some of the basic parameters as listed above. On the injury determination:

- The reduction in service flow from baseline will be 100%; and,
- There will be no recovery, so there is no recovery rate function, recovery period, or service level re-achieved.

This simplification leaves only the determination of the baseline level of services provided to be determined.

One action that has been discussed as a potential compensation project for the Craney Island expansion essentially involves the restoration of benthic river bottom habitat elsewhere. Depending on the exact circumstances, this type of compensation action presents an excellent situation for the application of HEA, and offers numerous advantages:

- If the compensation site is within the same river system, this type of action generally satisfies the in-place and in-kind aspect of HEA quite well.
- The trade-off in services are quite comparable, within the variance observed for different areas of the river
  (this factor will be discussed in more detail later).
- A common metric that characterized the quality of benthic habitat services already exists in the B-IBI index. This index has already received peer review and has been widely accepted and applied with the entire Chesapeake region.
- The capacity of the restored habitat to provide the services lost should basically be equal to that of the fill area because they are the same type of habitat.
- The opportunity of restored habitat to provide the services lost should again be essentially equal because they are in-place and in-kind. In this instance, because of the circulatory pattern of the Elizabeth River, there is excellent recruitment opportunity. The amount of freshwater surface flow to the Elizabeth is minimal, therefore tidal pumping dominates its circulation. This allows for larvae to be carried throughout the system.
- As long as the compensation site is within the river, there is equity in the services lost and provided.

The nature of benthic restoration that has been discussed is the remediation of contaminated river bottom. Although there may be some current, yet diminished, service flow to such an area, restoration would likely entail either dredging or capping of the impacted area. Either of these remedial actions would essentially eliminate any existing benthic community. Therefore, the initial level of service at the time of restoration could be assumed to be zero. This simplifying approach does attribute all benthic service flow gains to the restoration action.

The level of service flow that can be anticipated from a restoration site can reasonably be assumed to be the average for the river system as a whole. Recolonization of the compensation area would depend on two processes: larval recruitment from the water column, and, migration from adjacent areas. The degree of migration would be dependent on the quality of the benthic habitat surrounding the compensation site. However, the potential for larval recruitment should reflect the general conditions of the river since this is a function of the water column habitat quality. In the long run, recolonization of a site would be most affected by this larval recruitment potential.

Depending on the exact location of the restoration site, it is not unreasonable to assume perpetuity for the projected duration of the restored habitat. Filling of the river bottom may present the greatest threat to this assumption. The vast majority of the Elizabeth River shoreline has already been developed for some time. Thus, the likelihood of future filling operations is lower than it may be elsewhere. There are many agreements whose purpose is in fact to reverse the trend of filling fringe wetlands and restoring those that can be, further reducing the possibility of shoreline expansion. Because any filling operation would require permits, it may be possible to ensure the long-term viability of a restoration site by recording restrictions on future filling of the site. Another threat to a restoration site would be the potential for recontamination. This issue would need to be addressed through a remedial action of the original source of contamination so that re-contamination is precluded. Future contamination by diffuse, non-point sources within the watershed is possible. However, this factor would most likely be reflected in the quality of the water column as a transport route for contaminants to the site (and in the larval recruitment potential), whereby the service provided by the site would generally not be expected to drop below average for the river system. Furthermore, the network of environmental regulations (e.g., AWQC, NPDES and NPDES II, TMDLs) are geared toward reductions in the pollution load of the river, which would in turn raise the general baseline service level of the entire river.

The predominant determinants for the services supplied are then the anticipated rate function for recovery and the period to full recovery. Recolonization of benthic habitats has been described extensively, seemingly with nearly as much varying indications as there are reports. The basic pattern of recolonization is common though: sources for recolonizing organisms are larval recruitment and migration from surrounding areas (Crema, R. and A. Valentini, 1998). Timing, larval sources, spatial factors which affect migration potential, and so on are major determinants which affect the balance between these two sources. Typically though, larval recruitment by small opportunistic species occurs quite rapidly, such that high numeric abundance can be observed within months to weeks of major benthic disturbances . Under optimum circumstances (small ratio of area to circumference for instance), migration can result in similarities with adjacent areas within months (Stickney, R. R. and D. Perlmutter, 1975). In other cases, dredging can permanently affect the substrate sufficiently (Kenny, A. J. and H. L. Rees, 1994) that the benthic community that develops is never similar with what was there before or what surrounds the impacted site (Pagliai, A. M. B. et al., 1985, Kenny, A. J. and H. L. Rees, 1996, Kenny, A. J. et al., 1998). Often this is due to slight differences among benthic communities, with rare species not returning, but in some instances major perturbations allow for the development of a different community (Crema, R. and A. Valentini, 1998).

As a benthic community develops and matures past the rapid colonization of opportunists, reduced biomass is a common intermediate outcome (Lopez-Jamar, E. and J. Mejuto, 1988, Lopez-Jamar, E. et al., 1995, Kenny, A. J. et al., 1998). The

time period for the full development of a stable, mature, diverse benthic community can vary considerably on site-specific factors. Saila (1980) predicted 11 years to reach maturity in a dredge disposal site in Narragansett Bay. Recovery times for intertidal pits were found to exceed 15 years, while recovery in subtidal areas with low tidal stream velocities were observed to occur in 5-10 years (Veer, H. d. et al., 1985).

The tidally driven circulation of the Elizabeth River, with extremely low fresh water input may most closely mimic conditions reported by Veer (Veer, H. d. et al., 1985). So, a range of 5- 10 years could be applied for the recovery period for a compensation site. A liner function will be assumed for this recovery.

When the discount rate is applied to the fill area in perpetuity, assuming the fill occurs in 2005, each acre of fill accounts for 32 acres-years of lost resource habitat service flow. (Computationally, "perpetuity" translates into a period of about 400 years, or the point at which the present discounted value of future losses become negligible.) Because of the assumption of perpetuity for the compensation project, each acre restored in 2005 would generate 28-31 acres years of gains. The reason for the slightly lower figure is due to the time it takes for the establishment of a stable, mature community. This range presented here represents a period of 5 to 10 years. Thus, a 6-14% increase is acreage at the compensation site is required to offset the losses at the fill site. The values for 10 years are presented in Figure 3. As stated before, this analysis ignores the potential for any functional benthic community to be present at the compensation site and attributes service flow at the site to the restoration action. This obviously maximizes the benefits derived from the compensation site in this analysis.

The key assumption in this application of HEA that deserves further discussion is that the baseline level of services at the fill site is approximately that of the average for the entire river, and, that this average is also the level that would be attained at a compensation site. If this is true, then the implicit assumption of HEA that the public is willing to accept a one-to-one tradeoff between a unit of lost habitat services with a unit of restoration project services is met on an acre-for-acre basis. Costly, detailed assessments based on a specific functional metric for the benthic habitat are not required. A general indication of the benthic habitat quality that allows for comparison between areas would suffice.

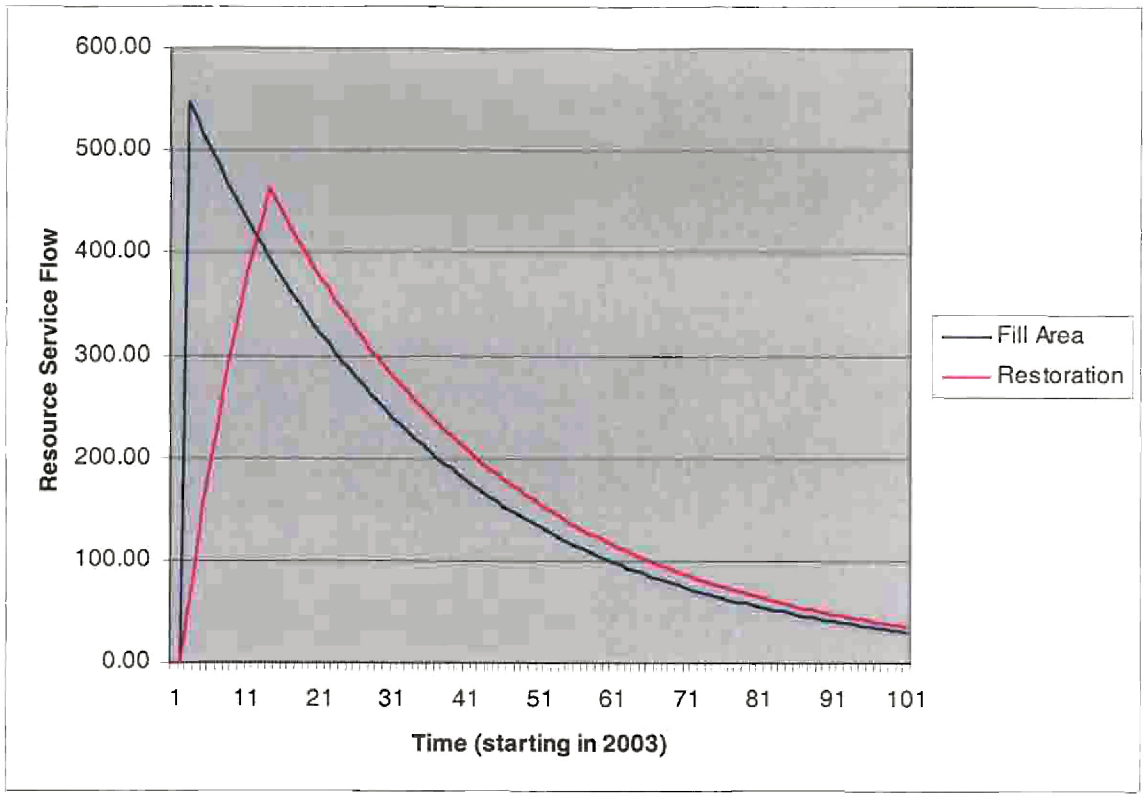


Figure 3: Graphical representation of service flow for the fill area and for a river bottom restoration site, with 3% discounting applied. Discounting results in essentially reaching zero service loss in approximately 400 years. Graph assumes fill and compensation both occur in 2005, and the restoration site requires a decade to reach maturity. This model requires 11.4 acres restored to compensate for every 10 acres filled.

The B-IBI metric provides just such a general habitat quality assessment and allows for some verification of this assumption. Values nearest the fill area would suggest that this area is at or above the average for the river in any of three consecutive years (Figure 4). The average of 11 stations near Craney Island, 2.8, is comparable to the average of 2.5 from nearly 300 stations throughout the river system. The comparison of B-IBI values therefore tends to support the approach that benthic habitat can be approached using the simplified metric of acre-year for habitat service flow.

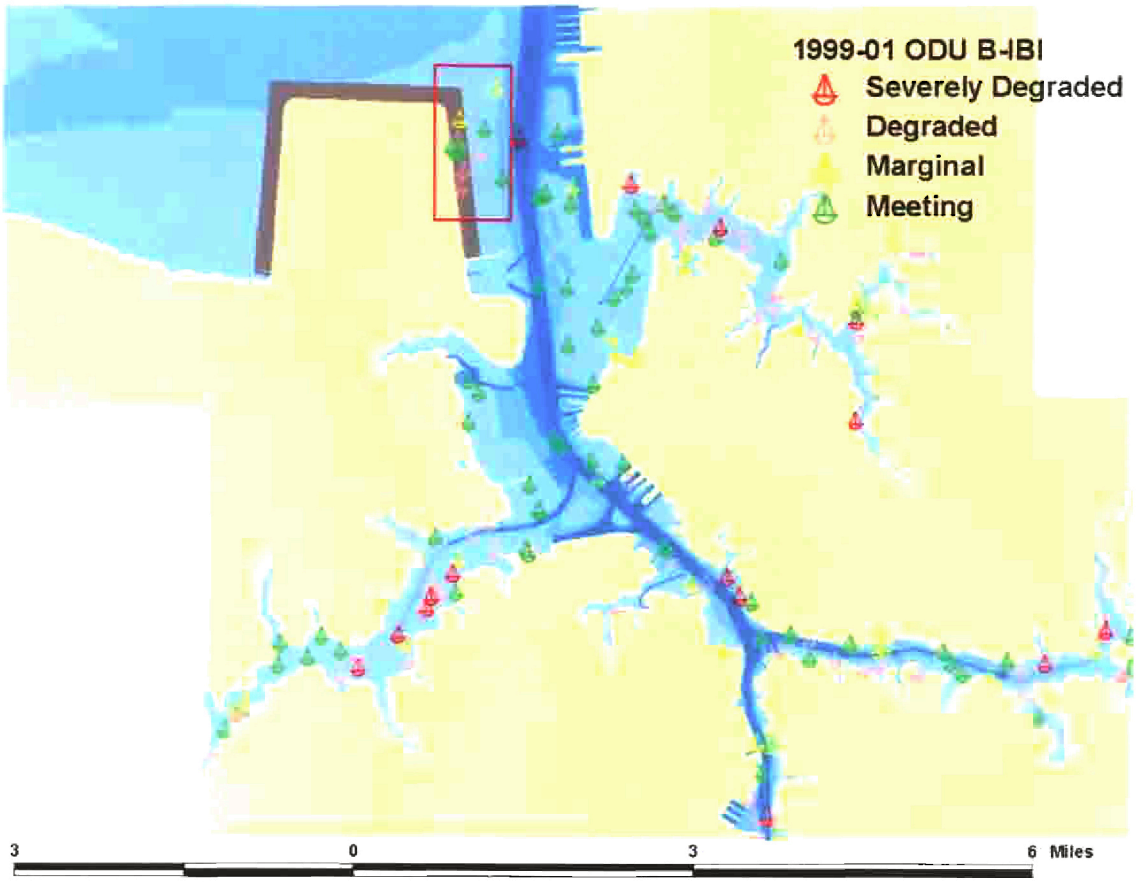


Figure 4: Benthic Index of Biotic Integrity results from Old Dominion University.

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Saila, S. B. (1980) Disposal of dredged materials at sea. *Maritimes,* **24,** 12-13.

Stickney, R. R.; and Perlmutter, D. (1975) Impact of intracoastal waterway maintenance dredging on a mud bottom benthos community. *Biological Conservation [Biol. Conserv.].* **7,** 211-226.

Veer, H. d.; Bergman, M. J. N.; and Beukema, J. J. (1985) Dredging activities in the Dutch Wadden Sea: Effects on macrobenthic infauna. *Neth. J. Sea Res.,* **19,** 183-190.

March 31, 2005

Mr. Craig Seltzer
Norfolk District, Corps of Engineers
Fort Norfolk, 803 Front Street
Norfolk, VA 23510-1096

*Re: Craney Island Expansion Project*

Dear Mr. Seltzer:

In the process of developing a mitigation plan for the Craney Island Expansion Project, you are using results from a report prepared by Dr. Charles Peterson entitled "Scaling Compensatory Restorations for the Craney Island Expansion Project in the Elizabeth River Estuary" dated July 28, 2003. While the first three drafts of the report (May 28, April 21, and March 4) were circulated to the Mitigation Subcommittee for review and comment, the last version was not. The failure to complete the review process occurred as a consequence of the District Engineers' decision to halt the study. I believe the report contains some serious errors and unresolved concerns. The purpose of this letter is to correct certain technical deficiencies in the report, suggest some issues that deserve further discussion, and review the limitations of the Habitat Equivalency Analysis (HEA) analysis to establish a context for using the results. I recommend that the Mitigation Subcommittee be given the opportunity to review the revised report with an aim of obtaining some level of concurrence.

## Oyster Biomass

The report states that the biomass of oysters sustained on the restored reefs near Fisherman's Island was 600 g AFDW /$m^2$ and cites O'Beirn et al. 1999. Because this figure was inconsistent with other studies reported in the literature, I checked this reference and found that there were no biomass figures given, only shell length data. Subsequently, I contacted Dr. Mark Luckenback, one of the authors of the report, and was told that he had personally given Dr. Peterson the biomass figure, based on some quick calculations. Further discussion with him revealed that an incorrect shell length-biomass regression had been used in the calculations. He provided me with corrected figures that show that the biomass was actually 160 g AFDW /$m^2$. This is a big change that will significantly affect the outcome of the analysis.

## Oyster P:B Ratio

There are problems with 2 of the 3 values that Dr. Peterson averaged to develop the oyster Production:Biomass ratio (2.4). The first value, 2.6, was taken from a paper by Bahr and Lanier (1981). A review of this reference revealed that this is not a P:B ratio but is a ratio between biomass (kcal/$m^2$) and respiration (kcal/$m^2$/yr). Respiration represents the total metabolic activity and not simply the portion that was devoted to growth of biomass. Confusion apparently developed because Bahr and Lanier referred to this as the "turnover time", which is also a term used to describe a P:B ratio. However, they clarify that this value is "the average time that any

given carbon molecule survives as a constituent of oyster tissue before becoming oxidized to $CO_2$ and recycled." This is different than the turnover time associated with a P:B ratio. The second P:B value, 2.2, was developed by Dr. Peterson using data from Dame (1976) that was reported in Bahr and Lanier (1981). Bahr and Lanier did not actually give a P:B ratio, but they did cite a figure from Dame for "gross" production that included biomass of dead oysters. The Dame study actually reported a P:B ratio of 2.0. The difference in the two figures occurred because Bahr and Lanier added Dame's mortality figure to his production figure. This is an error because Dame's production figure already included mortality. It is clear to me that 2.0 is the most correct P:B ratio. This ratio value was also reported in a review of P:B ratios published by Gray (1981).

## Meiofauna Estimate

Dr. Peterson assumes that the meiofauna production in the project footprint would be equal to the macrofauna production. As evidence for this, he cites data for a generalized silty sand station given in Table 6-17 in Knox (2001). For the oyster reef he assumes that the meiofauna production would be equal to two thirds of the macrofauna production. He arrived at this figure by averaging the previous 1:1 meiofauna:macrofauna ratio and a 1:3 ratio for a rocky shore (also from Knox 2001), reasoning that the oyster reef is a mix of hard and soft substrates. When the 2:3 ratio is applied to the oyster reef, the resulting meiofauna production is in the hundreds of grams per $m^2$/yr. I have found no support in the literature for such high meiofauna production.

One initial problem is that the data in Knox that purport to indicate a 1:1 ratio have been misinterpreted. The data come from a study by Gerlach (1978) which reported that the meiofauna production in a generalized 30-meter deep silty sand station (10 g AFDW/$m^2$/yr) was nearly equal to the production of the <u>subsurface deposit feeding component</u> of the macroinfauna (12 g AFDW/$m^2$/yr). The subsurface deposit feeding component of this community comprised 60% of the total macroinfauna biomass. So for this particular study, the meiofaunal:macrofauna ratio would be more like 1:2. However, since the subsurface deposit feeding component of the oyster reef community is so small, one must question how applicable this information would be.

A more fundamental problem is the assumption that macrofauna production can be used to predict meiofauna production. A review of the literature indicates that the ratio of meiofauna to macrofauna varies widely, and therefore, the use of macrofauna to estimate meiofauna production would give questionable results. In areas where macrofauna production is relatively low, meiofauna production will exceed the macrofauna (Koop and Griffiths 1982; Warwick et al.1979; McIntyre 1964). But, in areas where macrofauna production is relatively high such as in communities dominated by mollusks, macrofauna production will exceed meiofauna production (Gerlach 1971; Wigley and McIntyre 1964). In one study of a rocky shore (Gibbons and Griffiths 1986), the meiofauna:macrofauna production ratio varied from 1:18.5 to 1:0.4. depending on the particular position on the shoreline. [This is the same study that Knox cited as showing an average ratio of 1:3.] Austen et al. (1989) found no correlation between meiofauna biomass and macrofauna biomass at 14 stations within a large Portugese coastal lagoon system. This study also noted that meiofauna are not affected by physical disturbance as much as macrofauna are, and that meiofauna appear to be inherently more stable.

While meiofauna are operationally defined on the basis of sieve sizes (organisms passing through 0.5 mm or 1.0 mm, but retained on 0.042 or 0.63 mm sieve), they should not be simply viewed as small macrofauna. Rather, they are a functionally distinct community from macrofauna and are controlled by different biological and ecological factors (Giere 1993). Therefore, it is not surprising that the production ratio of macrofauna to meiofauna would be variable.

A much better approach to estimate meiofauna would be to select an appropriate value based on actual reported values. Coull (1999) noted that meiofauna are ubiquitous in estuarine sediments worldwide and that the reported values of standing crop biomass typically fall in the rather narrow range of 0.75-2 g dry weight/$m^2$. Some relatively recent studies have reported somewhat higher values. Rudnick et al. (1985) reported a value of 2.9 g AFDW/$m^2$ for a 7-meter deep mud bottom site in Narragansett Bay. He noted that his results were somewhat higher than the results from the majority of sublittoral mud studies, and attributed the difference to differences in the sampling and laboratory techniques. He also noted that no clear pattern of meiofauna differences has been observed between coastal (<200 m depth) marine ecosystems except for differences between the interstitial forms associated with clean sands and the burrowing forms found in muds. For example, Tietjen (1969) found no difference between the meiofauna biomass within an eelgrass bed and an unvegetated area. This stands in contrast to the macrofauna biomass which would be expected to be higher in the eelgrass bed. A long-term study by Coull (1985) found no difference in meiofauna abundance between a mud site and a sand site in the North Inlet estuarine system, South Carolina. The mud site was located within a 10 m wide creek protected from strong current and wave action and lined with mud flats and oyster bars, while the sand site was located adjacent to the confluence of two major creeks at the lower end of an extensive sand bar subject to strong wave and current action. It is noteworthy that the meiofauna abundance at the site next to the oyster bar was not elevated. A study of an exposed rocky shore with a rich growth of algae at False Bay, South Africa (Gibbons and Griffiths 1986) reported an average meiofauna biomass of 2.8 g dry weight/$m^2$, which is similar to the value reported by Rudnick for the muddy bottom at Narragansett Bay. This is another indication of the lack of a clear pattern in the distribution of meiofauna biomass.

A study by Blanchard (1991) reported that meiofauna biomass from an oyster pond on the French Atlantic coast was 1.034 g C/$m^2$. Assuming the carbon weight is equivalent to 0.45 times the ash-free dry weight (Wulff et al. 1997), this would equate to 2.3 g AFDW/$m^2$. While oyster habitat is known to support a high level of macrofauna production, the meiofauna production does not attain a similar high level. In fact Dinet et al. (1990) reported that meiofauna beneath cultures of oysters and blue mussels was actually reduced apparently due to biodeposition which caused strong reduction of the bottom sediment (negative Eh) and a high level of ammonium in the interstitial water. When oyster shells cover the bottom they may decrease the meiofauna habitat value of the sediment beneath by decreasing oxygenation. A similar effect was reported by Sundback et al. (1990) who found a decrease in the meiofauna beneath a mat of macroalgae due to an associated rise in ammonium and fall in oxygen values.

In view of the above information, it would be reasonable to assume that the meiofauna standing crop biomass estimate for the oyster bar would be similar to that of the open mud bottom. Considering the values reported from around the world, with particular emphasis given to the 2.3 g AFDW/$m^2$ value from the French oyster pond and the 2.9 g AFDW/$m^2$ value from Narragansett Bay, a reasonable value for the lower Chesapeake Bay would be 2.5 g AFDW/$m^2$. Since the production:biomass ratio for meiofauna is considered to be approximately 10 (Coull 1988), this biomass would equate to a production value of 25 g AFDW/$m^2$/yr.

## Determining the Net Increase In Benthos Production From Oyster Reef Creation

Dr. Peterson's report develops a figure for the biomass production that could be expected on a restored oyster reef, but does not account for the benthic production that would be occurring on the bottom where the reef restoration would be conducted. This base pre-restoration benthic production needs to be estimated and deducted from the oyster reef production to indicate the net increase in production. Extensive monitoring of the benthic macrofauna in the Elizabeth River system between 1999 and 2002 (Dauer 2000, 2001, 2002, and 2003) provides data that can be used to develop a general production figure. The mean of 256 biomass measurements is 1.58 g AFDW /$m^2$. Using the ratio P:B = 5.8 from the project footprint analysis, this would yield a benthic macrofauna production of 9.16 g AGDW /$m^2$/yr. Adding a meiofauna production estimate of 25 g AFDW $m^{-2}$/yr gives the baseline benthic invertebrate production prior to oyster reef creation. This base production should be subtracted from the oyster reef production to show the net increase in production.

## Macrozooplankton P:B Ratio

Dr. Peterson's report cites four macrozooplankton P:B ratios. He uses the highest and the lowest values (190 and 42.6) to calculate a range of zooplankton production estimates. These values are not simply different measurements of the same thing since they focus on different aspects of zooplankton production (i.e., certain seasons or particular species). It may be misleading to only use the extreme values. The intent may have been to incorporate a measure of uncertainty into the analysis. I agree that the final output will have a substantial level of uncertainty that needs to be made clear, but this should be accomplished by addressing the many assumptions and qualifications of the HEA analysis since the sources of error go far beyond the potential errors in this particular figure. The intermediate figure of 133 from Baird and Ulanowicz (1989) appears to be the most appropriate for our use because: 1) it provides a general estimate of macrozooplankton over an entire year; 2) it is focused on the mesohaline region of Chesapeake Bay where the project is located; and 3) it is from a published paper that is readily available for review. I believe that this is preferable to using an average of the extreme high and low values, or an average of all four values.

*Spartina* Marsh Production

To determine the saltmarsh invertebrate production, Dr. Peterson uses the model developed by Kneib (2003). To demonstrate a measure of verification for his model, Kneib's paper notes that his estimate of annual nekton production expected from the marsh using the bioenergetic approach (4.7 dw $m^{-2}$) is consistent with the high end of the range of nekton production values estimated from P:B ratios applied to nekton standing stock biomass measured from flume weir sampling (0.11 - 4.57 g dw $m^{-2}$; mean of 1.5 g dw $m^{-2}$). This supports his view that "the amount of primary production as modified by bioenergetic constraints operating through food web interactions will set the upper limit on the amount of nekton production from marshes in a region." He further notes that physical characteristics such as tidal frequency and duration of flooding will affect the accessibility of marsh resources and limit the amount of production available for nekton.

However, Dr. Peterson believes that the difference between the bioenergetic predicted value (4.7 g dw $m^{-2}$/yr) and the value determined from nekton sampling (1.5 g dw $m^{-2}$/yr) should have been even greater than it is. He believes that Kneib's nekton sampling failed to include significant sources of production, and that if these were quantified, the resulting production would be so large that it would indicate the value from the bioenergetic approach is too low. In particular, he states that Kneib's sampling did not include other tertiary consumers such as blue crabs and birds, and did not include nekton outside the marsh that may have experienced enhanced production associated with export of organic carbon. Because of this perceived limitation, Dr. Peterson elected to double the production value derived from application of Kneib's model.

I do not agree that this proposed increase in the predicted production value is warranted. Since the predicted production is more than three times greater than the value determined from nekton sampling, the nekton sampling would have had to be undercounted by at least this amount to cast doubt on the bioenergetic predicted production value. To justify Dr. Peterson's recommendation to increase Kneib's production value twofold, the undercount would have had to be even greater. There is little reason to suspect this large magnitude of undercount. Kneib's sampling would have collected blue crabs if they were present, and actually did collect other decapods. The production of rails and shorebirds expressed on a square meter basis and averaged over a period of a year would probably be relatively small. Kneib admitted that his bioenergetic estimate of nekton production "may not adequately account for all potential pathways by which marsh production contributes to the trophic support of adjacent estuarine and terrestrial ecosystems, including consumption by birds or other non-aquatic predators." But he pointed out a counterbalancing factor, which is that his estimate also does not "account for the biomass stored in long-lived potential prey species such as marsh periwinkles *Littoraria irrorata* or ribbed mussels, both of which have life spans ranging from 10 to 20 years." While it is true that some nekton that may benefit from export of material from the marsh were not sampled, this would tend to be offset by Kneib's implicit assumption that all of the nekton production from his sampling was derived from the marsh's primary production. Since the nekton from his collections included migratory species, a significant portion of this component would have been derived from primary production sources outside of the marsh. Even the resident species may leave the marsh seasonally and at low tide, and while in the subtidal estuary they would be

feeding on invertebrates that rely on other sources of primary production (phytoplankton, benthic algae, submerged grasses, allochthonus production from the upland portion of the watershed).

Determining the trophic transfer of primary production to tertiary production is certainly a difficult task. Dr. Peterson's modification to Kneib's model is based on his interpretation of the tertiary production data. However, our study only requires an estimate of secondary production. Problems with estimating production of nekton would not necessarily invalidate the trophic transfer estimate for secondary production.

Everything considered, I do not believe that Dr. Peterson has put forth sufficient reasons to justify his decision to double the marsh production value determined via Kneib's model. However, I also recognize that Kneib's model contains important assumptions that have a substantial level of uncertainty. I also have a concern that the output from Kneib's model is not strictly comparable to the direct measurements of benthic invertebrates and zooplankton trophic levels that are being used for the project footprint. These communities are not only composed of herbivores, but also contain some carnivores. The bioenergetic approach only determines the quantity of material that is transferred to the herbivore level. Thus, a modest adjustment to the output from Kneib's model may be justified to achieve a more balanced comparison with the direct community measurement values at the project site. Because of the complexity involved, and despite my concerns, I am withholding recommending any specific changes to this section of Dr. Peterson's report at this time, since I prefer that the issue be resolved via collective discussion with the Mitigation Subcommittee or other concerned persons.

## Conclusions

I have enclosed revised Tables 1, 2, 3, and 5 from Dr. Peterson's report reflecting my recommended changes. In Table 5, I have included the compensation ratios which indicate the number of project footprint acres that are compensated for by creation of one acre of compensation option. The ratios are 3.6:1 for the oyster reef and 2.1:1 for the salt marsh. As a comparison, the uncorrected data from Dr. Peterson's report produced ratios ranging from 115.5:1 to 31.8:1 for the oyster reef and from 8.7:1 to 2.4:1 for the salt marsh.

This application of the HEA has some important limitations. Development of the production values involved the use of some rather crude estimates since community production is a difficult parameter to measure. The analysis did not measure all of the biological production that would be lost in the project footprint or created with the salt marsh or oyster reef, but only focused on the production from one trophic level. It is hoped that the production of the other trophic levels would be proportional to the herbivore secondary production level that we measured, but this may not be true. For example, the oyster reef option does not contribute habitat for primary production. The analysis does not differentiate between different forms of production (e.g., species composition) except for adjusting for comparisons between trophic levels. The use of the trophic level concept itself presents some practical difficulty since community collections (i.e., bottom grabs or plankton nets) would typically contain species from more than one trophic level, and individual species may actually operate at more than one level. By using production to determine compensation requirements, there is an implied assumption that production is an

indicator of the sum of all of the environmental functions and values in the targeted habitats. Some of these other environmental functions and values may include: 1) moderating estuarine eutrophication and pollution problems; 2) providing special habitat functions such as spawning area; 3) supporting commercial and recreational fishing values; and 4) supplying habitat for rare, threatened, endangered, or keystone species. There is no assurance that the metric of production will be adequate to represent all of the functions and values associated with a habitat.

Because of the limitations in the HEA analysis, the output should not be simply accepted as the final answer for determining the compensation ratios, but reviewed and modified as needed to reflect local conditions and values.

Sincerely,

George Ruddy

Table 1 (revised). Estimated loss of benthic invertebrate production from filling 580 aces at Craney Island near the mouth of the Elizabeth River (VA).

Macrofauna

| | |
|---|---|
| Average macrofauna (0.5 mm mesh) biomass from summer samplings of Craney Island footprint (Dauer 2000, 2001) | |
| Yr 1999 (mean of 7 samples) | 0.962 g AFDW $m^{-2}$ |
| Yr 2001 (mean of 3 samples) | 0.899 g AFDW $m^{-2}$ |
| Mean biomass (of 10 samples) | 0.943 g AFDW $m^{-2}$ |
| P:B ratios for macroinfauna | |
| Howe and Leatham (1984) polychaetes - Del Bay | 7.5 |
| Steimle (1985) polychaetes - NY Bight | 3.0 |
| Diaz and Schaffner (1990) polychaetes - Ches Bay | 4.9 |
| Baird and Ulanowicz (1989) deposit feeders - Ches Bay | 7.7 |
| Mean P:B | 5.8 |
| Estimated annual macrofauna production | 5.47 g AFDW $m^{-2}$ /yr |
| Meiofauna biomass - Based on literature values esp Rudnick (1985) 2.9 g AFDW $m^{-2}$ for Narragansett Bay and Blanchard (1991) 2.3 g AFDW $m^{-2}$ for oyster pond | 2.5 g AFDW $m^{-2}$ |
| Meiofauna P:B ratio (Coull 1988) | 10 |
| Estimated anuual meiofauna production | 25 g AFDW $m^{-2}$/yr |
| Combined macro- and meiofauna production | 30.47 g AFDW $m^{-2}$/yr |
| Total annual loss of macro- and meiofauna for 580 acres (4046.86 $m^2$/acre) | 71,518 kg AFDW /yr |

Table 2 (revised). Estimated loss of zooplankton production from filling 580 acres at Craney Island near the mouth of the Elizabeth River, VA.

| | |
|---|---|
| Mean monthly macrozooplankton biomass (dry wt) at ELI2 3 km up the Elizabeth River from Craney Island averaged over 12 months (Sharp 1995) | 6.84 mg $m^{-3}$ |
| Mean monthly macrozooplankton biomass (dry wt) at WBE1 10 km up the Elizabeth River from Craney Island averaged over 12 months (Sharp 1995) | 4.66 mg $m^{-3}$ |
| Mean monthy macrozooplankton biomass (AFDW) predicted by linear extrapolation for the Craney Island expansion site [a] | 7.86 mg $m^{-3}$ |
| Mean monthly macrozooplankton biomass (AFDW) assuming a mean water depth of 3.2 m | 25.15 mg $m^{-2}$ |
| P:B ratio from Baird and Ulanowitz (1989) for mesohaline Ches Bay, ratio of total production to average biomass over 4 seasons [b] | 133 |
| Estimated macrozooplankton production | 3.34 g AFDW $m^{-2}$/yr |
| Estimated microzooplankton production - based on 5.75 ratio of micro- to macrozooplankton production in Baird and Ulanowicz (1989) | 19.20 g AFDW $m^{-2}$/yr |
| Combined micro- and macrozooplankton production | 22.54 g AFDW $m^{-2}$/yr |
| Total annual loss of micro- and macrozooplankton for 580 acres (4046.86 $m^2$/acre) | 52,905 kg AFDW/yr |

a- This extrapolated number includes conversion from dry wt to AFDW using 4.25% ash wt (Salonen et al. 1976)
b- The four seasonal values reported were: Sp (45.6); Su (59.5); Fa (30.3); Wi (9.1)

Table 3 (revised). Projected net increase in production of benthic invertebrates on a restored oyster reef habitat in the lower Chesapeake Bay.

| | |
|---|---|
| Biomass of oysters on restored reefs near Fisherman's Island (Luckenback unpublished data) | 160 g AFDW $m^{-2}$ |
| P:B ratio for oysters (Dame 1976) | 2.0 |
| Production of oysters | 320 g AFDW $m^{-2}$/yr |
| Production of other reef macrofauna [a] | 75 g AFDW $m^{-2}$/yr |
| Production of reef meiofauna [b] | 25 g AFDW $m^{-2}$/yr |
| Total reef production of benthic invertebrates | 420 g AFDW $m^{-2}$/yr |
| Deduction for existing macrofauna prior to restoration [c] | 9.16 g AFDW $m^{-2}$/yr |
| Deduction for existing meiofauna prior to restoration [b] | 25 g AFDW $m^{-2}$/yr |
| Net increase in benthic invertebrate production on the reef | 386 g AFDW $m^{-2}$/yr |
| Risk adjusted increase in reef benthic invertebrate production [d] | 193 g AFDW $m^{-2}$/yr |
| Estimated increase in invertebrate production per acre of restored reef | 781 kg AFDW/yr |

a- This is based upon demonstration in Bahr (1974) that oysters comprise 81 % of macrofaunal production
b- Based in literature biomass values esp Rudnick (1985) 2.9 g AFDW/$m^{-2}$ for Narragansett Bay and Blanchard (1991) 2.3 g AFDW $m^{-2}$ for oyster pond; and meiofauna P:B=10 from Coull (1988)
c- Based on the mean of 256 biomass measurements (1.58 g AFDW $m^{-2}$) taken at stations throughout the Elizabeth River system from 1999 to 2002 (Dauer 2000, 2001, 2002, and 2003) that was converted to production using P:B = 5.8 (see Table 1)
d- Because of the uncertainty in recruitment and survival, we reduce the production credit by 50 % relative to the successful restoration near Fisherman's Island, equivalent to assuming that only half of the reef restorations will be successful

Table 5 (revised). Computations of scaling oyster reef and *Spartina* salt marsh restoration projects to compensate for benthic invertebrate production losses after expansion of Craney Island by 580 acres.

| | |
|---|---|
| Project losses | |
| Benthic invertebrates | 30.5 g AFDW $m^{-2}$/yr<br>123 kg/acre/yr |
| Zooplankton | 22.5 g AFDW $m^{-2}$/yr<br>91 kg/acre/yr |
| Total | 53.0 g AFDW $m^{-2}$/yr<br>214 kg/acre/yr |
| Benefits from compensation options | |
| Oyster reef | 193 g AFDW $m^{-2}$/yr<br>781 kg/acre/yr |
| Compensation ratio (number of footprint acres that are compensated by one acre of oyster reef) | 3.6:1 |
| Number of reef acres required for compensation of the entire 580-acre project | 161 acres |
| Salt marsh | 111.1 g AFDW $m^{-2}$/yr<br>450 kg/acre/yr |
| Compensation ratio (number of footprint acres that are compensated by one acre of salt marsh) | 2.1:1 |
| Number of salt marsh acres required for compensation of the entire 580-acre project | 276 acres |

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# APPENDIX E

# VIMS BENTHIC STUDY (SEITZ AND LIPCIUS)

FINAL REPORT

# Impact of the Craney Island Extension on Abundance, Biomass, and Diversity of Dominant Benthic Species

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## Introduction

In Chesapeake Bay, coastal areas are characterized by vast expanses of sand and mud habitats that harbor significant benthic infaunal communities. Such communtiies provide critical ecosystem functions (e.g., nutrient cycling) and food for epibenthic predators including the blue crab, *Callinectes sapidus*, and various demersal fishes (Horwitz 1987, Hines et al. 1990, Seitz et al. 2001). For instance, benthic infaunal clams in these communities comprise the highest percentage of the blue crab diet (Laughlin 1982, Hines et al. 1990, Mansour and Lipcius 1991, Mansour 1992). The benthic communities are dominated in biomass by bivalves (i.e., clams, oysters, mussels) and in numbers by polychaetes (Boesch 1977, Virnstein 1977, Hines et al. 1990). Infaunal bivalve assemblages include key species such as the hard clam, *Mercenaria mercenaria*, the Baltic clam, *Macoma balthica*, and the stout razor clam *Tagelus plebeius,* which are common throughout Chesapeake Bay (Holland 1985, Boesch 1977).

Both natural and anthropogenic processes have caused habitat loss or degradation, which reduces the abundance and biomass of critical benthic prey for important fishery species by diminishing secondary production in impacted coastal habitats. Human expansion and human reliance on coastal waterways for recreation and shipping require that some parcels of land or water be relinquished for development or engineering. As stewards of the environment, our obligation is to determine the best locations for such development. Despite the significance of this issue, there is a dearth of information on the impact of shoreline development and the resultant habitat degradation upon benthic and fishery production. This lack of information has made it difficult for developers to assess optimal placement of impacted sites. For instance, although benthic biomass in deep-water, soft-bottom sediments has been documented, the comparative production of shallow-water habitats influenced by shoreline development and habitat degradation has not been adequately quantified.

A proposal to increase the size of Craney Island by filling approximately 243 ha of deep-water mud habitat may reduce a substantial percentage of the available soft-sediment habitat where dominant bivalve species occur. However, this hypothesis has not been adequately tested. Furthermore, studies in shallow tributaries of Chesapeake Bay indicate that benthic biomass in shallow expanses often exceeds that in deep-water habitats (Seitz et al. 2003), suggesting that if any habitat must be altered, the modification of deep-water habitats would be least destructive to benthic community structure. Consequently, an alternative hypothesis relevant to the Craney Island expansion is that the filling of some deep-water habitat will have minimal impact upon total benthic biomass in this portion of the ecosystem because it is relatively inconsequential when compared with that in adjoining shallower soft-bottom habitats. Therefore, we conducted an extensive comparative study to quantify the abundance, biomass, and diversity of dominant benthic bivalves in both deep and shallow soft sediments of the Craney Island and Lafayette River system. Bivalves were chosen because they are dominant and representative members of the benthic community, and because their sampling is relatively uncomplicated and accurate (Seitz et al. 2003). We specifically intended to

estimate the potential loss of bivalve biomass, due to development of Craney Island, both in absolute terms and as a percentage of the total biomass of the surrounding ecosystem.

## Objectives

We assessed whether destruction of deep-water mud habitat due to the Craney Island expansion would represent a significant loss of benthic (i.e., bivalve) abundance, biomass, and diversity in the Craney Island and Lafayette River (CI-LR) system. We determined whether or not a "significant loss" would occur by comparing bivalve density, biomass per unit area, and diversity (henceforth, bivalve prevalence) in the CI expansion area to bivalve prevalence in the remaining habitats of the CI-LR system. If bivalve prevalence is significantly lower in the CI expansion than in other habitats of the CI-LR system, then the loss of bivalve biomass and abundance in the CI expansion would be disproportionately lower than the loss of area of soft-bottom habitat. This would indicate that the total loss in bivalve biomass and abundance due to the CI expansion would likely be less than 5-10 % of that in the CI-LR system, and therefore relatively insignificant. In addition, we determined if any bivalve species are unique to the CI expansion area, and would therefore be eradicated by the CI expansion. From these data we also estimated the total abundance and biomass potentially lost due to the Craney Island expansion and therefore the resultant magnitude of mitigation needed.

For this report we have:

1. Estimated the areal extent of the CI expansion deep-water habitat relative to shallow and deep soft-bottom habitats in the CI-LR system using GIS technology.

2. Presented sampling methods and results for benthic bivalves and environmental variables in the CI expansion and in the remaining portion of the CI-LR system from box coring and suction sampling techniques.

3. Assessed bivalve density, abundance, diversity, size, and biomass in shallow and deep-water areas of the CI-LR system.

4. Compared the gear efficiency of the box core and suction sampling technique and compared sediment grain size among zones.

## Methods

### *a. Site Selection*

GIS-based maps of coastal shorelines were used to delineate the areas of the proposed Craney Island expansion (Fig. 1), the adjacent deep waters (Fig. 2), and the shallow waters (Fig. 3) of the CI-LR system. From the GIS-delineated strata, we used a random-number program to generate 60 possible random, independent sites in each of the three strata. Of the 60 potential sites in each stratum, we sampled 41 deep sites in the proposed CI expansion, 40 deep sites in the remainder of the CI-LR system, and 40 shallow subtidal sites in the CI-LR system.

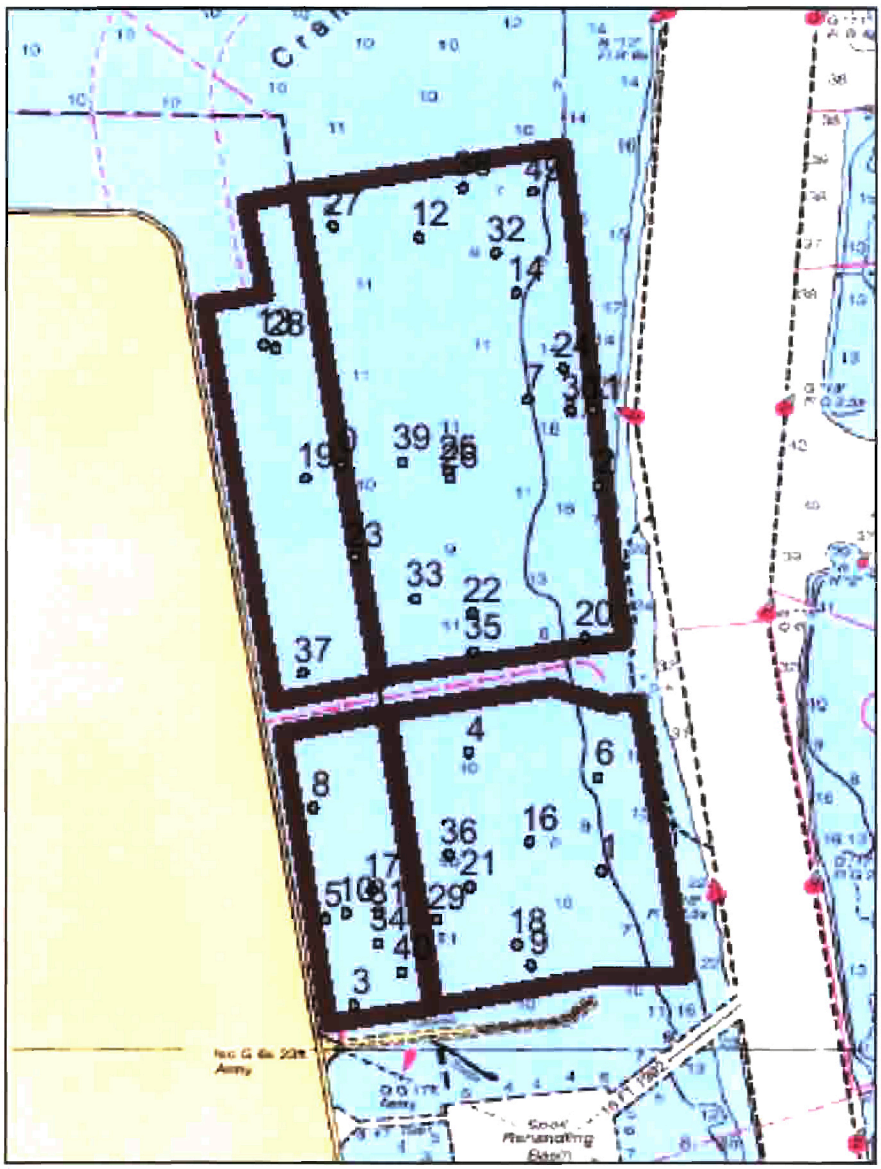

**Figure 1. Chart of 'Craney Island' sampling sites. Yellow shading is land, blue shading is water, white shading is channel, and black straight, thick lines encompass possible sampling regions within the proposed Craney Island expansion. Black squares with large numbers are 41 random sampling sites, and small black numbers are depths from a nautical chart.**

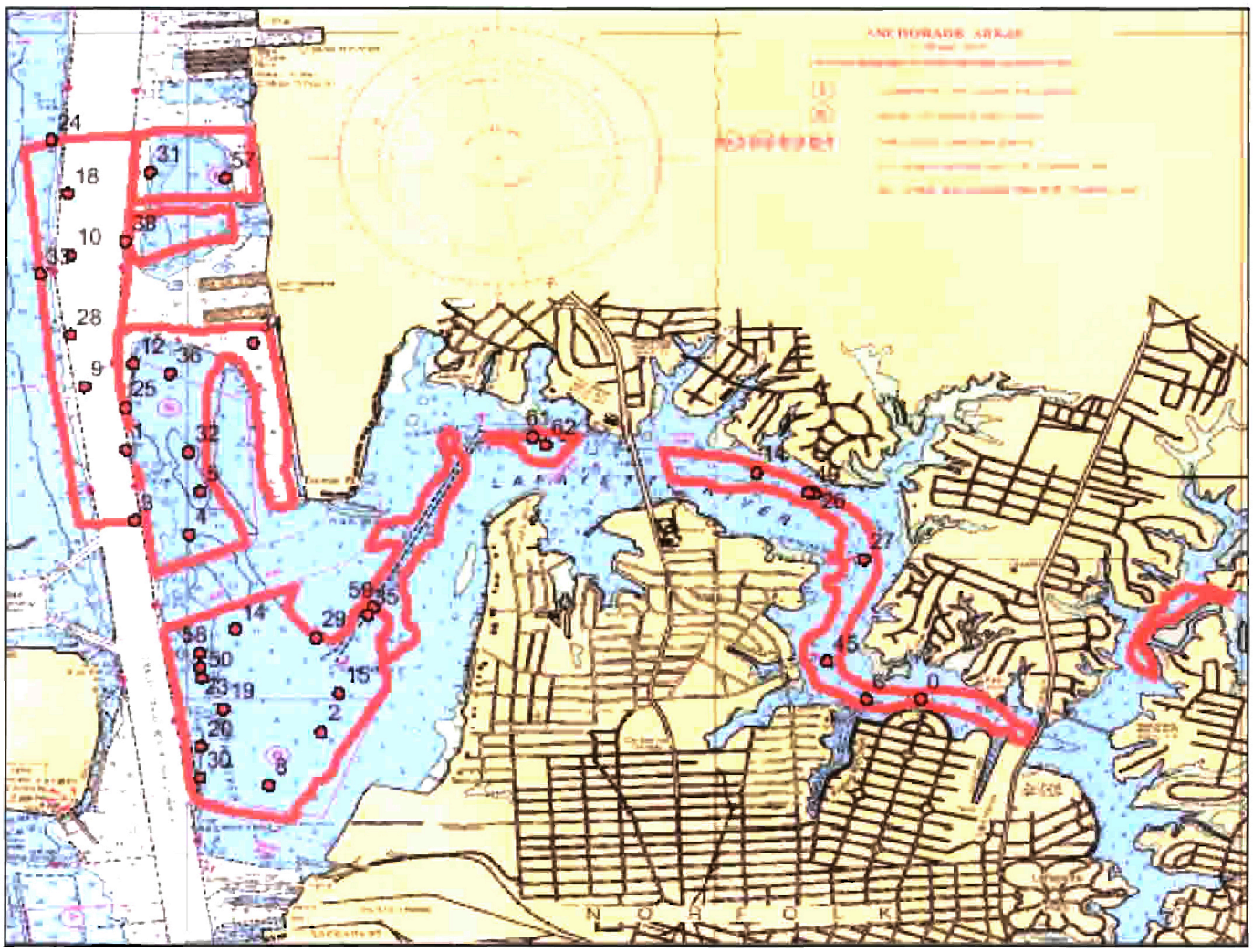


**Figure 2. Chart of 'Deep' (> 1.3 m) sampling sites within the Craney Island-Lafayette River system. Yellow shading is land, blue shading is water, white shading is channel, and pink, thick lines encompass possible sampling regions within the proposed CI-LR system. Pink filled circles with large numbers are 40 random sampling sites and small black numbers are depths from a nautical chart.**

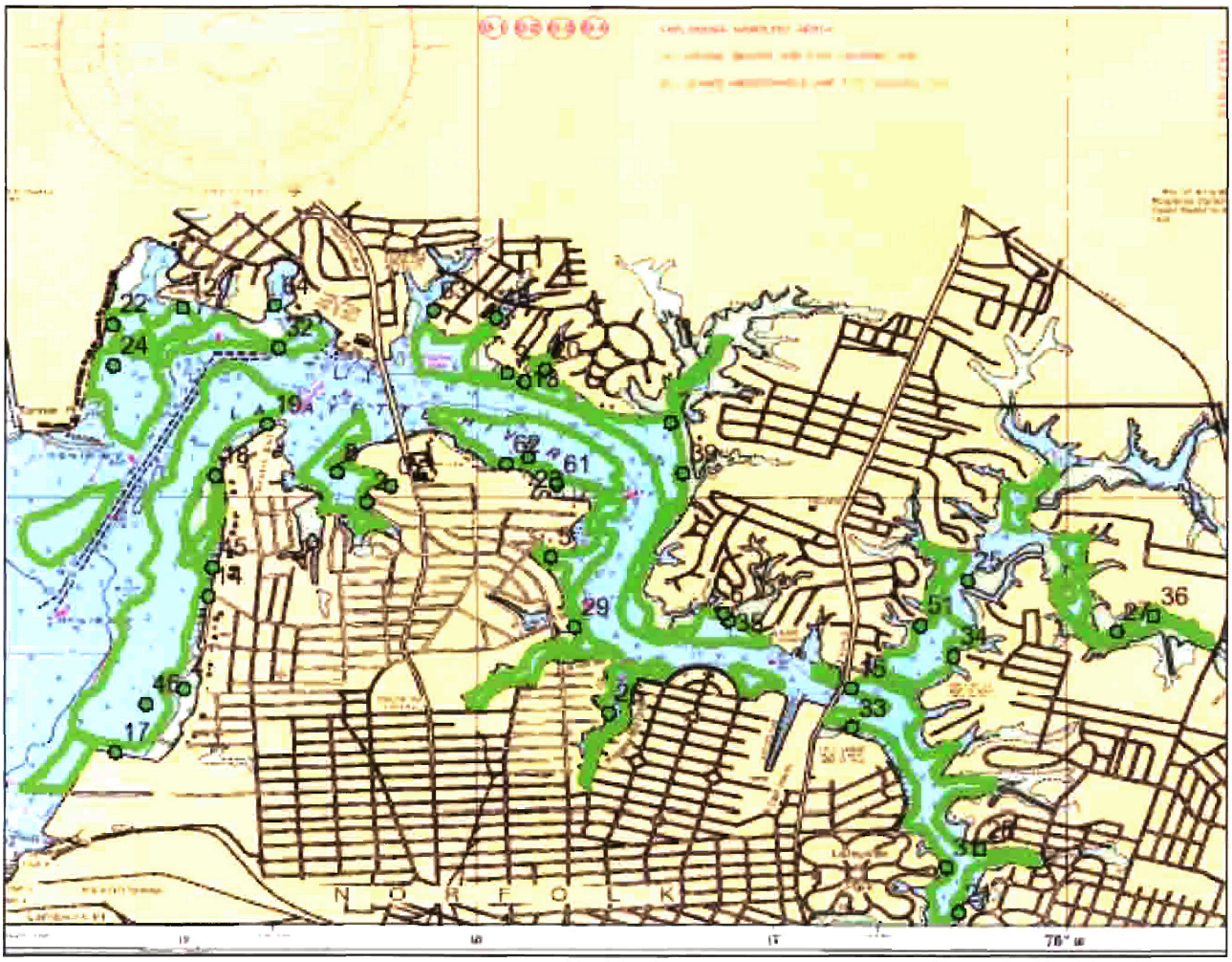


**Figure 3. Chart of 'Shallow' (< 1.3 m) sampling sites within the Craney Island-Lafayette River system. Yellow shading is land, blue shading is water, and green, thick lines encompass possible sampling regions within the proposed CI-LR system. Green filled circles with large black numbers are 40 random sampling sites, and small black numbers are depths from a nautical chart.**

One of the shallow sites was sieved on a larger mesh and was therefore removed from the analysis, leaving 39 shallow sites. We selected a stratum sample size of 40 because a statistical power analysis indicated that we would have an 80 % probability of detecting a 30 % difference in density between strata at $\alpha = 0.05$ (Coefficient of Variation = 50 %). Within the Craney Island and Lafayette River (CI-LR) system, 'Shallow' sampling was conducted 17-19 September 2002, 'Craney Island' and 'Deep' sampling was conducted 23-25 September 2002, and the gear efficiency study was conducted 26 September 2002.

***a. Physical variables & bivalve collections***

Water temperature, salinity, and dissolved oxygen were assessed at a majority of sites (if two sites were in close proximity, physical variables were only measured at one). We also took 2.5-cm-diameter surface sediment cores for grain size analysis. A total of 26-30 samples per zone was used for the grain-size comparisons. The percentage of gravel (>2 mm), sand (> 62.5 μm), silt (4 phi) and clay (8 phi) in sediments was determined by standard wet sieve and pipette analysis (Folk 1974; phi = - [ln (particle diam.)/ ln(2)]). Bivalves were quantified using a box core or suction sampling gear, both of which sample a large surface area and penetrate deeply into the sediment. This is essential for accurate estimation of densities of large bivalves that dwell deeply (40 cm) in the sediment and that are sparsely distributed.

For the deep-water sampling, we used a 25 cm x 25 cm box core that penetrates up to 60 cm into the sediment and that requires deployment from a relatively large research vessel (> 10 m long). Benthic cores were subsampled for sediment grain size and the remainder of the sediment was sieved on a 1-mm-mesh screen. All bivalves retained on the screen were identified to genus or species, measured, and frozen for biomass estimates.

For the shallow-water sampling, we used a suction apparatus (with attached 1-mm-mesh bag) from a small vessel (~ 7 m long). Bag contents were sieved on a 1-mm-mesh screen. All bivalves retained on the screen were identified to genus or species, measured, and frozen for biomass estimates. We compared average size among zones for species that had numerous individuals in all three zones (Craney Island, Deep, and Shallow).

***c. Gear efficiency***

Since two different gear types (box core and suction apparatus) were employed, a gear efficiency comparison was conducted. At each of three sites in the York River that had high clam densities and were accessible to both the large research vessel (sampled by box core) and the smaller vessel (sampled by suction apparatus), bivalves were sampled by five box cores and by five suction samples, generating 15 core and suction samples for analysis. These samples were compared with a two-way analysis of variance model with gear type and site as fixed factors.

***d. Biomass estimates***

To obtain biomass in terms of ash free dry weight (AFDW), clams collected for this project were dried to obtain dry weight, and ashed in a muffle furnace to obtain ash weight. Ash weight was subtracted from dry weight estimates to determine AFDW for biomass comparisons. The largest and most abundant clams, *Tagelus plebeius* and *Macoma balthica*, were shucked prior to ashing to remove additional weight of the periostracum associated with large shells. The other clam species were too small for shucking (<10mm length) or had thin shells, which could not withstand shucking. Juvenile clams of *M. mercenaria* were also too small to allow shucking. The effect of the periostracum on AFDW of small clams was assumed to be negligible.

Numerous *M. balthica* and *T. plebeius* were collected (>200 individuals ranging from 8.5-35.2 mm shell length for *M. balthica* and 8.7-80.0 mm shell length for *T. plebeius*).

To avoid drying and ashing each individual clam, a regression of length to AFDW was derived and used to estimate biomass from size. A sample of clams spanning the entire range of sizes (~80 from each species) was chosen for use in a regression analysis of biomass per unit length for *M. balthica* and *T. plebeius*. Because other species were not collected in large numbers (<75 individuals/species), each clam was dried and ashed.

Drying and ashing procedures

We prepared numbered, marked aluminum weighing dishes and aluminum foil cups in which to place the clam meats after they were shucked, or whole clams if they were not shucked. Then, we took frozen clams and measured their length, placed the clam tissue into its weighed cup, and then weighed the cup with clam to obtain a wet weight. We placed the cups with clams in the drying oven for four days at 60°C. We removed the dried clams from the oven, immediately placed them into a dessicator, and later weighed each clam and cup to obtain dry weight. We then placed each clam into the muffle furnace, and ashed for four hours. After the clams had been ashed, we removed them from the furnace (placing them into a dessicator) and weighed their ashes to obtain ash weight. We subtracted the ash weight from the dry weight to obtain AFDW. We then plotted AFDW as a function of length, and fit the best regression equation to the data. For both *M. balthica* and *T. plebeius*, our best-fit equations were the following power functions (Figs 4 and 5):

*M. balthica* : $y=ax^b$ where a=0.000005057, b=3.0068 ($r^2 = 0.88$, $P < 0.001$);
*T. plebeius* : $y=ax^b$ where a=0.000011, b=2.6189 ($r^2 = 0.94$, $P < 0.001$).

We used the equations to calculate AFDW for all *M. balthica* and *T. plebeius* clams, including those used for the regression, using the field-recorded measurements of length (most accurate measure of length). For all other species, if a clam was crushed and unusable for ashing, an AFDW was assigned to it using a clam of similar length, or using an average value for that species and size class.

For clams of the species *Aligena elevata*, many clams were too badly crushed to measure and dry. Therefore, after ashing and drying 51 individuals (lengths 3.3-11.5 mm), a special procedure was followed to assign an AFDW to each field-recorded clam. For

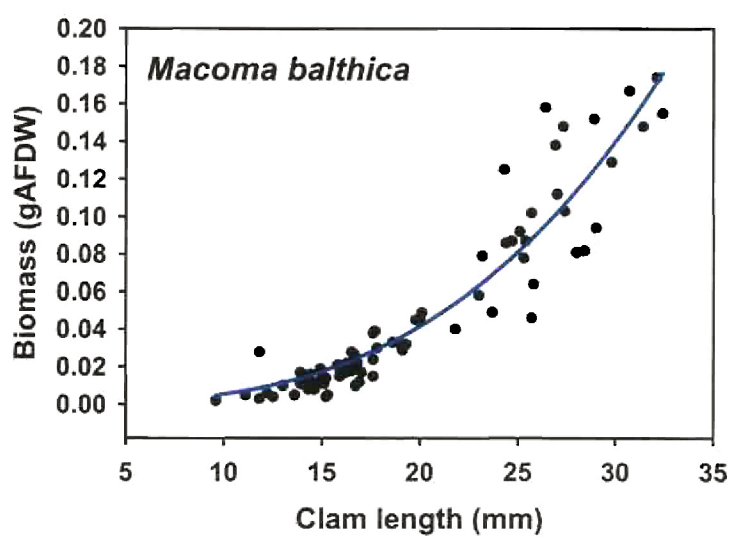


**Figure 4. Biomass versus clam length for 78 *Macoma balthica* from the Lafayette River. Black dots are individual clams and blue line is best fit regression (power function, $r^2 = 0.88$, $P < 0.001$).**

clams at or above the maximum length of clams dried and ashed, we assigned the maximum AFDW obtained (0.007g). For clams in a size range slightly below the maximum (6.0-6.7 mm), we assigned an AFDW of 0.006g (based on the weight for the largest clam in the size range 5.0-5.9 mm -- 0.004 and the weight of a 7.6 mm clam -- 0.007). To assign weights for the remaining clams of length <6.0 mm, we broke the AFDW data into two size classes (3-5 mm and 5-6 mm), found the mean of AFDW values in each class, and assigned that mean to each clam in the respective size classes. These mean weights were both = 0.001g. Clams with lab AFDW ≤ 0 were excluded from the calculation of mean values because it was assumed that all clams did have a positive weight, but less than that detectable by our balance (accurate to 0.001g). Fortunately, the collective biomass of this species was low, such that variation in the calculation of AFDW had little effect upon the results of the community analysis.

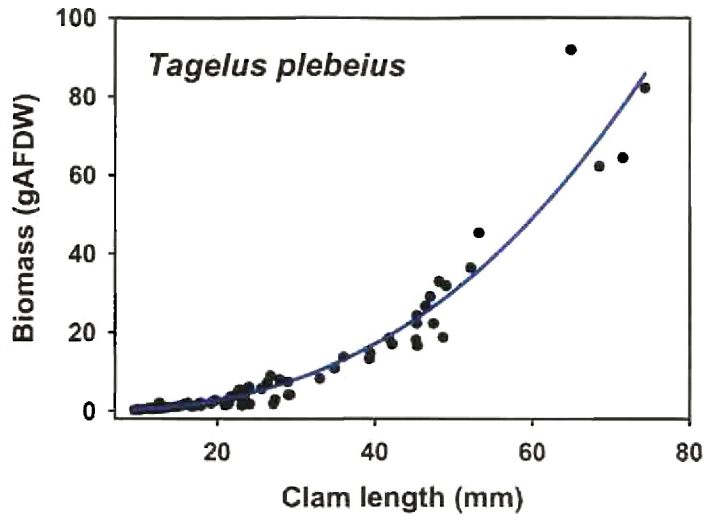


**Figure 5. Biomass versus clam length for 84 *Tagelus plebeius* from the Lafayette River. Black dots are individual clams and blue line is best fit regression (power function, $r^2 = 0.94$, $P < 0.001$).**

### *e. Impact assessment*

Using density and biomass estimates, respectively, from each stratum (i.e., CI, deep, and shallow) and the area of habitat that was encompassed in each stratum, we estimated the overall abundance and standing stock, respectively, for each of those habitats and estimated the potential loss of biomass due to alteration of Craney Island as a percentage of the abundance and biomass of the entire CI-LR system. From the abundance and biomass loss estimates, we derived estimates for mitigation options.

## Results

### *a. Physical variables*

As expected, temperature was significantly higher in the shallow (26.6 °C) than the deep (25.2 °C) or Craney Island (24.7 °C) zones (ANOVA, df = 65, F = 43.96, P < 0.0005, Tukey test). Salinity was significantly lower in the shallow (18.4 ppt) than the deep (21.4 ppt) or Craney Island (24.3 ppt) zones (ANOVA, df = 62, F = 9.0, P < 0.0005, Tukey test). Dissolved oxygen was normoxic (> 2 mg/L) at 4.0-12.0 mg/L across all sampling sites.

The mean percentage of sand, silt, and clay differed significantly by zone (Fig. 6). The percentage of silt was significanlty higher (ANOVA, df = 81, F = 3.78, P = 0.027, Tukey test) in 'Craney Island' (43.18 % ± 3.96) than in the 'Deep' (32.62% ± 2.95) or 'Shallow' zones (29.33 ± 4.27). The percent sand was significantly lower (ANOVA, df = 81, F = 3.76, P = 0.027, Tukey test) in the 'Deep' (25.60 ± 5.60) than in the 'Shallow' (46.22 ± 7.44) zone but did not differ from the 'Craney Island' zone (27.68 ± 4.17). Examining individual sites using Shepard's ternary diagram, it is also apparent that shallow zones had higher sand content, whereas Craney Island sites had higher silt content (Fig. 7).

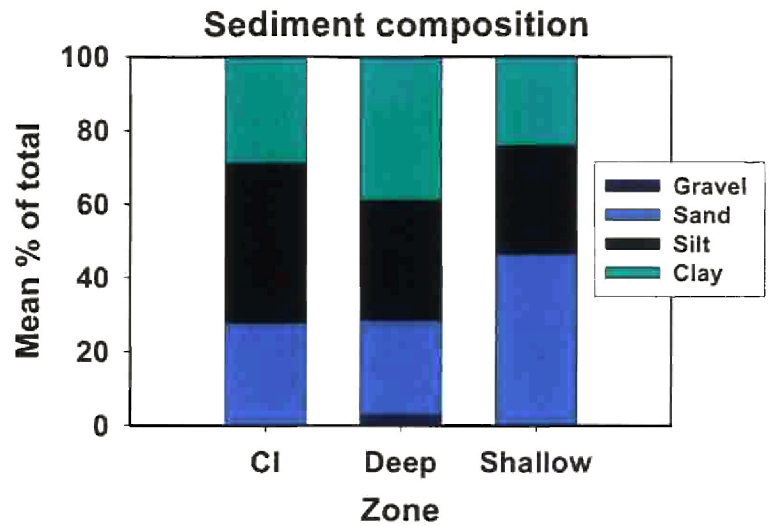


**Figure 6. Mean percent of gravel, sand, silt and clay in surface sediments from 'Craney Island', 'Deep', and 'Shallow' zones.**

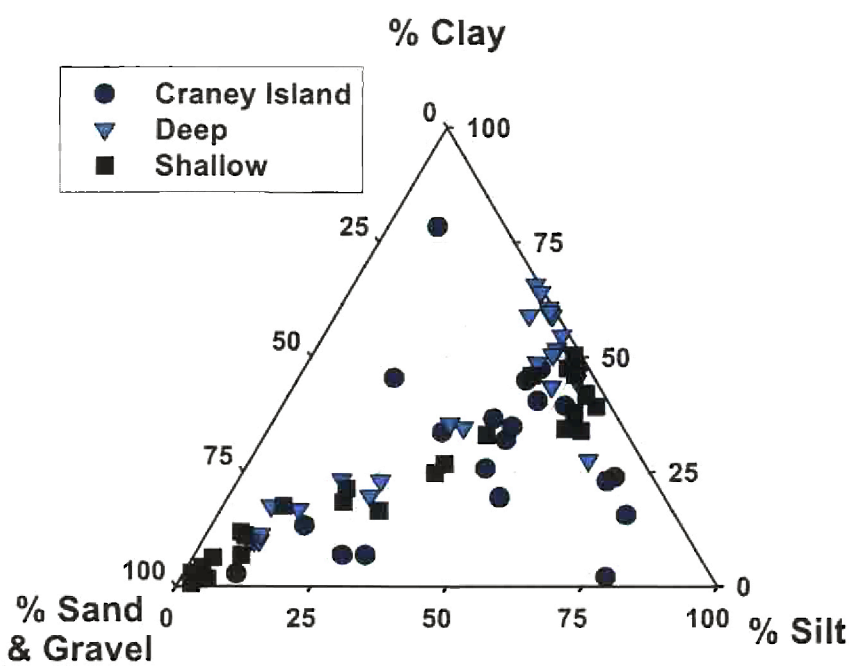


**Figure 7. Ternary diagram comparing grain size composition of surface sediments from 26-30 sites each in three zones, 'Craney Island', 'Deep', and 'Shallow.'**

***b. Bivalve collections***

Of our samples, 41 were in the 'Craney Island' zone, 40 in the 'Deep' zone, and 40 in the 'Shallow' zone (though one shallow site was removed since grain size would not allow sieving on a 1 mm mesh). We collected a total of 550 clams among all three zones. We found several common bivalve species including the thin-shelled clams *Macoma balthica, M. mitchelli and M. tenta*, the stout razor clam *Tagelus plebeius*, the hard clam *Mercenaria mercenaria*, as well as *Mulinia lateralis*, *Aligena elevata*, *Anadara* sp., *Gemma gemma*, and the angel wing clam *Cyrtopleura costata* (Table 1). The most numerous bivalve was *Macoma balthica*, comprising 40 % of clams collected. *Tagelus plebeius* was also dominant, comprising 36 % of clams collected. Only four species were collected in the 'Craney Island' zone, whereas seven species were collected in the 'Deep' zone, and nine species were collected in the 'Shallow' zone (Table 1).

**Table 1**. Mean densities (number of individuals $m^{-2}$) and standard error (SE) of bivalves found in 120 samples in each of three sampling areas, 'Craney Island'(CI), 'Deep' (D > 1.3 m MLW), and 'Shallow' (S < 1.3 m MLW). The P-value from the analysis of variance is listed, as well as the results of a Tukey multiple comparison test (at $P < 0.05$) to show which habitats differed significantly in bivalve density. ns = not significant ($P > 0.05$).

| **Species** | **Craney Is.** Mean (SE) | **Deep** Mean (SE) | **Shallow** Mean (SE) | **P-value** | **Tukey Test** |
|---|---|---|---|---|---|
| *Macoma balthica* | 0 | 1.20 (0.89) | 32.73 (7.40) | 0.0005 | S > CI, D |
| *Tagelus plebeius* | 2.34 (1.63) | 6.00 (1.69) | 27.00 (8.23) | 0.001 | S > CI, D |
| *Macoma mitchelli* | 0 | 0.40 (0.40) | 2.26 (0.83) | 0.010 | S > CI, D |
| *Aligena elevata* | 3.51 (3.51) | 1.60 (1.60) | 9.20 (3.89) | 0.218 | ns |
| *Mercenaria mercenaria* | 0 | 0.80 (0.56) | 2.11 (0.95) | 0.060 | ns |
| *Mulinia lateralis* | 0 | 0 | 0.95 (0.51) | 0.041 | S > CI, D |
| *Anadara* sp. | 0 | 0 | 0.30 (0.30) | 0.357 | ns |
| *Cyrtopleura costata* | 0 | 0.80 (0.80) | 0 | 0.371 | ns |
| *Macoma tenta* | 1.71 (0.66) | 0.80 (0.80) | 0 | 0.253 | ns |
| *Gemma gemma* | 0.39 (0.39) | 0 | 1.06 (0.81) | 0.341 | ns |
| *Mya arenaria* | 0 | 0 | 0.15 (0.15) | 0.357 | ns |
| Total bivalves | 7.41 (4.33) | 11.60 (2.75) | 75.70 (11.70) | 0.0005 | S > CI, D |

*c. Gear comparison*

There was no significant effect of gear type (i.e., box core or suction sampler) upon the density of clams collected (Fig. 8)(2-way ANOVA with the factors gear [$P = 0.520$], and site [$P < 0.05$], df = 14).

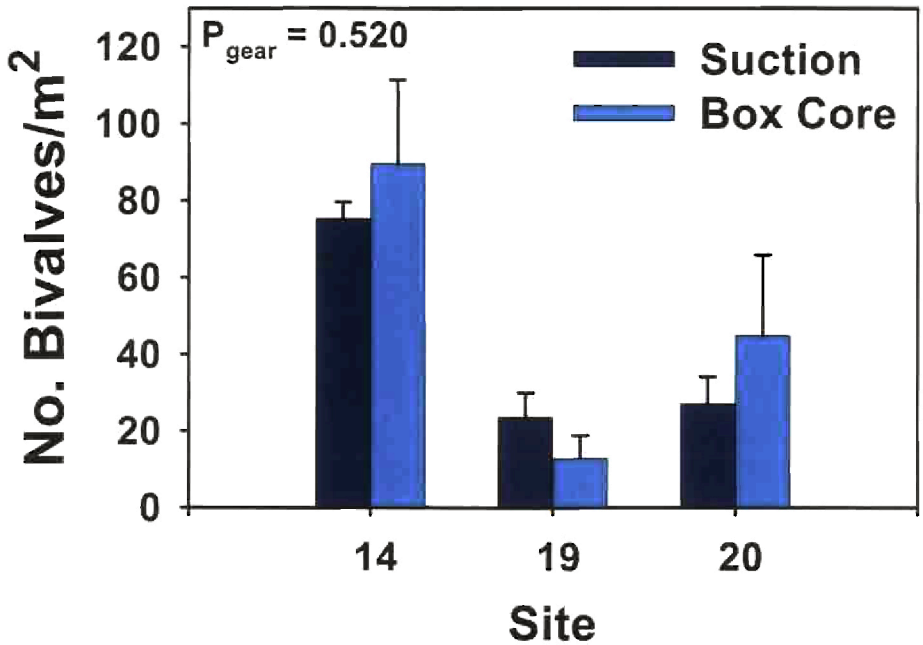


**Figure 8. Mean density of bivalves (+ SE) by site with two different sampling gears, box core (light bars) and suction sampler (dark bars).**

*d. Bivalve density and diversity*

The box core sampled 0.0625 $m^2$ of sediment area, whereas the suction sampling device sampled 0.170 $m^2$. We therefore standardized densities in all samples to number of individuals per $m^2$. The pattern for bivalves among the three zones was similar regardless of the variable examined; the number of clams was lowest in the 'Craney Island' zone, intermediate in the 'Deep' zone, and much higher in the 'Shallow' zone. The density (i.e., total number per $m^2$) of clams was significantly lower in the 'Craney Island' and 'Deep' zones than in the 'Shallow' zone (Fig. 9a; ANOVA, df =119, F = 27.65, $P < 0.0005$, Tukey test). The shallow-zone bivalve density (75.7 bivalves/$m^2$) was nearly an order of magnitude higher than either the Craney Island zone (7.4 bivalves/$m^2$) or the deep zone (11.6 bivalves/$m^2$). Mean bivalve species richness (i.e., total number of bivalve species per $m^2$) was significantly lower in the 'Craney Island' zone than in the 'Deep' zone, and both were significantly lower than bivalve richness in the 'Shallow' zone (Fig. 9b; ANOVA on log-transformed data, df =119, F = 51.58, $P < 0.0005$, Tukey test $P < 0.05$ for multiple comparisons).

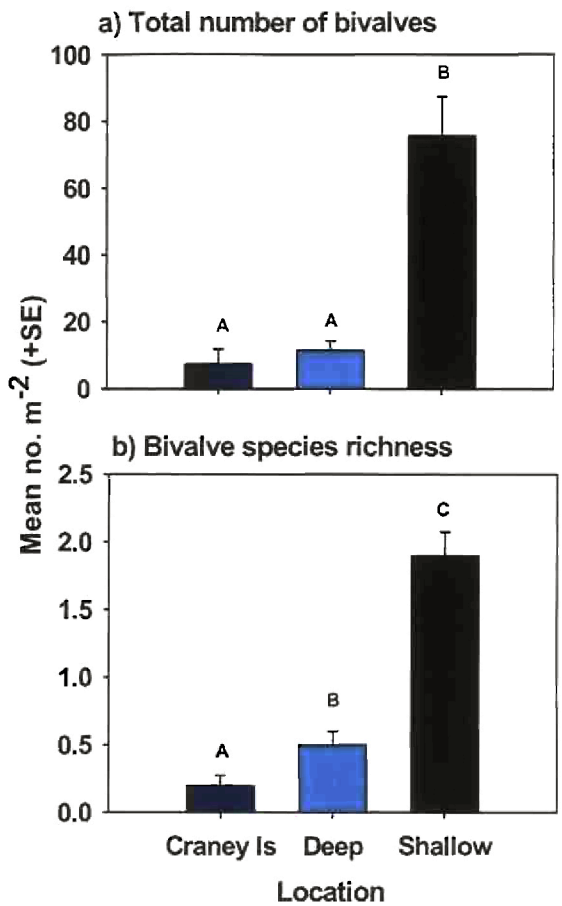


Figure 9. a) Mean bivalve density (+SE) for three locations: Craney Island, Deep, and Shallow. b) Mean bivalve species richness (+SE) for three locations: Craney Island, Deep, and Shallow. Distinct letters above bars indicate significant differences (Tukey Test).

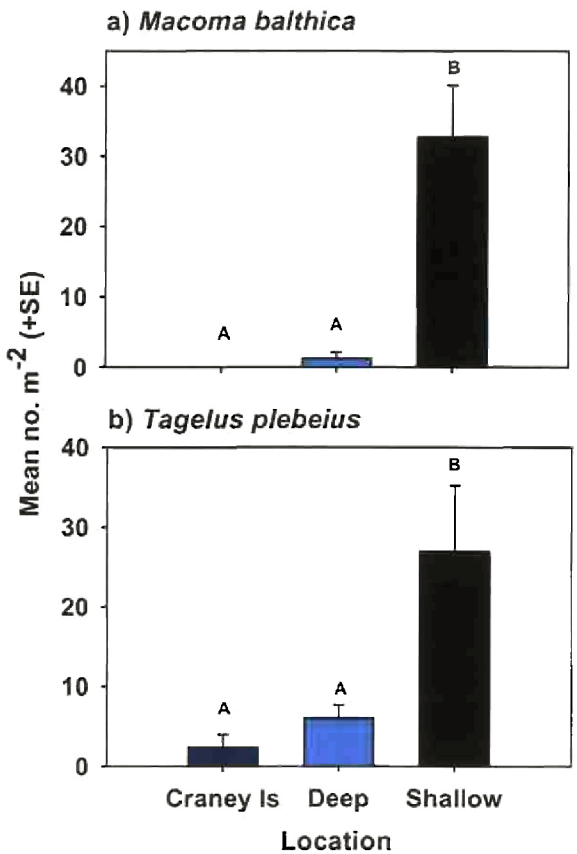


Figure 10. a) Mean density (+SE) of the bivalve *Macoma balthica* in three locations: Craney Island, Deep, and Shallow. b) Mean density (+SE) of the bivalve *Tagelus plebeius* in three locations: Craney Island, Deep, and Shallow. Distinct letters above bars indicate significant differences (Tukey Test).

The density of the most common bivalve, *Macoma balthica*, was significantly lower in the 'Craney Island' and 'Deep' zones than in the 'Shallow' zone (Fig. 10a; ANOVA, df =119, F = 19.34, P < 0.0005, Tukey test), as was the density of the second most common bivalve, *Tagelus plebeius* (Fig. 10b; ANOVA, df =119, F = 7.51, P = 0.001, Tukey test).

***e. Abundance and percentages***

As an estimate of the overall abundance of bivalves in the three areas, we multiplied the area sampled in each zone by bivalve density to calculate bivalve abundance. The area in each zone was 253.83 hectares (ha) in the 'Craney Island' zone, 625.02 ha in the 'Deep' zone, and 467.96 ha in the 'Shallow' zone (Fig. 11a). The percentage of the total area within the 'Craney Island' zone was 18.86 %, within the 'Deep' zone it was 46.41 %, and within the 'Shallow' zone it was 34.75 %. Multiplying the area available for sampling by mean density of bivalves, we estimate abundances of 18.8 million bivalves for the 'Craney Island' zone, 72.5 million for the 'Deep' zone, and 354.4 million for the 'Shallow' zone (Fig. 11b). Using these estimates, the percentage of bivalves within the 'Craney Island' zone (and potentially lost due to the Craney Island expansion) was 4.2 %, whereas it was 16.3 % in the deep zone, and 79.5 % in the shallow zone.

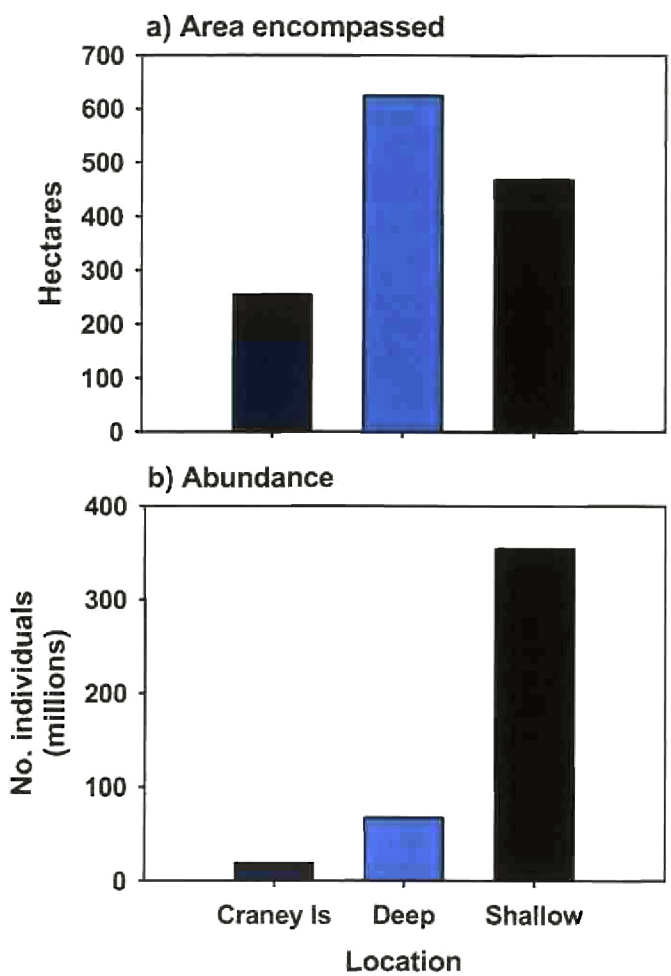


**Figure 11. a) Area (in hectares) encompassed in sampling zones within the Craney Island-Lafayette River system. b) Abundance of bivalves in each sampling zone, 'Craney Island', 'Deep', and 'Shallow'.**

### *f. Sediment and clam regressions*

The density of bivalves in all three zones was highly positively correlated with % sand (Fig. 12; regression significant at $P < 0.0005$, $r^2 = 24.7$ %), and negatively correlated with % silt (Fig. 13; regression significant at $P = 0.001$, $r^2 = 12.4$ %) of surface sediments.

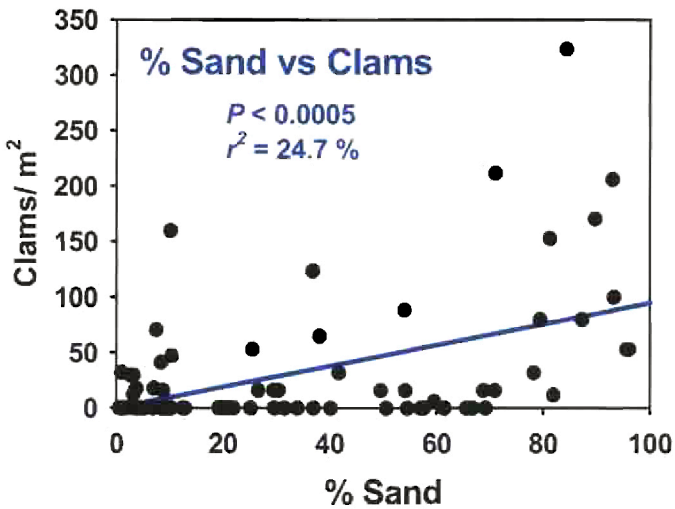


**Figure 12. Regression of clam density (No. $m^{-2}$) versus % sand in surface sediments from all three sampling zones.**

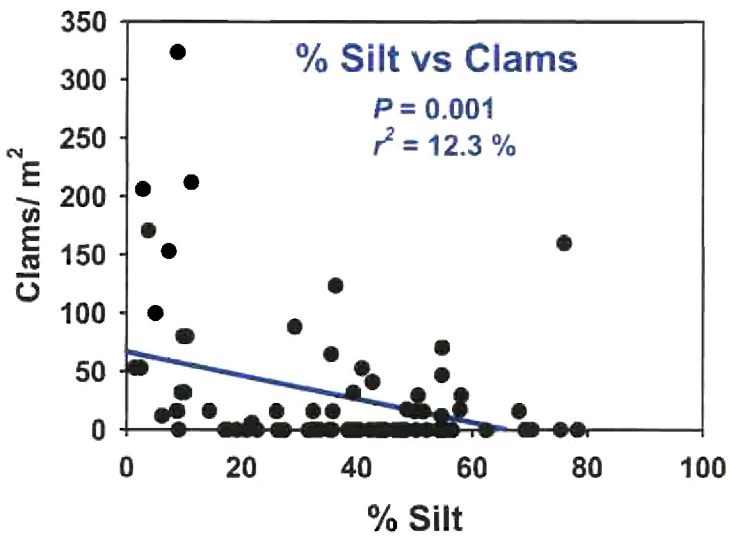


**Figure 13. Regression of clam density (No. $m^{-2}$) versus % silt in surface sediments from all three sampling zones.**

### *g. Bivalve size comparisons*

The mean size of all bivalves was significantly smaller in 'Craney Island' than in the 'Shallow' zone (Fig. 14a; ANOVA, df = 546, F = 5.35, P = 0.005, Tukey test P < 0.05 for multiple comparisons). *Tagelus plebeius*, the most abundant bivalve that was found in all three zones, was significantly smaller in the 'Craney Island' and 'Deep' zones compared to the 'Shallow' zone (Fig. 14b; ANOVA, df =198, F = 3.45, P = 0.034, Tukey test P < 0.05 for multiple comparisons).

### *h. Bivalve biomass*

The box core sampled 0.0625 $m^2$ of surface area, whereas the suction sampling device sampled 0.170 $m^2$. We therefore standardized biomass in all samples to biomass (g AFDW) per $m^2$. The pattern for bivalve biomass among the three zones was similar to that for density. The mean biomass per $m^2$ of clams was significantly lower in the 'Craney Island' and 'Deep' zones than in the 'Shallow' zone (Fig. 15; ANOVA, df =119, F = 13.98, P < 0.0005, Tukey test). The shallow zone bivalve biomass was 80 times

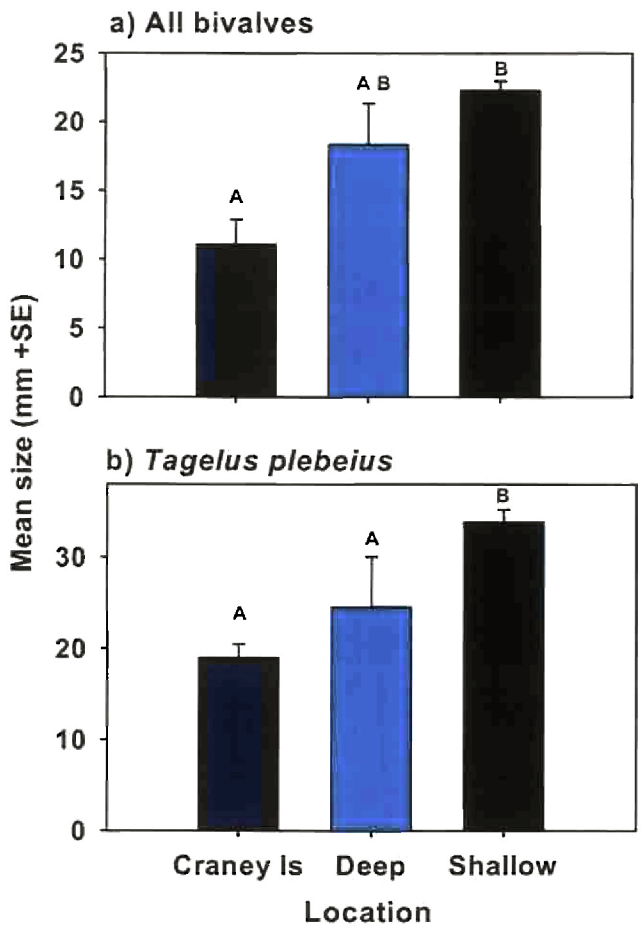


**Figure 14. a) Mean size (+SE) of all bivalves in three locations: Craney Island, Deep, and Shallow. b) Mean size (+SE) of the bivalve *Tagelus plebeius* in three locations: Craney Island, Deep, and Shallow. Distinct capital letters above bars indicate significant differences (Tukey Test).**

higher than the Craney Island zone and 7 times higher that the Deep zone. The total biomass of all samples was 47.997 g AFDW. Of the total, *Tagelus plebeius* made up 73.11 %, *Macoma balthica* made up 25.21 %, and together these two most common species accounted for 98.32 % of the biomass.

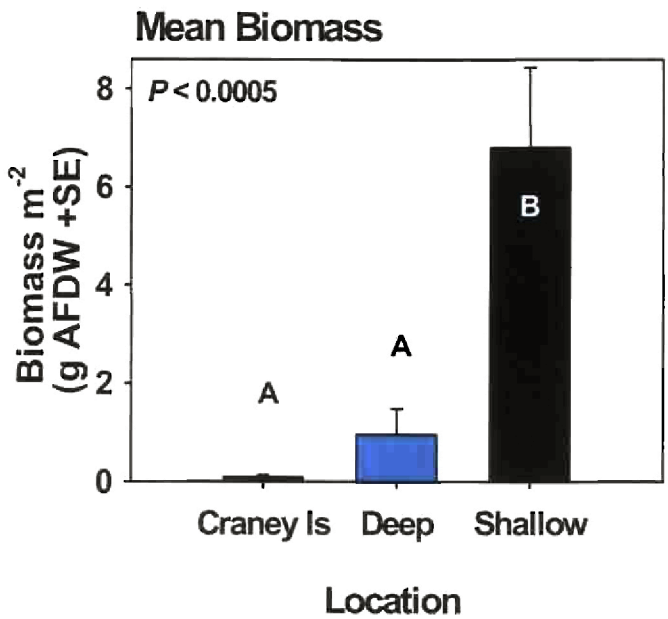


**Figure 15. Mean bivalve biomass per $m^2$ (+SE) in three locations: Craney Island, Deep, and Shallow. Distinct capital letters indicate significant differences.**

*Tagelus plebeius* was the most important bivalve in terms of biomass, and was the second most common bivalve in terms of density (see Results section ***d***). *Tagelus* biomass was significantly lower in the 'Craney Island' and 'Deep' zones as compared to the 'Shallow' zone (Fig. 16; ANOVA, df =119, F = 6.85, P = 0.002), due to the much smaller size of these clams in the 'Craney Island' and 'Deep' zones. *Macoma balthica* was the most common bivalve by number and the second most important in terms of biomass; *Macoma* were not found in the 'Craney Island' zone, their biomass was low in the 'Deep' zone, and their biomass was significantly higher in the 'Shallow' zone (Fig. 17; ANOVA, df =119, F = 14.78, P < 0.0005). *Aligena elevata* was also found at all three sites but biomass was similar among sites (< 0.15 g AFDW) and ANOVA was not possible since only one clam of this species was found in both the 'Craney Island' and 'Deep' zones.

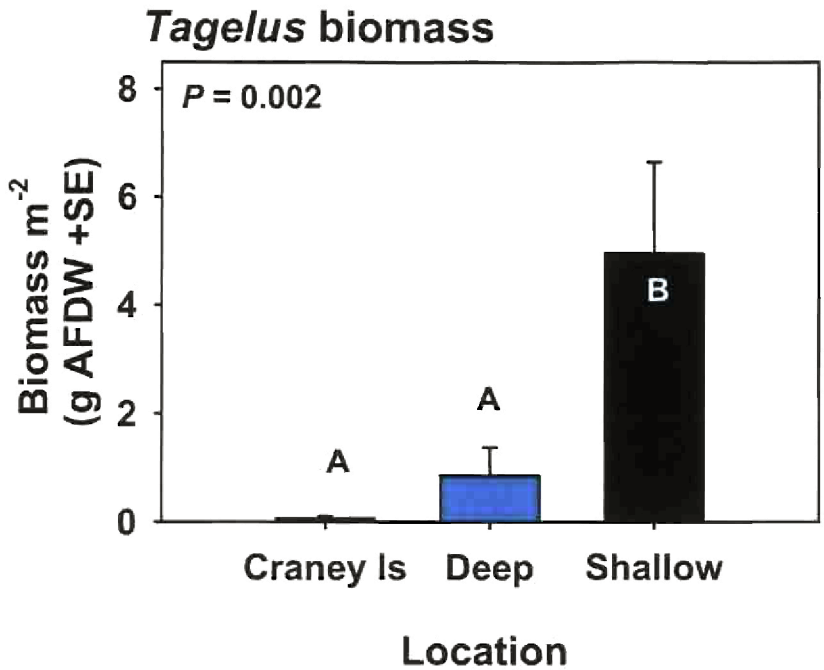


Figure 16. Mean biomass per $m^2$ (+SE) of the bivalve *Tagelus plebeius* for three locations: Craney Island, Deep, and Shallow. Different capital letters indicate significant differences (Tukey test).

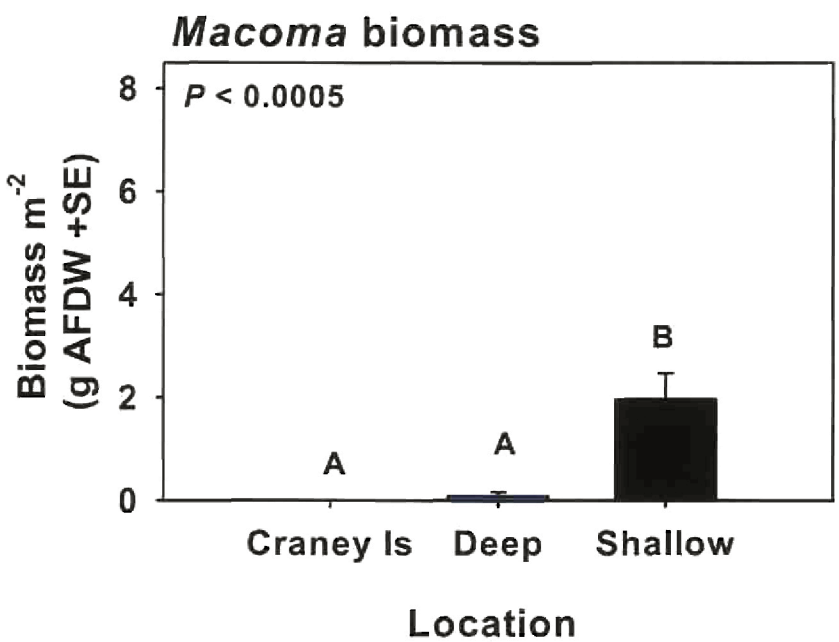


Figure 17. Mean biomass per $m^2$ (+SE) of the bivalve *Macoma balthica* for three locations: Craney Island, Deep, and Shallow. Different letters indicate significant differences (Tukey test).

*i. Biomass percentages*

To generate an estimate of the total bivalve biomass in each of the three areas, we calculated the product of the area in each zone and the mean biomass per unit area of each zone. The area we calculated in each zone was 253.83 hectares (ha) in the 'Craney Island' zone, 625.02 ha in the 'Deep' zone, and 467.96 ha in the 'Shallow' zone (Fig. 18a). The percentage of the total area within the 'Craney Island' zone was 18.86 %, within the 'Deep' zone it was 46.41 %, and within the 'Shallow' zone it was 34.75 %. From the product of the area and the mean biomass per unit area in each zone, we estimated a total bivalve biomass of 215 kg AFDW in the 'Craney Island' zone, 5,950 kg AFDW in the 'Deep' zone, and 31,821 kg AFDW in the 'Shallow' zone (Fig. 18b). Using these estimates, the total biomass in the system was 37,986 kg AFDW, of which 0.56 % was within the 'Craney Island' zone (and potentially lost due to the Craney Island expansion), 15.66 % was within the deep zone, and 87.77 % was in the shallow zone. The low biomass in the 'Craney Island' zone occurred because it had few bivalves, and those that were present were small and therefore of low biomass.

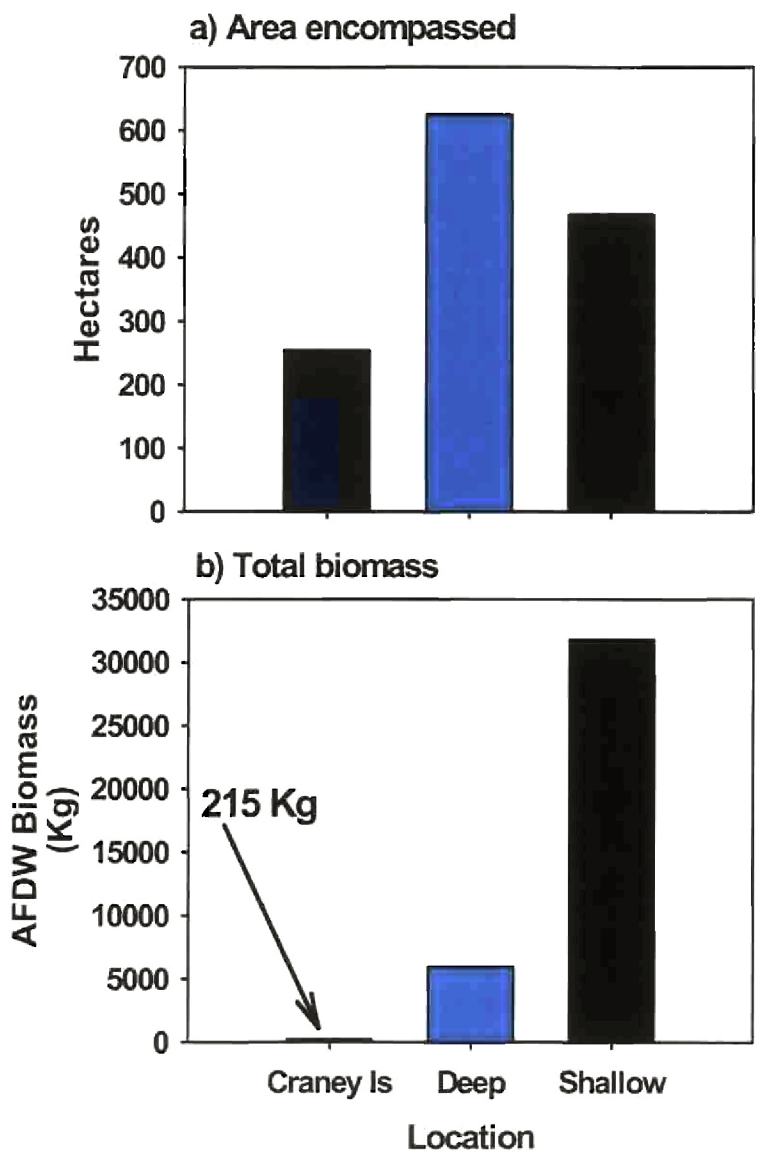


**Figure 18. a) Area (in hectares) included in sampling zones within the Craney Island-Lafayette River system. b) Total biomass of bivalves in each sampling zone, 'Craney Island', 'Deep', and 'Shallow'.**

*j. Impact assessment*

Using density and biomass estimates, we calculated a range of mitigation goals that would be appropriate for the potential loss of benthic bivalves due to the Craney Island expansion. The abundance estimates are more liberal and result in an upper estimate of the area necessary for mitigation since there were numerous individuals in the proposed Craney Island expansion. The biomass estimates are lower due to the generally small size of bivalves in the Craney Island zone, and represent a lower limit of the area needed for mitigation. We propose mitigating for the loss due to the Craney Island expansion by using shallow habitats since these areas have high abundance and biomass/m$^2$ and would have a larger impact for a smaller unit of area than deep waters. Furthermore, within the shallow habitats, the highest densities of bivalves were found in subtidal marsh habitats, which would therefore be ideal for mitigation since one could get the greatest impact per unit area by restoring marsh habitats.

For example, within the shallow-water habitats that we sampled, we compared densities of bivalves associated with different shoreline types and found that mean densities were higher adjacent to 'Natural Marsh' (109.8 bivalves/m$^2$) than 'Rip Rap' (38.2 bivalves/m$^2$) or 'Bulkhead' (27.7 bivalves/m$^2$). For some species, such as *Macoma balthica*, this difference was statistically significant (Fig. 19a), whereas for others, such as *Tagelus plebeius*, it was not (Fig. 19b). Given that natural marsh habitats house higher densities of clams, if one mitigates with natural marsh, then the area of shoreline habitat that would be needed would be less than that needed for shallow water in general.

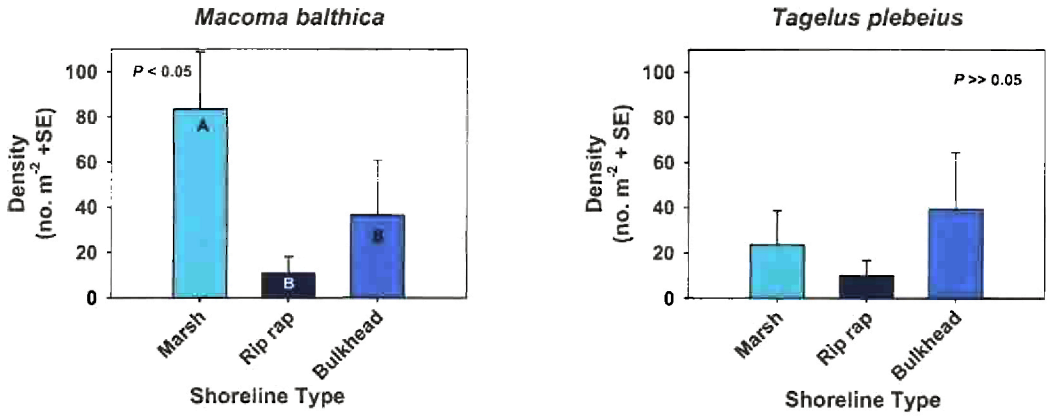


**Figure 19. Comparison of mean density (+ SE) of clams in shallow subtidal habitats adjacent to 'Marsh', 'Rip Rap' or 'Bulkhead' for a) *Macoma balthica* (left panel) and b) *Tagelus plebeius* (right panel). Different capital letters indicate significant differences (Tukey test).**

To estimate the quantity of bivalves lost in the proposed Craney Island expansion, if we use the more liberal estimates of mean bivalve density (7.4 bivalves/m$^2$ in the 'Craney Island' zone) and multiply by the area of the zone (253.83 ha), then the abundance of bivalves lost would be 18.8 million. If shallow-water habitat were used to mitigate (i.e., most beneficial per unit area), then using our estimates of shallow-water densities (75.7 bivalves/m$^2$), approximately 25 ha would be needed to reclaim 18.8 million bivalves. If a

given shoreline were "shallow" (i.e., less than 1.3 m) out to 50 m, then 5 km of shoreline would be needed to achieve 25 ha. If one were to mitigate using natural marsh habitats (highest densities/$m^2$), then the area of shoreline habitat that would be needed is 17.1 ha. In this case, 3.4 km of 50-m-wide natural marsh would be needed to equal 17.1 ha.

Alternatively, if we use our estimates for the potential loss of *biomass* from the proposed Craney Island expansion, the area for mitigation is less (owing to the diminutive biomass within the proposed Craney Island expansion). If we use the estimates of mean bivalve biomass (0.0847gAFDW/$m^2$ in the 'Craney Island' zone) and multiply by the area of the zone (253.83 ha), then the potential biomass of bivalves lost would be 215 kg AFDW. If shallow-water habitat were used to mitigate, then using our estimates of shallow-water biomass (6.8 g AFDW/$m^2$), approximately 3.15 ha would be needed to recover 215 kg of biomass. If a given shoreline were "shallow" (i.e., less than 1.3 m) out to 50 meters, then 632 meters, or 0.6 km of shoreline would be needed to equate to 3.15 ha.

In summary, the range of shoreline areas needed for mitigation depends upon the approach taken in viewing the potential losses. We estimate that approximately 0.6 to 5 km of 50-m-wide shallow shoreline would be needed to house the biomass and density of bivalves potentially lost due to the Craney Island expansion. However, we pose a couple of caveats to keep in mind regarding the interpretation of this study and its limitations. This was a single 'snap-shot' in time in the fall, after the majority of predation upon the benthos had occurred throughout the summer. The bivalve community that we sampled was, therefore, the remaining adult community available for reproduction of future generations of individuals. However, the absence of any large clams (e.g., adults) in the deeper habitats suggests that juveniles of dominant species such as *Macoma balthica* do not recruit to those habitats, suffer high mortality in those habitats, or emigrate from those habitats. Consequently, we would not expect our conclusions to change qualitatively, were we to repeat the study during the summer or spring. Nonetheless, the impact of seasonality on bivalve abundance patterns remains uncertain. Although we only quantified bivalve biomass, bivalves are representative of the benthic community (Boesch 1977), and we would therefore expect that restoring an appropriate area of shallow habitat would concurrently mitigate for other benthic species (e.g., polychaetes).

**Discussion and conclusions**

The area of the proposed Craney Island expansion had significantly lower bivalve density, diversity, and abundance than the adjacent deep-water habitats or shallow-water habitats in the Craney Island-Lafayette River (CI-LR) system. Bivalve density was significantly lower in the 'Craney Island' and 'Deep' zones than in the 'Shallow' zone. Indeed, bivalve density in shallow-water habitats was nearly 10-fold higher than that in the Craney Island area. The density of 10 out of 11 bivalve species (all except for *Macoma tenta*) was lower in the 'Craney Island' zone than the 'Deep' or 'Shallow' zones. Moreover, diversity in terms of species richness was lowest in the 'Craney Island' zone, which was significantly lower than that in 'Deep' habitats. Only four species of bivalves were collected in the 'Craney Island' zone, whereas seven species were collected in the adjacent deep habitats, and nine species were in the shallows.

The Craney Island expansion zone also had significantly lower mean bivalve biomass than the shallow-water habitats in the CI-LR system. Biomass in the 'Deep' zone was lower than in the shallow-water habitats, and higher but not significantly different from that in the 'Craney Island' zone. Since bivalve density in shallow-water habitats was nearly 10-fold higher than that in the Craney Island expansion area, and mean bivalve size was larger, the resultant biomass was much greater. The clams that comprised the biomass in the shallow zone were typically large individuals of *Macoma balthica* and *Tagelus plebeius*. Although some *Tagelus* and *Mercenaria* were present in the 'Craney Island' zone, they were usually smaller individuals (juveniles) with low biomass.

The collective data indicate that benthic habitats within the 'Craney Island' expansion zone are of inferior quality compared to nearby deep and shallow habitats. Within the CI-LR system, we estimated that there were approximately 445 million bivalves. Of these, only about 5 % (19 of 445 million) resided within the proposed Craney Island expansion area. Bivalve biomass within the Craney Island expansion constituted a small fraction of the biomass within the general area. Within the CI-LR system, we estimated that total bivalve biomass was approximately 37,986 kg AFDW. Of the total biomass, about 0.56 % (215 of 37,986 kg) was represented in the proposed Craney Island expansion area. Because of this extremely low bivalve biomass and because the bivalves were very small juveniles, the Craney Island area is not likely to be a significant feeding ground for the blue crab or demersal fish.

Given the high bivalve abundance, biomass, and diversity in shallow-water habitats, we recommend that mitigation efforts focus on enhancement of these productive habitats, particularly integrated salt marshes and shallow oyster reefs. Using a combination of our density and biomass estimates, we calculated a range of mitigation goals that could replace the potential loss of the benthic community in the Craney Island expansion area. Using the more liberal estimate of loss of bivalve abundance, 18.8 million bivalves would need to be replaced, whereas using bivalve biomass, 215 kg would need replacement. Based on our findings of significantly higher clam densities and biomass in shallow waters, we recommend that shallow-water habitats be restored in mitigation efforts for the potential loss of the benthic community in the proposed Craney Island expansion. Using this approach, then approximately 25 ha would be needed to reclaim 18.8 million bivalves, or 3.15 ha for 215 kg of bivalve biomass. Furthermore, given our estimates of higher bivalve densities in subtidal marsh habitats compared to other shallow-water habitats, we propose that marsh habitats be created and oyster reefs be restored in the adjoining shallows of the coastal marsh zone to produce an integrated landscape approach to mitigation.

**Acknowledgements**

Many thanks are due to Nancy Olmstead who coordinated and helped to conduct the field and laboratory research. We also thank the staff and students at the Virginia Institute of Marine Science who helped with the project including Mike Seebo, Deb Lambert, Kristen Delano, Marcel Montane, Chris Long, and Captain Charles Machen.

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# APPENDIX F

# NATIONAL ENVIRONMENTAL POLICY ACT COORDINATION TABLE

# Craney Island Eastward Expansion Feasibility Study
# ENVIRONMENTAL COORDINATION CHECKLIST

PROJECT TITLE: Craney Island Dredged Material Management Area (CIDMMA) East Expansion Feasibility Study and (Final) Environmental Impact Statement (EIS)

| ACTION | DATE | COMMENTS |
|---|---|---|
| **National Environmental Policy Act** | | |
| **Notice of Intent to Prepare an EIS** | | |
| Date of Notice in Federal Register | 03/02/01 | Completed |
| **NEPA Documentation** | | |
| Draft EIS prepared and circulated for review | 09/23/05 | Completed – Notice of Availability published in Federal Register |
| Mailing list prepared | 08/05 | Completed |
| Preparation of draft ROD | 1/06 | Ongoing and future completion date |
| Public review process initiated | 09/05 | Draft EIS sent out to public |
| Public review process completed | 05/06 | Future completion date |
| Final EA or EIS prepared (incl. comments) | 04/06 | Future completion date |
| Final (signed) FONSI/ROD | 08/06 | Future completion date |
| Final EIS to EPA | 04/06 | Future completion date |
| **Main Report Input (Feasibility)** | | |
| **Coordination, (Scoping) Environmental groups, Interest groups, etc.** | | |
| Letters or formal review process | Ongoing | A Stakeholders Group, NEPA Technical Committee, and Mitigation Subcommittee met regularly (27 meetings over 5 years) |
| Workshops/public meetings | Complete | |
| Informal coordination (phone calls, etc.) | Complete | |
| **Record of Decision (for EISs)** | | |
| Draft prepared, forwarded for review | 01/2006 | Future completion date |
| Date ROD signed | 08/2006 | Future completion date |
| Distribution to mailing list | 08/2006 | Future completion date |
| **Mitigation Planning/Compliance** | | |
| Plan developed | 06/2002 to 05/2005 | A "Consensus Mitigation Plan" has been developed with stakeholder input. Presented in Draft & Final EIS. |

| ACTION | DATE | COMMENTS |
|---|---|---|
| **National Environmental Policy Act** | | |
| **Mitigation Planning/Compliance (cont'd)** | | |
| Concurrence (Division, agencies, environmental groups) | 11/05 | Preliminary concurrence |
| Monitoring requirements | 9/05 | Presented in Draft & Final EIS |
| **Plans and Specifications** | | |
| Input to plans and specs prepared and coordinated with project manager and appropriate section for plans and specs | 8/2005 | Completed for Feasibility Phase Design |
| Review of final project plans and specs (constuctability conference) | 8/2005 | Completed for Feasibility Phase Design |
| **Coastal Zone Management Act** | | |
| Informal coordination with agency staff | 11/2000 to Present | CZMA presented in Draft & Final EIS |
| Coastal Consistency Determination (CCD) prepared | 2007/08 | CCD will be prepared and transmitted during PED concurrent with state permit(s) acquisition. |
| Transmittal of CCD to agency | 2007/08 | |
| Receipt of letter from agency | 2007/08 | During PED |
| **Clean Air Act** | | |
| Determine with state input whether area is an attainment or non-attainment area . | | Hampton Roads is a non-attainment area for 8-hr. ozone standard (as of April 2004). Presently in compliance with the NAAQS for all criteria pollutants other than ozone. Coordination with appropriate state and local agencies will be needed to demonstrate conformity with future SIP for Hampton Roads regional area. |
| Determine conformity with State Implementation Plan (SIP) | | |
| **Clean Water Act** | | |
| Determine need for 404 evaluation | 11/2000 | |
| Prepare 404(b)(1) evaluation | 09/2005 | Included in Draft and Final EIS |
| Determine 404(r) eligibility | --- | Not pursued for this project |
| Submit to state agency for water quality certification unless pursuing 404(r) | --- | Future date to be determined during PED |

| ACTION | DATE | COMMENTS |
|---|---|---|
| **National Environmental Policy Act** | | |
| **Endangered Species Act** | | |
| Letter to U.S. Fish and Wildlife Service requesting a list of threatened and endangered species in the area | Ongoing coordination | Coordination with F&WS has indicated that no threatened or endangered species under their jurisdiction would be impacted by the project. No Formal Section 7 consultation required. Planning Aid Report dtd 12/04/02, FWCA Report dated 11/1/05. USACE letter to NMFS dated 1/5/06 determined "not likely to effect" threatened or endangered species under their jurisdiction. |
| Preparation of biological assessment (if needed) | N/A | |
| Initiation of Section 7 Consultation | Complete | |
| Formal USFWS Biological Opinion | N/A | |
| Letter to NMFS Service requesting a list of threatened and endangered species in the area | Complete | |
| Preparation of biological assessment (if needed) | N/A | |
| Initiation of Section 7 Consultation | Future Date | Informal consultation completed with NMFS concurrence. |
| Formal NMFS Biological Opinion | N/A | No formal consultation req'd. |
| **Farmland Protection Policy Act** | | |
| Letter and Form AD 1006 requesting identification of Prime & Unique Farmlands | N/A | N/A |
| Receipt of response from Natural Resource Conservation Service | | |
| **Fish and Wildlife Coordination Act** | | |
| **U.S. Fish and Wildlife Service** | | |
| Coordination of scope of work and funding | 05/2000 | |
| Informal coordination (phone, meetings, field trips, etc., especially if no FWCA document required | Ongoing | Participation on NEPA Committee and Mitigation Subcommittee |
| Planning Aid Letter (for use as planning tool for alternative selection, mitigation) | 12/04/02 | Planning Aid Report prepared by F&WS |
| Coordination Act Report (include in EIS's) | 11/1/05 | Appears as Appendix in Final EIS |
| a. Draft CAR received | 11/05 | Will receive (projected date) |

| ACTION | DATE | COMMENTS |
|---|---|---|
| **National Environmental Policy Act** | | |
| **Fish and Wildlife Coordination Act (cont'd)** | | |
| **U.S. Fish and Wildlife Service** | | |
| b. Final CAR received | 11/05 | Will receive (projected date) |
| Mitigation Agreement (concurrence with recommendations) | 11/3/05 | Dept. of Interior, FWS letter dated 11/3/05 |
| **State Resource Agency (Coordination under Coordination Act)** | | |
| Informal coordination (phone, site visit, etc) | Complete | Participation on NEPA Committee and Mitigation Subcommittee |
| Letter of concurrence with project and mitigation | Complete | Received |
| **National Environmental Policy Act** | | |
| **National Marine Fisheries Service (Coordination under Coordination Act)** | | |
| Informal coordination (phone, site visit, etc) | 09/25/02 | |
| Letter of concurrence with project and mitigation (if applicable) | N/A | Final EIS answers extensive NMFS comments |
| **Magnuson-Stevens Fishery Management and Conservation Act (if applicable to project)** | | |
| Notify NMFS that an EIS is being prepared | 03/2001 | |
| USACE prepares EFH assessment | Complete | In Final EIS |
| Submit Draft EIS with EFH assessment section to NMFS for review | 09/2005 | Anticipated |
| Receipt of NMFS EFH Conservation Recommendations | Future Date | May not be applicable |
| USACE response to NMFS' EFH Conservation Recommendations within 30 days | Future Date | May not be applicable |
| **Marine Protection, Research, and Sanctuaries Act** | | |
| Section 103 – Bioassay protocol (USACE and USEPA review) | | (Possible) Future completion date during PED |

| ACTION | DATE | COMMENTS |
|---|---|---|
| **National Environmental Policy Act** | | |
| **National Historic Preservation Act** | | |
| Letter to SHPO documenting results of the investigation (if investigations are required based on initial consultation) including:<br>a. A request for concurrence with evaluation of eligibility for the National Register of Historic Places<br>b. Request for concurrence with evaluations of the effect a proposed project may have on a National Register, or eligible, property<br>c. Request for concurrence with plans to avoid, mitigate, or minimize effects | Draft Report 10/11/00<br><br>Final Report 01/02/01 | Letters transmitting results of remote sensing investigations with recommendations of no further action.<br><br>No response from SHPO received. |
| **Wild and Scenic Rivers Act** | | |
| Listing consulted, determination of effect | | N/A; No effect |
| Informal agency coordination (NPS) | | |

# APPENDIX G

# PERTINENT CORRESPONDENCE

## Part 1. Included in Draft EIS

## Part 2. From Draft EIS Coordination

## Part 3. From Final EIS Coordination

# APPENDIX G

# PART 1
# INCLUDED IN DRAFT EIS

# COMMONWEALTH of VIRGINIA

## Department of Historic Resources

H. Tayloe Murphy, Jr.
*Secretary of Natural Resources*

2801 Kensington Avenue, Richmond, Virginia 23221

Kathleen S. Kilpatrick
*Director*

Tel: (804) 367-2323
Fax: (804) 367-2391
TDD: (804) 367-2386
www.dhr.state.va.us

RECEIVED
MAR 15 2002
MALCOLM PIRNIE
NEWPORT NEWS

March 14, 2002

Kathryn B. Sweeney
Malcolm Pirnie, Inc.
11832 Rock Landing Drive
Newport News, Virginia 23606

RE: Maps Only Archives Search -
Craney Island Expansion

Dear Ms. Sweeney:

Thank you for your recent request for information from our archives on previously recorded archaeological and architectural resources within the area of potential effect, as delineated on your map, for the above referenced project. Please note that your request for information from the Department of Historic Resources archives concerning the location of historic resources does not relieve you or your client from possible obligations under state or federal historic preservation regulations. I strongly recommend that you contact Dr. Ethel Eaton of the DHR's Resource Services and Review Division at (804) 367-2323, extension 112, if you have any questions concerning state and federal regulatory requirements.

Enclosed are the maps showing the location of any archaeological or architectural resources near the project area. If after examining the maps, you determine that you will require copies of additional files, those can be provided to you at the standard ten-dollar per file charge. An invoice is enclosed for the charges incurred through your use of our archives search service.

DHR serves as the official state repository on historic resources. This information has been compiled primarily by independent cultural resource consultants. DHR makes no warranty as to the fitness of the data for any purpose. **The absence of historic resources in DHR records does not necessarily mean that no historic properties are present.** It is advisable to check with local government planning offices for information on any properties that may meet the age and significance tests of the National Register criteria and have not yet been recorded in the DHR archives. Also, the area in question may not have been systematically surveyed for resources, possibly necessitating a survey and submittal of that data with your Project Review application.

Please contact me at (804) 367-2323, extension 125, if I can be of further assistance.

Sincerely,

Trent M Park

Trent M. Park
Archives - VDHR

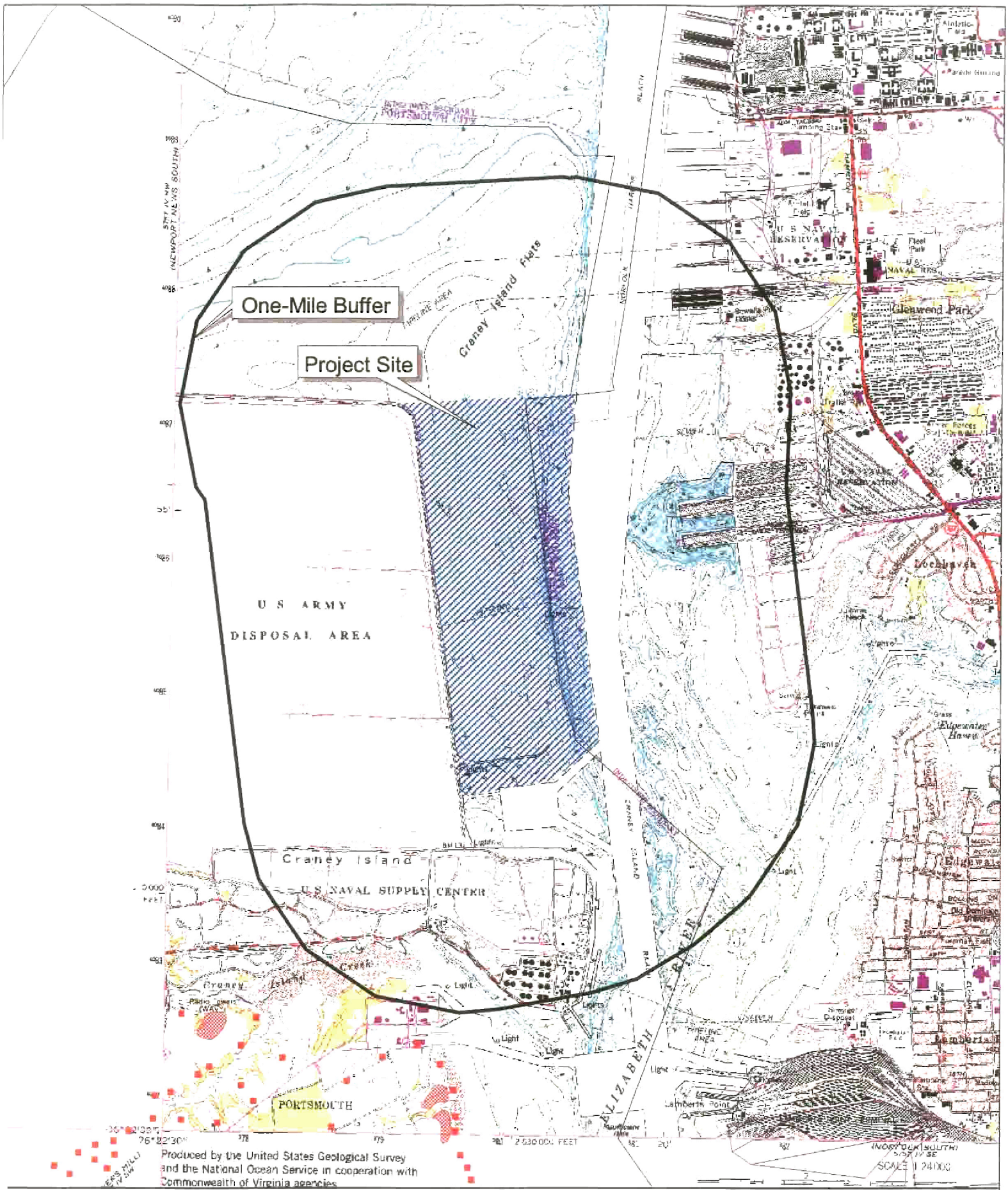
Program Services Div.
10 Courthouse Ave.
Petersburg, VA 23803
Tel: (804) 863-1685
Fax: (804) 862-6196

Petersburg Office
19-B Bollingbrook Street
Petersburg, VA 23803
Tel: (804) 863-1620
Fax: (804) 863-1627

Portsmouth Office
612 Court Street, 3rd Floor
Portsmouth, VA 23704
Tel: (757) 396-6709
Fax: (757) 396-6712

Roanoke Office
1030 Penmar Avenue, SE
Roanoke, VA 24013
Tel: (540) 857-7585
Fax: (540) 857-7588

Winchester Office
107 N. Kent Street, Suite 203
Winchester, VA 22601
Tel: (540) 722-3427
Fax: (540) 722-7535




***Virginia Department of Historic Resources***

***Craney Island Expansion Project***

*Norfolk North Quad*
*Archaeological Site Map*
*Map printed 3/12/2002*

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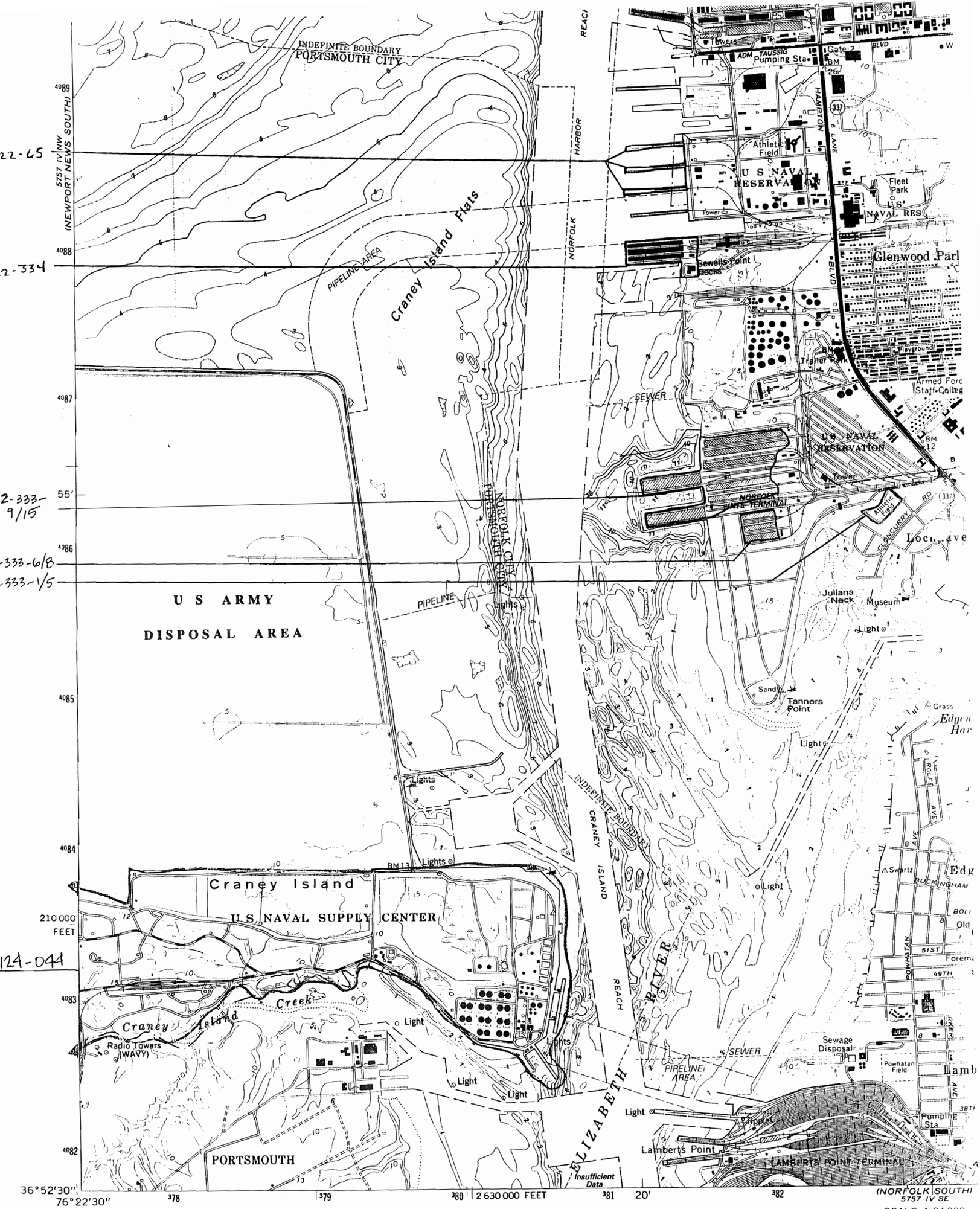


Produced by the United States Geological Survey and the National Ocean Service in cooperation with Commonwealth of Virginia agencies

Control by USGS and NOS/NOAA

Topography by photogrammetric methods from aerial photographs taken 1963. Field checked 1965

Bathymetry compiled by the National Ocean Service from tide-coordinated hydrographic surveys. This information is not intended for navigational purposes

Mean low water (dotted) line and mean high water (heavy solid) line compiled by NOS from tide-coordinated aerial photographs

Apparent shoreline (outer edge of vegetation) shown by light solid line

Polyconic projection. 1927 North American Datum

10,000-foot grid based on Virginia coordinate system, south zone

1000-meter Universal Transverse Mercator grid ticks, zone 18 shown in blue

To place on the predicted North American Datum 1983, move the projection lines 11 meters south and 30 meters west as shown by dashed corner ticks

Red tint indicates areas in which only landmark buildings are shown

There may be private inholdings within the boundaries of the National or State reservations shown on this map

3 OF 4

VIRGINIA

QUADRANGLE LOCATION

Architectural Resources Map

8½° 151 MILS | 0°47' 14 MILS

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Norfolk North Quad

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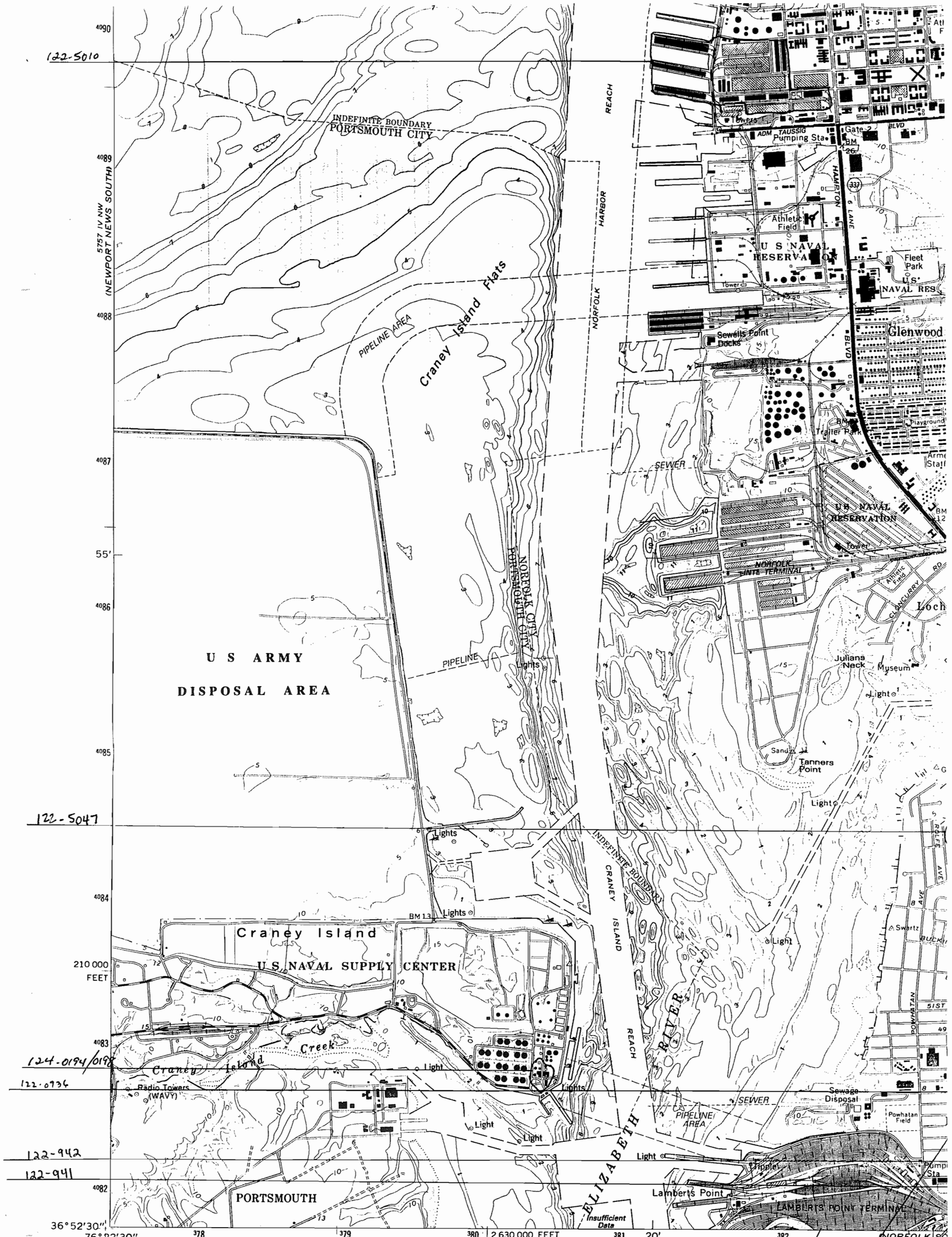


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To place on the predicted North American Datum 1983, move the projection lines 11 meters south and

4/4

VIRGINIA

QUADRANGLE LOCATION

Norfolk North Quad

Architectural Resources Map

8½° 151 MILS | 0°47' 14 MILS

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
1650 Arch Street
Philadelphia, Pennsylvania 19103-2029

Colonel David L. Hansen
District Engineer
Norfolk District, Corps of Engineers
Fort Norfolk, 803 Front Street
Norfolk, Virginia 23510-1096

DEC 8 2001

Dear Colonel Hansen:

The Environmental Protection Agency (EPA) is currently reviewing information in support of a Corps of Engineers' proposal to expand an existing dredged material disposal site in southeastern Virginia. The Norfolk District Corps of Engineers (COE) has indicated that the Norfolk Harbor and Channels Eastward Expansion of Craney Island —Feasibility Study, currently being conducted, will determine the need for and the federal interest in an eastward expansion of the Craney Island Dredged Material Management Area (CIDMMA). This project is being coordinated with the Commonwealth of Virginia through the Virginia Port Authority (VPA).

The Craney Island Dredged Material Management Area (CIDMMA) is a 2,500-acre confined dredged material disposal site located near Norfolk, VA receiving 3-5 million cubic yards of dredged material annually. CIDMMA was constructed in 1956-1958 and is federally owned and operated. It is used by federal, state, and local governments as well as by private interests. CIDMMA was originally designed to have a capacity of 100-million cubic yards but due to compaction and implementation of intensive management techniques its capacity has been considerably increased. At the end of 1997 CIDMMA contained over 200-million cubic yards of dredged material. CIDMMA is authorized to handle all types of dredged material including material suitable and unsuitable for open ocean disposal.

As described by Congressional Resolution 2539 on Craney Island Virginia (signed September 24, 1997) and the COE, the objectives of the expansion project include:

1. Extending the useful life of the CIDMMA as a dredged material containment area.
2. Providing additional acreage for the development of projected long-term berthing and landside port facilities adjacent to the Norfolk Harbor Channel.
3. Providing a logistical and tactical area for support of the deployment of national defense forces.

As an agency with jurisdiction by law (i.e., Section 309 of the Clean Air Act and Clean Water Act) and with special expertise (e.g., marine and estuarine ecosystems) we intend to fully participate in the development of an environmental impact statement (EIS) for Norfolk Harbor and Channels Eastward Expansion of Craney Island project. Because scoping is such a critical step in defining the direction and intensity of the analysis process, EPA respectfully submits the

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following comments in order to facilitate an efficient and effective NEPA process. Although the following list is exhaustive we intend to work with the Corps of Engineers, through the NEPA (National Environmental Policy Act) process, to identify the significant issues which should be analyzed in detail. We thank for the opportunity to participate in this process. If you have any questions regarding our comments please contact Regina Poeske of my staff at 215-814-2725.

Sincerely,

Thomas Slenkamp

Thomas Slenkamp, Acting Director
Office of Environmental Programs

Attachment

**Norfolk Harbor and Channels Eastward Expansion of Craney Island – Feasibility Study**
**EPA Scoping Comments**

In the resultant Environmental Impact Statement (EIS) the objectives of the feasibility study, the scope of decisions to be made (including analysis of alternatives), and the effects to be considered in the environmental analyses and document must be clearly identified. The following comments should help raise pertinent issues related to creation of additional dredged material disposal options and port facility development for your consideration in the EIS. Where applicable we will work with the COE and the NEPA team to identify and eliminate from detailed studies those issues which are not significant.

**Purpose and Need**

The document should describe the underlying problem (problem statement), the facts and analyses used to support the problem statement (including information about why in this particular location, at this particular time) and the context or perspective of the agency mission in relation to the need for action. For example, the basic problem appears to be lack of future capacity in the existing Craney Island Dredged Material Management Area (CIDMMA). The facts and analyses used to support this statement would include existing capacity at CIDMMA, existing and projected dredged material volumes from all sectors using CIDMMA, information documenting current management practices at CIDMMA, etc. The COE is responding to these problems because they have a mandate under Congressional Resolution (Resolution) 2539 as well as under separate authorities regarding dredging and disposal.

Additional issues noted in the objectives of the feasibility study include providing for additional acreage for the development of a port facility which could also serve for national defense purposes. Because it lies within the COE's scope of decisions to be made EPA considers the development of a port facility (and subsequent use for national defense) on the proposed eastward expansion of CIDMMA a connected action (as described under CEQ Regulations at 1508.25). As such it should be discussed in the same impact statement including, need for and alternatives to, development at this location. The purpose, need and development of these facilities is less well understood at this time, however, EPA believes it is incumbent upon the COE, in their EIS, to describe the underlying problems associated with port facilities in the area. The facts and analyses used should include a description of current port facilities in the Norfolk Harbor Channel and the projected lack of or deficiency in adequate port facilities in the area. This same type of information should also be included regarding current and projected needs for national defense deployment.

Furthermore, the Resolution directs the COE to give specific attention to rapid filling which appears to conflict with the primary purpose of an expansion of CIDMMA. This conflict between project objectives needs to be clearly articulated and understood in order for the public and decision maker to fully understand the scope of decisions to be made.

The Purpose and Need Section of the EIS should also establish a clearly defined time frame for addressing the problems. When will CIDMMA reach full capacity? What is the planning

horizon for dredged material management in the Norfolk Harbor Channel? Please define "useful life" as directed by the Resolution. What time frames exist for the port facility developers and those planning for national defense concerns? How do these time frames overlap or conflict?

**Alternatives**

The Alternatives Analysis Section must analyze all reasonable and feasible alternatives to the proposed project, including the No Action alternative. An alternative is considered reasonable and feasible, if it is practical in the technical, economic and social sense, even if it outside the jurisdiction of the lead agency (CEQ regulations at section 1502.14). Alternatives must meet the defined objectives and fulfill the need for action. A potential conflict with local or federal law does not necessarily render an alternative unreasonable, although such conflicts must be considered [Section 1506.2(d)]. Alternatives that are outside the scope of what Congress has approved or funded must still be evaluated in the EIS if they are reasonable, because the EIS may serve as the basis for modifying the Congressional approval or funding in light of NEPA's goals and policies. Section 1500.1(a).. In determining the scope of alternatives, the emphasis is on what is "reasonable" rather than on whether the proponent or applicant likes or is capable of carrying out a particular alternative (NEPA's Forty Most Asked Questions, 1981). Any alternative raised and then discarded from detailed study must be identified and the rationale for elimination briefly discussed.

Current COE documentation indicates that the following are being considered as feasible alternatives:

- expansion of CIDMMA (options include east, west, north or combinations of these)
- placement of material at other confined sites
- ocean placement of suitable material
- demand reduction by alternative beneficial uses of dredged material
- combination of dredged material management plans
- evaluation of existing CIDMMA for possible joint use as a containment area and container port
- evaluation of use as a defense logistics and tactical support area
- no action alternative

EPA would add to this list the possibility of raising the berms at CIDMMA to increase capacity, alone or in conjunction with other alternatives mentioned above. Also, because the Congressional Resolution directs the COE to "give specific attention to rapid filling" of the proposed eastern expansion "to accommodate anticipated port expansion" EPA believes that the COE is required to consider alternatives to port development at the proposed expansion site. This would include port development elsewhere within a prescribed geographic area and the No Action alternative (no port development at eastward expansion site). This analysis is critical since it could show that eastern expansion is preferable for extending the useful life of CIDMMA while port development is accommodated elsewhere.

**Affected Environment**

This section of the EIS should describe the affected environment in terms of the physical. biological, cultural and socioeconomic resources that would be impacted by the proposed alternatives and the No Action alternative. Examples of affected environment for the expansion options include CIDMMA proper, the open and shallow water areas where the expansion will occur and areas directly and indirectly affected by the proposed expansions (e.g., Elizabeth River, Nansemond River, etc). Ocean disposal options include the area of direct disposal, adjacent areas indirectly affected and any areas that would be affected by transport of the dredged material. This list is expansive, however, EPA recognizes that the resultant EIS should focus on the issues that are truly significant and important in terms of decisions to be made.

A. **Physical Resources Section** should provide a description of the physical environment at the proposed project site including:

1. Substrate - This section should describe the existing aquatic ecosystem substrate at project areas associated with each alternative. Aquatic ecosystem substrate is considered to be the benthic material underlying all open water areas and constitutes the soil-water interface of wetlands. It is distinguished from soils by permanent inundation.

2. Water Quality - Describe existing physical and chemical water quality of surface waters in the project areas, including affected stream and rivers if applicable. These characteristics include salinity gradients, suspended particulates/turbidity, temperature, nutrients, dissolved gas levels and pH.

3. Hydrology - Describe the existing surface water or groundwater hydrology in the project areas. These characteristics include current patterns, and normal water fluctuations/tidal patterns (daily, seasonal and annual tidal and flood fluctuations) as described in the Virginia Institute for Marine Science (VIMS) models.

4. Groundwater Resources - Describe groundwater resources at each project site or within areas that could be impacted by project development.

5. Soil and Mineral Resources - Describe soils and mineral resources located within the project areas.

6. Air Quality - Identify existing air quality in the vicinity of the project areas.

B. **Biological Resources Section** should provide a description of the biological environment at the proposed project sties.

1. Endangered, Threatened or Sensitive Species - Section should provide a listing of all state or federally listed endangered or threatened species or sensitive species (or any candidates for listing) which could be affected by implementation of project alternatives. This should also include critical habitat identification.

Critical habitat is defined as (1) the specific areas within the geographical area occupied by a species, at the time it is listed, in accordance with provisions of section 4 of the Endangered Species Act (ESA), on which are found those physical or biological features (a) essential to the conservation of the species and (b) which may require special management considerations or protection; and (2) specific areas outside the geographical area occupied by the species at the time it is listed in accordance with the provisions of section 4 of the ESA, upon determination of the Secretary (of the Interior) that such areas are essential for the conservation of the species. Critical habitats are described in 50 CFR Parts 17 or 226.

2. Fish and Invertebrates - Section should list the fish and invertebrates and other aquatic organisms in the food web that may be affected by the implementation of the proposed alternatives. Aquatic organisms in the food web include fin fish, crustaceans, mollusks, insects, annelids, planktonic organisms and plants and animals on which they feed and depend on for their needs. All forms of life stages throughout its geographic range should be included in this category. Data should be presented describing the type, composition and ecological value of the resource. Information related to Essential Fish Habitat (EFH) in the area should also be included. EFH for federally managed fish species is defined as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity."

3. Other Wildlife - Section should identify wildlife that may be affected by the implementation of the proposed alternatives which are not addressed in the Endangered, Threatened or Sensitive Species Category or the Fish and Invertebrates Category. Game and non-game species (resident and transient mammals, birds, reptiles and amphibians) should be identified. Data should be presented describing the type, composition and ecological value of the resource.

4. Terrestrial Ecosystems - This section should identify terrestrial habitat that may be affected by the implementation of the proposed alternatives. If pertinent, data should be presented describing the amount, type, composition and ecological value of the resource and the relative rarity of the ecosystem on a national, regional and local level.

5. Sanctuaries and Refuges - This section should identify any sanctuaries or refuges which could be affected by the implementation of proposed alternatives. For the purposes of this analysis, sanctuaries and refuges are defined as areas designated under federal, state or local authority to be managed principally for the preservation and use of fish and wildlife resources.

6. Wetlands and Vegetated Shallows - This section should identify, delineate and describe the wetlands and vegetated shallows which could be affected by implementation of the proposed alternatives. Data should be presented characterizing the amount, type, composition (pattern diversity) and ecological value of the resource and the relative rarity of the ecosystem on a national, regional and local level.

Wetlands are defined as areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.

Vegetated shallows are defined as permanently inundated areas that under normal circumstances support communities of rooted aquatic vegetation, such as submerged aquatic vegetation (SAV). The recent decline in SAV areas in the bay should be noted and areas of historic and current communities should be noted for the lower James, Nansemond and Elizabeth River systems as well as Hampton Roads and lower Chesapeake Bay area.

7. Mudflats - This section should identify any mudflat areas that may be affected by the implementation of the proposed alternatives. Mudflats are broad, flat areas along the coast, in coastal rivers to the head of tidal influence, and in inland lakes, ponds and riverine systems. Tidal mudflats are typically exposed at low tides and inundated at high tides with water at or the surface of the substrate.

C. Socioeconomic and Cultural Resources Sections should address the proposed alternatives potential effects on human use characteristics as defined under Clean Water Act 40 CFR 230.50 to 230.54 and Section 106 of the National Historic Preservation Act of 1966 (16 U.S.C. 470(f)) which requires that the head of any Federal agency having direct or indirect jurisdiction over a proposed Federal or federally assisted undertaking in any State, take into account the effect of the undertaking on any district, site, building, structure, or object that is included in or eligible for inclusion in the National Register of Historic Places (see generally 36 CFR sec 800). If applicable, the existence of submerged historical resources should also be noted.

Land use and watershed characteristics should be described for each alternative. The number of homes, commercial businesses and industrial developments that may be impacted by project implementation should be described. This section should also describe any communities of concern related to Executive Order 12898 "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations".

**Environmental Consequences**

The Environmental Consequences Section should be devoted largely to scientific analysis of the direct, indirect and cumulative impacts of the proposed actions and of each of the alternatives as well as the No Action alternative. This section provides the analytic basis for the comparison of alternatives in the EIS. This analysis should include impacts related to expansion of CIDMMA, operation and maintenance of the new cell, dredging related to rapid filling of eastern expansion, ocean disposal, beneficial use placement, operation and maintenance of the new port facility, impacts related to berthing of ships at this facility, and any other anticipated impacts related to project implementation.

This section of the document is needed to draw hard conclusions regarding the loss of aquatic and potentially wetland ecosystems. This section should discuss these losses on a direct, indirect and cumulative basis. The document should discuss what these impacts mean for the larger ecosystems of the Elizabeth, lower James, and Nansemond River ecosystems, Hampton Roads, the Chesapeake Bay, the Commonwealth of Virginia and the mid-Atlantic Region.

The environmental effects related to the implementation of each alternative should be described

in the following categories:

A. Physical Resources (as described above)
B. Biological Resources (as described above)
C. Cultural Resources (as described above)
D. Socioeconomic Resources (as described above)
E. Unavoidable and Adverse Environmental Impacts
F. Irreversible and Irretrievable Commitments of Resources
G. Relationship Between Short-Term Uses of Man's Environment and the Maintenance and Enhancement of Long-Term Productivity

**A. Physical Resources**

1. Substrate - This section should identify the potential impacts, individual and cumulative, of each alternative on aquatic ecosystem substrate. Consideration should be given to any potential changes in substrate elevation and bottom contours, including changes outside the disposal site that may occur as a result of erosion, slumpage, or other movement of the discharged material.

2. Water Quality - This section should evaluate the potential impacts to surface water quality from the implementation of the proposed alternatives; include severity of any impacts, magnitude of any water quality changes, and relative probability that there would be an impact. Impaired waters [as described by CWA section 303(d)] and sources of impairment should be described for all project areas.

Impact assessment should also include a thorough description of the anticipated water quality impacts related to CIDMMA discharge. It should be noted that a Virginia Pollution Elimination Discharge System (VPDES) permit may required for the expansion site if new discharges are proposed for the Hampton Roads estuary.

Particular attention should be given in this section to:

- dissolved oxygen content
- turbidity
- nutrients
- toxic pollutants
- development of pool habitats for water-borne vectors, primarily mosquitos

3. Hydrologic Impacts - Hydrologic impact analysis should include the potential environmental impacts of each proposal on surface water or groundwater hydrology, with particular attention to the Elizabeth River system. The nature and degree of effect that the proposed project will have individually and cumulatively on water current patterns, circulation including downstream flows and normal water fluctuations.

4. Groundwater Resources - This section should evaluate the impacts, if any, to groundwater quality and quantity related to project implementation.

5. Soil and Mineral Resources - This section should describe the impacts to soil and mineral resources from project implementation including prime agricultural soils, if applicable.

6. Air Quality - This section should describe the impacts of each alternative on air quality. Impacts should address construction and operation impacts as well as impacts related to operation of the port facility.

**B. Biological Resources**

1. Threatened and Endangered Species - This section should address the potential for impacts to state or federally listed endangered or threatened species, or other sensitive species including sensitive habitat types. This section should include an evaluation of the loss of biodiversity in the immediate area as well as the state of Virginia.

2. Fish and Invertebrates - This section should address the potential for impacts to fish and invertebrates and other aquatic organisms in the food web. Impacts to resident, anadromous and catadromous fishes should be evaluated including all life cycles and habitat requirements; spawning, nursery, feeding and shelter. Loss of benthic food organisms and production export needs to be evaluated in detail. This section should include an evaluation of the loss of biodiversity in the immediate area as well as the state of Virginia. Also include impacts related to EFH.

3. Other Wildlife - This section should evaluate potential impacts to wildlife species not addressed in the Threatened, Endangered and Sensitive Species and Fish and Invertebrate Section. If applicable, evaluate the loss or change of breeding and nesting areas, escape cover, travel corridors and preferred food sources for resident and transient species. This section should also include an evaluation of the loss of biodiversity in the immediate area as well as the state of Virginia.

4. Terrestrial Habitat - If applicable, this section should evaluate the consequences associated with the loss of terrestrial habitat. This section should include an evaluation of the loss of biodiversity in the immediate area as well as the state of Virginia.

5. Sanctuaries and Refuges - This section should evaluate the potential impacts to sanctuaries and refuges as a result of project implementation. Evaluate the loss or change of breeding and nesting areas, escape cover, travel corridors and preferred food sources for resident and transient species.

6. Wetlands and Vegetated Shallows - This section should evaluate the consequences of losing wetlands and vegetated shallows as a result of project implementation. Impacts should assess not only acreages but the relative permanence of the impact and the function and value of the areas to be impacted. The analysis should include the value of these habitat types in the estuary or watershed, in the region or the Chesapeake Bay watershed. This section should include an evaluation of the loss of biodiversity in the immediate area as well as the state of Virginia.

The assessment should evaluate the adverse impacts to the biological productivity of the wetlands or shallows, reduction or elimination of nutrient exchange, and the loss of habitat (spawning, nursery, feeding and shelter).

7. Mudflats - This section should evaluate the potential impacts to mudflats identified at each alternative site. Impact assessment should include loss of foraging and nursery areas for fish and other wildlife.

**C. Cultural Resources** - Potential direct and indirect impacts to known cultural resources within the project area should be discussed in this section.

**D.Socioeconomic Resources**

1. Municipal and Private Water Supplies - Describe the potential for alternatives to negatively or positively affect water supplies for the area based on quality and quantity criteria.

2. Recreational and Commercial Fisheries - This section should address the potential for impacts (direct or indirect) to recreational and commercial fisheries as a result of project implementation.

3. Water Related Recreation and Aesthetics - This section should describe the potential positive and negative impacts to water-related activities and aesthetics of the area as a result of project implementation.

4. Parks and Preserves - This section should identify the potential impacts to parks and preserves which would result from project implementation. Parks and preserves are described as areas designated under Federal and State laws or local ordinances to be managed for their aesthetic, educational, historical, recreational or scientific value.

5. Land Use - This section should identify the potential impacts to existing and future land use patterns in the project area. This assessment should include impacts related to operation of a port facility or operations for national defense.

6. Noise - This section should describe the noise impacts of each project alternative, including impacts related to operation of the port and operations for national defense.

7. Other Socioeconomic Impacts - This section should describe the degree to which the proposed project will impact residential homes, commercial businesses and industrial developments by displacement, increased/decreased property values etc.. Also include the likelihood of secondary development as a result of project implementation (i.e., increased industrial development and infrastructure related to port facility). This section should also describe any impacts to communities of concern under Executive Order 12898 "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations".

**E. Indirect/Secondary Impacts** - Indirect impacts are defined as those impacts that are likely to occur later in time or in a different location as a result of the proposed action. Indirect impact

analysis requires identifying the indirect cause-effect relationships between the proposed actions and secondary actions and assessing the effects of the secondary actions on the environment. All factors influencing the secondary actions should be considered in the analysis.

The analysis of the secondary impacts should include noise, air quality, soil erosion, increased stormwater runoff, habitat loss, etc. related to development of all feasible alternatives and including development of a port facility at CIDMMA. Landside infrastructure improvements including rail spurs, new and improved roadways or interchanges should also be described and their impacts evaluated and disclosed in the EIS.

Indirect impacts include reduction in the diversity of the benthic population, impacts associated with support facilities for the port (roads, parking lots, etc), changes in property values, and changes in land use from increased development due to project construction. If applicable, impact assessment should include but not be limited to adverse impacts to wetlands, fish and wildlife resources, air quality, water quality, agricultural resources, socioeconomic resources and human health.

**G. Cumulative Impacts** - Cumulative impacts are defined as effects resulting "from the incremental impact of the action when added to other past, present and reasonably foreseeable future action regardless of what agency or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time." (40CFR1508.7).

For shallow water areas and benthos, the historic loss of these important resources in the Hampton Roads estuary, the Chesapeake Bay and Virginia needs to be recognized. When Craney Island was originally constructed in Portsmouth, VA it filled approximately 2500 acres of open water and presumably shallow water habitat in the Hampton Roads estuary. This impact, coupled with the proposed loss of benthic habitat, needs to be discussed and these losses recognized on a regional, and Bay-wide scale.

The cumulative impacts of the proposed projects at CIDMMA in conjunction with the impacts related to the proposed Hampton Roads Crossing need to be assessed particularly for physical and biological resources.

**H. Mitigation** - CEQ Regulations at Sec. 1508.20 describe mitigation as follows. "Mitigation" includes:

(a) Avoiding the impact altogether by not taking a certain action or parts of an action.
(b) Minimizing impacts by limiting the degree or magnitude of the action and its implementation.
(c) Rectifying the impact by repairing, rehabilitating, or restoring the affected environment.
(d) Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.
(e) Compensating for the impact by replacing or providing substitute resources or environments.

The mitigation measures discussed in an EIS must cover the range of impacts of the proposals. The measures must include such things as design alternatives that would decrease the footprint of an alternative, possible land use controls that could reduce the need for dredging, and compensation alternatives that could include a range of restoration efforts targeting the Hampton Roads estuary and the Chesapeake Bay. All relevant, reasonable mitigation measures that could improve the project are to be identified, even if they are outside the jurisdiction of the lead agency. This will serve to alert agencies or officials who can implement these extra measures, and will encourage them to do so. Because the EIS is the most comprehensive environmental document, it is an ideal vehicle in which to lay out not only the full range of environmental impacts but also the full spectrum of appropriate mitigation. However, to ensure that environmental effects of a proposed action are fairly assessed, the probability of the mitigation measures being implemented must also be discussed. Thus the EIS and the Record of Decision should indicate the likelihood that such measures will be adopted or enforced by the responsible agencies (NEPA's Forty Most Asked Questions, 1981).

**DEPARTMENT OF THE ARMY**
NORFOLK DISTRICT, CORPS OF ENGINEERS
FORT NORFOLK, 803 FRONT STREET
NORFOLK, VIRGINIA 23510-1096

REPLY TO
ATTENTION OF

March 25, 2005

Planning and Policy Branch

Mr. Thomas Slenkamp
Deputy Chief
Environmental Programs Branch (3EA30)
US Environmental Protection Agency, Region III
1650 Arch Street
Philadelphia, PA 19103-2029

Dear Mr. Slenkamp:

Thank you for the opportunity afforded to Craig Seltzer of my staff and Mike Crist of Moffatt & Nichol, representing the Virginia Port Authority (VPA), to meet with you and Bill Arguto of your staff on March 24, 2005 at your office.

This meeting was requested by the Corps and VPA in response to your letter of February 24, 2005. In part, your letter expressed that " EPA believes that the alternatives analysis for the project needs additional work..." and that "...To date, a limited discussion of alternatives for this project has been presented..." The primary focus of our discussion and presentation, therefore, was on the alternatives analysis that has been performed both for dredged material placement and for port development. The PowerPoint we used in this briefing addressed all of the Corps' and VPA's work to date on this topic and was compiled from presentations made at various stakeholder and committee meetings over the last approximately five years.

You and Bill had a number of questions which, hopefully, were addressed to your satisfaction throughout the presentation. We believe that the end result was that you are satisfied that all reasonable alternatives have been thoroughly examined, and, as long as this is documented in the Draft Environmental Impact Statement (EIS) for public review, you are satisfied with the progress made at this point in the EIS development. You also indicated that the conceptual mitigation plan that has been developed is adequate for this stage in the EIS scoping and development process.

A copy of this correspondence is being sent to Mike Crist of Moffatt & Nichol, and Heather Wood Mantz of the Virginia Port Authority. Thank you again for the opportunity to discuss this important project. If you have any questions about this letter, or need any additional information in the future, please contact Mark Mansfield at (757) 201-7764 or Craig Seltzer of my staff at (757) 201-7390.

Sincerely,

Mark T. Mansfield

Mark T. Mansfield
Chief, Planning and Policy Branch

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
1650 Arch Street
Philadelphia, Pennsylvania 19103-2029

February 24, 2005

Mr. Craig Seltzer, Project Manager
U.S. Army Corps of Engineers, Norfolk District
Fort Norfolk
803 Front Street
Norfolk, Virginia 23510-1096

Subject: Craney Island Mitigation Subcommittee: Opportunities for Comprehensive Mitigation and Conceptual Mitigation Plan

Dear Mr. Seltzer:

The Craney Island Mitigation Subcommittee has developed an Opportunities Assessment Package, as well as a Conceptual Mitigation Plan, for consideration of its members. These mitigation options are related to the proposed Craney Island Dredged Material Management Area (CIDMMA) in Hampton Roads Virginia. The U.S. Army Corps of Engineers (Corps) has done a commendable job in identifying and developing mitigation sites for this project that will prove useful as the project progresses through the Environmental Impact Statement (EIS) process. The work done to date by the Subcommittee will help to complete more detailed mitigation proposals for the eventual selected alternative.

However, before the mitigation package can be further refined, the Environmental Protection Agency (EPA) believes that the alternatives analysis for the project needs additional work. As we have previously stated in our scoping comments for this project, the EIS must analyze all reasonable and feasible alternatives capable of meeting the project's purpose and need, including a no action alternative for comparison. It is difficult to determine the extent of mitigation requirements without knowing which alternatives are being considered and their resultant impacts to the environment. To date, a limited discussion of alternatives for this project has been presented. For example the mitigation discussions to date are based on the impacts of creating a third cell at CIDMMA. Without knowing whether there are other alternatives under consideration, it is difficult to determine if there are alternatives that require less mitigation or a different type of mitigation than that listed in the conceptual package.

Until the more detailed alternatives analysis is completed, EPA recommends retaining all of the mitigation options developed by the Mitigation Subcommittee and making further progress in the NEPA process. The conceptual mitigation plan can then be updated to address the specific impacts of the eventual alternative(s) selected. In this way, the conceptual mitigation plan will serve as a broad, overall strategy from which the final package can then be designed and tailored to address the unavoidable impacts from the selected alternative.

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I hope the above is useful to you and the Subcommittee during upcoming deliberations on mitigation for the Craney Island project. Thank you for coordinating the mitigation opportunities and mitigation strategies for this project. EPA remains committed to continued collaboration with all of the involved agencies in the development of this EIS.

Sincerely,

William Arguto
NEPA Team Leader

Wetlands Watch, Inc.
P.O. Box 9335
Norfolk, Virginia 23505

March 1, 2004

Colonel Yvonne J. Prettyman-Beck, District Engineer
U.S. Army Corps of Engineers, Norfolk District
803 Front Street
Norfolk, VA 23510-1096

Re: Craney Island and APM Terminal cumulative impacts

Dear COL Prettyman-Beck:

Members of Wetlands Watch are concerned about recent news reports ("Corps Revives Study of Craney Island Terminal," Virginian Pilot, February 19, 2004) that indicate the Norfolk District has decided to reopen consideration of an eastward expansion of Craney Island for a new port facility. We believe that this calls into question its decision last year to issue a permit for the APM Terminals project. In response to the APM Terminals Public Notice, Wetlands Watch and others, including state and federal resource agencies, raised the issue of the cumulative impacts of these two projects. As you know, the Final Environmental Assessment (FEA) APM Terminasl reached a Finding of No Significant Impact (FONSI) in part because the eastward expansion of Craney Island for a port facility had been taken off the table by COL Hansen in his letter of July 30, 2003 to the Virginia Port Authority.

Wetlands Watch sought elevation of this FONSI. (Please see our letter dated August 7, 2003, enclosed.) Among other concerns, we argued that the District Engineer's letter was being used to neutralize concerns about cumulative impacts from the APM project. We pointed out that the letter was not a formal denial of the Craney Island expansion and could later be reversed, allowing the Corps to sequence these projects in a way to allow both of them to be approved eventually. It appears that our concern was justified.

Were the APM permit application open and under active review today, with the Norfolk District reconsidering the eastward expansion of Craney Island, we believe it would be required to undergo an EIS to assess the cumulative impacts of the two projects. Our research has determined that recent and current projects of the magnitude of the APM Terminals project have consistently been required to have Environmental Impact Statements. If the Corps is to reverse its decision on the Craney Island expansion, it is only logical that it reconsider its Finding of No Significant Impact for the APM Terminals project.

Wetlands Watch has not yet taken a position on the construction of a port facility at Craney Island. But we are very concerned about the lack of attention being paid to the cumulative environmental impacts of this and other development projects on the Elizabeth River, projects like the APM facility

as well as smaller ones like recreational dredging projects. If the Corps proceeds to reconsider the eastward expansion of Craney Island without reconsidering the APM Terminals FONSI, it will be showing, we believe, disregard for the National Environmental Policy Act, which requires full and serious consideration of cumulative impacts.

We would like to better understand your decision to reopen consideration of the eastward expansion of Craney Island. We would also appreciate having your thoughts on how the several reasons Col. Hansen gave to support his decision to close further consideration of the eastward expansion of Craney Island would be resolved: i.e., the minimal basis for cost sharing, even if it was found to be in the Federal interest; the lack of need for additional dredged material placement area; navigational safety problems; and the significant environmental impact of filling 580 acres at the mouth of the Elizabeth River.

According to CFR Section 325.7, Title 33 – Navigation and Navigable Waters, "the district engineer may reevaluate the circumstances and conditions of any permit…at the request of…a third party…and initiate action to modify, suspend, or revoke a permit as may be made necessary by consideration of the public interest." We will determine whether or not to ask the Norfolk District to take such action on the APM Terminal permit after reading whatever reports and other materials you may be able to provide to us and after conferring with you and your staff.

We look forward to receiving your response to this letter, and we hope to meet with you and your staff about this matter soon.

Sincerely,

John Blandin

John Blandin
President

Enclosure: Wetlands Watch letter to EPA, August 7, 2004.

Wetlands Watch, Inc.
P.O. Box 9335
Norfolk, Virginia 23505

August 7, 2003

U.S. Environmental Protection Agency
12201 Sunrise Valley Drive
Reston, Virginia 20192

Attn: Peter Stokely

Re: APM Terminals/Maersk Project, Application # 02-V1913-14

Dear Mr. Stokely:

Wetlands Watch has carefully monitored the Maersk Project over the past two years. In May we submitted detailed comments to the Norfolk District, Corps of Engineers in response to its Draft Environmental Assessment and requested that an Environmental Impact Statement (EIS) be prepared. After having reviewed the just-released Final Environmental Assessment (FEA), we believe that the matter should be elevated to a higher level of review because the FEA is not responsive to many of the important concerns raised by the Environmental Protection Agency (EPA), the U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS) in their comment letters.

Elevation of this matter is required because more than 15 days will be required for a thorough review and evaluation of the FEA and supporting documents, not only by Wetlands Watch and other interested parties, but also by the federal resource agencies. We hope that the Corps' "rush to judgment" will not be repeated by the federal resource agencies. Elevation to a higher level of review will provide for a more comprehensive and objective assessment of this project, a project that offers the promise of significant economic benefit to the Hampton Roads community, but also threatens major damage to its environment. As EPA has pointed out, "the tidal wetland fringe, the inter-tidal mudflats and the adjacent shallow water can be considered ARNI [Aquatic Resources of National Importance]." USFWS stated that it is "the position of the Service that the proposed marine container terminal, as proposed, will result in substantial and unacceptable impacts to aquatic resources of national importance." USFWS recommended, as we did, that an EIS be prepared.

We have carefully compared each of the resource agencies' comment letters to the FEA. We are pleased that compensatory mitigation has been increased. Unfortunately, however, we have

found so many instances in which the Corps has either not responded to resource agency concerns, or responded inadequately, that we cannot determine objectively whether or not the proposed compensatory mitigation would actually be sufficient. Nor can we determine if the economic benefits would actually outweigh the environmental damage. Described below are the findings of our comparison.

1. The FEA does not include a complete references section and in many instances does not cite the source document, as requested by EPA, when data is being cited to support conclusions. The FEA is weakened by its reliance on assumptions and speculations, rather than on facts and conclusions.

2. The FEA does not describe the history of the Elizabeth River and restoration efforts to provide a context for the proposed project, as requested by EPA and USFWS, thus preventing a conclusive assessment of the environmental risks and benefits.

3. Benthic impacts:

    a. the FEA contains errors – two of the July sampling sites are incorrectly labeled "severely degraded" when their B-IBI index is 2.0. Therefore, only a minority (4) of the 10 sites is "severely degraded," not a majority as the FEA reports.

    b. the FEA fails to provide a comprehensive review of Dr. Dauer's samplings, as requested by EPA, only selectively citing Dr. Dauer to support its conclusions.

    c. the FEA's documentation of the July, 2003, benthic sampling is inadequate to provide a basis for judging its scientific validity.

    d. the FEA fails to address the effects of maintenance dredging on the benthic community, as requested by EPA.

    e. the FEA merely reiterates the Draft EA treatment of the effects of turbidity and redeposition of sediments on aquatic life, despite the request for more information by USFWS.

4. Stormwater impacts – the stormwater management plan is not adequately responsive to EPA comments:

    a. the FEA does not provide any further evidence for the adequacy of plans to filter potential and grease runoff than was provided in the Draft EA.

    b. the FEA still does not explain if the modeling that was performed to size the basins took into consideration the effect of the locally high ground water levels on the capacity of these basins to store and treat runoff.

    c. the FEA admits that the Virginia Department of Environmental Quality (DEQ), the Virginia Department of Conservation and Recreation (DCR) and the

Chesapeake Bay Local Assistance Department (CBLAD) have not yet approved the stormwater management plan. It leaves that for the future, as it does other important matters that should be resolved before the permit is issued.

5. Craney Island Dredged Disposal Site – while the Corps believes it can suspend its Management Plan "for the next few years," to accommodate the initial dredging, there is no explanation of the legal basis for that move. Nor is there any discussion of its impact upon already-permitted activities. In addition, the FEA does not address the future storage of maintenance dredge spoil, as requested by EPA.

6. Other Fish and Wildlife Issues

   a. USFWS recommended that a survey be conducted to determine bird use of the sandflats that would be destroyed "so that compensation can be targeted toward those species that will be impacted by the loss of over 10 acres of sandflats." Wetlands Watch questions the adequacy of the one-day survey that was conducted on 7/14/03. On the basis of that limited survey, and without reporting data in any detail, the FEA concluded that "No effect on the piping plover is anticipated." This is based in part on the finding that the project shoreline "has not been designated critical habitat for the Piping Plover and no Piping Plover has been observed to occur on the site," even though they are known to use Craney Island nearby. Repeatedly, the Corps uses a lack of information "in the files" about a natural resource as a basis for finding no significant environmental impact when information could be found if it were sought.

   b. Furthermore, the FEA finds that no significant adverse effects are anticipated for more than a dozen species that Dr. Beck did observe on the property that day. Wetlands Watch believes that the shorebird survey was inadequate to fully address the serious concerns of USFWS. The Corps' superficial treatment of this and other equally important issues is evidence of its "rush to judgment."

   c. USFWS noted that the Draft EA "fails to identify what fish species occur within the project area or address potential impacts to them." The FEA goes no further than the Draft EA did in addressing this concern.

7. Cumulative Effects – USFWS stated that it "does not concur" with the Draft EA conclusion that cumulative effects of the proposal are expected to be minimal without better supporting data. The "supporting data" provided in the FEA is not persuasive. Indeed, it is hardly responsive to USFWS and EPA concerns. The EPA informed the Norfolk District Engineer that, "Without a comprehensive study of the cumulative effect of these projects, the combined effects can not be determined." The FEA does not report on a comprehensive study. The impacts of the known and anticipated major projects are still addressed in isolation, not cumulatively. Furthermore, the Corps' recent decision about the permit application for the eastward expansion of Craney Island suggests that rather than comprehensively addressing cumulative impacts, the Corps is simply seeking

to sequence these projects in a way to allow both of them to be approved eventually. Two days before it issued this FEA, the Norfolk District Engineer sent a letter to the Virginia Port Authority indicating his intention to deny the permit for the eastward expansion of Craney Island for a new cargo handling facility. Locally, this has been widely construed to mean that the cumulative impacts issue for the Maersk facility is resolved. However, the legal status of that letter is not clear, nor is its impact upon the ongoing permit process. In addition, of course, the applicant is free to submit a new plan and, with the high level of state and local interest in a new port facility at Craney Island, it most certainly will. Therefore, the Corps has not resolved the cumulative impacts issue, but has merely postponed it. Unfortunately, elevation is required to force the Corps to "connect the dots."

8. Mitigation – While promises of mitigation have been improved, as reported in the FEA, there are no legally binding assurances that proposed mitigation steps will ultimately be successfully carried out. Furthermore, several significant mitigation issues have not been addressed adequately in the FEA:

a. EPA stated that "only through a comprehensive mitigation commitment agreement, signed by all parties, can a project of this magnitude be considered for a Finding of No Significant Impact....This document should be made available to the public for formal comment and be finalized prior to a decision." No such agreement has been signed nor presented to the public. On page 29 of the FEA, it is stated that mitigation plans are to be "circulated for review and comment" to the federal resource agencies and VIMS before they are approved and implemented by the Corps. But Wetlands Watch believes that the Corps is "putting the cart before the horse." The failure of the Corps to obtain a comprehensive mitigation commitment agreement before issuing its "letter of intent" is further evidence of its "rush to judgment."

b. NMFS stated that its "ability to assess potential impacts on EFH and associated marine resources was confounded by the lack of information provided in the EFH assessment included in the EA." NMFS recommended that, "A detailed mitigation plan be prepared delineating the type, location, and extent of the habitats to be restored, created, or enhanced as replacement for those impacted by project implementation...." The FEA indicates only that the applicant's consultant performed an EFH assessment and that it is incorporated in the FEA by reference. Since it is not included in the FEA itself, the public (and perhaps the federal resource agencies) is impaired in its ability to determine whether or not this assessment was competently performed and whether or not it addresses the concerns about EFH raised by NMFS. More time than 15 days will be required to review and evaluate the EFH assessment and the benthic study that were conducted in July.

c. The mitigation plan described in the FEA does not offer documented evidence for adequate mitigation of EFH impacts, as requested by NMFS.

d. The proposed location of the oyster reef mitigation is not given in the FEA, though it was requested by USFWS. Nor are any performance criteria listed for the mitigation.

e. No consideration is given in the FEA to submerged aquatic vegetation (SAV) restoration, as suggested by USFWS.

Wetlands Watch has not yet taken a position on the building of this container handling facility because there are too many unanswered questions about the potential environmental impacts. We are also concerned about the cultural, land use, transportation, noise, recreational and commercial fisheries, water-related recreation and aesthetics and environmental justice issues, about which we are less competent to comment. But we would point out that these issues have been only briefly addressed in the FEA, whereas they deserve the expanded treatment of an EIS. While we would welcome the economic benefits that the Maersk project can bring to the community, we also are aware that the environmental impacts of this project are large. We believe that NEPA requires a more comprehensive and objective assessment of this project. We feel it is our duty to ask that this matter be elevated to provide for that assessment. While we can be reasonably assured of a full assessment through the EIS process, we would be open to other approaches to answering the serious questions that have been raised by EPA, USFWS and NMFS and many more interested organizations and individuals.

Thank you for your consideration of our concerns.

Respectfully submitted,

Jay Taylor
President

Cc: Donald Welsh, EPA
Richard Bennett, Ph.D. and Karen Mayne, USFWS
Patricia Kurkul, NMFS
Corps of Engineers, Norfolk District
Corps of Engineers, HQ, Washington
VIMS
VA DEQ
VMRC
Portsmouth Wetlands Board

**DEPARTMENT OF THE ARMY**
**NORFOLK DISTRICT CORPS OF ENGINEERS**
**FORT NORFOLK 803 FRONT STREET**
**NORFOLK, VIRGINIA 23510-1096**

April 1, 2004

Planning, Programs & Project Management Division

Mr. John Blandin
President
Wetlands Watch, Inc.
P.O. Box 9335
Norfolk, Virginia 23505

Dear Mr. Blandin:

Thank you for your March 1, 2004 letter expressing your concerns with the continuation of the Craney Island eastern expansion study and the issuance of a permit to APM Terminals (APM). I have attempted to respond to your concerns below, but am also available to meet with you in the event that you would like to discuss this matter further.

Our permit decision on the APM Terminal project was based on information contained in the Environmental Assessment of the project and comments received from Federal, State and local agencies and the general public. Mitigation played a major role in reaching this determination. The environmental consequences of the project, notably the impacts to benthic habitat, may have exceeded the threshold of significance that would require the preparation of an Environmental Impact Statement (EIS) when considered without mitigation. However, the extensive compensatory mitigation discussed in the Environmental Assessment, reduced the net impacts on the quality of the human environment to a level of non-significance.

The scope of work for the Craney Island Eastward Expansion Feasibility Study includes development of an EIS. The EIS will include a cumulative impacts assessment. Cumulative impacts refer to the impacts on the environment that result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time (40 CFR 1508.7). This cumulative impacts assessment will evaluate the construction and operation of a new marine terminal by APM, the Norfolk Harbor and Channels deepening, the Virginia Department of Transportation's proposed Third Crossing of Hampton Roads, and the ecosystem restoration program for the Elizabeth River.

My decision to continue the Craney Island Eastward Expansion Feasibility Study is based upon several factors: the results of an independent technical review that I directed to be accomplished, a written request from the VPA to continue the study and new economic information regarding shipping and transportation. The July 30, 2003 letter from Col. David Hansen to the VPA that you mentioned in your correspondence acknowledges that the District would move forward to draft a report on the potential eastern expansion following an

independent technical review of the navigational studies and engineering analysis. This course of action is consistent with the Congressional authorization to conduct the study.

Please be assured that my decision to continue the study in no way dictates a particular project outcome. All of the interested stakeholders including the project proponent, the federal, state and local resource agencies, interest groups and the public will be included in the study process. All of the concerns raised by the stakeholders, as well as those outlined in Colonel Hansen's July 30th letter will be considered during the review. We hope that your organization will also participate in the study process as we move forward.

Finally, I would like to address the suggestion that the Craney Island study was somehow suspended so that the APM permit could be issued without considering the eastern expansion in the cumulative impacts analysis. As I noted above, while the July 30, 2003, letter to VPA expressed many concerns with the potential expansion project, it also indicated that the study would be processed to a conclusion. As many of the concerns expressed in the July 30, 2003, letter remain unresolved, the outcome of the study is still undetermined. The District has not changed its views of the project in any significant manner since the July 30, 2003, letter.

Courtesy copies of this letter are being provided to the Virginia Port Authority, APM Terminals, and the U.S. Environmental Protection Agency, Region III.

I would be glad to meet with you to further discuss your questions and concerns if you feel such a discussion would be helpful. You may contact Ms. Sheila Venoit at 441-7674 to arrange scheduling.

Sincerely,

Yvonne J. Prettyman-Beck
Colonel, District Engineer
Commanding

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
1650 Arch Street
Philadelphia, Pennsylvania 19103-2029

February 24, 2005

Mr. Craig Seltzer, Project Manager
U.S. Army Corps of Engineers, Norfolk District
Fort Norfolk
803 Front Street
Norfolk, Virginia 23510-1096

Subject: Craney Island Mitigation Subcommittee: Opportunities for Comprehensive Mitigation and Conceptual Mitigation Plan

Dear Mr. Seltzer:

The Craney Island Mitigation Subcommittee has developed an Opportunities Assessment Package, as well as a Conceptual Mitigation Plan, for consideration of its members. These mitigation options are related to the proposed Craney Island Dredged Material Management Area (CIDMMA) in Hampton Roads Virginia. The U.S. Army Corps of Engineers (Corps) has done a commendable job in identifying and developing mitigation sites for this project that will prove useful as the project progresses through the Environmental Impact Statement (EIS) process. The work done to date by the Subcommittee will help to complete more detailed mitigation proposals for the eventual selected alternative.

However, before the mitigation package can be further refined, the Environmental Protection Agency (EPA) believes that the alternatives analysis for the project needs additional work. As we have previously stated in our scoping comments for this project, the EIS must analyze all reasonable and feasible alternatives capable of meeting the project's purpose and need, including a no action alternative for comparison. It is difficult to determine the extent of mitigation requirements without knowing which alternatives are being considered and their resultant impacts to the environment. To date, a limited discussion of alternatives for this project has been presented. For example the mitigation discussions to date are based on the impacts of creating a third cell at CIDMMA. Without knowing whether there are other alternatives under consideration, it is difficult to determine if there are alternatives that require less mitigation or a different type of mitigation than that listed in the conceptual package.

Until the more detailed alternatives analysis is completed, EPA recommends retaining all of the mitigation options developed by the Mitigation Subcommittee and making further progress in the NEPA process. The conceptual mitigation plan can then be updated to address the specific impacts of the eventual alternative(s) selected. In this way, the conceptual mitigation plan will serve as a broad, overall strategy from which the final package can then be designed and tailored to address the unavoidable impacts from the selected alternative.

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I hope the above is useful to you and the Subcommittee during upcoming deliberations on mitigation for the Craney Island project. Thank you for coordinating the mitigation opportunities and mitigation strategies for this project. EPA remains committed to continued collaboration with all of the involved agencies in the development of this EIS.

Sincerely,

William Arguto
NEPA Team Leader

# APPENDIX G

# PART 2
# FROM DRAFT EIS COORDINATION

**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY**
**REGION III**
**1650 Arch Street**
**Philadelphia, Pennsylvania 19103-2029**

November 7, 2005

Mr. Craig Seltzer
U.S. Army Corps of Engineers
Norfolk District
803 Front Street
Norfolk, Virginia 23510

**Subject: Draft Environmental Impact Statement (DEIS), Craney Island Eastward Expansion, Norfolk Harbor and Channels, Hampton Roads, Virginia. CEQ # 20050385**

Dear Mr. Seltzer:

In accordance with the National Environmental Policy Act (NEPA) and Section 309 of the Clean Air Act, the U.S. Environmental Protection Agency (EPA) offers the following comments regarding the Draft Environmental Impact Statement (DEIS) for the Craney Island Eastward Expansion. The Craney Island Eastward Expansion is a proposed extension of the existing Craney Island Dredged Material Management Area (CIDMMA) and the development of a port container terminal. By expanding the CIDMMA, the project proponent's objectives are to extend the useful life of the dredged material management area as well as to build long term berthing and land side port facilities.

The DEIS describes significant environmental impacts from the Craney Island Eastward Expansion. The most notable impacts are related to the loss of 580 acres of open water to construct a new cell for the facility. These impacts are proposed to be mitigated through a conceptual mitigation plan as discussed below. Other notable environmental impacts, however, have not been as clearly defined in the document. For example, there is a lack of defined impacts due to air emissions from the port facility's installation and operation. The DEIS accurately identifies the need to address issues like non-conformity with the State Implementation Plan (SIP), but without such information, the total impacts from this proposal are uncertain. Other informational deficiencies that detract from the completeness of the document are described more fully in the attachment to this letter.

As noted above the environmental impacts that will result from the open water fill have been proposed to be mitigated through a conceptual mitigation plan in the DEIS. The conceptual mitigation plan developed for this project was based on a landscape approach. The U.S Army Corps of Engineers (USACE) has done a commendable job in developing a consensus among the resource agencies on the appropriate mitigation. We strongly suggest that this mitigation plan be monitored and the functional success be guaranteed through either an Environmental Management System (EMS) approach or adaptive management approach that would be able to modify the mitigation if not successful. This could be accomplished by incorporating such a requirement into a future Record of Decision for the project.

As suggested above, the level of detail in assessing the impacts of these two efforts is more clearly defined for the CIDMMA portion of the project. This is in part due to the long planning horizon required for the port development. As a result, EPA recommends that this portion of the document be considered as a tiered EIS in that the additional information required for the port development be evaluated in a subsequent NEPA document. This DEIS refers to just such an approach that we believe could be clarified in the executive summary and clearly described in the main body of the EIS.

Related to the preceding point, combining two possible independent components into a single project (CIDMMA expansion and port development) may be problematic. The major environmental impacts of the project appear to be caused primarily by the need for a port container facility. By combining the two distinct components into a single purpose and need formulation, the only alternative that satisfies both needs (dredge material expansion at CIDMMA and port development) is the proposed development at the expansion site. The effect of this formulation eliminates any alternative port locations not located on the current CIDMMA site. Our concern is that since the DEIS did not rigorously explore other port locations due to this narrowing of purpose and need, the DEIS may not have fully considered all other viable locations for the port container terminal location. If other alternatives exist for the development of the port container terminal, then impacts described in this DEIS would result primarily from expanding the facility solely for dredged material management, which may or may not justify the 580 acre expansion.

As discussed above and expanded upon in the technical attachment to this letter, we have rated the DEIS as EC-2 in EPA's classification system. This rating is based on the environmental impacts to aquatic resources; incomplete information concerning air toxics, particulates and wetland impacts; and environmental justice. The "EC" means that we have environmental concerns with respect to the preferred alternative (described as the recommended plan) and the "2" indicates that additional information needs to be provided in the Final Environmental Impact Statement (FEIS) to alleviate these environmental concerns. A copy of EPA's rating system is enclosed for your information.

EPA appreciates the opportunity to provide comments on the DEIS for the Craney Island Eastward Expansion project and would be pleased to discuss any of the comments and suggestions presented in this letter and attachments. Please feel free to contact Mr. William Arguto, the NEPA Team Leader and principal reviewer for this project, at 215-814-3367.

Sincerely,

William J. Hoffman, Chief
Environmental Programs Branch

Enclosures

## Supporting Detailed Comments

The following detailed comments and questions have been prepared by DEIS section.

Executive Summary

Please provide a discussion of interrelated permits and activities required, especially the role of the 404 process for this project. In addition it may be useful at the end of this section to describe the next steps, for instance a description of the final EIS and the selection of a preferred alternative. For example is the recommended plan, which is the language used in this document, the preferred alternative?

Table II-1 . What are the national defense criteria that were used that eliminates all of the existing Craney Island Dredged Disposal area alternatives that do not include a port expansion located on this site?

The reference to House Document 563 of the 79th Congress should be included in the Appendix. This document defines the operation of the CIDMMA and would be an important reference for understanding the operating parameters as defined by Congress.

E2.1 In the first sentence of this paragraph what is the authorizing document referred to in the sentence? Is it House Document 563, or some other document? Also this paragraph mentions that CIDMMA is authorized to handle unsuitable navigational dredged material. Does this include all types of contaminated dredged material?

E2.1 Mention is made on page ES-3 paragraph 3 that the dikes are capable of being raised to a height of 47 feet which will increase capacity of CIDMMA until 2025. However this paragraph does not state the goal and objective for the capacity of this part of the project. This is critical because it addresses purpose and need. What are the criteria for meeting the project objectives for the expansion of the CIDMMA for dredge disposal? The eastward expansion should be described in the context of how it meets this need.

The Virginia Port Authority Master Plan referenced would be useful as an appendix.

E2.2 page ES-4 The proposed Craney Island Terminal which is 580 acres is not large enough in acres to meet the VPA master plan estimate of needed acreage for port capacity. As stated it would be 300 acres short as estimated in the VPA document. However the DEIS states in this paragraph that the 580 acres would meet port facility needs well into the planning horizon? Please clarify this statement. Will additional port facility acreage be needed to meet VPA projections? Or is 580 acres more than is required.

E3.6 (East port expansion and west berm plan.) What is the purpose of the west berm strengthening? The purpose of this alternative is not fully described in this section of the detailed alternative analysis section. In addition, maps of this might be useful in understanding this alternative in comparison to the recommended plan (just an eastward expansion). It is also mentioned that after filling the new cell it would be turned over to the VPA. Does turned over

mean that VPA owns the property?

E3.8 Plan Selection. The eastern port expansion and west berm plan was not selected because it is not supported by the local sponsor but there is no explanation of why it is not supported.

E4.1.2 What is the source of the potential phosphorus load estimated in the terminal development?

E4.2.1 As stated in this section both VOC and NOx emission estimates exceed the 100 ton per year threshold. The process for developing a new SIP for the Hampton Roads area begins in 2005/2007. How will the issues of air mitigation be resolved before further planning or construction begins? Is it the intent of the USACE to submit an additional NEPA document to address these issues?

E4.2.2 / E4.2.1 Are there any impacts due to hazardous air pollutants generated because of either the CIDMM or Port Development.

E4.5 Is there an estimate of wetland impacts from the potential impacts of the rail corridor that could be quantified. This information would be useful in assessing the total impacts of the project. There is little information provided as to the impacts of the necessary infrastructure needed for the port development portion of this project.

E4.14 EPA recommends that an adaptive management approach or some form of commitment be adopted that assures the anticipated mitigation is successful in achieving the functional restoration of the environmental loss anticipated by these actions. An adaptive management approach would monitor the efforts of the mitigation and correct mitigation that does not achieve the compensation for the impacted resources.

Purpose and Need

1.0 Article I – Is there language that was intended to follow this heading?

1.0 Article II. What is the anticipated time required to rapid fill the new cell as described in the study authority?

1.0 Article III – Is there language that was intended to follow this heading?

1.0 Article IV page I-6. What is the planning horizon for the CIDMM? After 2025 it is anticipated that CIDMM will be filled to capacity? What is the goal or how long is it intended for this project to extend the life of CIDMM and how does this project fulfill this need?

Evaluation of Alternatives

1.0 For clarity purposes please identify who developed the "formulation process". Is it a USACE process in accordance with their NEPA implementing regulations?

1.1 The decision criteria used to evaluate the alternatives does not seem to address the port project or the Military logistical and tactical deployment. Provide decision criteria used to evaluate these needs.

1.1 Page II-2 The third bullet of the economic criteria is confusing. Please provide some additional clarification of these criteria.

2.1.1 Page II-4 Please explain the plan for rapid fill. How long is it anticipated to rapid fill the new cell and how does this extend the life of CDIMM?

2.1.1 Page II-8. What are the criteria for military training uses? The DEIS states that CIDMM is routinely used for military training but does not provide criteria used to evaluate the various alternatives considered.

Table II-1 Explain that the No Action Alternative also provides a baseline. This analysis provides a benchmark, enabling decision makers to compare the magnitude of environmental effects of the action alternatives.

Table II-1 This table compares only solutions for dredging, section 2.1.2 discusses the port alternatives but does not provide the comparative table similar to Table II-1. It might be more comprehensive to add the issues discussed in Section 2.1.2 into this table.

Section 2.1.2 Page II-33. Please rephrase the second sentence, first paragraph. In lieu of the word "constructed" perhaps the word "developed" would be more appropriate.

Section 2.1.2 Page II-34. Figure II-3 referred to in the first sentence in the fourth paragraph does not provide the information as described in the sentence. This comment also applies to other references to this figure, Page II-35.

Section 2.1.2 Page II-35 Maersk Sealand property. Other paragraphs in this section have conclusions that evaluate the site as an alternative. There are no conclusions about this site provided.

Section 2.1.2 Page II-38 The second paragraph implies that only alternatives that provide for rapid fill and can build a port meet the criteria. Please explain the criteria in more detail. Can an alternative that extends the CIDMMA and provides a port in a different location be considered? Why not?

Section 3.0 Please add language describing the No Action Alternative as a baseline condition to which all the alternatives can be compared. This section continues with the negative economic effects of the No Action Alternative. This is a little misleading in that if economic benefits are the sole evaluation criteria then there could be several other alternatives besides building a port that could be considered.

Section 4.0 Page II-40. Please provide an explanation of why the western dike needs to be

strengthened. A figure that differentiates this alternative from the alternative of eastern expansion without the strengthening would be helpful.

Section 5.0 Page II-41. Please provide further explanation of cost credit

Section 6.0 The second paragraph provides some excellent points. However the same concerns about selecting an alternative that has uncertainty because of a projected need in 2028 of strengthening the western dike could also be used to argue that the estimates projected in 2050 for port demand are also uncertain.

Section 6.0 page II-45. Does the recommended plan only extend the life of CIDDMA by three years after it reaches capacity in 2025? If so, it appears that this is primarily a port project and that the primary purpose is to build a port facility.

Section 7.0 Please provide additional information on rapid fill. Will the cell be filled in the course of planned dredging operations or will areas be dredged expressly to fill the cell?

Section 7.0 Page II-47. Access to the proposed terminal. There appears to be additional studies planned for the rail connections that may be dependant on the third crossing project. Please elaborate on the additional NEPA documents required. Is this considered a tiered EIS with additional EISs developed to address the unknown impacts?

Affected Environment

Section 1.1.8 Page III-7. The referenced Figure III-1 seems to need additional data on the maps. The figure doesn't present the data described in this section.

Section 1.2 There is no discussion of hazardous air pollutants. The existing condition of this area with respect to hazardous air pollutants would be a meaningful comparison in respect to the consequences section.

Section 1.3.2 Page III-15. The discussion of the sea turtle provides no conclusion. Are there any impacts expected?

Section 1.4.5 Page III-23. Table III-5 and the discussion uses data from 1985 – 20 years old. Is there more current data available for this discussion?

Section 1.4.7 Page III-29. In the oyster discussion please also consider identifying other factors that have caused oyster population declines such as pollution and over harvesting.

Section 1.4.7 Page III-31. The figure referenced should be Figure III – 10 vs Figure II – 10. The figure does not provide the information mentioned in the discussion. The oyster grounds are not depicted on the maps.

Section 1.7.4 Page III-36. Which port is being referred to in this section? Are these all the port facilities in this area?

facilities in this area?

Section 1.7.6 Public and Private Terminals referred to in this section are acronyms. Please provide the full names of the ports if not already described in the document. An acronym table would be helpful in this respect.

Section 1.7.7 In the description of vessel traffic it is stated that the number of vessels has decreased but the container numbers have increased. Is this due to larger vessels? If so it might be good to add this clarification to the discussion.

Section 1.8.2 Page III-42. There is no conclusion in this section as to the capacity of the waste water facilities to be able to handle the increase of waste water.

Section 1.11.2 Page III-52. Some lead agencies also look at a 5 db change in noise from existing conditions to ascertain noticeable changes due to the impact of the project on the surrounding community. Can this be reflected in the noise analysis?

Environmental Consequences

Page IV-1 In the first paragraph, please provide more detail on how the additional information needed for port development would be used and how it will meet the NEPA requirements.

Section 1.1.2.1 Page 1.1.2.2. Please provide a description of the CWA Section 404 process requirements for this project. The 404 process requirements should also be clearly stated in the introduction to the EIS.

Section 1.1.2.2 Page IV-7. Third Paragraph. Could the VPA provide a buffer in another area as an offset?

Section 1.2 There is no discussion of the project in relation to PM2.5. Please follow the Best Practices for port emissions dated June 23, 2005, enclosed for your reference. The best practices should be used to estimate all emission sources for the port, including harbor craft.

Section 1.2.2 This project does not meet the SIP for VOC and NOX. The section states further that air quality permits may be required and goes on to discuss potential mitigation. Will mitigation be part of the permit? And how will these impacts be quantified and communicated for public review?

Section 1.2.3 This section states that the construction related emissions were not quantified. It is hard to conclude that these are not significant without some type of quantification.

Section 1.4.1.3 Page IV-32. The first paragraph in this section describes that the rip rap will provide an extremely diverse and productive community. Has this been the case for the existing dikes? Please provide the history and experience learned from the existing dike berms.

Section 1.5.2.1 The environmental consequences and the impacts to wetlands from the rail spur

and road access corridors was not clear. What are the wetlands impacted, quantity in acres, and how will these impacts be mitigated? Will these issues be the subject of another NEPA document tiered off of this document?

Section 1.5.2.3. Is the statement provided in this section accurate? If the port is not developed would there still be an eastward expansion? Or does this section mean that the channel would be dredged regardless of the port and therefore part of the No Action Alternative?

Section 1.7 It should be noted that the LOS on most of the roads is already E or F defined as extremely unstable or break down. Also provide more detail on how the trip distribution was estimated.

Section 1.11 Noise. Noise contour maps would be helpful to describe the noise effects of the two projects. Also please provide a discussion on the change on noise levels from the no action and the build out. For example, what would be the db change to the nearest affected community?

Section 1.14.1 Economics. Why are there reduced dredging costs for users of the eastward expansion? Also, in the fifth paragraph of this section please provide more clarification, who are the users of the eastward expansion?

Section 1.14.4 This section describes the economic impact of the CIDMMA in terms of costs and benefits. The section provides good detail on the estimated benefits. However the costs of the project are explained in one overall cost. Are there any indirect costs not accounted for, such as the cost of additional pollution.

Section 1.19 Coastal Zone Resources and Permits. This section would benefit from a description and the requirements of the Coastal Zone Management Act. Also it states in this section that a 404 permit will be required. Appendix H is a 404(b) (1) evaluation?

Section 1.21.2 Cumulative Effects Assessment. Page IV-72. In step 11 of the cumulative effects assessment a reference is made to adaptive management strategies and monitoring the effects of this project along with the cumulative effects. EPA strongly encourages the use of monitoring whether it be in conjunction with an EMS or adaptive management strategies under this EIS. EPA requests a commitment to monitor the success of the mitigation package to assure that it is functionally equivalent to the environmental impacts of this project

Environmental Justice

1. This document has taken a great deal of time and effort in its researching and assessment of the potential impacts on the ecosystem of the Elizabeth River, but spends very little time on the assessment of the human population from an Environmental Justice standpoint.

2. There has been no clear identification of the communities that could potentially be impacted by the project. Very general information is provided on the cities of Portsmouth and Newport News, but no attempt is made to look at specific communities that could potentially be impacted by these two major projects. Characterization of those communities, summary of potential

impacts upon those communities, or any indication that an in depth examination of the potential for impacts, issues or concerns related to Environmental Justice should have been assessed. There is considerable information and assessment related to blue crabs, hard clams, and other forms of aquatic life, but the key information related to Environmental Justice is missing.

3. Figures, diagrams, and other graphic representations fail to clearly show where population is located with respect to the proposed site of the project.

4. The study area around the project needs to be defined. It does not seem reasonable to characterize the entire Cites of Portsmouth and the Norfolk, Virginia Beach, Newport News MSA as though they are the study area. There must be some neighborhoods that are in close proximity to the study area. If so, they should be evaluated for environmental justice concerns.

5. The assessment of non-white population presented in the document seems flawed. It is not reasonable to assume that there are no potential Environmental Justice concerns because the non-white in the study area does not exceed the non-white population of either the City of Portsmouth or the Norfolk, Virginia Beach, Newport News MSA. Please note that the non-white percentages noted in the Tract Data exceeds the state average.

6. Please provide information on the low-income population in the area of impact. Information is provided for the City of Portsmouth, the Norfolk, Virginia Beach, Newport News MSA, and the State of Virginia. What about the area of concern? It seems that there should be concern due to the large numbers of persons living in poverty in the areas mentioned above. It seems reasonable that there will be significant numbers of persons living below the poverty level in the area near the project.

7. What are the plans for conducting meaningful outreach and community involvement for this project? How will you assure the meaningful participation of the at-risk population? Remember environmental justice also entails meaningful community involvement and access to information. What is being done to address these issues?

8. What strategies will be employed to assure the mitigation of potential cumulative or multiple impacts upon the at-risk community?

9. It seems difficult to conduct a proper Environmental Justice assessment when the potential communities of concern have not been clearly defined. For this reason, the Environmental Justice assessment appears to be inadequate.

General Comments

The following two voluntary programs have been successful in reducing pollution and its impacts for stormwater and diesel engine idling. Please consider implementing these initiatives for this project.

Low Impact Development

Please consider using Best Management Practices related to stormwater controls throughout the development of this project as described below.

A Presidential Memorandum (dated April 26, 1994) and Guidance (dated August 10, 1995) applicable to Federal facilities and federally funded projects pertinent to environmentally and economically beneficial landscape practices is to be incorporated into all NEPA-related documents. As outlined in Executive Order 13148 dated April 26, 2000 (Federal Register Vol. 65, No. 81) on Greening the Government, it has been directed that all agencies incorporate the above Guidance into landscape programs, policies and practices. The Guidance calls for agencies that fund any landscape to provide recipients with information of beneficial landscaping as well as to work to support and encourage application of the principles. The EPA, GSA, and USDA are tasked with providing technical information on beneficial landscaping to other federal agencies and their facilities. This effort, also recognized as low impact development, has the potential to reduce impacts on watershed hydrology and aquatic resources as described below.

Low impact development, or LID, is a natural approach to land development and stormwater management designed to reduce impacts on watershed hydrology and aquatic resources. It is important to incorporate LID efforts to mitigate the effects of development through traditional stormwater management practices which have proven to not be entirely successful. Traditional collection and conveyance systems, stormwater ponds and other stormwater facilities do not replicate natural systems, which greatly slow water before it reaches streams, wetlands and other waters. Development often times results in the loss of trees and other vegetation, the compaction of soils by heavy equipment, and the creation of vast stretches of connected impervious areas. These combined factors are extremely difficult to compensate for using traditional practices. Prior to the development of any structural stormwater practices on a site, significant reductions in stormwater quantity and quality impacts can be made through enhancements to site design. As a result, the following site design goals and planning practices can be used to minimize stormwater impacts:

* Design Goal: Minimize direct stormwater impacts to streams and wetlands to the maximum extent practicable. Practices: 1. Locate stormwater facilities outside of streams and wetlands; 2. maintain natural drainage routes on site; 3. preserve riparian buffers; and 4. distribute "Integrated Management Practices (IMPs)" used in lieu of centralized ponds.

* Design Goal: Preserve the natural cover on as much of the site as possible, especially for areas located on hydrologic soil groups (HSG) A and B. Practices: 1. Utilize clustered development designs that preserve a significant portion of the site in a natural state; 2. utilize "fingerprint" clearing by limiting the clearing and grading of forests and native vegetation to the minimum area needed for the construction of the lots, the provision of necessary access, and fire protection; 3. avoid impacts to wetlands or vegetated riparian buffers; and 4. Preserve A & B soils in natural cover.

* Design Goal: Minimize the overall impervious cover. Practice: 1. Utilize the minimum required width for streets and roads; 2. utilize street layouts that reduce the number of homes per

unit length; 3. minimize cul-de-sac diameters, use doughnut cul-de-sacs, or use alternative turnarounds; 4. minimize excess parking space construction, utilize pervious pavers in low-use parking areas; 5. utilize structured or shared parking; 6. reduce home setbacks and frontages; 7. where permitted, minimize sidewalk construction by utilizing sidewalks on one side only, utilizing "skinny" sidewalks, or substituting sidewalks with pervious trails through common greenspace; 8. substitute pervious surfaces for impervious wherever possible; 9. where permitted, avoid the use of curb and gutter and utilize vegetated open swales, preferably "engineered swales" with a permeable soil base; and 10. minimize compaction of the landscape and in areas where soils will become compacted due to construction equipment, specify that the soils will be "disked" prior to seeding, and amended with loam or sand to increase absorption capacity.

* Design Goal: Locate infiltration practices on HSG A and B soils wherever possible. Thus, every effort should be made to utilize areas with these soils for IMPs that promote infiltration.

* Design Goal: Locate impervious areas on less permeable soils (HSG C and D). Placement of impervious areas on lower permeability soils minimizes the potential loss of infiltration/recharge capacity on the site.

* Design Goal: "Disconnect" impervious areas. "Disconnecting" means having impervious cover drain to pervious cover, i.e. downspouts draining to the yard, not the driveway. This decreases both the runoff volume and time of concentration.

* Design Goal: Increase the travel time of water off of the site (time of concentration). Practices: 1. Flatten grades for stormwater conveyance to the minimum sufficient to allow positive drainage; 2. increase the travel time in vegetated swales by using more circuitous flow routes, rougher vegetation in swales, and check dams; and 3. utilize "engineered" swales in lieu of pipes or hardened channels.

* Design Goal: Utilize soil management/enhancement techniques to increase soil absorption. Practices: 1. Delineate soils on site for the preservation of infiltration capacity; and 2. require compacted soils in areas receiving sheetflow runoff (such as yard, downslope of downspouts).

* Design Goal: Revegetate all cleared and graded areas with native and noninvasive species.

* Design Goal: Utilize level spreading of flow into natural open space.

For additional LID information, please refer to the following web sites.

- LID Manuals:
  http://www.epa.gov/owow/nps/lid_hydr.pdf
  http://www.epa.gov/owow/nps/lidnatl/pdt
- http://www.bmpdatabas.org
- http://www.txnpsbook.org/
- http://www.epa.gov/ednnrmrl/

SmartWay Transport - diesel engine idling BMPs

Please consider incorporating any SmartWay initiatives that can be integrated into this project or general facility operating procedures, especially some of the idling best management practices. This effort has the potential to reduce pollution emissions as noted in the brief smart way description provided below.

SmartWay Transport is a voluntary partnership between various freight industry sectors and EPA that establishes incentives for fuel efficiency improvements and greenhouse gas emissions reductions. By 2012, this initiative aims to reduce between 33-66 million metric tons of carbon dioxide (CO2) emissions and up to 200,000 tons of nitrogen oxide (Nox) emissions per year. At the same time, the initiative will result in fuel savings of up to 150 million barrels of oil annually. There are three primary components of the project: creating partnerships, reducing all unnecessary engine idling, and increasing the efficiency and use of rail and intermodal operations.

One component of the SmartWay Transport Partnership is to eliminate unnecessary truck and rail idling by developing a nationwide network of idle-reduction options along major transportation corridors - truck stops, travel centers, distribution hubs, rail switch yards, borders, ports, and even along the side of the road. The Environmental Protection Agency is working with the trucking industry, manufacturers of idle control technologies, various states, and other partners to help save fuel and reduce air pollution from idling trucks. EPA is conducting emissions testing on idling trucks under various conditions, surveying trucking fleets to learn more about idling times, implementing demonstration projects to test idle control technologies, and holding workshops to educate affected communities. The vast majority of fuel consumed during long-duration idling can be saved and air emissions reduced by installing one of several idle control technologies that provide heat, air conditioning, and electrical power. These technologies include auxiliary units and truck stop electrification. The technologies to address engine idling are evolving, and EPA plans to test new technologies as they come to the market. You can find a list of the currently available idle technologies at http://www.epa.gov/otaq/retrofit/idlingtech.htm.

It would be useful to include a list of acronyms. There were several areas were acronyms were used and not defined.

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
NORTHEAST REGION
One Blackburn Drive
Gloucester, MA 01930-2298

OCT - 7 2005

Mark T. Mansfield
Chief, Planning and Policy Branch
Department of the Army
Norfolk District, Corps of Engineers
Fort Norfolk, 803 Front Street
Norfolk, Virginia 23510-1096

Re: Craney Island Dredged Material Management Area

Dear Mr. Mansfield,

This is in response to your letter dated September 13, 2005 transmitting a copy of the draft Environmental Impact Statement (EIS) for the proposed Craney Island Dredged Material Management Areas (CIDMMA) Eastward Expansion located in Norfolk Harbor and Channels, Hampton Roads, Virginia. The CIDMMA has been in continuous use since 1957, serving the dredging needs of the Norfolk Harbor. The CIDMMA has received over 225 million cubic yards of dredged material deposits as of the end of Fiscal Year 2004. Without adding additional dredged material placement capacity, the CIDMMA is projected to reach the end of its useful life in 2025.

The site of the proposed project lies between and is adjacent to the CIDMMA and the Craney Island Reach Federal navigation channel in the Elizabeth River. Specific elements of the proposed project include: 580 acres of marine bottom and open-water for construction of a new dredged material placement cell, including a main dike and perimeter dikes; and subsequent re-development of the 580-acre cell for a container terminal complex including an access channel, berths, wharves, container yards, cranes, gate facilities, intermodal yards, new access roads and ramps, new rail track, cargo processing and support facilities, and stormwater management areas.

Several threatened and endangered species under the jurisdiction of NOAA's National Marine Fisheries Service (NMFS) can be found in the Chesapeake Bay and its tidal tributaries. Several species of sea turtles are known to be present in the Chesapeake Bay from April 1 – November 30 each year. Loggerhead (*Caretta caretta*), Kemp's ridley (*Lepidochelys kempi*), and green sea turtles (*Chelonia mydas*) are present in the Chesapeake Bay, mainly during late spring, summer and early fall when water temperatures are relatively warm. An estimated 3,000 - 10,000

loggerhead turtles and 500 Kemp's ridley sea turtles are found in the Chesapeake Bay annually. In the Chesapeake Bay, Kemp's ridleys frequently forage in shallow embayments, particularly in areas supporting submerged aquatic vegetation and on tidal flats. Approximately 95 percent of the loggerheads found in the Chesapeake Bay are juveniles; these turtles are found most commonly from the mouth of the Bay to the Potomac River while foraging along channel edges. The summer developmental habitat for green turtles encompasses estuarine and coastal waters of Chesapeake Bay and this species occurs is known to occur in the Bay in warmer months. Leatherback sea turtles (*Dermochelys coriacea*) are predominantly pelagic but are also seasonally present in the Chesapeake Bay. Recent data from sightings and incidental captures in fishing gear indicate that loggerhead and Kemp's ridley are the species of sea turtles most likely to be found in the waters of Chesapeake Bay while leatherback and green sea turtles are less common in the area. Sea turtles may occur in the Elizabeth River.

The federally endangered shortnose sturgeon (*Acipenser brevirostrum*) is known to be present in the Chesapeake Bay. The US Fish and Wildlife Service Reward Program for Atlantic Sturgeon began in 1996. Through the fall of 2004, the incidental capture of fifty-seven different shortnose sturgeon have been reported via the reward program in the Maryland waters of the Chesapeake Bay and its tributaries. Few shortnose sturgeon have been documented in Virginia waters and at this time there is no information to suggest that shortnose sturgeon occur in the Elizabeth River.

Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*) are distributed along the entire East Coast of the United States and have been designated a Species of Concern by NMFS. Many populations, including those found in the Chesapeake Bay, have undergone drastic declines in abundance since the late 1800s. Consequently, NMFS has initiated a status review for this species to determine if listing as threatened or endangered under the ESA is warranted. If it is determined that listing is warranted, a final rule listing the species could be published within a year from the date of publication of the listing determination or proposed rule.

The best available scientific information indicates that a reproducing Atlantic sturgeon population persists in the James River, into which the Elizabeth River flows. This population is likely to be very small and as such, it may be particularly vulnerable to natural and/or anthropogenic disturbances. The James River population may be the only remaining reproducing population in the Chesapeake Bay and is, therefore, critical to the recovery of this species in the Bay. While Atlantic sturgeon currently receive no substantive or procedural protection under the ESA, NMFS recommends that the ACOE consider implementing conservation actions to limit the potential for adverse effects on Atlantic sturgeon from this project.

Section 7(a)(2) of the Endangered Species Act (ESA) of 1973, as amended, states that each Federal agency shall, in consultation with the Secretary, insure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of a listed species or result in the destruction or adverse modification of designated critical habitat. Any discretionary federal action that may affect a listed species must undergo Section 7 consultation. As noted above, sea turtles may occur in the Elizabeth River where the CIDMMA expansion will occur. As such, the ACOE must consider the effects of the expansion on sea turtles, particularly how the expansion may affect sea turtle foraging habitat. The draft EIS notes that at full build out shipping traffic in

the Hampton Roads Harbor System is expect to increase by about 20 percent or 19 vessel calls per week. The draft EIS states that this increase will increase the potential number of vessel encounters with marine mammals. Large whales, particularly the endangered Northern Right Whale, are vulnerable to ship strikes. As the increased potential for ship strikes is an indirect effect of the CIDMMA expansion, the ACOE must consider these effects. As listed species may be effected by the proposed project, the ACOE should initiate section 7 consultation on the effects of this project. The ACOE is responsible for determining whether the proposed action is likely to affect any listed species. The ACOE should submit their determination along with justification for the determination and a request for concurrence, to the attention of the Endangered Species Coordinator, NMFS, Northeast Regional Office, Protected Resources Division, One Blackburn Drive, Gloucester, MA 01930. After reviewing this information, NMFS would be able to conduct a consultation under section 7 of the ESA. Should you have any questions about these comments or about the section 7 consultation process in general, please contact Julie Crocker at (978)281-9328 ext. 6530. To discuss ship strike issues specifically, please contact Kristen Koyama, NMFS Northeast Region ship strike coordinator at 978-281-9300 x6531. NMFS Habitat Conservation Division (HCD) has the responsibility of overseeing programs for designated Essential Fish Habitat (EFH). As such, you may receive comments from NMFS HCD under separate cover. Thank you for the opportunity to comment on the draft EIS.

Sincerely,

Mary A. Colligan
Assistant Regional Administrator
for Protected Resources

Cc: Nichols, F/NER4 - Annapolis
Koyama, F/NER3

File Code: Sec 7 ACE NAB Craney Island DMMA expansion

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
PROGRAM PLANNING AND INTEGRATION
Silver Spring, Maryland 20910

Mark T. Mansfield
Chief, Planning and Policy Branch
Department of the Army
Norfolk District, Corps of Engineers
Fort Norfolk, 803 Front Street
Norfolk, VA 23510-1096

NOV 4 2005

Dear Mr. Mansfield:

The National Oceanic and Atmospheric Administration (NOAA) has reviewed the *Draft Environmental Impact Statement* (DEIS) for the *Craney Island Eastward Expansion, Norfolk Harbor and Channels, Hampton Roads, Virginia*. In addition to the comments you have already received from NOAA's National Marine Fisheries Service (NMFS) Northeast Region's Protected Resources Division, NOAA provides the following comments.

The proposed project is located in the Port of Hampton Roads between the Cities of Portsmouth and Norfolk, Virginia. The alternative preferred by the Norfolk District Army Corps of Engineers (ACOE) and the non-federal sponsor, the Virginia Port Authority (VPA) is a 580 acre eastward expansion of the existing Craney Island Dredged Material Management Area (CIDMMA) into the Elizabeth River and the subsequent construction of a container terminal.

The DEIS was prepared by ACOE "to assess a range of alternatives and to evaluate the environmental consequences of those alternatives, including the preferred alternative, to extend the useful life of the CIDDMA, provide additional acreage for long-term berthing and landside port facilities and possibly serve as tactical and logistical area supporting the deployment of national defense forces."

The proposed CIDMMA expansion would involve new work dredging of 15.4 million cubic yards of material to a depth of -60 feet from an area of approximately 154 acres of subtidal shallows for the construction of the CIDMMA expansion dikes, the filling of 580 acres of subtidal shallows habitat for the CIDMMA expansion and the new work dredging of more than 96 acres of subtidal shallows adjacent to the CIDMMA expansion area to a depth of -52 feet in order to create an access channel for the proposed container terminal. A total of approximately 19.1 million cubic yards of material dredged from the access channel area and the dike footprint would be disposed of either at the existing CIDMMA (approximately 10% of the total) or at the existing Dam Neck and Norfolk Ocean Disposal Sites. An additional 19.5 million cubic yards of sand would be dredged from the Atlantic Ocean Channel (primary source) or the Thimble Shoal Channel or Cape Henry Channel (secondary sources) for the construction of the expansion area dikes. According to page II-45 of the DEIS, this project would add three additional years to the operational life of the CIDMMA.

**GENERAL COMMENTS:**

It does not appear that all of the direct, indirect, individual and cumulative impacts of the proposed project have been addressed adequately in the DEIS. The project purpose and need appear to be overly restrictive and to limit artificially the range of alternatives that would meet all of the project purposes required by the ACOE and VPA. Documentation to demonstrate the national economic benefits of the project should be expanded and less environmentally damaging alternatives that would allow for dredged material management and reasonable port capacity expansion have not been investigated fully.

The EFH assessment included in the DEIS is incomplete because it does not include several species for which EFH has been designated in the project area and it does not address all of the impacts to EFH that may result from the project, including those that will occur at the expansion area, the ocean disposal sites and the sand borrow areas. In addition, the DEIS does not address how the ACOE and the VPA would

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provide compensatory mitigation for the impacts to EFH, particularly the impacts to the habitat area of particular concern (HAPC) for sandbar shark (*Carcharinus plumbeus*).

**ESSENTIAL FISH HABITAT**

Section 305(b)(2) of the Magnuson Stevens Fishery Conservation and Management Act (MSA) requires all federal agencies to consult with NOAA Fisheries (NMFS) on any action authorized, funded, or undertaken by that agency that may adversely affect EFH. Included in this consultation process is the preparation of a complete and appropriate EFH assessment to provide necessary information on which to consult. Our EFH regulation at 50 CFR 600.905 mandates the preparation of EFH assessments and generally outlines each agency's obligations in this consultation procedure. The consultation process for civil works projects is further described in our January 18, 2000 EFH Finding letter to the ACOE's North Atlantic Division. This finding specifies that the EFH consultation for civil works projects will be completed through the National Environmental Policy Act (NEPA) process. The information contained within the DEIS is not sufficient to constitute a complete EFH assessment as defined in the MSA.

In order to comply with the requirements of the MSA, the EFH assessment must address all of the direct (e.g., contamination or physical disruption), indirect (e.g., loss of prey, reduction in species' fecundity), site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions of the entire project. This must include both the immediate and long-term impacts of the 580-acre fill, the dredging for the construction of the dikes and the access channel, the disposal of the dredged material from the construction of the project at the existing CIDMMA and ocean disposal sites, the dredging of sand from the borrow sites for the facility's construction, as well as the impacts of the operations of the port facilities to be constructed on the site, including the need for future maintenance dredging at the facility. The EFH assessment included within the DEIS does not address fully all of the potential impacts of the project on EFH, and is incomplete in this respect. In addition, several federally managed species of fish for which EFH has been designated in the project area are not included in the assessment, including juvenile windowpane (*Scopthalmus aquosus*), clearnose skate (*Raja eglanteria*), little skate (*Raja erinacea*) and winter skate (*Raja ocellata*).

The DEIS states that the Atlantic Ocean Channel, Thimble Shoal Channel and Cape Henry Channel, proposed as sources of material and the Dam Neck and Norfolk Ocean Disposal Sites, proposed as disposal sites for the dredged material from the project, have been subjected to the NEPA and ESA process and have received all of their federal and state permits, approvals, and authorizations. However, the NEPA process for the use of these sites was completed prior to the passage of the MSA. As a result, EFH consultations were not completed for the use of these sites. In accordance with 50 CFR 660.920 (a), an EFH consultation is not required for actions that were completed prior to the approval of the EFH designations by the Secretary of the Department of Commerce (e.g., permits issued). However, consultation is required for renewals, reviews, or substantial revisions of the action if the renewal, review, or revision may adversely affect EFH. The use of the Atlantic Ocean Channel, the Thimble Shoal Channel and the Cape Henry Channel as borrow sites and the Dam Neck and Norfolk Ocean Disposal sites as dredged material disposal sites for the expansion of the CIDMMA was not within the scope of the original analyses for the use of these sites. As a result, the impacts of 19.5 million cubic yards of sand mining over a five year period and the disposal of 19.1 million cubic yards of material at the open water disposal sites substantial amount of material to be removed from the borrow areas and disposed of at the disposal site over the same time frame were not contemplated in the original NEPA review. Because of the substantial revisions to the scope of these projects, we consider their use for this purpose to be a federal action requiring consultation.

**Need for an Expanded Consultation**
Because of the scope of the proposed project and the adverse effects the filling of 580 acres of aquatic habitat, the dredging of 250 acres (154 for the dikes and 96 for the access channel) of EFH, the disposal of 19.1 million cubic yards of dredged material from the expansion area and the dredging of additional 19.5 million cubic yards sand from the proposed borrow sites would have on EFH, including a HAPC for sandbar sharks, it is apparent that an expanded EFH consultation as described 50 CFR 600.920 (f) is needed. The expanded consultation process allows the maximum opportunity for NMFS and the federal action agency to work together to review the action's impacts on EFH, and to develop EFH consultation recommendations. Expanded consultations must be used for federal actions that would result in substantial adverse effects on EFH. The complete loss of 580 acres of EFH, as well as adverse impact to several hundred more acres due to dredging and disposal activities associated with the construction and operation of the new CIDMMA expansion and container terminal, will result in a substantial adverse effect on EFH.

The EFH final rule published in the Federal Register on January 17, 2002 defines an adverse effect as: "any impact which reduces the quality and/or quantity of EFH." The rule further states that:

> An adverse effect may include direct or indirect physical, chemical, or biological alterations of the waters or substrate and loss of, or injury to, benthic organisms, prey species and their habitat and other ecosystems components, if such modifications reduce the quality and/or quantity of EFH. Adverse effects to EFH may result from action occurring within EFH or outside EFH and may include site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions.

Under the expanded consultation procedures, the ACOE must submit its EFH assessment to NMFS as soon as practicable, but at least 90 days prior to a final decision on an action. NMFS must respond within 60 days of the submittal of a **complete** EFH assessment unless consultation is extended by agreement between NOAA Fisheries and the ACOE. If the ACOE fails to comply with the consultation requirements of the MSA, NMFS will provide the ACOE with EFH conservation recommendations based upon the information that is available to us.

In the absence of a complete, expanded EFH consultation, we must conclude that the proposed project would have significant adverse affects on EFH and we must recommend that it not be constructed pursuant to Section 305(b)(4)(A) of the MSA.

**PART 1 - Purpose and Need:**
According to the DEIS (page I-2), there are three areas of potential Federal interest in the eastward expansion of the CIDMMA that were identified in the Reconnaissance Phase for further study. These include increased dredged material disposal capacity, National Economic Development (NED) benefits in terms of transportation savings by providing for the development of an East Coast megaport, thus keeping the U.S. competitive in the growing container market, and national defense as the expanded CIDMMA could serve as a defense logistical and tactical area supporting the deployment of national defense forces.

NMFS Northeast Region has been involved in the review of several port improvement plans proposed along the New England and Mid-Atlantic coasts of the United States and as a result, we cannot agree that any one port facility should be given regulatory preference as the "East Coast megaport" in this region. Article 1, Section 9 of the U.S. Constitution states "No Preference shall be given by any Regulation of Commerce or Revenue to the Ports of one State over those of another." We must evaluate each plan in light of its impacts to aquatic resources and with the same criteria used throughout the Northeast Region.

Other ports within the region such as Baltimore, Philadelphia or New York may be able to handle increased cargo without the need to fill aquatic habitat to construct additional port facilities.

Based upon the information in the DEIS, it appears that the primary purpose of the CIDMMA eastward expansion is to create fast land for the construction of the VPA's new container terminal, not to increase the capacity of the CIDMMA, particularly since this expansion adds only three additional years to the life of the CIDDMA (page II-45).

The stated purpose of the proposed container terminal at the CIDMMA is to provide the Commonwealth of Virginia with sufficient capacity to meet the containerized forecast for Hampton Roads and the continuing long-term growth anticipated during the 2050 planning horizon. The DEIS does not provide documentation to support the VPA's assertion that an additional 1,800 acres of land are needed (page I-9) to accommodate the projected increases of containerized cargo. Also lacking is the documentation to demonstrate the need for the level of growth predicted by the VPA and why the costs of filling of 580 acres of productive aquatic habitat are outweighed by the project's benefits.

The DEIS states that portions of the VPA's facilities are functionally obsolete and that the VPA has developed a capital improvement program to improve and to maximize the capacity at its existing facilities cargo terminals. Although the DEIS states that the VPA has developed a master plan for its facilities, little information has been provided to demonstrate that these capacity improvements are insufficient to provide reasonable growth in the port or that there would be significant economic consequences to the Nation if cargo moved through other nearby East Coast ports such as Baltimore, Philadelphia or New York.

**PART II - Evaluation of Alternatives**

The project purpose put forth by the ACOE and the VPA includes three required elements: extending the life of the existing CIDMMA, providing for future port development and supporting national defense needs. Linking the need for dredge material placement options with the development of a port facility eliminates from consideration any alternative that does not create developable land. Because these two functions have independent utility, they should be considered as separate projects.

The existing CIDMMA is currently authorized to handle all types of navigational dredged material, including materials both suitable and unsuitable for open ocean disposal. There are several existing open water disposal sites including the Norfolk Ocean Disposal Site and the Dam Neck Disposal Site that are available to receive dredged material suitable for open water placement. Clearly, limiting the use of the CIDMMA to material that is unsuitable for ocean disposal and placing the suitable material at the open water sites would extend the useful life of the facility. On this alternative, the DEIS states that the placement of dredged material at the CIDMMA cannot be limited to only unsuitable material without additional Congressional Authorization. However, the DEIS does not include information on the amount of material that currently goes into the CIDMMA that could be placed at open disposal sites or how much this would extend the life of the facility. It does not appear that any attempt was made to seek authorization for this change in the management of the CIDMMA and it seems to have been dismissed as an option without consideration. Other East Coast ports, notably the Port of NY and NJ, have segregated the disposal of suitable and unsuitable dredged material in order to protect the aquatic environment, preserve upland disposal capacity and manage dredged material for beneficial uses. There does not appear to be a reason why this cannot be accomplished in the Port of Hampton Roads.

The DEIS states that the existing CIDMMA is used regularly for military training exercises. It does not state that this function will not be able to continue as the CIDMMA reaches its capacity. Also, as

mentioned above, no documentation has been provided to demonstrate a need for additional military uses of the site for the transport of troops, supplies, etc, or that this type of function is lacking in the area or cannot be accommodated if needed at the existing port facilities in the area.

Page II-4 states that a general assumption for the initial alternatives screening was that any proposed confined disposal facility (CDF) expansion cell would be added into the cell rotation to continue optimal drying of material disposal in the facility. The next sentence states that it is assumed the expansion cells will be rapidly filled for port development, which consists of having dredged material placed into the cell as rapidly as possible without the expansion cell participating in the DMMP cell rotation for optimal drying. These two statements contradict each other. The ACOE should clarify how any expansion of the CDIMMA will fit into the DMMP for the site and how it will meet the criteria for extending the useful life of the CIDMMA.

It does not appear that the disposal of dredged material is a significant problem in the project area. Even under the no action alternative, ocean disposal of dredge material would still be permitted for suitable material. Since the ACOE has not provided any information on the percentage of material unsuitable for ocean disposal, it is not possible to assess the impacts of the loss of the CIDMMA as a disposal site for unsuitable material. In any case, the DEIS lists several practicable alternatives for dredged material placement that would extend the life of the existing CIDMMA without filling 580 acres of aquatic habitat. These alternatives include the placement of material on upland confined disposal sites, ocean placement, filling in deep holes and some beneficial use projects.

The use of dredged material, particularly material unsuitable for ocean disposal does not appear to have been considered for the remediation of brownfields, landfill closures, redevelopment of industrial sites that may exist in and around the Port of Hampton Roads. This is a common practice in other states, such as New Jersey where several projects are underway to cap and to close landfills for redevelopment and open space and to remediate and to construct warehousing facilities on brownfields for use by port related industries. The ACOE did not appear to consider these options as part of this DEIS and focused primarily on those options that would create new land in the port area. This omission is a serious deficiency in the DEIS. We recommend that the ACOE undertake a comprehensive approach in creating a new Dredged Material Management Plan for the region that incorporates the latest options for beneficially using dredged material. The Port Authority of New York and New Jersey, the New York District ACOE and the State of New Jersey can provide both examples of economically viable and environmentally beneficial placement options and guidance on developing a plan for environmentally sound dredged material management.

According to the DEIS, various sites throughout the Hampton Roads area were evaluated for the construction of a marine terminal. Based upon Table II-4 on page II-37, it appears that sites of less than 400 acres were not considered and that only undeveloped sites were evaluated as part of the DEIS. No rationale has been given for the size limitation. This should be clarified. Also, it does not appear that any redevelopment or brownfield sites were considered as part of the alternatives analysis. The ACOE and VPA should provide justification for restricting the alternatives analysis in this manner.

The No Action alternative was eliminated from consideration in the DEIS. Page II-38 states that the most notable national effect of the No Action alternative would be the economic consequences felt by the entire East Coast and Midwest markets. The DEIS does not explain fully what these economic consequences would be and why this is a reason that the No Action alternative should be eliminated from further consideration. According to CEQ NEPA regulations, Federal agencies must analyze the No Action alternative in each EIS. The complete analysis of the No Action alternative provides a baseline for

analysis of the action alternatives, allowing decisionmakers to compare the environmental effects of the various alternatives. This DEIS eliminates the No Action alternative from analysis, restricting the ability to make a proper comparison among alternatives.

The Economic Evaluation of Alternative Plans section of the DEIS does not include an analysis of the economic consequences of the loss of aquatic habitat such as the lost commercial and recreational fishing opportunities and the effects on businesses associated with these types of activities such as marinas, fishing gear suppliers boatyards and even fuel suppliers. A complete evaluation of the plans should include both the economic benefits and costs of the project to all economic contributors in the region.

**PART III – Affected Environment**

The DEIS does not include any information about the affected environment at the open water disposal sites or at the sand borrow areas that would be used for the construction of the CIDMMA expansion and port facility. In order to evaluate fully all of the direct, indirect, individual and cumulative effects of the proposed project and its alternatives, the effects on all of the areas that will be impacted by the project's construction must be considered. Although NEPA documents may have been completed for the use of the Atlantic Ocean Channel, the Thimble Shoal Channel, the Cape Henry Channel, the Dam Neck Ocean Disposal Site and the Norfolk Ocean Disposal Site, this project was outside the scope of the analysis completed for these sites. As a result, the impacts and the existing environment at these sites should be included in this DEIS.

**1.4 Aquatic Biota**

**1.4.2 Essential Fish Habitat**

As discussed above, several federally managed species for which EFH has been designated were not included in the DEIS including juvenile windowpane, clearnose skate, little skate and winter skate.

**1.8 Utilities**

**1.8.1 Water Supply**

We note that page III-41 of the DEIS states that the City of Portsmouth has stated that the existing water distribution system is "unlikely" to meet fire flow and pressure requirements. If the City of Portsmouth is required to seek additional water supplies or distribution capacity as a result of this project, the environmental impacts associated with this action should be included in the DEIS.

**PART IV – Environmental Consequences**

**Section 1.1.2 Water Quality**

**1.1.2.1 Dredging for Access Channel and Cell Construction**

While the cubic yardage of dredging needed for the access channel and cell construction is included in the DEIS, the acres of bottom that would be impacted is not provided. We were able to calculate approximately how many acres of bottom would be dredged for the dike construction (154) and for the access channel (96) from the information in the DEIS, but we could not determine the acreage that would be impacted at the borrow areas or the ocean disposal sites. The DEIS should state the areal extent of the impact.

We note that Page II-5 states that a channel and berth area will be dredged to allow ship access to the port facility. Yet on page IV-5 in which the environmental consequences of the project are discussed it states that dredging is planned as part of the proposed CIDMMA eastward expansion and would be completed regardless of port development. These statements appear to contradict each other because one says the purpose of the dredging is for port facility access and the other says its purpose is to access the disposal area. No information is provided to explain why a new berthing area would need to be dredged for the

CIDMMA expansion only. The site currently has access at the rehandling basin and that access does not appear to change with the proposed expansion. The remaining areas around the existing site do not have deep water access. The DEIS should explain why the expansion area would need this access if a port facility was not constructed and it should resolve these inconsistent statements.

The effects of the suspended sediment on benthic communities and aquatic resources have not been addressed fully. Since CIDMMA expansion and Phase I of the container terminal construction are expected to take five years to construct, it is misleading to say that the impacts will be short-term. For five years, elevated levels of suspended sediment will occur within the vicinity of the project area. Such suspended sediment levels can reduce dissolved oxygen, can mask pheromones used by migratory fishes, and can smother immobile benthic organisms and demersal newly-settle juvenile fish (Auld and Schubel 1978; Breitburg 1988; Newcombe and MacDonald 1991; Burton 1993; Nelson and Wheeler 1997). According to the DEIS, a portion of the plume from the dredging containing very fine sediment particles is expected to move south of the site on flood tides. The figures in the DEIS indicate that there are two oyster reefs south of the site, one on each side of the Elizabeth River. While a thin layer of sediments may not be fatal to adult oysters, it may affect reproduction (Wilber *et al.* 2005). Because larval oysters require hard substrate for settlement, the presence of even a few millimeters of sediment covering an oyster reef may inhibit larval recruitment (Galtsoff 1964; McKinney *et al.* 1976 in Wilber *et al.* 2005).

**1.1.2.6 Ballast Water**

This section does not address the impacts of ballast water exchange at the port facility. Entrainment of aquatic organisms occurs as ships take on ballast water. Depending upon the size of the vessel, millions of gallons of water and its associated aquatic life, particularly eggs and larvae of managed species and their prey can be transferred from the surrounding aquatic system into the ballast tanks of a ship at a rate of tens of thousands of gallons per minute. As stated on page III-18, the Elizabeth River is an important nursery for many commercial and recreational species including spot (*Leiostomus xanthurus*), Atlantic croaker (*Micropogonias undulatus*), Atlantic menhaden (*Brevoortia tyrannus*), weakfish (*Cynoscion regalis*), striped bass (*Morone saxatilis*), black sea bass (*Centopristis striata*) and summer flounder (*Paralichthys dentatus*) and that the project area is spawning grounds for important forage species such as bay anchovy (*Anchoa mitichilli*) and Atlantic silversides (*Menidia menidia*). The DEIS should address the impacts of the entrainment these species as a result of port operations and ballast water intake.

**1.3 PROTECTED RESOURCES AND CRITICAL HABITAT**

NMFS Northeast Region's Protected Resources Division has provided comments on this DEIS in a separate letter dated October 7, 2005. Threatened and endangered species under the jurisdiction of NMFS may be found in the project area, including the offshore borrow areas and the ocean disposal areas. Further consultation with NMFS will be necessary. For additional information and coordination on threatened and endangered species or the Section 7 consultation process, please contact Julie Crocker at 978-281-9300, ext 6530.

**1.4 AQUATIC BIOTA**

**1.4.1 CIDMMA Expansion**

**1.4.1.1 Essential Fish Habitat**

As discussed above, the DEIS does not contain a complete EFH assessment. In order to comply with Section 305(b) (2) of the MSA, the ACOE must prepare an assessment of the project's direct, indirect, individual and cumulative effects on EFH. The DEIS fails to address all of the projects impacts or the effects on each federally managed species. This includes the EFH designated at the Atlantic Ocean Channel, the Thimble Shoal Channel, Cape Henry Channel and the Dam Neck and Norfolk ocean placement sites.

Of particular concern are the impacts of the CIDMMA to sandbar shark. The project area has been designated as a Habitat Area of Particular Concern (HAPC) for these species. It is important to note that impacts to EFH cannot be dismissed as minimal because they are a small percentage of the total EFH for a particular federally managed as species. These areas have been designated as EFH because they are "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity" (16 U.S.C. 1802(10)." HAPC are subsets of EFH identified based on one or more of the following considerations: 1) the importance of the ecological function, 2) extent to which the habitat is sensitive to human-induced degradation, 3) whether and to what extent, development activities are stressing the habitat type, or 4) rarity of habitat type (50 CFR 600.815(a)(8)).

The sandbar shark is one of the most important commercial species in the shark fisheries of the southeastern United States (NMFS 1999). Hampton Roads, Virginia ranked fourth in the nation in the value for highly migratory fish landings, including sharks in 2003 (NMFS 2004 in NMFS 2005). Estuarine shallows in the lower Chesapeake Bay provide important nursery and pupping grounds for the sandbar shark (NMFS 1999). Musick *et al.* (1993 in NMFS 1999) have documented a severe decline in the catch per unit effort (CPUE) of the sandbar shark in the Chesapeake Bay area. The proposed project would destroy 580 acres of HAPC for sandbar sharks due to the filling of shallow estuarine habitat used by the species as a pupping and nursery area. An additional 96 acres of HAPC will be lost as a result of the construction of the access channel. In addition, direct mortality of the species may occur if dredging is conducted during the pupping and nursery season of May to October.

The Highly Migratory Species (HMS) Fishery Management Plan developed by NMFS includes EFH conservation recommendations to reduce impacts to this important species. The recommendations include the following (NMFS 1999):

- Permanent dredge material disposal sites should be located in upland areas. Where long-term maintenance is anticipated, upland disposal sites should be acquired and maintained for the entire life of the project.

- Destruction of wetlands and shallow coastal water habitats should not be permitted in areas adjacent to HMS EFH. Mitigating or compensating measures should be employed where destruction is unavoidable. Project proponents should demonstrate that project implementation will not negatively affect HMS, their habitat or their food sources.

- Best engineering and management practices (e.g. seasonal restrictions, modified dredge methods, and/or disposal options) should be employed for all dredging and in-water construction projects. Such projects should be permitted only for water dependent purposes when no feasible alternatives are available. Mitigating or compensating measures should be employed where significant adverse impacts are unavoidable. Project proponents should demonstrate that project implementation will not negatively affect HMS, their habitat or their food sources.

- Project guidelines should make allowances to cease operations to take additional precautions for avoid adversely affecting HMS EFH during seasons when sensitive life stages might be the most susceptible to disruption (e.g., seasons when spawning is occurring.)

Another serious concern is the impacts of the proposed project on summer flounder. In Virginia, the shoal water flat areas of higher salinity, greater than 18 parts per thousand, in the lower Chesapeake Bay are one of the most important nursery areas for summer flounder (Packer *et al.* 1999). The CIDMMA

expansion area has been designated as EFH for larvae, juveniles and adults of this species. From October to May, larvae and post larvae summer flounder migrate inshore, entering coastal and estuarine nursery areas to complete transformation (Merriam and Sclar 1952, Olney 1983; Olney and Boehlert 1988; Able *et al.* 1990; Szedlmayer *et al.* 1992). They leave the water column and settle into the bottom where they bury into the sediments and complete development to the juvenile stage (Packer *et al.* 1999). During metamorphosis, it is unlikely that summer flounder will be able to escape impingement or entrainment in a dredge or burial during the filling of the site.

This project would also result in the removal of 580 acres of benthic habitat that supplies a food source for both federally managed species and species managed by the Atlantic States Fisheries Commission such as striped bass and weakfish. According to the information in the DEIS and the USFWS Planning Aid Report included as Appendix A of the DEIS, the benthic community at the CIDMMA expansion area includes benthic invertebrates such as *Neries succinea*, *Sabellaira vulgarus* and *Ampelisca abdita*. Steimle *et al.* (2000), report that *Ampelisca abdita* is particularly important to the diets of winter flounder (*Pseudopluronectes americanus*), windowpane, juvenile scup (*Stenotomus chrysops*), juvenile weakfish, striped searobins (*Prionotus evolans*), juvenile black sea bass and juvenile silver hake (*Merluccius bilinearis*), all of which have been documented to occur around the CIDMMA. *Paraprionospio pinnata*, the second most abundant benthic invertebrate species collected adjacent to Craney Island by Dauer and Ewing (1986 in FWS 2002) and *Neries succinea*, the seventh most abundant species, were found to be prey species of spot in the Chesapeake Bay by Homer and Boynton (1978).

Fisheries sampling in the vicinity of the project area is reported in the DEIS. In addition to the species mentioned above, a wide variety of species have been caught in the waters around Craney Island, including red hake (*Urophycis chuss*), butterfish (*Peprilus tricanthus*), cobia (*Rachycentron canadum*), Spanish mackerel (*Scomberomorus maculatus*), bluefish (*Pomatomus saltatrix*), tautog (*Tautog onitis*), alewife (*Alosa pseudoharenus*), blueback herring (*Alosa aestivalis*) and American shad (*Alosa sapidissima*) (USFWS 2002). This information also indicates that the Elizabeth River is an important nursery area for many commercial and recreational species including spot, Atlantic croaker, Atlantic menhaden, weakfish, striped bass, black sea bass, and summer flounder. The most intensive use for spawning is by forage fish, including bay anchovy and Atlantic silversides (Priest 1981 in ACOE 2005). Bay anchovy has been shown as a prey species for windowpane (Kimmel 1973; Carlson 1991 in Packer *et al.* 1999)) for striped bass (Homer and Boynton 1978; Hollis 1952) and weakfish (Chao and Musick 1977; Hartman and Brandt 1995). Both species are also important to the diets of summer flounder (Homer and Boynton 1978; Smith and Daiber 1977). Juvenile spot and Atlantic menhaden are also components of the diets of weakfish and bluefish (Hartman and Brandt 1995), summer flounder and spotted hake (*Urophycis regia*) (Homer and Boynton 1978). Clearly, the loss of 580 acres of aquatic habitat for the expansion of the CIDMMA and the subsequent port facility development will have an adverse effect on a wide variety of aquatic resources due to the loss of nursery areas and habitat for forage species as well as managed species and should be discussed in the DEIS.

In addition to the direct, physical removal of EFH and the removal of the forage base, sustained water column turbulence can reduce the feeding success of sight-feeding fish such as winter flounder, tautog, and summer flounder. According to Olla *et al.* (1974 and 1975 in Collette and Klein-MacPhee 2002), tautog are opportunistic sight feeders. Winter flounder are also sight feeders and are diurnally active in both inshore and offshore waters (Pearcy 1962 in Collette and Klein-MacPhee 2002).

According to the DEIS, riprap placed on the dikes will attract species that are normally associated with reef structures, species that are commonly found around estuarine inlets and species that seasonally migrate along the coast; and a study from West Harbor, Ohio is cited as evidence that this will occur. No

information is presented to demonstrate how the estuarine waters of the Chesapeake Bay are comparable to West Harbor, Ohio. There is no discussion of what species would use this habitat. Further, since the CIDMMA would be used as a port facility, it is unclear how much of the new dike area would be exposed riprap since the berthing areas of wharf facilities are usually not faced with exposed riprap. This is additional evidence of the need for an expanded consultation.

**1.4.1.3.3 Benthos and 1.5.2.3 Subaqueous Bottom**

The benthic community present at the site provides a forage base for a number of commercial and recreational fish species including striped bass, summer flounder, winter flounder, windowpane, spot, weakfish, striped bass and winter flounder. The permanent loss of 580 acres of this habitat must be considered a long-term impact from both the CIMMDA expansion and the port terminal development. This section of the DEIS states that all dredging activities needed for the port expansion will be completed as part of the proposed CIDMMA expansion and other proposed harbor improvements, not as a result of the proposed container terminal development. As previously noted, page II-5 of the DEIS states that a channel and berth area would be dredged to allow ship access to the port facility. No information is provided to explain why this new dredging to create a berthing area would need to be dredged for the expansion only.

**1.13 RECREATIONAL AND COMMERCIAL USE OF WATERS**

**1.13.2.2 Commercial Fishing**

The DEIS states that the loss of benthic habitat due to the project construction would have a negligible effect on commercial fisheries in Chesapeake Bay and vicinity because benthic species of commercial importance such as hard clams (*Mercenaria mercenaria*) were not abundant in recent surveys of the CIDMMA expansion area. However, as discussed above, the benthic community of the project site provides forage habitat and nursery habitat for a variety of commercially important species including summer flounder, winter flounder, Atlantic menhaden and Atlantic croaker. In addition, the area is a HAPC for sandbar shark, one of the most important commercial species in the shark fisheries of the southeastern United States (NMFS 1999). The impacts to these species, their forage base and the fisherman and related industries that depend upon these species were not considered in the DEIS. In 2004 commercial fish landings in the Hampton Roads, VA area totaled 34 million pounds worth 100.6 million dollars (NMFS 2005).

**1.13.1.3 Recreational Boating and Fishing**

In 2001, Virginia waters attracted over 724,000 recreational anglers making more that 3.1 million fishing trips (ASA 2002). The American Sportfishing Association (ASA 2002) also reported that in 2001, recreational fishing in Virginia generated 248.6 million dollars in retail sales and 4,251 jobs. The primary target species were striped bass, flounder, weakfish, drum and bluefish. EFH for flounder (winter, summer and windowpane), bluefish and red drum have been designated in the project area. In addition, the Chesapeake Research Consortium (1991) has listed the project area as a known spawning river for striped bass. The DEIS does not include an evaluation of the projects impacts to the recreational fishing and boating industries based upon the impacts to their habitat or food sources. As discussed above, the project would likely substantial impacts to these recreationally important fish species.

**1.14 ECONOMICS**

The economic value of the aquatic resources in the project area should be considered in the DEIS. A great deal of information is presented on the economic contributions of the VPA, but no data is provided on the value of commercial and recreational fishing in the area. As stated above, in 2004 commercial fish landings in the Hampton Roads, VA area totaled 34 million pounds, worth 100.6 million dollars (NMFS 2005); and recreational fishing in Virginia generated 248.6 million dollars in retail sales and 4,251 jobs in

2001 alone (ASA 2002). In order to have a balanced evaluation of the project's impacts, all of the contributors to the region's economy should be included, not just VPA.

**1.20 SAND BORROW FOR DIKE CONSTRUCTION**

The impacts to EFH, fishery resources and federally protected species from the use of the Atlantic Ocean Channel, Thimble Shoal and Cape Henry Channels are not addressed in the DEIS. The proposed project will remove more than 19 million cubic yards of sand from these areas. As discussed above, an EFH assessment must be prepared to address the removal of sand from these areas. In addition, this project is outside of the scope of the Endangered Species Act Section 7 consultations prepared for these channels which were based only upon maintenance dredging activities, not sand mining for the expansion of the CIDMMA. As a result, additional consultation pursuant to Section 7 of the ESA is required.

**1.22 MITIGATION and Appendix B Mitigation Analysis**

The Mitigation Analysis only considers the 580-acre fill as an action requiring mitigation. As discussed above, NEPA guidelines require that the ACOE consider all of the direct, indirect, individual and cumulative impacts of the project. These impacts include 96 acres of new work dredging for the berthing area that will result in the conversion of subtidal shallow water habitat to deepwater habitat, the placement of 19.1 million cubic yards of dredged material at the Dam Neck or Norfolk Ocean Disposal Sites, the removal of 19.5 million cubic yards of sand from the Atlantic Ocean, Thimble Shoal or Cape Henry channels for the dike construction and the impacts of the operation of the proposed port facility including impacts from future maintenance dredging and disposal actions and ballast water intake. Without a full and complete evaluation of the projects impacts, it is not possible to determine the compensatory mitigation that would be needed to offset those impacts.

As discussed above, the project would result in the permanent loss of 580 acres of EFH for fourteen federally managed species including a HAPC for sandbar shark. The mitigation analysis does not address the specific impacts to these species or their EFH. Because the project site has been designated as EFH, compensatory mitigation needs to be provided that would offset the permanent loss of habitat as well as any habitat degradation that would occur due to the dredging, sand mining, dredged material disposal and port facilities operations. The mitigation analysis uses the Habitat Equivalency Analysis (HEA) methodology "to quantify the loss in habitat productivity from the proposed CIDMMA expansion and to provide a scale for a mitigation project that would compensate for the estimated loss in ecosystem services and production at the appropriate trophic levels." This approach is used often by Natural Resource Trustees, including NOAA, to determine compensation for natural resource injuries resulting from vessel groundings, oil spill and hazardous waste sites. However, the implicit assumption of the HEA is that the public is willing to accept a one-to-one trade-off between a unit of services and a unit of restoration project services (i.e. the public equally values a unit of services at the injury site and the restoration site (NOAA 2000). Habitat equivalency analysis is applicable as long as the services provided are comparable. However, the DEIS does not justify how the services provided at the CIMMDA, including the value for the site as a spawning and nursery area for federally managed species and their forage base and the HAPC for sandbar sharks, are comparable to the services that will be provided by the mitigation proposed.

Although sediment remediation, wetlands restoration from uplands and oyster reef restoration can provide a variety of ecological benefits to NOAA trust resources including EFH, it is premature to conclude that these actions will compensate for the substantial impacts to aquatic resources of national importance that would result from the construction of the CIDMMA Eastward Expansion and VPA container terminal. Without a full and complete analysis of all of the direct, indirect, individual and cumulative impacts of the proposed project, a complete analysis of alternatives including the No Action alternative, and

documentation that the propose mitigation will offset the impacts to EFH, federally managed species and their food sources, it is premature for the DEIS to conclude that the "Best Buy" plan selected by the ACOE and the VPA will compensate fully for environmental impacts of the project.

**CONCLUSIONS**

Section 2 (a) (9) of the MSA states "One of the greatest long-term threats to the viability of commercial and recreational fisheries is the continuing loss of marine estuarine and other aquatic habitat." The expansion of the CIDMMA would result in the permanent loss of 580 acres of estuarine habitat, as well the conversion of 96 acres shallow estuarine habitat to deep water channels. The proposed expansion results only in an additional three years use of site. Alternate dredged material disposal options appear available. The alternatives analysis for port facility expansion evaluated only undeveloped sites greater than 400 acres without providing justification for limiting the alternatives in this manner. Options for port facility expansion, such as the redevelopment of brownfields, do not appear to have been considered. Also, the DEIS does not address adequately the impacts to aquatic resources that would result from the construction of the CIDMMA expansion and port facility. Impacts to EFH, federally managed species, the HAPC for sandbar sharks, forage species and nursery and spawning habitat are not considered fully; and adequate mitigation for these impacts has not been proposed. As discussed above, an expanded EFH consultation is needed as is further consultation pursuant to Section 7 of the ESA. These consultations must include an evaluation of the entire project on EFH and ESA species, including the impacts of the fill at the CIDMMA, the access channel dredging, the Atlantic Ocean Channel, Thimble Shoal Channel and Cape Henry Channel sand borrow areas and the Dam Neck and Norfolk Ocean disposal areas. If you would like to discuss this matter further, please contact Mr. Stan Gorski or Ms. Karen Greene of NOAA's NMFS Northeast Region's Sandy Hook field office at 732-872-3037 or 732 872-3023.

Sincerely,

Susan A. Kennedy
Acting NEPA Coordinator

cc: NMFS NERO HCD - Gloucester, Sandy Hook, Annapolis
NMFS NERO PRD – Gloucester
NOAA OCRM – R. Schnieder
FWS – Annapolis
EPA – Region III
MAFMC- T. Hoff
NEFMC - L. MacGee
VMRC- W. Pruitt

# United States Department of the Interior

OFFICE OF THE SECRETARY
Office of Environmental Policy and Compliance
Custom House, Room 244
200 Chestnut Street
Philadelphia, Pennsylvania 19106-2904


TAKE PRIDE IN AMERICA

IN REPLY REFER TO:

November 3, 2005

ER 05/861

Mr. Craig Seltzer
U.S. Army Corps of Engineers
803 Front Street
Norfolk, VA 23510

Dear Mr. Seltzer:

The Department of the Interior has reviewed the Draft Environment Impact Statement (DEIS) for the Craney Island Expansion Norfolk Harbor and Channels, Hampton Roads, Virginia, dated September 2005. Please consider the following comments in completing the Final Environmental Impact Statement.

**GENERAL COMMENTS**

We believe the DEIS contains deficiencies in three main areas. First, the biological conditions in the affected area are not adequately represented. Second, adverse impacts (especially effects associated with the suspended sediment plume, dredging for dike construction material, and ocean disposal) are not sufficiently described, while positive effects associated with riprap placement are overemphasized. Third, some information on the mitigation plan is confusing and/or misleading.

Concurrent with the preparation of these comments, the U.S. Fish and Wildlife Service (Service) has prepared a report to the Corps in accordance with Section 2(b) of the Fish and Wildlife Coordination Act. The report reviews the biological impacts of the project, including the loss of 580 acres of estuarine open water habitat, and the proposed mitigation plan. The Service concludes that the mitigation plan is a reasonable effort to compensate for the project impacts. It further notes that because of the complexity of the mitigation, further coordination with the Service will likely be necessary as more advanced planning is conducted.

**SPECIFIC COMMENTS**

Part III. The document often describes the expansion area conditions by presenting information on the Elizabeth River as a whole. It fails to point out that the conditions at the expansion site are believed to be better than the river in general. This is particularly true for water quality, contamination issues, and biological conditions. This problem even occurs where site specific information is available. For example, page III-26 presents considerable information concerning benthic community indices for the

Elizabeth River and its tributaries which portrays a picture of substantial degradation, but it does not mention the data presented in Table III-6 showing less degraded values at the project site. Where the document presents information for the Elizabeth River as a whole, it should distinguish the situations where the conditions in the project area are better than in the river generally.

Pg IV-3, Sect. 1.1.2.1. The section on the water quality effects resulting from dredging and cell construction lacks clarity and is incomplete. This section indicates that approximately 19 million cubic yards (mcy) would be removed for navigational access. In fact, 15.4 mcy of this dredging is to remove poor foundation material. To assess the effect on water quality, the document should indicate the character of the material in terms of its grain size and potential contaminant burden. The impacts associated with disposal of dredged material at the Norfolk Ocean Site should be acknowledged. Also, the effects associated with the dredging of 19.5 mcy to obtain dike material, and the discharge of this material into open water to create the cell dikes, should be described. The prediction that the suspended sediment plume will be restricted to the navigation channel is not convincing as it seems to assume that most of the material would be generated from the dredging of the navigational access area. On the contrary, most of the sediment plume would be generated from dredging and filling activities conducted in shallower water apart from the channel. The prediction that the plume of suspended sediment that moves into Hampton Roads (the lower James River) during the ebb tide would return to the dredged area on the flood tide seems unlikely.

Pg IV-5, Para. 1. The description of the findings from the study of Boon and Byrne (1975) regarding the sediment plume from dredging of Hampton Bar is vague and misleading. The plume description in the text fails to identify the type of dredge operation. In actuality, this plume resulted from the use of a hydraulic dredge to excavate sandy material and deposit it into scows with overflow. Most of this large surface sediment plume was due to the scow overflow. The document text should be revised to indicate these important details, or perhaps consideration should be given to deleting the information because of lack of relevance to the proposed dredging. Another problem with this paragraph is that it only presents information on hydraulic cutterhead dredges despite the fact that the project will also be using bucket (clamshell) dredges. This may create a biased perspective because while cutterhead dredges produce relatively small plumes that are predominately near the bottom, clamshell dredges create larger plumes that occur throughout the water column. The document should add information clarifying the type of plume that would occur with a clamshell dredge. In the last sentence the meaning of "impounded sediments" is uncertain and should be clarified.

Pg IV-29. The document should clarify that EFH only pertains to Federally managed species. The discussion on the project's effect on fish is improperly restricted to EFH. Potential impacts to the much broader range of indigenous species should be considered.

Pg IV-29, Para. 4. The document, here and on page IV-31, overstates the expected habitat value of the riprap placed on the exterior of the dike. It notes that the riprap is likely to "provide an extremely diverse and productive community, and serve as a nursery

and feeding area for many fishes and invertebrates" and infers that it would attract fish species that are normally found associated with reef structures and coastal estuarine inlets. While it is true that riprap provides a hard attachment substrate for epifaunal invertebrates, and nooks and crannies attractive to small motile organisms and some fish, in this situation these values will come at the expense of the infaunal habitat on the slope. The riprap would not be providing a genuine three dimensional reef habitat, but would simply cover the slope. The existing shoreline is already lined with riprap which would be eliminated by the project. The document did not indicate that the existing riprap shoreline is providing noteworthy habitat value. The value of the new riprap will not be much different, apart from the increased shoreline coverage. Additionally, information on page II-46 indicates that the riprap would only extend down the exterior slope to a depth of -3 feet. This appears to be an error since the riprap would probably be placed all the way down the slope.

Pg IV-30, Sec 1.4.1.3. The document notes that "public oyster grounds (Baylor grounds) are located within the vicinity of CIDMMA" but fails to describe the effect of the project on them. It should note that approximately 200 acres of legally designated Baylor grounds would be covered by the expansion cell, but the actual impact on oysters would be negligible because these grounds have not been productive for many years.

Pg IV-31, Para. 2. The document notes that a study by Seitz and Lipcius (2002) concluded that "the area of the Craney Island expansion had significantly lower bivalve density, diversity, and abundance than the adjacent deep-water habitats or shallow-water habitats in the Craney Island-Lafayette River system." While it is true that this conclusion was made in the study report, the conclusion is not completely supported by the report's data analysis. The report's statistical tests showed that the bivalve density and biomass were not significantly different between the Craney Island expansion area and the deep-water area. Therefore, it would be appropriate to delete the word "significant" from the conclusion or to qualify the statement is some other way. We would also suggest dropping the word "adjacent" from the conclusion statement because the deep-water and shallow-water stations were not predominately adjacent to the Craney Island expansion area. We also question another conclusion which is cited from this report stating that the low bivalve biomass indicates that the expansion area is not likely to be a significant feeding ground for demersal fish. The report notes that bivalves were selected for sampling in part because they are "dominant and representative members of the benthic community." However, other studies cited in the Corps document (Dauer and Ewing, 1986, Dauer, 2000, 2002) show that bivalves are not dominant representatives of the larger benthic community in the expansion area. Bivalves comprise less than 10 percent of the infaunal community biomass (0.085 grams ash free dry weight/$m^2$ compared with 0.940 gAFDW/$m^2$). The community at this site is actually dominated by small polychaete worms. While this level of community biomass is mediocre, it would nonetheless provide a suitable prey base for a variety of common bottom feeding fishes including spot, croaker, silver perch, gizzard shad, mullet, killifishes, blennies, gobies, skilletfish, hogchoker, blackcheek tonguefish, and winter flounder. The area is also likely to have other potential prey organisms, such as mysids, shrimps, small crabs, and other motile epifaunal crustaceans that are not effectively sampled in routine benthic

surveys. Since the conclusion in the Seitz and Lipcius report regarding the potential value of the area as a feeding ground for demersal fish is based solely on sampling bivalves, which do not represent a dominant component of the benthic community at this site, the document should include some clarifying language.

Pg IV-31, Para. 5. The document notes that "Based on the Benthic Index of Biotic Integrity, the impact area is generally poor quality and exhibits degraded conditions." We believe that this description gives an overly negative impression of the area. The data in Table III-6 shows that only 50 % of the samples taken in 1999 and 2001 from the expansion area fail to meet the benthic restoration goal (i.e., show a degraded condition). This is comparable to values from the Elizabeth main stem, but lower than any of the tributary segments which range between 64 and 92 % (see page III-26 for the figures). The average for all Virginia tidal waters was 30% in 1999, and 38% for the three-year period from 1997-1999. Therefore, the document should further qualify the description of the benthic community condition to reflect its condition relative to Virginia tidal waters generally and to other Elizabeth River areas in particular.

This paragraph of the document also states that the widening of the navigation channel for ship access and berthing will provide an equivalent cross sectional area of open water to what would be lost by construction of the expansion cell. The statement is apparently derived from the 2001 report of the hydrodynamic modeling study. However, the volume of water column that would be enlarged due to the ship access dredging (3.7 mcy) is much less than the volume that would be lost due to construction of the expansion cell (580 acres X 3.5 yd deep X 4840 sq yd/acre = 9.8252 mcy). This indicates that the increase in the cross sectional area of open water resulting from the ship access dredging is substantially less than the area that would be lost due to construction of the expansion cell. Since this discrepancy raises a concern about the assumptions used in the hydrodynamic modeling study, it must be resolved.

Pg IV-67, Sec 1.20. The document notes that the USACE has a long-standing policy to use dredged material from navigation projects for beach replenishment or similar purposes that would benefit local, state, and Federal interests. It then notes that "significant quantities of material suitable for dike construction are expected to be available in these channels" (referring to the Atlantic Ocean Channel, Thimble Shoal and Cape Henry channels). This implies that normal maintenance dredging of these channels would be sufficient to produce the 19.5 mcy needed for dike construction. Because this seems unlikely, the document should clarify whether the dike material would be obtained from normal maintenance activities or whether the channels would be used as borrow areas that would be deepened beyond the normal depths. Does use of channel material for dike construction mean locals would receive less sand for beach replenishment?

Page IV-75, Para. 5. The document states, here and elsewhere, that the mitigation plan includes 411 acres of bottom sediment remediation. This figure is misleading because information in the Mitigation Analysis appendix shows that only 68 acres of bottom would be directly remediated. The 411-acre figure is a conjecture of the potential benefit to benthic communities from remediating 68 acres, based on an assumption that there

would be a 25 percent increase in the benthic biomass throughout the Southern Branch. Because this larger benefit is highly speculative, the document should primarily refer to the 68 acres that would be directly remediated, with a supplementary explanation provided, if necessary, for the potential of additional improvement to neighboring areas.

Pg IV-76, Para. 1. We question the validity of the statement that "this mitigation plan amounts to a slightly greater amount of production than is estimated to be lost from project construction." It is true that the mitigation ratios developed for the oyster reef and marsh creation options were based on their relative amounts of secondary production (benthic invertebrates and zooplankton) as determined from actual site specific measurements in the expansion area and from data from the literature. However, the sediment remediation portion of the plan, which is the dominant component, was not determined on the basis of expected production increases. As noted in our previous comment, the Corps estimate that the sediment remediation of 68 acres would result in improved production equivalent to 411 acres is highly speculative. Since the justification for this estimate is so weak, we recommend that the aforementioned statement be deleted.

Pg IV-76, Parag 2. The document states that a number of state and federal organizations, including the Service support the mitigation plan. While a Service representative participated on the committee that developed the mitigation plan, the Corps was informed by the representative that he was not empowered to give official agency approval of the plan, but only to provide technical assistance. Verbal comments and opinions expressed during committee meetings certainly did not constitute the official position of the Service which would only be conveyed by the Field Office Supervisor or higher level agency official, usually in written format.

Page IV-89, Table IV-22. This table is confusing and fails to adequately describe the mitigation plan. Under the heading "Mitigation Type" there should be four basic entries: sediment remediation, wetland restoration, oyster reef (add clam as necessary), and bird management. We suggest adding an additional column for "Site Name", which would be distinct from the location. For example, Lambert Point would be the site name and Main-stem Elizabeth River would be the location. As noted previously, the 411-acre figure for sediment remediation is speculative and misleading. Each individual sediment remediation site should be listed, along with its actual acreage figure. It is not meaningful to give a sum of the total mitigation project acreages because the environmental values of the different types of projects are different, i.e., one acre of oyster reef is not equivalent to one acre of sediment remediation. Also, the value of one acre of habitat in the expansion area would not be ecologically equivalent to one acre of a particular mitigation option. The differences in the habitat values were taken into account through the Habitat Equivalency Analysis which developed acreage equivalency ratios. In the Executive Summary of the document, the total mitigation acreage is given in an attempt to help summarize the plan. We recommend that this be avoided because it falsely implies acre-for-acre equivalency. Presenting the acreages of the different mitigation types would be appropriate (i.e., 68 acres sediment remediation, 56 acres wetland/riparian habitat establishment, and 20 acres of oyster reef/clam restoration).

Appendix B, Pg 7, Para. 1. The document is imprecise in stating that: "Overall, and compared to other areas in the lower Chesapeake Bay and the Elizabeth River, the area is of relatively low overall productivity and low ecological value." It is true that the expansion area has somewhat lower productivity and ecological value than other typical areas in the lower Chesapeake Bay and James River. However, the ecological condition of the expansion area (as indicated by benthos and zooplankton surveys) is much better than most of the other areas within the Elizabeth River, where the habitat has been substantially degraded by sediment contamination and poor water quality.

Appendix B, Pg 21, Parag 2. It is misleading to state that the "Buchman's results were used by the Subcommittee to develop the sediment remediation portion of the mitigation plan." These results were simply a demonstration of the capability of the HEA approach to determine the potential value of sediment remediation as mitigation for habitat lost in the expansion area. The actual process that was used to determine the sediment remediation component of the mitigation plan is described on pages 23 and 24 of this appendix.

Appendix B, Pg 27, Parag 3. The definition of zooplankton as pertaining to its use in the Habitat Equivalency Analysis contains some inaccuracies and could be otherwise improved. The spelling of "protests" should be corrected to protists. We recommend deleting the reference to foraminiferans (which are primarily benthic) and radiolarians (which are strictly marine) and substituting tintinids and non-loricate ciliates as examples of the most common planktonic protists in the project area. We also suggest deleting the reference to "larval stages of many fish species" since they only comprise an incidental component in the routine zooplankton collections used in the HEA. In place of the reference to Nybakken (1988), which provides a general description of marine zooplankton, the following citations would provide more appropriate site specific information.

Sharp, W.C. 1995. Zooplankton community dynamics in the Elizabeth River, Virginia. M.S. Thesis, Old Dominion University, Norfolk, VA.

Park, G. and H. Marshall. 1993. Microzooplankton in the lower Chesapeake Bay and the tidal Elizabeth, James, and York rivers. Virginia Journal of Science, 44(4): 329-340.

Thank you for the opportunity to present these comments. Any questions or further coordination on fish and wildlife resource issues should be directed to George Ruddy of the U.S. Fish and Wildlife Service's Chesapeake Bay Field Office at (410) 573-4528.

Sincerely,

Michael T. Chezik

Michael T. Chezik
Regional Environmental Officer

cc:
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# COMMONWEALTH of VIRGINIA

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November 17, 2005

Mr. Mark T. Mansfield
Chief, Planning and Policy Branch
U.S. Army Corps of Engineers, Norfolk District
803 Front Street
Norfolk, Virginia 23510

RE: Draft Environmental Impact Statement and Federal Consistency Determination: Craney Island Eastward Expansion Study, Norfolk Harbor and Channels, Hampton Roads, Virginia
DEQ-05-244F

Dear Mr. Mansfield:

The Commonwealth of Virginia has completed its review of the above Draft Environmental Impact Statement (Draft EIS) and federal consistency determination. The Department of Environmental Quality ("DEQ") is responsible for coordinating Virginia's review of federal environmental documents prepared pursuant to the National Environmental Policy Act ("NEPA") and responding to appropriate federal officials on behalf of the Commonwealth. In addition, DEQ is the lead agency for review of federal consistency determinations prepared under the Coastal Zone Management Act (CZMA) and the Virginia Coastal Resources Management Program. The following state agencies, regional planning district commission, and localities joined in this review:

Department of Environmental Quality
Department of Game and Inland Fisheries
Department of Conservation and Recreation
Department of Health
Department of Transportation
Department of Historic Resources
Virginia Institute of Marine Science
Virginia Port Authority
Hampton Roads Planning District Commission
City of Newport News

City of Hampton
Northampton County

In addition, the following agencies, planning district commission, and localities were invited to comment:

Marine Resources Commission
Department of Emergency Management
Accomack-Northampton Planning District Commission
City of Chesapeake
City of Norfolk
City of Portsmouth
City of Suffolk.

Project Description

The Corps of Engineers and the Virginia Port Authority (the non-federal project sponsor) propose a 580-acre eastward expansion of the Craney Island Dredged Material Management Area, and to develop a container terminal thereon. The proposed expansion is located in the Port of Hampton Roads between Portsmouth and Norfolk. The Corps and the Port Authority propose to use the 580-acre expansion for a new dredged material placement cell, including a main dike and perimeter dikes, and then to re-develop it for a container terminal complex. The complex would include an access channel, ship berths, wharves, container yards, cranes, gates, inter-modal yards, access roads and ramps, new rail track, cargo processing and support facilities, and stormwater management area (Draft EIS, page ES-2).

Environmental Impacts and Mitigation

*1. Natural Heritage Resources.* The Department of Conservation and Recreation has searched its Biotics Data System for occurrences of natural heritage resources in the project area. "Natural heritage resources" are defined as the habitat of rare, threatened, or endangered species of plants and animals, unique or exemplary natural communities, and significant geologic resources. The Department of Conservation and Recreation ("DCR") reports that there are natural heritage resources in the vicinity of the project. However, due to the project location and the distance to the resources, DCR does not anticipate that the project will adversely affect natural heritage resources.

Under a memorandum of agreement between DCR and the Department of Agriculture and Consumer Services ("VDACS"), DCR represents VDACS in

commenting on potential project impacts on state-listed endangered or threatened insect or plant species. The proposed project will not affect any such species.

*2. Fisheries and Wildlife Resources.*

*(a) Agency Responsibilities.* The Department of Game and Inland Fisheries, as the Commonwealth's wildlife and freshwater fish management agency, exercises enforcement and regulatory jurisdiction over wildlife and freshwater fish, including state or federally listed endangered or threatened species, but excluding listed insects. The Department (hereinafter "DGIF") is a consulting agency under the U.S. Fish and Wildlife Coordination Act (16 U.S.C. sections 661 et seq.), and provides environmental analysis of projects or permit applications coordinated through the Department of Environmental Quality and several other state and federal agencies. DGIF determines likely impacts upon fish and wildlife resources and habitat, and recommends appropriate measures to avoid, reduce, or compensate for those impacts.

*(b) Findings.* In general, the Department of Game and Inland Fisheries ("DGIF") supports the overall mitigation plan (see item 2(c), below). However, DGIF states concerns and provides recommendations concerning protection of bird and mammal species (items 2(e) and 2(f)) and of Elizabeth River fisheries (item 2(d)). DGIF recommends strict erosion and sediment controls throughout the project.

*(c) Mitigation Plan.* According to DGIF, the project proposal includes 20 acres of oyster reef restoration, 56 acres of wetland restoration, and 411 acres of bottom sediment restoration and remediation as mitigation for the loss of open water and benthic habitat which will result from the proposed project. The sediment restoration and remediation is proposed at several contaminated sites along the South Branch of the Elizabeth River. Wetland sites to be restored include:

- the Old Dominion University drainage canal;
- the former Exxon Terminal (Shotmeyer Property);
- Paradise Creek Park; and
- St. Julien's Annex (Blows Creek).

Proposed oyster reef sites include the Elizabeth and Lafayette River systems. Other potential mitigation options include:

- wetland/oyster reef restoration at Ragged Island Wildlife Management Area (see "Regulatory and Coordination Needs," item 1(a), below);
- a Craney Island Bird Management Plan (see item 2(e), below); and
- oyster reef restoration at Hoffler Creek in Portsmouth.

The Department of Game and Inland Fisheries supports the overall mitigation plan, but recommends strict monitoring of all mitigation sites. To assess the functional value of the mitigation, DGIF recommends developing measurable success criteria, including biological components (vegetation, benthics, fishery, and wildlife). Similarly, the Department of Conservation and Recreation, which participated in the development of the mitigation plan, finds that it adequately addresses environmental concerns related to the protection of the Chesapeake Bay and the Elizabeth River.

*(d) Elizabeth River and Fisheries.* The Elizabeth River has been designated as a Confirmed Anadromous Fish Use Area, according to DGIF. The proposed dredging of a 50-foot deep access channel for the project has the potential to result in increased sedimentation in the River. To minimize potential adverse impacts from this sedimentation, DGIF recommends that no dredging occur during the migratory and spawning season for anadromous fish, defined as February 15 through June 30.

*(e) Bird Management.* The Department of Game and Inland Fisheries encourages the Corps to develop a Craney Island Bird Management Plan, one of the mitigation options mentioned above (see item 2(c)). This development should be coordinated with DGIF (see "Regulatory and Coordination Needs," item 1(b), below). The Plan should include the following elements.

*(i) Nesting Areas.* The Corps should make every effort to protect and maintain appropriate nesting areas for shorebirds and early successional nesters, such as:

- Wilson's plover (state-listed as endangered);
- Piping plover (listed by state and federal governments as threatened); and
- Least tern (state species of concern).

Protection of nesting areas is particularly important along the western side of the proposed facility.

*(ii) Secondary On-site Breeding Area.* According to DGIF, the Corps should protect and maintain a secondary on-site breeding area from April 1 through September 1. The substrate in these protected areas should consist of sand with some shell mixed in, and have sufficient elevation to avoid flooding or pooling of water. Because the species in question require bare sand with little or no vegetation, potential nesting areas should be disced and graded prior to the onset of each breeding season. The areas should also be roped off and/or posted with "closed area" signs during the breeding season, to keep construction equipment and human traffic out of the areas.

*(iii) Protecting Nesting Areas.* To avoid potential direct adverse impacts upon listed bird species, it is important that all construction activities and material inflows avoid any areas on Craney Island where bird nests (with eggs) are found. DGIF recommends that the Corps work around nesting areas from the date nesting activity is first documented until the date when all young have fledged or when all breeding adults have abandoned the site, as determined by a DGIF biologist or a biological consultant approved by DGIF (see "Regulatory and Coordination Needs," item 1(b), below).

If the project appears likely to result in disturbance of shorebirds or early successional nesters, such as the piping plover (listed by state and federal governments as a threatened species), the Department of Game and Inland Fisheries recommends that islands be created and maintained as alternative nesting sites.

*(iv) Training of Personnel.* During each breeding season, all Corps and Port Authority employees and contractors engaged in construction activities should be informed of the location of all protected nesting areas. They should receive instruction on how to identify early successional nesting birds, and on the sensitive nature of these breeding species.

*(v) Mammalian Predator Removal.* DGIF also recommends that an annual mammalian predator removal program be established by the Corps. DGIF offers guidance on development and implementation of such a program (see "Regulatory and Coordination Needs," item 1(c), below).

*(f) Marine Mammal Protection.* The Department of Game and Inland Fisheries is concerned that increased container ship traffic in coastal waters, attributable to the establishment of an additional ship terminal on the expanded

Craney Island, may adversely affect marine mammals. In recent years, marine mammal vessel strikes have increased in Virginia's coastal waters. The toll has included mortal injuries to two northern right whales (listed by federal and state governments as endangered species), which collided with vessels near the mouth of the Chesapeake Bay. Marine mammals are known to occur in Virginia's ocean and in-shore shipping channels, although their densities and temporal and spatial distribution remain largely unknown. For these reasons, DGIF disagrees with the assertion in the Draft EIS that the increased opportunity for collision and injury to marine mammals presented by the new terminal is expected to be "minimal."

DGIF recommends that the Port Authority address the issue of potential marine mammal mortality by assessing the spatial and temporal distribution and abundance of marine mammals in Virginia's nearshore and in-shore shipping channels. In addition, the Port Authority should examine measures intended to minimize the potential for vessel strikes of marine mammals.

*(g) Additional Information.* The Department of Game and Inland Fisheries maintains a data base of wildlife locations, including threatened and endangered species, trout streams, and anadromous fish waters. This data base may contain information not available from the DCR Biotics Data System (see item 1, above). The data base is at the following web site:

- http://www.dgif/virginia.gov/wildlife/info_map/index.html.

Questions on the data base may be directed to the Department of Game and Inland Fisheries (Shirl Dresser, telephone (804) 367-6913).

*3. Chesapeake Bay Preservation Areas.* According to the Department of Conservation and Recreation's Division of Chesapeake Bay Local Assistance (DCR-DCBLA), the eastward expansion of Craney Island takes place on open water that is not under the jurisdiction of the Chesapeake Bay Preservation Act (*Virginia Code* sections 10.1-2100 et seq.) or the Chesapeake Bay Preservation Area Designation and Management Regulations (9 VAC 10-20-10 et seq.) which implement the Act. However, subsequent development of the 580-acre expansion will be required to comply with the Act and the Regulations. Specifically, development of the marine terminal facility will have to comply with stormwater management criteria that meet the water quality protection provisions of the Virginia Stormwater Management Regulations (4 VAC 3-20 et seq.; see 4 VAC 3-20-71). In addition, for land disturbance of 2,500 square feet or more, the development of the terminal must comply with the Virginia Erosion and Sediment

Control Regulations and the *Erosion and Sediment Control Handbook* (third edition, 1992).

*4. Air Quality.* According to DEQ's Division of Air Program Coordination, Craney Island is in an ozone non-attainment area. For this reason, emissions of volatile organic compounds (VOCs) and oxides of nitrogen ($NO_x$) to project construction and operation should be kept to a minimum. VOCs and $NO_x$ are precursors to atmospheric ozone ($O_3$), which is harmful to lungs and to vegetation.

*(a) Open Burning.* If project activities include the burning of construction or demolition material, this activity must meet the requirements of the Regulations for open burning (9 VAC 5-40-5600 et seq.), and it may require a permit (see "Regulatory and Coordination Needs, item 2). The Regulations provide for, but do not require, the local adoption of a model ordinance concerning open burning. The Corps and the Port Authority should contact appropriate local officials to determine what local requirements, if any, exist. The model ordinance includes, but is not limited to, the following provisions:

- All reasonable effort shall be made to minimize the amount of material burned, with the number and size of the debris piles;
- The material to be burned shall consist of brush, stumps and similar debris waste and clean burning demolition material;
- The burning shall be at least 500 feet from any occupied building unless the occupants have given prior permission, other than a building located on the property on which the burning is conducted;
- The burning shall be conducted at the greatest distance practicable from highways and air fields;
- The burning shall be attended at all times and conducted to ensure the best possible combustion with a minimum of smoke being produced;
- The burning shall not be allowed to smolder beyond the minimum period of time necessary for the destruction of the materials; and
- The burning shall be conducted only when the prevailing winds are away from any city, town or built-up area.

*(b) Fugitive Dust Control.* During construction fugitive dust must be kept to a minimum by using control methods outlined in 9 VAC 5-50-60 et seq. of the Regulations for the Control and Abatement of Air Pollution. These precautions include, but are not limited to, the following:

- Use, where possible, of water or chemicals for dust control;
- Installation and use of hoods, fans, and fabric filters to enclose and vent

the handling of dusty materials;

- Covering of open equipment for conveying materials; and
- Prompt removal of spilled or tracked dirt or other materials from paved streets and removal of dried sediments resulting from soil erosion.

*(c) Fuel-burning Machinery.* Fuel-burning machinery used in the expansion of Craney Island, the resulting construction of a shipping terminal, and the operation and maintenance of the terminal may require air pollution control permits from DEQ. See "Regulatory and Coordination Needs," item 2, below.

*5. Water Quality.*

*(a) Water Quality Impacts and Virginia Water Protection Permit.* The proposed project will involve significant impacts to surface waters, including wetlands, according to DEQ's Tidewater Regional Office. Accordingly, the project proponents will need to submit a Joint Federal-State Permit Application ("JPA") which documents that the impacts have been avoided and minimized to the maximum extent practicable, and that remaining unavoidable impacts have been properly compensated (see "Regulatory and Coordination Needs," item 5, below).

While the mitigation plan presented in the Draft EIS represents a consensus of a diverse group of stakeholders (see item 2(c), above), it is not sufficiently detailed for regulatory purposes. See "Regulatory and Coordination Needs," item 5, below.

The Draft EIS makes a number of references to "Proposed Water Quality Standards," according to DEQ's Tidewater Regional Office. The term "proposed" should be changed to "existing." In addition, the preparers of the Draft EIS should ensure that the most recent DEQ monitoring data are used in the Final EIS.

*(b) Characterization of Impacts.* According to DEQ's Tidewater Regional Office and the Virginia Institute of Marine Science, the Draft EIS appears to understate the extent of water quality impacts. We have several examples.

*(i) Water Quality Criteria for Rating of Impacts of Alternatives.* Table II-2 in the Draft EIS (page II-27) indicates that a water quality/ hydrodynamics rating of "Negligible" means that the "Impact [is] not detectable, no discernable effect on water quality/hydrodynamics." DEQ's Tidewater Regional Office questions the use of this rating in Table II-3 for the East Expansion, CDF cell (page II-29), in view of the results of the Chen Model which

shows modeled impacts to sedimentation, current velocity, salinity, etc. Based on model results, the rating of these impacts should be "minor" or "moderate" but not "negligible" for the recommended plan. The model indicates that discernable and detectable impacts are clearly predictable. While hydrodynamic models are voluminous documents, they are nonetheless a major component of environmental evaluation, and should be included in an appendix of the Final EIS.

*(ii) Project Duration and "Temporary" Impacts.* The Virginia Institute of Marine Science ("VIMS") noted that the Draft EIS made reference to an "aggressive" schedule for rapid fill, ground preparation, and port construction (Phase I) that will continue for at least 12 years (5 years for cell construction, 1 year for fill and wharf construction, the rest for the remaining development). VIMS asks whether perpetual, year-round construction is contemplated for at least 5 years and possibly 12. If so, VIMS asks whether this time frame was considered in determining that water quality impacts from re-suspension of sediments would be "temporary" in nature.

*(iii) Sediment Suspension.* VIMS points out that the Draft EIS predicts minor, short-term, and localized increases in suspended sediments and turbidity. VIMS requests specific data to support this assumption.

Little data was presented to identify a baseline condition supporting the prediction that total suspended solids would remain within the natural range of the Elizabeth River. In addition, VIMS seeks more specific analysis of the prolonged duration and potential cumulative impacts from concurrent projects. If multiple types of dredges are to be used, the EIS should disclose their efficiencies, and how much dredged material can be expected to remain in suspension, and the duration of the suspension. It should be noted, according to VIMS, that impacts from suspended sediments will also include the sand borrow area (15.4 million cubic yards, or MCY) and should be addressed. Similarly, impacts to water quality and the benthic community from proposed open ocean disposal of 17.1 MCY from dike foundation and channel dredging are not discussed. While the Dredge Management Plan is expected to address these and other concerns associated with the anticipated turbidity plume or plumes, VIMS states that these impacts should be quantified and analyzed at this time, to allow an accurate assessment of impacts.

*(iv) Sediment Contamination.* Contamination of sediments is another issue meriting attention. Given the variation in contaminant levels in the Elizabeth River, VIMS questions the assumption in the Draft EIS that 90% of the

material removed for cell construction will be suitable for ocean disposal. Supporting data is needed to justify this assumption.

*(c) Benthic Impacts.* The Draft EIS depicts oyster restoration reefs south and east of the project area (Figure III-11). Given the close proximity of these five reefs to the project area, VIMS believes that potential impacts to the reefs should be discussed in part III, section 1.4.5 (Draft EIS, pages III-22 through III-28) and part IV, section 1.4.1.3 (Draft EIS, pages IV-30 and IV-31). Benthic re-colonization of the dredged channel is projected to occur in 1 to 5 years, although depths will increase from 3 meters to 16 meters, and ship traffic and associated propeller wash will occur on a continuing basis in the berthing area within 6 to 9 months. While the benthic community may re-establish over time, VIMS indicates that the potential exists for a significant shift in community structure. Similarly, the Draft EIS assumes habitat suitability for affected fish and other marine organisms along the riprap dikes after cell construction. Given the significant change from shallow water, soft bottom habitat to rock structures at increased depths, the potential for a shift in community composition exists and should be discussed.

*6. Solid and Hazardous Waste Management.* According to DEQ's Waste Division, the Draft EIS addressed solid waste issues and sites and hazardous waste issues and sites. However, it did not include a search of Virginia's waste-related data bases.

*(a) Finding.* The Waste Division performed a cursory review of its data files and determined that the Craney Island Dredged Material Management Area is listed by EPA as a small-quantity generator of hazardous wastes (SQG) under identification number VAR000006569. (The Draft EIS states that the area is a conditionally-exempt small-quantity generator of hazardous wastes; see page III-44). The following web site may be helpful in locating additional information for this identification number:

- http://www.epa.gov/echo/search_by_permit.html.

*(b) Guidance.* Any sediment suspected of contamination, or hazardous or solid wastes that are generated, transported, disposed, stored, or treated in Virginia must be tested and handled in accordance with applicable federal, state, and local laws and regulations. Dredge spoils, when managed in accordance with requirements of the State Water Control Board or other Virginia agencies with similar authority, are conditionally exempt from the Virginia Solid Waste Management Regulations (9 VAC 20-80-60.E.), and are excluded from the waste barging regulations (9 VAC 20-170-10).

In addition, any storage, treatment, or disposal of hazardous wastes must be conducted in accordance with applicable state laws and regulations. These include, but are not limited to, the following:

- Virginia Waste Management Act (*Virginia Code* sections 10-1400 et seq.);
- Virginia Hazardous Waste Management Regulations (9 VAC 20-60);
- Virginia solid Waste Management Regulations (9 VAC 20-80); and
- Virginia Regulations for the Transportation of Hazardous Materials (9 VAC 20-110).

Applicable federal laws include, but are not limited to:

- Resource Conservation and Recovery Act (RCRA) (42 U.S.C. 6901 et seq.);
- U.S. Department of Transportation's Rules for Transportation of Hazardous Materials, 49 Code of Federal Regulations, Part 107.

*(c) Pollution Prevention.* DEQ encourages the Corps to implement pollution prevention principles, including the reduction of solid wastes at the source, re-use of materials, and recycling of waste materials.

*7. Historic Structures and Archaeological Resources.* According to the Draft EIS, the project will not affect historic resources, because no known historic resources are located within the project area (Draft EIS, page IV-64, section 1.17.1). As the Department of Historic Resources notes, the proposed expansion of Craney Island would cover area that is currently a shipping channel. The pre-history and the maritime history of the Norfolk area make it likely that submerged archaeological resources exist along the proposed expansion area. In addition, there are multiple known historic structures and resources in Norfolk and its surroundings that may be visually affected by the proposed Craney Island expansion and terminal construction.

*(a) Section 106 Review Process Requirements.* Section 106 of the National Historic Preservation Act requires that the federal agency, in this case the Corps, identify resources that may be affected by the proposed undertaking, in consultation with the State Historic Preservation Office (the Department of Historic Resources) and other interested parties.

*(b) Historic Resources Review to Date.* The Draft EIS indicates (page III-67) that a remote sensing survey of the expansion area was conducted in 2000, during which over 400 magnetic anomalies were discovered. (None of these was considered to be historic.) The Department of Historic Resources ("DHR"), in an archives search, did not find any report detailing the results of this survey, or copies of any DHR response to the consultant's recommendations. Similarly, the Draft EIS (pages III-67 and III-68, section 1.17) indicates that consultation with DHR on effects of the proposed project on historic resources took place in 2002 and that a copy of the Department's response was included in the document. The archives search did not locate any correspondence on this matter, and the copy of the response did not appear in the Draft EIS.

DHR requests copies of the correspondence and report identified above, and continued consultation on effects of the project to historic properties. See "Regulatory and Coordination Needs," item 3, below.

*8. Road Transportation.* According to the Department of Transportation, the proposed project will not affect the local road and highway network. However, planned road projects such as the "Third Crossing" with its connection through the Craney Island Expansion to Route 164 (Western Highway) may affect the project.

*9. Beneficial Uses of Dredged Material.* The Draft EIS indicates that dredged material brought to the Craney Island Dredged Material Management Area will continue to be used beneficially when possible, but the Virginia Institute of Marine Science ("VIMS") cites the document as stating that "based on the experience of recent years, it is assumed littler of the material placed into the existing site will be suitable for beneficial use." VIMS asks whether there is data to demonstrate that most of the inflow material is not suitable for beneficial use. If it is not, then the material may not be suitable as a foundation for a major port facility. In addition, VIMS questions whether sand mined offshore for dike construction would otherwise be considered suitable for beneficial use elsewhere, such as the nourishment of public beaches or other public interest projects. The Draft EIS did not present an economic analysis of using sand in this manner.

*10. Comments by Non-federal Partner.* According to the Virginia Port Authority, the proposed project involves every effort to ensure consistency with the Virginia Coastal Resources Management Program (however, see "Federal Consistency...," below). In addition, using the Virginia Watershed Action Plan as a guide, a compensatory mitigation plan has been developed by consensus of a committee of federal and state agency representatives, scientists, and local

environmental organizations. According to the Port Authority, as much as 487 acres of the benthic and water column productivity within the Elizabeth River watershed will be restored once construction is completed.

The Port Authority also cites the economic importance of the project to the Hampton Roads area and supports the findings of the Corps in the Draft EIS.

*11. Local and Regional Concerns.* The Hampton Roads Planning District Commission ("PDC"), following its consultation with localities and its participation in the Stakeholder Group and various technical teams, indicates that the proposed project is consistent with local and regional plans. According to the PDC, the proposed project supports continued economic development of the Hampton Roads region and the Commonwealth in a number of ways. The PDC acknowledges environmental impacts of the project, but states that the mitigation plan will provide adequate compensation, including the addressing of environmental restoration needs in the Elizabeth River and James River watersheds.

Northampton County has no comments on the project.

The City of Hampton joins in the PDC endorsement of the project.

The City of Newport News indicates that the project is critical to keeping navigation routes open for the Navy and for commercial shipping. In addition, the expansion of port facilities will allow larger vessels to dock at a state-owned facility.

Federal Consistency under the Coastal Zone Management Act

Pursuant to the Coastal Zone Management Act of 1972, as amended, federal activities located inside or outside of Virginia's designated coastal management area that can have reasonably foreseeable effects on coastal resources or coastal uses must, to the maximum extent practicable, be implemented in a manner consistent with the Virginia Coastal Resources Management Program (VCP). The VCP consists of a network of programs administered by several agencies. DEQ coordinates the review of federal consistency determinations with agencies administering the Enforceable and Advisory Policies of the VCP.

The Draft EIS includes a general commitment on the part of the Corps to obtain and comply with all approvals from agencies administering the Enforceable Policies of the VCP (page IV-67). However, there are several

information gaps. In consequence, there is insufficient information to enable the Commonwealth to concur that the proposed project is consistent with the enforceable policies of the VCP at this time. Accordingly, we invite the Corps to submit a revised federal consistency determination at a later date, during or after consideration of the Joint Federal-State Permit Application ("JPA") for the project by regulatory agencies and following the improved analysis we expect in the Final EIS for the project. The consistency determination must fully address all the enforceable policies of the VCP that apply, or may apply, to the proposed project. The discussion which follows indicates tentative conclusions, or provides preliminary guidance, on the issues of significance in the federal consistency determination review.

*1. Fisheries Management.* The issues relative to fisheries management described in the discussion of fisheries and wildlife resources ("Environmental Impacts and Mitigation," item 2, above) should be resolved, and the resolution described, to address this component of the Enforceable Policies.

*2. Subaqueous Lands Management.* Unless there is a legal or regulatory exemption, the project will require a permit from the Marine Resources Commission, and compliance with that permit will be necessary for consistency of the project with this component of the Enforceable Policies.

*3. Wetlands Management.* Provided that a Virginia Water Protection Permit is issued, that the applicants comply with it, and that all required compensatory mitigation is provided, the project should be consistent with the Wetlands Management component of the Virginia Coastal Resources Management Program, according to DEQ's Tidewater Regional Office. However, as indicated above, final determination must await a later submission of a full consistency determination.

*4. Dunes Management.* This program, administered by the Marine Resources Commission, does not apply to the project.

*5. Non-point Source Pollution Control.* This enforceable policy will apply to the marine terminal project constructed on top of the eastward expansion through the Erosion and Sediment Control Plan requirement, administered by the Department of Conservation and Recreation.

*6. Point Source Pollution Control.* The water quality certification under section 401 of the federal Clean Water Act is an enforceable policy of the VCP. This certification will be addressed by DEQ's Tidewater Regional Office as part of its Virginia Water Protection Permit process.

*7. Shellfish Sanitation.* The Department of Health had no comments on the Draft EIS. However, the project raises shellfish issues, as identified in the discussion of Virginia Institute of Marine Science comments (see "Environmental Impacts and Mitigation," item 5, above).

*8. Air Pollution Control.* Aspects of this enforceable policy will apply to the development of a marine terminal on the 580-acre area created by the eastward expansion of Craney Island (see "Environmental Impacts and Mitigation," item 4, above).

*9. Coastal Lands Management.* See "Environmental Impacts and Mitigation," item 3, above.

The Document

In addition to the assumptions and questions concerning environmental impacts of the project, the Draft EIS leaves several unresolved questions in its presentation of the project and evaluation of alternatives, as follow.

*1. Purpose and Need.* The Draft EIS quotes the study authority as listing national defense, increased dredged material disposal capacity, and growth in commodity transport as three areas of potential federal interest in the proposed project (page 1-2), but it does not explain the national defense objective fully, according to DEQ's Tidewater Regional Office. The factor is not mentioned at all in the Executive Summary.

*2. Evaluation of Alternatives.* As in the "purpose and need" discussion, the national defense objective needs further explanation. The table of the screening results states that any alternative involving port development gets a "yes" under "supports national defense needs" (see Draft EIS, pages II-9 through II-16), but is not otherwise explained.

As the Virginia Institute of Marine Science ("VIMS") points out, the eastward expansion of the Craney Island Dredged Material Management Area, with western dike strengthening, is the alternative with the greatest net National Economic Development ("NED") benefits, yet it was not selected as the preferred alternative (eastward expansion without western dike strengthening). Under the alternative with western dike strengthening, the cost would be $1.37 million more than the preferred alternative, but the life expectancy of the CIDMMA would be extended 17 years, and the disposal capacity expanded by 67 million cubic yards. The preferred alternative supported by the Port Authority would extend the service life by 3 years. (See Draft EIS, page II-44.) The rationale needs

further explanation, although VIMS recognizes that future consideration of western dike strengthening is possible under the preferred alternative.

Regulatory and Coordination Needs

*1. Wildlife Resources Protection.*

*(a) Ragged Island Wildlife Management Area.* Any activities proposed for this area, including wetland and oyster reef restoration efforts (see "Environmental Impacts and Mitigation," item 2(x), above) should be coordinated with the Department of Game and Inland Fisheries (Glen Askins, Wildlife Division, telephone (757) 253-4180).

*(b) Bird Management and Protection.* Questions relating to bird management and protection, such as developing a bird management plan and protecting nesting areas, should be addressed to the Department of Game and Inland Fisheries (Ruth Boettcher, telephone (757) 442-2429).

*(c) Bird Predator Removal Plan.* For assistance in developing a removal plan for mammalian predators of shorebirds, the Corps and the Port Authority should consult the Department of Game and Inland Fisheries (Ruth Boettcher, as above).

*2. Air Quality Regulation.* As indicated above ("Environmental Impacts and Mitigation," item 3), any open burning contemplated in connection with the project may require an open burning permit from DEQ. Similarly, fuel-burning equipment may require air pollution control permits from DEQ. Questions on both types of permitting requirements should be directed to DEQ's Tidewater Regional Office (Jane Workman, Air Permits Manager, telephone (757) 518-2112).

*3. Historic Resources.* As indicated above (see "Environmental Impacts and Mitigation," item 7(a)), the National Historic Preservation Act (section 106) requires consultation with the Department of Historic Resources concerning the effects to historic resources resulting from the proposed project. The Corps should contact the Department (Joanna Wilson, telephone (804) 367-2323, extension 140) to carry out this consultation.

*4. Road Transportation.* Any land use requirements, lane closures, traffic control, or work safety zone issues arising from the proposed project should be coordinated with affected localities and with VDOT's Norfolk Residency (telephone (757) 494-2451).

*5. Water Quality Regulation.* As indicated above ("Environmental Impacts and Mitigation," item 5), this project will require a Virginia Water Protection Permit from DEQ. Significantly more detail will be required for each component of the mitigation plan as part of the permitting process. Depending on the nature of the details presented, adjustments to the plan may be required. In addition, if specific compensatory mitigation projects are undertaken by the Corps or the Port Authority, the mitigation must be completed successfully, irrespective of the associated costs. Questions on this permitting process may be directed to DEQ's Tidewater Regional Office (Harold Winer, Deputy Regional Director, telephone (757) 518-2153).

Thank you for the opportunity to review the Draft EIS. We look forward to reviewing the Final EIS and the revised federal consistency determination for this project. If you have questions, please feel free to call me (telephone (804) 6988-4325) or Charlie Ellis of this Office (telephone (804) 698-4488).

Sincerely,

Ellie L. Irons
Program Manager
Office of Environmental Impact Review

Enclosures

cc: (next page)

cc: Andrew K. Zadnik, DGIF
Scott Bedwell, DCR
Steven Pellei, VDH
Allen R. Brockman, DEQ-Waste
Kotur S. Narasimhan, DEQ-Air
Catherine M. Harold, DEQ-Water
Harold J. Winer, DEQ-TRO
Mary T. Stanley, VDOT
Tony Watkinson, MRC
Joanna Wilson, DHR
David L. O'Brien, VIMS
Heather L. Wood, VPA
Michael Cline, DEM
Arthur L. Collins, Hampton Roads PDC
Paul F. Berge, Accomack-Northampton PDC
Brian Ballard, City of Norfolk
Edwin Maroney, City of Newport News
James Freas, City of Hampton
Janice Williams, Northampton County
Robert Baldwin, City of Portsmouth
Clarence V. Cuffee, City of Chesapeake
R. Stephen Herbert, City of Suffolk

## Ellis,Charles

**From:** Andrew Zadnik [Andrew.Zadnik@dgif.virginia.gov]
**Sent:** Thursday, October 20, 2005 12:32 PM
**To:** Ellis,Charles
**Cc:** nhreview@dcr.virginia.gov; Glen Askins; John Kleopfer; Mitchell Norman; ProjectReview.Richmond_PO.DGIF@dgif.virginia.gov; Ruth Boettcher
**Subject:** 05-244F_ESSLOG 19857_Craney Island Eastward Expansion Study

This project involves a proposed 580-ac eastward expansion and development of a container terminal at the Craney Island Dredged Material Management Area (Craney Island). Adverse impacts will include the loss of approximately 580 ac of open water and benthic habitat. We understand that no vegetated wetlands will be adversely impacted during the expansion or terminal construction.

Proposed mitigation for the loss of open water and benthic habitat includes 20 ac of oyster reef restoration, 56 ac of wetland restoration, and 411 ac of bottom sediment restoration/remediation. The sediment restoration/remediation is proposed at several contaminated sites along the South Branch of the Elizabeth River. Weland restoration sites include the ODU drainage canal, the former Exxon Terminal (Shotmeyer Property), Paradise Creek Park, and St. Julian's Annex (Blows Creek). Proposed oyster reef sites include the Elizabeth and Lafayette River systems. Other potential mitigation options include wetland/oyster reef restoration at Ragged Island Wildlife Management Area, a Craney Island Bird Management Plan, and oyster reef restoration at Hoffler Creek, Portsmouth.

We support the overall mitigation plan. We recommend strict monitoring of all mitigation sites. To assess the functional value of the mitigation, we recommend developing measureable success criteria, including biological (vegetation, benthos, fishery, wildlife) components.

The Elizabeth River has been designated a Confirmed Anadromous Fish Use Area. The proposed dredging of a 50-ft-deep access channel for this project has the potential to result in increased sedimentation in the river. To minimize the potential adverse impacts that may result from this sedimentation, we recommend that no dredging occur during the migratory/spawning season for anadromous fish, defined as Feb. 15 - June 30. We recommend strict erosion and sediment control measures throughout this project.

We encourage development of a Craney Island Bird Management Plan. Development of this plan should be coordinated with DGIF Eastern Shore Biologist Ruth Beottcher. We recommend that the Army Corps of Engineers (Corps) make every attempt to protect and maintain appropriate nesting areas for shorebirds/early successional nesters (e.g., State Endangered Wilson's plover, Federal/State Threatened piping plover, State Species of Concern least tern) at Craney Island. This is particularly important along the western side of the facility. We also recommend protecting and maintaining a secondary on-site breeding area from April 1 - Sept. 1. The substrate in these protected nesting areas should consist of sand with some shell mixed in and have sufficient elevation to avoid flooding or pooling of water. Because these species require bare sand with little or no vegetation, potential nesting areas should be disced and graded prior to onset of each breeding season. They also should be roped off and/or posted with closed area signs during the breeding season to keep construction equipment and human traffic out of these areas.

To avoid potential direct adverse impacts upon listed bird species, it's important that all construction activities and material inflows avoid any areas on Craney Island where bird nests (with eggs) are found. We recommend that the Corps work around these areas from the date nesting activity is first documented to the date when all young have fledged or when all breeding adults have abandoned the site, as determined by a DGIF-approved biological consultant or a DGIF biologist. These sites also need to be roped off and/or posted with closed area signs during the breeding season to keep construction equipment and human traffic out of these areas. During each breeding season, all Corps employees and contractors engaged in construction activities should be informed of the location of all protected nesting areas, received instructions on how to identify early successional nesters, and be made aware of the sensitive nature of these breeding species.

To further aid in the conservation of nesting birds at Craney Island, we also recommend that the Corps initiate an annual mammalian predator removal program. A DGIF-approved biological consultant or DGIF biologists can provide the necessary guidance to develop and implement the program.

We recommend the any activities proposed for the Ragged Island Wildlife Management Area be coordinated with DGIF Wildlife Division staff (contact Glen Askins, 757-253-4180).

Thank you for the opportunity to comment on this Draft EIS. Please contact me if I can be of further assistance.

Andrew K. Zadnik
Environmental Services Section Biologist
Department of Game and Inland Fisheries
4010 West Broad Street
Richmond, VA 23230

(804) 367-2733
(804) 367-2427 (fax)

## Ellis,Charles

**From:** Andrew Zadnik [Andrew.Zadnik@dgif.virginia.gov]
**Sent:** Wednesday, November 02, 2005 1:43 PM
**To:** Ellis,Charles
**Cc:** David Whitehurst; Frances Greenway; ProjectReview.Richmond_PO.DGIF@dgif.virginia.gov; Ray Fernald
**Subject:** 05-244F_ESSLOG 19857_Crany Island_additional comments

Charlie,

I don't know if you can accept additional comments at this time, but Ruth Boettcher (DGIF Eastern Shore Biologist) sent me some, so I thought I'd forward them on.

We are concerned that the increase in container ships operating in Virginia's coastal waters, as a result of this project, may result in adverse impacts upon marine mammals. Over the last several years, marine mammal vessel strikes have increased in Virginia's coastal waters. This has included two Federal/State Endangered northern right whales that sustained mortal injuries after colliding with vessels near the mouth of Chesapeake Bay. Marine mammals are known to occur in Virginia's ocean and inshore shipping channels, though their densities and temporal/spatial distribution in these waters remain largely unknown. Because of these recent collision events, we disagree with the Draft EIS statement that the increased opportunity for collision and injury presented by the new marine terminal is expected to be minimal. We recommend that the Virginia Port Authority (VPA) address the issue of potential marine mammal mortality by assessing the spatial and temporal distribution and abundance of marine mammals in Virginia's nearshore and inshore shipping channels. The VPA also should examine measures to minimize the potential for vessel strikes.

Regarding shorebird use of Craney Island, if it is determined that this project may result in significant disturbance upon shorebird/early successional nesters (e.g., Federal/State Threatened piping plover), we recommend that islands be created and maintained as alternate nesting sites within the project area.

Thank you,

Andrew K. Zadnik
Environmental Services Section Biologist
Department of Game and Inland Fisheries
4010 West Broad Street
Richmond, VA 23230

(804) 367-2733
(804) 367-2427 (fax)

W. Tayloe Murphy, Jr.
Secretary of Natural
Resources

Joseph H. Maroon
Director

# COMMONWEALTH of VIRGINIA

## DEPARTMENT OF CONSERVATION AND RECREATION

217 Governor Street
Richmond, Virginia 23219-2010
Telephone (804) 786-7951 FAX (804) 371-2674 TDD (804) 786-2121

## MEMORANDUM

DATE: November 3, 2005

TO: Mr. Ernst F. Aschenbach
Department of Environmental Quality
Office of Environmental Impact Review
629 East Main Street, Sixth Floor
Richmond, Va. 23219
efaschenbach@deq.virginia.gov
(804) 698-4326

FROM: Robert Munson, Planning Bureau Manager
Virginia Department of Conservation and Recreation

SUBJECT: DEQ-05-244F: DOD/DOA/COE – Craney Island Eastward Expansion Study

After review of the above referenced project, the Department of Conservation and Recreations' (DCR) Division of Planning and Recreation Resources has determined that the above-mentioned project is acceptable as proposed.

The Department of Conservation and Recreation (DCR) has searched its Biotics Data System for occurrences of natural heritage resources from the area outlined on the submitted map. Natural heritage resources are defined as the habitat of rare, threatened, or endangered plant and animal species, unique or exemplary natural communities, and significant geologic formations.

Biotics documents the presence of natural heritage resources in the project area. However, due to the scope of the activity and the distance to the resources, we do not anticipate that this project will adversely impact these natural heritage resources.

Under a Memorandum of Agreement established between the Virginia Department of Agriculture and Consumer Services (VDACS) and the Virginia Department of Conservation and Recreation (DCR), DCR represents VDACS in comments regarding potential impacts on state-listed threatened and endangered plant and insect species. The current activity will not affect any documented state-listed plants or insects.

**Ellis,Charles**

**From:** Steve Pellei [Steve.Pellei@vdh.virginia.gov]
**Sent:** Tuesday, November 15, 2005 9:18 AM
**To:** Ellis,Charles
**Subject:** Re: comments on Corps Draft EIS for Craney Island Eastward Expansion Study (DEQ-05-244F)

I just heard from them. They do not have any comments either.
Steve

Ellis,Charles wrote:

> Steve – thanks for the comment. This is exactly the type of project for which the Division of Shellfish Sanitation should be invited to comment, so I'm glad you asked them. However, I hope they get with it, because I have to turn this in pretty fast, like today or tomorrow.
>
> Charlie
>
> > -----Original Message-----
> > **From:** Steve Pellei [mailto:Steve.Pellei@vdh.virginia.gov]
> > **Sent:** Tuesday, November 15, 2005 7:45 AM
> > **To:** Ellis,Charles
> > **Subject:** Re: comments on Corps Draft EIS for Craney Island Eastward Expansion Study (DEQ-05-244F)
> >
> > ODW has no objections to this project. I have forwarded the project for to the Divisions of Shellfish Sanitation for reivew. You may hear from them directly.
> > Sincerely,
> > Steve Pellei
> > Director
> > Division of Technical Services
> > Office of Drinking Water/ VDH
> >
> > Ellis,Charles wrote:
> >
> > Everybody – I need your comments on this Draft EIS when you get a chance. Thanks very much.
> >
> > Charlie Ellis
> > DEQ, Office of Environmental Review
> > November 14, 2005

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# COMMONWEALTH of VIRGINIA

W. Tayloe Murphy, Jr.
Secretary of Natural Resources

*DEPARTMENT OF ENVIRONMENTAL QUALITY*
*Street address:* 629 East Main Street, Richmond, Virginia 23219
*Mailing address:* P. O. Box 10009, Richmond, Virginia 23240
Fax (804) 698-4500 TDD (804) 698-4021
www.deq.virginia.gov

Robert G. Burnley
Director

(804) 698-4000
1-800-592-5482

**MEMORANDUM**

**TO:** Charles H. Ellis, III, Environmental Program Planner

**FROM:** ARB Allen Brockman, Waste Division Environmental Review Coordinator

**DATE:** October 13, 2005

**COPIES:** Sanjay Thirunagari, Waste Division Environmental Review Manager; file

**SUBJECT:** Draft Environmental Impact Statement
ACOE—Craney Island Eastward Expansion, DEQ Project #05-244F

The Waste Division has completed its review of the Army Corps of Engineers's Draft Environmental Impact Statement (EIS) for the eastward expansion of Craney Island Dredged Material Management Area. We have the following comments concerning the waste issues associated with this project:

Both solid waste issues and sites and hazardous waste issues and sites were addressed in the assessment. However, the report did not include a search of Virginia's waste-related data bases. The Waste Division staff performed a cursory review of its data files and determined that the management area is listed by EPA as a Small Quantity Generator of Hazardous Wastes (SQG), EPA ID # VAR000006569. (However, the EIS on p. III-44 states that the status of the area is a conditionally exempt small quantity generator of hazardous wastes). The following website may prove helpful in locating additional information for this identification number: http://www.epa.gov/echo/search_by_permit.html.

Any sediment that is suspected of contamination or hazardous or solid wastes that are generated, transported, disposed, stored, or treated in Virginia, as defined in the Virginia Solid and Hazardous Waste Regulations must be tested and handled in accordance with applicable Federal, State, and local laws and regulations. (Dredge spoils, when managed in accordance with the Virginia State Water Control Board or other Virginia state agencies with similar authority, are conditionally exempt from the solid waste regulations (9VAC 20-80-60.E) and are excluded from the waste barging regulations (9VAC 20-170-10)). Also, any treatment, storage, or disposal of hazardous wastes must be conducted in concert with applicable state laws and regulations. Some of the applicable state laws and regulations are: Virginia Waste Management Act, Code of Virginia Section 10.1-1400 *et seq.*; Virginia Hazardous Waste Management Regulations (VHWMR) (9VAC 20-60); Virginia Solid Waste Management Regulations (VSWMR) (9VAC 20-80); Virginia Regulations for the Transportation of Hazardous Materials (9VAC 20-110).

Some of the applicable Federal laws and regulations are: the Resource Conservation and Recovery Act (RCRA), 42 U.S.C. Section 6901 *et seq.*, and the applicable regulations contained in Title 40 of the Code of Federal Regulations; and the U.S. Department of Transportation Rules for Transportation of Hazardous materials, 49 CFR Part 107.

Please note that DEQ encourages all construction projects and facilities to implement pollution prevention principles, including the reduction, reuse, and recycling of all solid wastes generated. All generation of hazardous wastes should be minimized and handled appropriately.

If you have any questions or need further information, please contact Allen Brockman at (804) 698-4468.

# DEPARTMENT OF ENVIRONMENTAL QUALITY
## DIVISION OF AIR PROGRAM COORDINATION

**ENVIRONMENTAL REVIEW COMMENTS APPLICABLE TO AIR QUALITY**

**TO: Charles H. Ellis III** **DEQ - OEIA PROJECT NUMBER: 05 – 244F**

**PROJECT TYPE:** ☐ STATE EA / EIR / FONSI **X FEDERAL EA / EIS** ☐ SCC

☐ CONSISTENCY DETERMINATION/CERTIFICATION

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DEQ-Office of Environmental Impact Review

**PROJECT TITLE: CRANEY ISLAND EASTWARD EXPANSION STUDY**

**PROJECT SPONSOR: DOD / DEPT. OF THE ARMY / ARMY CORPS OF ENGINEERS**

**PROJECT LOCATION: X OZONE NON ATTAINMENT AREA**

**REGULATORY REQUIREMENTSMAY BE APPLICABLE TO:** **X** **CONSTRUCTION**
☐ OPERATION

**STATE AIR POLLUTION CONTROL BOARD REGULATIONS THAT MAY APPLY:**

1. ☐ 9 VAC 5-40-5200 C & 9 VAC 5-40-5220 E – STAGE I
2. ☐ 9 VAC 5-40-5200 C & 9 VAC 5-40-5220 F – STAGE II Vapor Recovery
3. ☐ 9 VAC 5-40-5490 et seq. – Asphalt Paving operations
4. **X** **9 VAC 5-40-5600 et seq. – Open Burning**
5. **X** **9 VAC 5-50-60 et seq. Fugitive Dust Emissions**
6. ☐ 9 VAC 5-50-130 et seq. - Odorous Emissions; Applicable to_____
7. ☐ 9 VAC 5-50-160 et seq. – Standards of Performance for Toxic Pollutants
8. ☐ 9 VAC 5-50-400 Subpart_____, Standards of Performance for New Stationary Sources, designates standards of performance for the_____
9. ☐ 9 VAC 5-80-10 et seq. of the regulations – Permits for Stationary Sources
10. ☐ 9 VAC 5-80-1700 et seq. Of the regulations – Major or Modified Sources located in PSD areas. This rule may be applicable to the _____
11. ☐ 9 VAC 5-80-2000 et seq. of the regulations – New and modified sources located in non-attainment areas
12. ☐ 9 VAC 5-80-800 et seq. Of the regulations – Operating Permits and exemptions. This rule may be applicable to _____

**COMMENTS SPECIFIC TO THE PROJECT:**

**Being in an area of ozone non-attainment, all precautions are necessary to restrict the emissions of volatile organic compounds (VOC) and oxides of nitrogen ($NO_X$) during construction.**

K. S. Narasimhan

**(Kotur S. Narasimhan)**
**Office of Air Data Analysis**

**DATE: October 7, 2005**

**Ellis,Charles**

**From:** Winer,Harold
**Sent:** Wednesday, November 02, 2005 8:01 AM
**To:** Ellis,Charles
**Cc:** Parolari,Bert
**Subject:** EIR #05-244F, Craney Island Expansion Study, Draft EIS

As requested, TRO staff has reviewed the supplied information and has the following comments:

**Regarding VWP issues,** we note that the proposed project will clearly involve significant impacts to surface waters, including wetlands. As such, a Joint Permit Application (JPA) documenting that impacts to these areas have been avoided and minimized to the maximum extent practicable and that remaining unavoidable impacts have been properly compensated should be prepared and submitted to DEQ and other state/local regulatory bodies for review and authorization prior to commencing work. The final EIS should serve as an excellent foundation for preparation of the necessary JPA but will not supplant it. Provided that a permit is issued, complied with and that all required compensatory mitigation is provided, the project should be consistent with the requirements of this program. It should also be noted that while the mitigation plan presented in this document represents a consensus of a diverse group of stakeholders, it is not sufficiently detailed for regulatory purposes. Significantly more detail will be required for each discrete component of the plan as a part of the VWP permitting process. Depending on the nature of the details presented, adjustments to the plan may be required. Also, there should be no confusion that if specific compensatory mitigation projects are undertaken by the Corps or VPA, the mitigation must be completed successfully, irrespective of the associated costs. More specific comments follow:

1. **PURPOSE AND NEED**: National Defense is listed as one of three areas of potential federal interest. While it is intuitively clear how expanded port facilities may serve to enhance national defense via an increased capacity to transport goods in support of military needs, other benefits are unclear. If this document purports to value this objective as one of only three potential federal interests, it should be more thoroughly explained. References to existing routine use of CIDMMA for military training exercises should be more specific. No mention of this third area of federal interest is made in the Draft EIS executive summary.

2. **EVALUATION OF ALTERNATIVES** – Again, utilization of national defense as a separate objective needs further explanation. It appears from table II-1 that <u>any</u> alternative providing port development also receives a "yes" under national defense needs screening. Interestingly, Page II-16 indicates that an upland placement site in Portsmouth between the power plant and State Highway 164 was given a "yes" for this screening item even though no port expansion is involved.

3. **EVALUATION OF ALTERNATIVES** – Table II-2 on page II-27 indicates that a water quality/hydrodynamics rating of "Negligible" indicates that "Impact not detectable, no discernable effect on water quality/hydrodynamics." We question use of this rating (1=Negligible) in table II-3 for the East Expansion, CDF Cell given the results of the Chen Model showing modeled impacts to sedimentation, current velocity, salinity, etc. Based on model results, rating of these impacts should be "minor" or "moderate", not "negligible" for the recommended plan. The model indicates that detectable and discernable effects are clearly predictable. Recognizing that the Hydrodynamic Models are voluminous documents, they are nonetheless a major component of EIS evaluation and should be included in Appendix of the final EIS.

4. **PART III – AFFECTED ENVIRONMENT** - The Draft EIS make numerous references to "Proposed" Water Quality Standards". Proposed should be changed to existing . Preparers should ensure that the most recent DEQ

monitoring data are utilized in the final EIS.

Thanks for the opportunity to comment.

Harold J. Winer
Deputy Regional Director
Virginia DEQ, Tidewater Regional Office
Phone: 757-518-2153/Fax: 757-518-2003
Email: hjwiner@deq.virginia.gov

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*COMMONWEALTH of VIRGINIA*

**DEPARTMENT OF TRANSPORTATION**
1401 EAST BROAD STREET
RICHMOND, VIRGINIA 23219-2000
VirginiaDOT.org

**GREGORY A. WHIRLEY**
ACTING COMMISSIONER

October 25, 2005

Mr. Charles Ellis III
Department of Environmental Quality
Office of Environmental Impact Review
629 East Main Street, Sixth Floor
Richmond, VA 23219

Re: Craney Island Eastward Expansion

Dear Mr. Ellis:

Mr. Harold Paxton of the Virginia Department of Transportation has reviewed the information provided for the referenced project. This review covers impacts to existing and proposed transportation facilities. Our preliminary review does not indicate any negative impacts to the transportation system at this time. However, the "Third Crossing Proposal" with connection thru the Craney Island Expansion and connecting to Route 164 (Western Highway) may impact this proposal. We can only conclude any additional traffic or traffic disruption regarding this expansion are negligible.

Any land use requirements, lane closures, traffic control or work zone safety issues that develop as a result of this project should be closely coordinated with affected counties and VDOT's Norfolk Residency (757-494-2451).

Thank you for the opportunity to comment on this project.

Sincerely,

Mary T. Stanley

Mary T. Stanley
Environmental Engineer
Virginia Department of Transportation
(804) 786-0868

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# COMMONWEALTH of VIRGINIA

W. Tayloe Murphy, Jr.
Secretary of Natural Resources

**Department of Historic Resources**
2801 Kensington Avenue, Richmond, Virginia 23221

Kathleen S. Kilpatrick
Director

Tel: (804) 367-2323
Fax: (804) 367-2391
TDD: (804) 367-2386
www.dhr.virginia.gov

October 17, 2005

Mr. Charles Ellis III
Department of Environmental Quality
Office of Environmental Impact Review
629 E. Main Street, Sixth Floor
Richmond, VA 23219

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OCT 20 2005
DEQ-Office of Environmental Impact Review

Re: Craney Island Eastward Expansion Study
DEQ No. 05-244F
DHR File No. 2004-1428

Dear Mr. Ellis:

We have received for review a copy of the Draft Environmental Impact Statement (DEIS) for the above referenced project. Our staff has completed review of these materials. We understand that the US Army Corps of Engineers, after considering multiple alternatives, proposes to expand the existing Craney Island Dredge Material Management Area (CIDMMA) to the east, to encompass approximately 580 acres of space. The expansion area is currently a shipping channel.

The Corps recommends that there will be no effect to historic resources as no known resources are located within the project area. Section 106 of the National Historic Preservation Act requires that the federal agency identify resources that may be affected by the proposed undertaking in consultation with the SHPO and other interested parties. Page III-67 of the DEIS indicates that a remote sensing survey of the expansion area was conducted in 2000, during which over 400 magnetic anomalies were discovered (none of which were believed to be historic). A search of our Department's Archives, however, failed to locate any report detailing the results of this survey, or copies of any DHR response to the consultant's recommendations. The DEIS also states that consultation regarding effects to historic resources as a result of the planned expansion took place in 2002, and that a copy of DHR's response was included in the document. Again, a search of our review files failed to locate any correspondence on this subject, and the copy of our letter of response was not included in the DEIS. As you know, the prehistory and maritime history of the Norfolk area

Administrative Services
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Capital Region Office
2801 Kensington Ave.
Richmond, VA 23221
Tel: (804) 367-2323
Fax: (804) 367-2391

Tidewater Region Office
14415 Old Courthouse Way, 2nd Floor
Newport News, VA 23608
Tel: (757) 886-2807
Fax: (757) 886-2808

Roanoke Region Office
1030 Penmar Ave., SE
Roanoke, VA 24013
Tel: (540) 857-7585
Fax: (540) 857-7588

Winchester Region Office
107 N. Kent Street, Suite 203
Winchester, VA 22601
Tel: (540) 722-3427
Fax: (540) 722-7535

renders it likely that submerged resources exist along the proposed expansion area. As well, there are multiple known architectural resources in the City of Norfolk and its surrounds that may be visually affected by this action. We request that the Corps continue to consult with DHR regarding effects to historic properties, including those with the potential to be affected by proposed mitigation activities, and that the previously mentioned report and correspondence be provided to DHR as soon as possible.

We appreciate the opportunity to be of assistance to you in this matter. If you have questions about our comments, please call me at (804) 367-2323, Ext. 140.

Sincerely,

Joanna Wilson, Archaeologist
Office of Review and Compliance

cc: Mr. Mark T. Mansfield, US Army Corps of Engineers

WILLIAM & MARY
VIMS
*Virginia Institute of Marine Science*
*School of Marine Science*

Wetlands Program

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NOV 09 2005
DEQ-Office of Environmental Impact Review

November 7, 2005

Mr. Charles H. Ellis, III
Department of Environmental Quality
Office of Environmental Impact Review
629 East Main Street, Sixth Floor
Richmond, VA 23219

Re: Craney Island Eastward Expansion Study-Draft EIS

Dear Mr. Ellis,

Thank you for the opportunity to provide comment on the U.S. Army Corps of Engineers' and Virginia Port Authority's proposed eastward expansion of the Craney Island Dredge Material Management Area (CIDMMA) and subsequent port facility development. Impacts to the marine environment resulting from the proposed activities appear commensurate with a project of this scope. However, it is our opinion that portions of the EIS document warrant additional clarification or supporting documentation from the applicants.

**Evaluation of Alternatives**
The eastward expansion of CIDMMA with western dike strengthening is the alternative with the greatest net NED benefits, yet it was not selected as the preferred alternative (eastward expansion without west dike strengthening). While 99% of the benefits will still be realized under the preferred alternative, the cost difference between the two is only $1.37 million, and the CIDMMA life expectancy would be extended 17 years to 2042 and the disposal capacity would be increased by 67 mcy. The preferred alternative supported by the Virginia Port Authority only extends the service life of CIDMMA by 3years. The local partner does not support western dike strengthening, with the stated rationale as the "preference is based on project cost savings and the uncertainty associated with making a decision today to strengthen the western dikes in 2028" (p. II-44). Additional explanation of this rationale would help strengthen the choice of the preferred alternative, though we recognize that future consideration of west dike strengthening is possible under the preferred alternative.

**CIDMMA Expansion**
As previously noted, the proposed alternative will extend the life expectancy of CIDMMA by 3 years, as presented in Section II (p.II-45) and again in Section IV (p.IV-59). This seemingly minimal extension of the service life would appear to fall within a margin of error associated with estimating projected annual dredge material volumes. Further explanation of the rationale used to select the preferred alternative of eastward expansion without western dike strengthening appears warranted.

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804/684-7380 • FAX 804/684-7179

The proposed process to rapidly fill the first cell without entering into the normal cell rotation was not clearly detailed in Section II of the EIS, although additional information was provided in the Feasibility Study (pp.89-91). Modeling predicts rapid fill will occur within 12 months, but it was not clear how much inflow material is required to reach the target elevation (+15 MLLW) and how this material will be handled. Additionally, we are concerned that rapid fill process will result in impacts to water quality associated with the outfall weirs. We recommend implementing a water quality monitoring program throughout the rapid fill process to ensure turbidity does not exceed maximum acceptable levels.

The projected inflow is based on a historic annual average of 4.8 mcy, yet less than this amount has been actually deposited every year since 1988 with the exception of 1996. Is there the potential that material will be mined from the existing CIDMMA deposits for rapid filling if the actual inflow is not sufficient for rapid filling of the proposed eastern cells?

**Project Duration**

It is stated that the need for port expansion will drive the construction schedule, with a reference to an "aggressive" schedule for rapid fill, ground preparation and port construction (Phase I) that will continue for a minimum of 12 years (Feasibility Study), including cell construction (5 years), rapid fill (1 year) with simultaneous wharf construction, followed by the remaining port development. Is perpetual, year-round construction expected for at least 5 and possibly as many as 12 years? Was this timeframe for construction and land disturbance considered in determining that impacts to water quality resulting from resuspension of sediments would be "temporary" in nature?

**Sediment Suspension**

The volumes of dredge material to be handled are the largest (19.1 mcy dredged at CIDMMA and 19.5 mcy dredged at sand borrow areas) of any project proposed in Hampton Roads since the original creation of CIDMMA. Cell expansion construction is projected to last 5 years, with multiple dredges operating simultaneously with different levels of efficiency, in the "immediate vicinity" of the project (600 acres). Despite this, only minor, short-term, localized increases in suspended sediments and turbidity are predicted. We ask that specific data be provided that supports this assumption.

While TSS levels are predicted to remain within the natural range of the Elizabeth River, little data where presented to identify this baseline condition. Further, can the prolonged duration and potential cumulative impact from concurrently conducted projects be addressed more specifically? If multiple types of dredges will be used, what are the different efficiencies of the equipment and what amount of dredged material can be expected to remain in suspension and for what duration? Further, impacts resulting from suspended sediments will also include the sand borrow area (15.4 mcy ) and should be addressed. Similarly, impacts to water quality and the benthic community resulting from the proposed open ocean disposal of 17.1 mcy from dike foundation & channel dredging are not discussed. Although the Dredge Management Plan proposed during the PED

phase is expected to address these and other concerns of the anticipated turbidity plume(s), it is our opinion that these impacts need to quantified and addressed at this time so that an accurate assessment of the project impacts can be conducted.

**Sediment Contaminants**
Although no sediment testing has yet been completed, pre-dredging sediment testing is proposed during the PED phase of the project. Given that contaminant levels vary greatly in the Elizabeth River, we question the assumption that 90% of the material removed for cell construction will be suitable for ocean disposal without supporting data.

**Benthos**
Oyster restoration reefs are depicted in Figure III-11 located south and east of the project area. Given the close proximity of these five reefs to the project area, it is our opinion that potential impacts to these reefs resulting from the turbidity plum should be discussed in Section III.1.4.5 and IV.1.4.1.3. Benthic re-colonization of the dredged channel is projected in 1-5 years, although depths will increase from 3m to 16m, and ship traffic and associated propeller wash will occur on a continual basis in the berthing area within 3-9 months. We contend that although the benthic community may reestablish over time, the potential exists for a significant shift in community structure to occur. Similarly, habitat suitability is also assumed for impacted fish and other marine organisms along the riprap dikes after cell construction. Again, given the significant change from shallow water, soft bottom habitat to rock structures at increased depths, the potential for a shift in community composition exists and should be discussed.

**Beneficial Uses**
As stated in the document, dredged material brought to CIDMMA for disposal will continue to be used beneficially when possible, but "based on the experience of recent years, it is assumed little of the material placed into the existing site will be suitable for beneficial use". Are there supporting data to demonstrate that most of the actual inflow material is not suitable for beneficial use? If the material is not considered suitable for beneficial use, it seems counterintuitive that the material would then be suitable upon which to construct a major port facility. In addition, we question whether the sand mined offshore for dike construction would otherwise be considered suitable material available for beneficial use elsewhere, such as the nourishment of public beaches or other public interest projects. The economic analysis of utilizing sand material in this manner was not presented in the document.

It is our pleasure to provide comment on this significantly large and important project at this time and hope that our comments will help to improve the overall quality of the project. If you have any question or comments regarding our comments or concerns please contact me directly at 804-684-7828. Again, we appreciate the opportunity to participate in the review process.

Best Regards,

David L. O'Brien
Director, Wetlands Program

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OCT 25 2005

DEQ-Office of Environmental Impact Review

# *COMMONWEALTH of VIRGINIA*

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**600 World Trade Center**
**Norfolk, Virginia 23510-1679**
**Telephone (757) 683-8000**
**Fax (757) 683-8500**

**J. Robert Bray**
*Executive Director*

October 24, 2005

Mr. Charles H. Ellis, III
Department of Environmental Quality
Office of Environmental Impact Review
629 East Main Street, 6th Floor
Richmond, Virginia 23219

Re: Craney Island Eastward Expansion, Draft Feasibility Report
And Environmental Impact Statement

Dear Mr. Ellis:

The Virginia Port Authority supports the conclusions and recommendations reported in the Draft Feasibility Report and Environmental Impact Statement for the Eastward Expansion of Craney Island. The EIS and Feasibility Study are the culmination of five years of independent study and analysis of over 60 alternatives.

Every effort has been taken to ensure consistency with the Virginia Coastal Resource Management Program. Comprehensive hydrodynamic, navigation, and environmental impact studies conducted by the Corps of Engineers and other independent agencies determined that impacts associated with the construction of the expansion are relatively minor and can be compensated.

Using the Virginia Watershed Action Plan as a guide, a compensatory mitigation plan has been by consensus of a committee consisting of representatives from various Federal and State regulatory agencies, scientists, and local environmental interest groups. A $50 million plan comprised of sediment remediation, tidal wetlands creation, and oyster reef construction is proposed. $33 million is targeted for sediment restoration in the Southern Branch of the Elizabeth River. It is estimated that up to 487 acres of the benthic and water column productivity within the Elizabeth River watershed will be restored upon completion of construction.

In addition, the Eastward Expansion of Craney Island is expected to generate over 54,000 jobs in the region and $155 million in annual state and local tax revenues. Also, 26,000 jobs and

$788 million in annual wages are expected from regional distribution center operations that will benefit from expanded port services.

The Craney Island Eastward Expansion is critically important to the economic and environmental future of Hampton Roads. We support the USACE, Norfolk District's findings. Thank you for the opportunity to comment on this proposal.

Very truly yours,

Heather L. Wood
Director of Environmental Affairs

cc: J.J. Keever, Deputy Executive Director
Jeffrey A. Florin, P.E., Chief Engineer

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OCT 28 2005

DEQ-Office of Environmental
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October 27, 2005

Colonel Yvonne J. Prettyman-Beck
District Engineer
U.S. Army Corps of Engineers
Norfolk District, Fort Norfolk
803 Front Street
Norfolk, Virginia 23510

Re: Craney Island Eastward Expansion (THY:Craney Island)

Dear Colonel Prettyman-Beck:

Pursuant to your request of September 13, 2005, the staff of the Hampton Roads Planning District Commission has reviewed the Draft Feasibility Report and Environmental Impact Statement for the Craney Island Eastward Expansion, Norfolk Harbor and Channels, Hampton Roads, Virginia. The HRPDC staff is pleased to have had the opportunity to participate in the Stakeholder Group and various technical teams as this study has been undertaken.

Based on this review, the Eastward Expansion and associated terminal development is consistent with local and regional plans. It supports the continued economic development of the Hampton Roads region and the Commonwealth of Virginia in a number of ways.

- The Eastward Expansion provides expanded capacity for disposal of dredged material, which is essential for the continued maintenance and deepening of navigation channels throughout the port complex.

- The long-term plan for development of port facilities on the expansion area supports the continued viability and competitiveness of the Port of Hampton Roads.

- While they are separable projects, there is a close synergistic relationship between the Eastward Expansion and the Third Crossing of Hampton Roads Project.

- This comprehensive project, as shown in the Feasibility Study and EIS will have considerable positive economic impacts in terms of job creation, increases in income levels and state and local tax revenues.

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As is to be expected from a project of this magnitude, adverse environmental impacts will result from both project construction and operation. The comprehensive mitigation plan, which has been developed to address the anticipated impacts, appears to provide adequate compensation for those impacts. Concurrently, it appears to address critical environmental restoration needs in both the Elizabeth River and James River watersheds. In at least some instances, mitigation measures will enhance environmental quality in existing sensitive environmental areas. Literature and experience show that environmental enhancements improve the region's quality of life and will further support the positive economic benefits of the Eastward Expansion Project.

The staff of the Hampton Roads Planning District Commission appreciates the opportunity to review and comment on this important project. If you have any questions or need further information, please do not hesitate to call me or John Carlock of the staff.

Sincerely,

Arthur L. Collins
Executive Director/Secretary

JMC:fh

Copy: Mr. J. Robert Bray, VPA
Mr. Mark T. Mansfield, COE
Mr. Charles Ellis, DEQ ✓

**If you cannot meet the deadline, please notify CHARLIE ELLIS at 804/698-4488 prior to the date given. Arrangements will be made to extend the date for your review if possible. An agency will not be considered to have reviewed a document if no comments are received (or contact is made) within the period specified.**

REVIEW INSTRUCTIONS:

A. Please review the document carefully. If the proposal has been reviewed earlier (i.e. if the document is a federal Final EIS or a state supplement), please consider whether your earlier comments have been adequately addressed.

B. Prepare your agency's comments in a form which would be acceptable for responding directly to a project proponent agency.

C. Use your agency stationery or the space below for your comments. **IF YOU USE THE SPACE BELOW, THE FORM MUST BE SIGNED AND DATED.**

Please return your comments to:

**MR.CHARLES H. ELLIS III**
**DEPARTMENT OF ENVIRONMENTAL QUALITY**
**OFFICE OF ENVIRONMENTAL IMPACT REVIEW**
**629 EAST MAIN STREET, SIXTH FLOOR**
**RICHMOND, VA 23219**
**FAX #804/698-4319**

Charles H. Ellis III

**CHARLES H. ELLIS III**
**ENVIRONMENTAL PROGRAM PLANNER**

COMMENTS

No comment

(signed) Janice Williams (date) 9/26/05

(title) Acting County Administrator

(agency) Northampton County

**PROJECT # 05-244F** **8/98**

# City Of Newport News

Virginia 23607

Office Of The City Manager

2400 Washington Avenue
(757) 926-8411
Fax (757) 926-3503



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OCT 25 2005

DEQ-Office of Environmental Impact Review


October 21, 2005

Mr. Charles Ellis, III
Office of Environmental Impact Review
Virginia Department of Environmental Quality
629 East Main Street, Suite 644
Richmond, VA 23219

Dear Mr. Ellis:

The Department of Planning has reviewed the draft Feasibility Report and Environmental Impact Statement for the Craney Island Eastward Expansion Study. We have no objection to the project and favor the recommended plan supported by the Virginia Port Authority and the Army Corps of Engineers.

Increasing the dredge spoil capacity of Craney Island is critical to keep our navigation routes open for the Navy and commercial shipping. The expansion of the port facilities as part of this expansion will permit the larger vessels used for container shipping to dock at a state owned port facility. In addition, development of this project will give the region a necessary ingredient to fund the Third Crossing of Hampton Roads Harbor.

Thank you for this opportunity to comment on the draft Feasibility Report and Environmental Impact Statement for the Craney Island Eastward Expansion Study.

Sincerely,

Ed Maroney
City Manager

EM:kj
P:\Plan05-06\Env.Impact Review Comments\EIS Craney Island Eastward Expansion.wpd

Copy to: Assistant City Manager, NAM
Director of Planning

**Ellis,Charles**

**From:** Freas, James [jfreas@hampton.gov]
**Sent:** Friday, November 04, 2005 8:46 AM
**To:** Ellis,Charles
**Subject:** RE: comments on Corps EIS, "Craney Island Eastward Expansion Study" (DEQ-05-244F)

The City of Hampton concurs with the comments provided by the HRPDC.

James Freas
City Planner
City of Hampton
Planning Department
One Franklin Street, Suite 603
Hampton, VA 23669
757-728-5233
757-728-2449 (Fax)

-----Original Message-----
**From:** Ellis,Charles [mailto:chellis@deq.virginia.gov]
**Sent:** Thursday, November 03, 2005 9:33 AM
**To:** Harold,Catherine; anpdc@a-npdc.org; Sherbert@city.suffolk.va.us; jfreas@hampton.gov; brian.ballard@norfolk.gov; bbaldwin@portsmouthva.gov
**Subject:** comments on Corps EIS, "Craney Island Eastward Expansion Study" (DEQ-05-244F)

Everybody - I need your comments on this Corps Draft EIS when you get a chance. Thank you.

Charlie Ellis
DEQ, Office of Environmental Impact Review

Nov. 3, 2005

Tel. (804) 698-4488

Virginia Marine Resources Commission
November 5, 2005

Staff of the Virginia Marine Resources Commission has reviewed the "Draft Environmental Impact Statement, Craney Island Eastward Expansion, Norfolk Harbor and Channels, Hampton Roads, Virginia" and offers the following comments.

The proposed mitigation plan consists of 487 acres of "large scale ecosystem restoration" to offset the loss of 580 acres of subtidal riverine habitat. While this does not represent a 1:1 replacement of the resource lost, we note that NOAA's Habitat Equivalency Analysis (HEA) was utilized as a tool to examine function, in terms of productivity, of the lost acreage and the scale of mitigation that would be necessary to replace of the productivity lost by the proposed project. We further note that additional factors, such as habitat diversity, were considered in addition to HEA results. Given that it is not feasible to create 580 acres of open water elsewhere within the impacted watershed, staff believes the use of a functional analysis for determining a mitigation plan is an acceptable alternative.

Specific to the mitigation options, staff believes the success of existing artificial reefs within the Elizabeth River system should be carefully examined before construction of additional reefs is heavily relied upon as a viable mitigation option. In addition, staff recommends that mitigation for clam resources, at a ratio of 1.33:1, be considered as an addition to the mitigation plan. While the density of clams within the footprint of the proposed expansion may be low, the overall scale of the proposed fill may result in a significant loss of clam resources. Virginia Marine Resources Commission Fisheries Management Division can perform an evaluation of clam density within the footprint of the proposed fill area. Also, a time of year restriction for the protection of anadromous fish will be further evaluated during the application-processing phase. Lastly, staff strongly discourages the filling of additional subtidal lands for the purpose of creating wetlands as part of any mitigation strategy for the expansion of Craney Island. The filling of subtidal habitat to mitigate for the filling of subtidal habitat seems to run counter to the purpose of mitigation to begin with. We strongly encourage the grading of existing uplands for the purposes of creating wetlands for mitigation.

Thank you for the opportunity to comment on this project.

# THE Elizabeth River Project

November 7, 2005

Col. Yvonne Prettyman-Beck
District Engineer
US Army Corps of Engineers, Norfolk District
803 Front Street
Norfolk, VA 23510

**Re: Comments, Draft Environmental Impact Statement, proposed Craney Island Dredged Material Management Area Eastward Expansion**

Dear Col. Prettyman,

The Elizabeth River Project commends the Corps of Engineers, Norfolk District, and Virginia Port Authority for their commitment to seeking win-win in the form of appropriate mitigation for the proposed Craney Island expansion, despite the challenges of addressing the largest potential impacts to the Elizabeth River in modern history. The degree of diverse stakeholder participation in the mitigation planning process was important and unprecedented.

As a result of more than three years of dialogue with stakeholder and technical experts from across the community, the published draft mitigation plan represents a dramatic improvement over earlier iterations. The plan incorporates a number of key recommendations that The Elizabeth River Project has advocated as essential to achieving appropriate mitigation. In fact, the plan represents one of the largest mitigation packages in history for the East Coast. **We believe that, overall, the current plan offers the potential to achieve the win-win for the river and the economy that has been our long-held goal, offsetting the huge impacts with at least equally large environmental gains.**

**<u>Specific areas of the mitigation plan that we find encouraging include:</u>**

1) Most importantly, we are encouraged to see a significant amount of funds earmarked for sediment restoration, which we believe is the most appropriate way to offset the impacts. The plan proposes cleanup of all known toxic hot-spots in the sediments of the Southern Branch of the Elizabeth River, with the potential for significant ecological improvement to offset the losses in the impact area.

To elaborate on two significant factors in support of our long-standing recommendation for a reliance on sediment cleanup in the mitigation plan:

a) The river sediments in the Mainstem, near or directly at this site, have shown some the highest scores in the Elizabeth River on the Benthic Index of

*475 Water Street ~ Suite 103A ~ Portsmouth, Virginia 23704 ~ (757)399-7487 ~ Fax (757)397-8377*
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a) The river sediments in the Mainstem, near or directly at this site, have shown some the highest scores in the Elizabeth River on the Benthic Index of Biological Integrity (B-IBI), which gauges benthic, or bottom-dwelling, community health (Daniel M. Dauer, Old Dominion University, 1999-2004). These scores indicate a higher species diversity and abundance, and a higher ecological value to the Elizabeth River system, than would be indicated by the (Lipicus and Seitz, 2002) bi-valve study which you reference (B. Mitigation Analysis, Project-Related Adverse Impacts, pages 6 & 7). In fact, the B-IBI studies would indicate the bottom-dwelling community in the impact area is some of the most valuable to the ecology of the Elizabeth River.

b) Sediment clean-up was recognized by the mitigation sub-committee as offering the "nearest in-kind relatedness" of all the mitigation options under consideration (table 3, Mitigation Option Weighting Factor Evaluation, p. 15 of your study). The in-kind relatedness of this mitigation option, while not thoroughly discussed in your study, is the primary reason that The Elizabeth River Project recommends sediment clean-up as the most appropriate form of mitigation. We agree it is not practical to create 580 acres of new river bottom elsewhere on the system. Returning contaminated river bottom to ecological function through remediation efforts is the nearest in-kind replacement for what will be lost.

In addition, it may be possible to improve the cost-effectiveness of this mitigation measure by exploring whether any design options are feasible for construction of the cells which could also serve as remediation of some contaminated sediments, such as placing some contaminated sediment in the cells for permanent isolation from the system. Study would need to be conducted to ensure no re-contamination of the Mainstem.

2) The Elizabeth River Project is also encouraged that the plan takes a landscape approach to achieve ecosystem benefits through placing sediment cleanup projects in near proximity to wetland and oyster reef projects, maximizing the potential cumulative habitat functions. The draft plan includes some large, promising wetland mitigation sites on the Southern Branch, which, coupled with the nearby sediment cleanups, strengthen the potential to off-set losses to the ecosystem at the site of impact.

3) The percent of the mitigation plan intended for oyster reefs strikes an appropriate balance between this still experimental, while promising, mitigation measure and other mitigation approaches.

**At the same time, given the importance of this mitigation plan for the future of the Elizabeth River, we also wish to <u>reiterate several issues, discussed previously during the planning process, which remain significant for achieving an appropriate mitigation plan</u>.**

1) As discussed, The Elizabeth River Project believes it remains practical and appropriate to seek 1:1 mitigation, in acreage, of the 580 acres of river to be lost. As mentioned in

previous discussions; assuming that your landscape approach does, in fact, provide ecological improvement for a total of 487 acres, as presented in your draft plan, a minimal cost of $10,000 per acre could achieve an additional 93 acres of mitigation in vegetated buffer adjacent to wetland restoration areas (total estimated cost, $930,000). Replacement habitat for threatened/endangered bird species should be considered in these buffer areas, as the project area includes habitat of the federally threatened Piping Plover.

2) As we also discussed during the planning process, there remains a need to complete the investigation of the feasibility of some key sites. One way to address this might be to maintain an on-going list of alternative sites to address uncertainties in site availability/feasibility.

a) The status of potential wetland sites is a moving target, with some sites still on the market for economic development and others, such as the St. Julien site, under remediation for other purposes which may or may not be compatible with wetland restoration. A list of alternative sites should be considered, particularly for wetland mitigation, to achieve the 51.6 acres prescribed for the Elizabeth River.

b) Some sediment sites (Scuffletown Creek, Money Point) also have alternate sources of potential funding which may remove them from the list of sites available for mitigation of this project, as also discussed previously. Alternative sites which could be mentioned include the Copper Slag and Scotts Creek sites which Elizabeth River Project has identified previously (not in the Southern Branch), and a Norfolk Steel site in the Southern Branch.

c) Regarding the feasibility of the Wycoff and Republic cleanup sites, The Elizabeth River Project this past summer contracted with Virginia Institute of Marine Science for additional sampling data (attached). In addition, US EPA has secured additional data for Wycoff that should be used to calculate the acreage of this site (25 samples, visual interpretation attached).

d) Figure IV-8, Mitigation Site, Southern Branch, Elizabeth River, shows the Republic sediment cleanup site inaccurately (S2). Should be moved to the north.

**Finally, there are <u>several issues that were not addressed during the mitigation subcommittee deliberations</u> which have bearing on the assessment of environmental impacts and the viability of the mitigation plan.**

1) We do not recall any discussion with the subcommittee regarding mitigation for the impacts of dredging 3.7 million cubic yards of Elizabeth River bottom to create an access channel to the port facility. This dredging will result in the loss of a healthy river bottom community from the initial dredging and maintenance dredging over time. As a result, the mitigation plan should address these losses, which we understand to equate to more than 120 acres not currently mitigated.

2) Regarding impacts during construction and impacts from on-going port operations, our recommendations include:

a) State-of-the-art controls to limit impacts related to suspended sediments and dissolved oxygen during the construction of the cells, and monitoring of the same, as this activity will suspend a large amount of sediments.
b) The Environmental Impact Statement was insufficient in assessing specific impacts to air and water quality after construction, during long-term operation of a port with its anticipated increases in shipping and trucking. (It is our understanding that an additional Environmental Impact Statement is planned by the port authority when design issues are more developed). Maximum, state-of-the-art storm water and air emission controls, and maximum pollution prevention practices to reduce emissions and discharges, should be incorporated into design of the port facility to reduce impacts for the Mainstem, one of the more ecologically healthy areas of the river. The Elizabeth River Project commends the Virginia Port Authority for its progress with implementing innovative storm water and pollution prevention practices at its other facilities as a Model Level River Star and would hope to serve an advisory role to the Port Authority in its achievement of model environmental protection during port operations.

3) In pursuing the oyster reefs:

a) As with wetland and sediment sites, it is advisable to identify specific, potential habitat restoration areas in the Elizabeth River for oyster and/or clam restoration. One spot that should be considered is the sand flat immediately south of Amerada Hess and adjacent to the Elizabeth River Terminals wetland restoration site. This site would support a landscape approach. Other sites could include former Baylor grounds.
b) Your draft plan may have under-estimated costs of 3-D oyster reef construction in the Elizabeth River (costs estimated at $100,000 per acre, p. 64, B. Mitigation Analysis). VA Marine Resources Commission's current estimate for construction costs, using shucking-house oysters, is $191,000 per acre ($1.91 per bushel, with 100,000 bushels needed per acre), plus seeding costs.
c) Funding should be identified and programmed for long-term adaptive management of the mitigation reefs, as needed.

4) The Elizabeth River Project supports the recommendation of the Cumulative Effects Assessment by Larry Canter (April 2004), p. 206, for the Corps to take the lead in "establishing a Hampton Roads Area Environmental Management Committee" to review monitoring information about the 17 referenced projects with related cumulative impacts, for the purposes of adaptive environmental management.

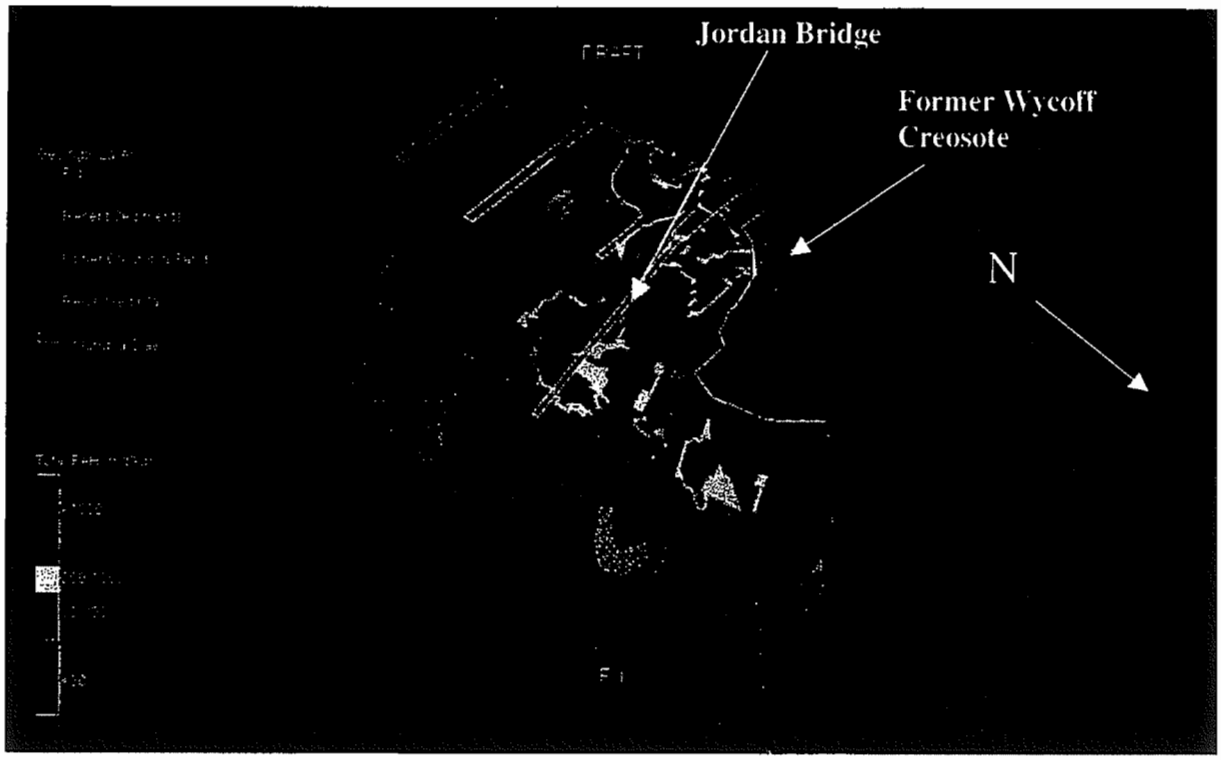
Please do not hesitate to call me or Marjorie Mayfield Jackson, Executive Director, with any questions you may have.

Sincerely,

Col. J.J. Thomas, USA, Ret.
Board President

Cc: Mark Mansfield, US Army Corps of Engineers
Heather Wood, Virginia Port Authority
William Arguto, US Environmental Protection Agency
George Ruddy, US Fish & Wildlife Service
Bert Parolari, VA Department of Environmental Quality
Lee Hill, VA Department of Conservation and Recreation
Traycie West, VA Marine Resources Commission

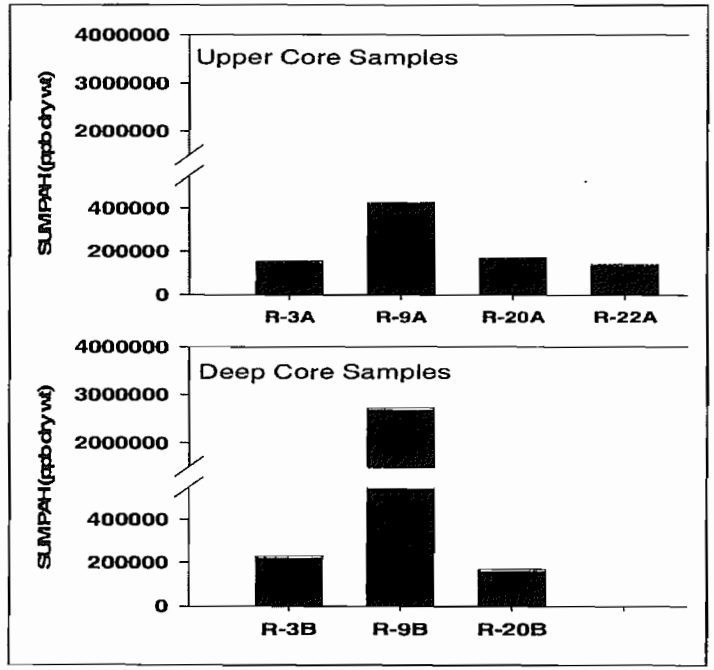
# Wycoff Sediment Data from US Environmental Protection Agency




**New data to better define Wycoff site**

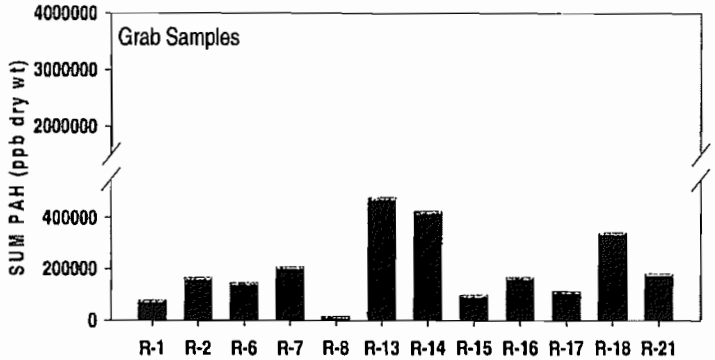
Graphic above depicts the current extent of PAH contaminated sediments, using recently collected data from US EPA (summer 2005), at the former Wycoff Creosote. The area being evaluated for sediment remediation as a mitigation project for the eastward expansion of Craney Island are the red, yellow, and green areas north of the Jordan Bridge (levels of contamination are depicted under the Total PAH (mg/kg) key in the bottom left hand corner). Most of these areas are above the level at which adverse effects on aquatic organisms are observed and the red areas contain the highest level of contamination. The area of contamination appears to be larger than indicated in the draft mitigation plan. Additional information can be provided by contacting Joe Rieger (757-399-7487).

# Republic Creosote Sediment Data from The Elizabeth River Project and VA DEQ




**New data to better define Republic Creosote site**

Aerial photo above depicts sites sampled from the summer of 2005 to determine PAH contamination at the former Republic Creosote site, a potential sediment mitigation site for the eastward expansion of Craney Island. Results show elevated levels of contamination in the federal navigation channel and around station R9. Deep core samples were only to 2 foot. For additional information or data report contact Joe Rieger 757-399-7487. *(Data collected by VA DEQ and ERP with VIMS support for analytical work)*



WETLANDS WATCH
WETLANDSWATCH.ORG

November 7, 2005

Col. Yvonne Prettyman-Beck
District Engineer
US Army Corps of Engineers, Norfolk District
803 Front Street
Norfolk, VA 23510

**Re: Comments, Draft Environmental Impact Statement, proposed Craney Island Dredged Material Management Area (CIDMMA) Eastward Expansion**

Dear Col. Prettyman,

Wetlands Watch appreciates the opportunity to have participated in the Mitigation Subcommittee for this draft Environmental Impact Statement (EIS) for the CIDMMA expansion and port operation. We also appreciate the opportunity to comment upon the draft EIS.

The process used to develop this EIS was an extensive and expensive one. With more than three years of discussions involving stakeholders and groups such as ours, the Norfolk District took its responsibilities seriously. These efforts have contributed to some significant advances in our understanding of the Elizabeth River ecosystem and have resulted in some novel advances in regulatory policy.

In the determination of environmental impacts posed by this project, the Norfolk District included the impacts on water column productivity, a significant and long-neglected water quality and habitat impact. In addition, there was inclusion of a "landscape approach" in both determining impacts and in development of the mitigation plan for this project. Again, the use of this ecological concept is an overdue advance. The use of a habitat equivalency analysis (HEA) to map ecosystem losses onto potential mitigation options was a useful way of quantifying discussions that, in the past, have been more qualitative and based on the judgment of staff.

The inclusion of a comprehensive cumulative effects analysis (CEA) is long overdue and will help both regulatory agencies as well as the public in future regulatory decisions. As you may recall, the absence of what we considered to be an adequate CEA in the APM Terminals permit has been an issue with Wetlands Watch for some time. The CEA conducted for this draft EIS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moves in the right direction although as noted below there are still significant shortcomings in its application to this project.

After conducting an intensive review of this draft EIS, Wetlands Watch would like to make the following additional comments.

**Overall Focus**

The proposed project is really two separate ones – CIDMMA expansion and Virginia Port Authority (VPA) terminal construction. However, it is difficult to tell from this draft EIS which proposed activity is covered and which is not. The text deals with the CIDMMA and port operation, using the port operation to establish the national economic development threshold leading to a justification for the combined project. Yet, it is clear that the actual port construction will require a subsequent permit for undetermined activities not mentioned in this draft EIS. There needs to be a "bright line" between the proposals in this draft EIS and a subsequent permit application by VPA.

The rationale for the CIDMMA expansion is to provide additional dredge material disposal capacity as well as a platform for a VPA port. However, the Locally Preferred Plan (LPP), the one preferred by the VPA, provides only three years or 12 mcy of additional capacity. While marginally more costly, the Tentatively Proposed plan (TPP) provides 17 years or 67 million cubic years (mcy) of additional capacity. We believe that, if the project goes forward, the Tentatively Proposed Plan should be the one followed.

If the LPP is chosen, the useful life of the CIDMMA will be exhausted during the operation of the port facility and the future dredging operations in the port of Norfolk would fall within the time line for analysis of this draft EIS. In that case the impacts of the future disposition of dredge spoils after 2028 should be addresses in the EIS.

Finally, because the expansion of the CIDMMA is the primary reason for this EIS, the proposed capacity increases for both the LPP and TPP should be prominently noted with in the Executive Summary and the body of the EIS.

The draft EIS mentions briefly the dredging of an access channel to 52 feet, removing 3.7 mcy. This access channel appears to be outside of the footprint of the expansion. This project is not mentioned as part of the discussion of environmental impact and was not part of the discussion in the Mitigation Subcommittee when the mitigation plan was discussed. If this access channel has not been accounted for in this draft EIS and its mitigation plan, it needs to be.

**Cumulative Effects Assessment**

We are encouraged to see the inclusion of a comprehensive Cumulative Effects Assessment (CEA) in this draft EIS. The need for a robust CEA was a major objection from Wetlands Watch to the APM Terminal permit environmental assessment in 2003. This CEA is an improvement over that situation, but the CEA has limitations as noted with the lack of data on the other projects being evaluated.


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This CEA appears to run in parallel to the draft EIS, rather than being a driving force within it. There is no indication that the results of the CEA were included to make adjustments to the level of compensatory mitigation. As the CEA states on page 194,

> **"It is stressed that no specific mitigation plan for cumulative effects has been addressed by the Norfolk District.** Rather, attention has been given to identifying mitigation options for the direct effects of the eastward expansion of the CIDMMA."

Having stated that, the CEA also seems to say that one could consider the direct impact mitigation proposal as also addressing the cumulative impacts:

> "However, because cumulative effects can occur on the same resources and ecosystems subject to expansion cell-related direct effects, the potential mitigation options identified to date could be considered by collaborating agencies in a program focused on cumulative effects mitigation."

We do not agree that the direct impact mitigation proposals are sufficient to deal with cumulative impacts. We see the statement quoted above as speculative, saying that the direct impact options "could be considered...in a program focused on cumulative effects mitigation," and stating that a "program" is needed to deal with cumulative effects, beyond the direct impacts mitigation.

Projects of this magnitude negatively impact a finite and limited environmental resource and just as with any resource, this value increases with scarcity. To address this increased value, we suggest that it is entirely appropriate to levy a "cumulative effects surcharge" in addition to the direct effects mitigation. If more than lip service is to be paid to cumulative effects, future projects of significant magnitude will have to, through mitigation, produce a significant net positive environmental benefit. For example, this might be done by financing essential monitoring plans, or additional landscape-based restoration or preservation, or some percentage of mitigation above that done to offset direct effects.

Indeed, the draft EIS mentions the need for additional steps to be taken beyond mitigation for direct effects. At page IV-74, the draft EIS states,

> **"In the absence of appropriate monitoring and mitigation efforts, potentially significant adverse cumulative effects could occur on water quality, benthic habitat, and protected species and critical habitat."**

There is no mention of a permanent monitoring effort in this draft EIS to insure that the mitigation efforts are successful. The wetlands mitigation narrative mentions targets for survival of plantings and accounts for the need for monitoring on an occasional basis, but no formal proposal to perform that monitoring is made. For the oyster reef and sediment mitigation proposals, there is likewise no monitoring proposed.

Without a comprehensive monitoring program, adequately funded above and beyond the direct impact mitigation proposed, the mitigation efforts could fall short. The danger in this is stated clearly in the draft EIS, again at page IV-74,

> **"However, other cumulative effects, such as impacts to aquatic resources, if not successfully mitigated, would be considered in a negative context."**


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If this happens, this project would produce "potentially significant adverse cumulative effects," using the language of the draft EIS. It is our belief that monitoring should be an integral part of the mitigation plan.

We also feel that the call in the CEA for a 'Hampton Roads Area Environmental Management Committee' is an excellent on and ask that it, and the funds necessary for its operation over the life of this project, be made a part of the final EIS.

**Oyster Reefs**

We applaud the use of Landscape-based mitigation planning. However, as noted in the mitigation analysis of the EIS:

> "Oyster reef restoration has more risk associated with it than the other selected options. To reduce this risk, a monitoring and adaptive management program will be implemented to maintain the restored oyster reefs over time."

We see no provision in the mitigation cost estimate for this ongoing "adaptive management program." We recognize that adjustments to reef acreage were made based on "risk-weighting," however, project effects are permanent; the mitigation must be no less permanent. Accordingly, the Corps should require a performance bond or other financing tool, to cover the costs of the adaptive management program for the life of the project.

**Sediment remediation**

Contaminated sediment is one of the largest problems within the Elizabeth River and we are glad to see that sediment clean up is a significant component of the mitigation plan. However, two concerns we have are the cost estimate and the number of acres to be mitigated.

1) The mitigation costs are based on the average of three remediation strategies. This would be appropriate if the target sediments were "average." However, the targeted sediments are the "hotspots" of the Southern Branch, meaning that they are likely to require the more expensive of the remediation options. In addition, there may be significant costs associated with sampling, testing and characterization of the contaminated sediments that don't appear to have been accounted for.
2) The mitigation plan for the CIEE specifies the clean up of 68 acres at a cost of $33 million, but claims credit for remediation of 411 acres. Although we understand the logic behind stating that the areas adjacent to the cleanup will also reap benefits, it is misleading to claim that benefit. Remediation is commonly understood as an active process. The simple passage of time has remediation power in some instances, yet one can't take credit for doing nothing. If we agree that the HEA is a valid approach for determining remediation acreage, there is no need to "pad the numbers." We suggest and support simply footnoting why there is a discrepancy between the acres impacted and the acres remediated.

We also feel strongly that the monitoring issue raised in the CEA has applicability here. There is great uncertainly about the nature of the "hot spots" being targeted. Indeed, they may only be fully characterized when mitigation efforts are commenced. There is also a need to ascertain if the assumptions in the multiplier for actual acres treated are borne out in reality. Without


P.O. Box 9335 Norfolk, Virginia 23505 (757) 456-1394 info@wetlandswatch.org

monitoring, there will continue to be uncertainty in future CEA's due to a lack of real world data – data that can only be provided by monitoring.

Again, thank you for the opportunity to participate in and comment on this draft EIS.

Sincerely,

John Blandin

John Blandin
President
Wetlands Watch



P.O. Box 9335 Norfolk, Virginia 23505 (757) 456-1394 info@wetlandswatch.org

# Fifth Coast Guard District

---

**From:** Mansfield, Mark T NAO
**Sent:** Monday, November 07, 2005 6:26 PM
**To:** 'John.R.Walters@uscg.mil'; Seltzer, Craig L NAO; Clipston, Amy G NAO
**Cc:** Clark, Bill LT; Smith, Roger LCDR; Stamper, Douglas H NAO
**Subject:** RE: Craney Island Dredged Material Management Area Eastward Expansion (CIDMMA) EIS

John-
Good evening. Thank you for your note below and the accompanying voice mail message received earlier today. Your comments will be included in the report and this office will continue to engage your office as the study progresses.

Regards,
Mark Mansfield
Chief, Planning & Policy
Norfolk District
U.S. Army Corps of Engineers

Amy & Craig-
Please add these comments to the subject draft feasibility report to the public comment section of the report and continue to keep John's office on the mailing list for future notices, etc. Thank you

---

**From:** John.R.Walters@uscg.mil [mailto:John.R.Walters@uscg.mil]
**Sent:** Monday, November 07, 2005 4:05 PM
**To:** Seltzer, Craig L NAO
**Cc:** Mansfield, Mark T NAO; Clark, Bill LT; Smith, Roger LCDR
**Subject:** Craney Island Dredged Material Management Area Eastward Expansion (CIDMMA) EIS

Craig,
The Fifth Coast Guard District has reviewed the Draft EIS dated September 13, 2005, and has no comments with respect to the Recommended Plan, construction of the Eastward Expansion Alternative.

Once the expansion is completed, we anticipate disestablishing three buoys that currently mark the federal navigation project and would impede traffic destined for the new terminals.

As the Recommended Plan is implemented, the Coast Guard will need to be engaged with construction activity including:

- Publication of construction activity in the Local Notice to Mariners
- Fuel transfer policies through Coast Guard Sector Hampton Roads
- Hurricane contingency plans, also, through Coast Guard Sector Hampton Roads
- Construction related traffic management measures

Please continue to include this office in notifications for progress meetings and continue to include us on your mailing list. Also, please add Coast Guard Sector Hampton Roads to the list of addresses for this project:

Commander
Coast Guard Sector Hampton Roads
200 Granby St, 7th Flr
Norfolk, VA 23510

Thanks for the opportunity to review the EIS,

John Walters
Waterways Management Section Chief
Aids to Navigation and Waterways Management Branch
Fifth Coast Guard District

# COMMONWEALTH of VIRGINIA

W. Tayloe Murphy, Jr.
Secretary of Natural Resources

**Department of Historic Resources**
2801 Kensington Avenue, Richmond, Virginia 23221

Kathleen S. Kilpatrick
Director

Tel: (804) 367-2323
Fax: (804) 367-2391
TDD: (804) 367-2386
www.dhr.virginia.gov

October 17, 2005

Mr. Mark T. Mansfield
US Army Corps of Engineers
Planning and Policy Branch
803 Front Street
Norfolk, VA 23510-1096

Re: Craney Island Eastward Expansion Study
DEQ No. 05-244F
DHR File No. 2004-1428

Dear Mr. Mansfield:

We have received for review a copy of the report *Phase I Archaeological Remote Sensing Survey East of the Craney Island, Elizabeth River, Virginia* (Panamerican 2000). We are pleased to inform you that the report meets the Secretary of the Interior's *Standards and Guidelines for the Documentation of Archaeological Sites* (48 FR 44734-44742) and our Department's *Survey Guidelines* (revised 2001).

We understand that survey of the project area resulted in the identification of over 400 magnetic anomalies, all of which were determined to be non-cultural in origin (most apparently associated with dredging, equipment storage, and other modern use of the channel). We concur with the findings, and with the recommendation that no historic properties that may be damaged by proposed activities exist within surveyed area. No further archaeological investigation within the channel is necessary.

We appreciate the opportunity to be of assistance to you in this matter. If you have questions about our comments, please call me at (804) 367-2323, Ext. 140.

Sincerely,

Joanna Wilson, Archaeologist
Office of Review and Compliance

Administrative Services
10 Courthouse Avenue
Petersburg, VA 23803
Tel: (804) 863-1624
Fax: (804) 862-6196

Capital Region Office
2801 Kensington Ave.
Richmond, VA 23221
Tel: (804) 367-2323
Fax: (804) 367-2391

Tidewater Region Office
14415 Old Courthouse Way, 2nd Floor
Newport News, VA 23608
Tel: (757) 886-2807
Fax: (757) 886-2808

Roanoke Region Office
1030 Penmar Ave., SE
Roanoke, VA 24013
Tel: (540) 857-7585
Fax: (540) 857-7588

Winchester Region Office
107 N. Kent Street, Suite 203
Winchester, VA 22601
Tel: (540) 722-3427
Fax: (540) 722-7535

# COMMONWEALTH of VIRGINIA

**DEPARTMENT OF TRANSPORTATION**
1401 EAST BROAD STREET
RICHMOND, VIRGINIA 23219-2000

**GREGORY A. WHIRLEY**
ACTING COMMISSIONER

October 24, 2000

**MEMORANDUM**

To: Mark T. Wansfield
Chief, Planning and Policy Branch
Department of the Army
Norfolk District, Corps of Engineers
Fort Norfolk, 803 Front Street
Norfolk, Virginia 23510-1096

From: Harold Paxton
Transportation Planning Engineer
VDOT Hampton Roads District

Subject: Environmental Impact Report
Craney Island Expansion
Norfolk Harbor and Channels
Norfolk, Virginia

The Hampton Roads District Planning Section has reviewed the above referenced Environmental Evaluation for impacts to the existing and future transportation system. Our preliminary review does not indicate any negative impacts to the transportation system at this time. However, the "Third Crossing Proposal" with connection thru the Craney Island Expansion and connecting to Route 164 (Western Highway) may impact this proposal. We can only conclude any additional traffic or traffic disruptions regarding this program being considered are negligible.

This improvement/construction should note coordination with VDOT's Norfolk Residency is required to insure that all current VDOT standards are met. Otherwise, this office has no objections to the proposed improvements.

If further assistance is needed, please advise.

Harold Paxton

Harold Paxton, Transportation Planning Engineer
Cc: Gary German
Eric Stringfield
Mary Stanley

# COMMONWEALTH of VIRGINIA

*Office of the Governor*

Mark R. Warner
Governor

November 1, 2005

Colonel Yvonne J. Prettyman-Beck
District Engineer
U.S. Army Corps of Engineers
Norfolk District
803 Front Street
Norfolk, Virginia 23510

Dear Colonel Prettyman-Beck:

On behalf of the Commonwealth of Virginia, we wish to express our support for the Norfolk District's recommendation to construct an eastward expansion of Craney Island for additional dredge material disposal and future port development.

The recommended expansion addresses many regional concerns including the critical need for future dredge material disposal and containerized cargo capacity at the Port of Virginia. The Port and supporting Federal navigation channels are lifelines for regional and national economic growth and are essential for the future success of Virginia's maritime and supply chain industries.

The Eastward Expansion of Craney Island will generate over 54,000 jobs in the region and $155 million in annual state and local tax revenues. Also, 26,000 jobs and $788 million in annual wages are expected from regional distribution center operations that will benefit from expanded port services. The recommended improvements to Craney Island coupled with other Federal and State initiatives, like the Heartland Corridor, will improve the efficiency of the Nation's transportation system and provide economic benefits to millions of Americans. Successful completion of the compensatory mitigation projects outlined in the Draft Environmental Impact Statement appear to balance any adverse impacts to the environment resulting from this project.

The Craney Island Eastward Expansion is critically important to the future of Hampton Roads and the Nation. We support the District's findings and encourage you to approve the recommended plan. Thank you for the opportunity to comment on this proposal.

Sincerely,

Pierce R. Homer
Secretary of Transportation

Michael J. Schewel
Secretary of Commerce and Trade

W. Taylor Murphy, Jr.
Secretary of Natural Resources

State Capitol • Richmond, Virginia 23219 • (804) 786-2211 • TTY (804) 371-8015 • www.governor.virginia.gov

# SENATE OF VIRGINIA

FRANK W. WAGNER
7TH SENATORIAL DISTRICT
PART OF THE CITY OF VIRGINIA BEACH
POST OFFICE BOX 68008
VIRGINIA BEACH, VIRGINIA 23471

COMMITTEE ASSIGNMENTS:
COMMERCE AND LABOR
GENERAL LAWS
REHABILITATION AND SOCIAL SERVICES
TRANSPORTATION

November 1, 2005

Colonel Yvonne J. Prettyman-Beck, District Engineer
U.S. Army Corps of Engineers, Norfolk District
803 Front Street
Norfolk, Virginia 23510

Dear Colonel Prettyman-Beck:

I write to enthusiastically endorse the recommendations reported in the *Draft Feasibility Report and Environmental Impact Statement for the Eastward Expansion of Craney Island*. As an elected official representing the 7th District in Virginia Beach, I am certainly pleased by the Norfolk District's recommendation to construct an expansion of Craney Island for additional dredge material disposal and future port development.

The recommended expansion addresses many regional concerns including the critical need for future dredge material disposal capacity to maintain the Federal navigation channels into Norfolk Harbor and to deepen the channels to the authorized 55-foot depth in the future. The channels are a lifeline for regional economic growth and the future success of Virginia's ports and supply chain industries.

The Eastward Expansion of Craney Island will generate over 54,000 jobs in the region and $155 million in annual state and local tax revenues. 26,000 jobs and $788 million in annual wages are expected from regional distribution center operations that will benefit from expanded port services. The recommended improvements to Craney Island coupled with other Federal and State initiatives, like the Heartland Corridor will improve the efficiency of the Nation's transportation system and provide economic benefits to millions of Americans.

The Craney Island Eastward Expansion is vitally important to the economic well-being of my constituents in Virginia Beach, Hampton Roads and the Commonwealth. I encourage you to approve the recommended plan. Thank you for the opportunity to comment on this proposal. I know you will give it your careful consideration.

With kindest regards, I remain

Sincerely yours,

Frank W. Wagner

Frank W. Wagner

# SENATE OF VIRGINIA

YVONNE B. MILLER
5TH SENATORIAL DISTRICT
PART OF THE CITIES OF CHESAPEAKE, NORFOLK,
AND VIRGINIA BEACH
555 FENCHURCH STREET, SUITE 403
NORFOLK, VIRGINIA 23510

COMMITTEE ASSIGNMENTS:
COMMERCE AND LABOR
GENERAL LAWS
REHABILITATION AND SOCIAL SERVICES
TRANSPORTATION

October 19, 2005

Colonel Yvonne J. Prettyman-Beck
District Engineer
U.S. Army Corps of Engineers
Norfolk District
803 Front Street
Norfolk, VA 23510

Re: Craney Island Eastward Expansion, Draft Feasibility Report and Environmental Impact Statement

Dear Colonel Prettyman:

I wish to express my support for the conclusions and recommendations reported in the Draft Feasibility Report and Environmental Impact Statement for the Eastward Expansion of Craney Island. We are greatly encouraged by the Norfolk District's recommendation to construct an expansion of Craney Island for additional dredge material disposal and future port development.

The recommended expansion addresses many regional concerns including the critical need for future dredge material disposal capacity to maintain the Federal navigation channels into Norfolk Harbor and to deepen the channels to the authorized 55-foot depth in the future. The channels are a lifeline for regional economic growth and the future success of Virginia's ports and supply chain industries.

The Eastward Expansion of Craney Island will generate over 54,000 jobs in the region and $155 million in annual sales and local tax revenues. 26,000 jobs and $788 million in annual wages are expected from regional distribution center operations that will benefit from expanded port services. The recommended improvements to Craney Island coupled with other Federal and State initiatives, like the heartland Corridor will improve the efficiency of the Nation's transportation system and provide economic benefits to millions of Americans.

The Craney Island Eastward Expansion is vitally important to the future of Hampton Roads and the Nation. I support the District's findings and encourage you to approve the recommended plan. Thank you for the opportunity to comment on this proposal.

Sincerely,

Yvonne B. Miller

Yvonne B. Miller

# SENATE OF VIRGINIA

NICK RERRAS
6TH SENATORIAL DISTRICT
ALL OF ACCOMACK, MATHEWS, AND
NORTHAMPTON COUNTIES; AND PART OF
THE CITIES OF NORFOLK AND VIRGINIA BEACH
1518 SPRINGMEADOW BOULEVARD
NORFOLK, VIRGINIA 23518-4814

COMMITTEE ASSIGNMENTS:
COMMERCE AND LABOR
COURTS OF JUSTICE
REHABILITATION AND SOCIAL SERVICES
TRANSPORTATION

December 15, 2005

Colonel Yvonne J. Prettyman-Beck
District Engineer
U. S. Army Corps of Engineers
Norfolk District
803 Front Street
Norfolk, VA 23510

Dear Colonel Prettyman:

I fully support the conclusions and recommendations reported in the Draft Feasibility Report and Environmental Impact Statement for the Eastward Expansion of Craney Island. I am greatly encouraged by the Norfolk District's recommendation to construct an expansion of Craney Island for additional dredge material disposal and future port development.

The recommended expansion addresses many regional concerns including the critical need for future dredge material disposal capacity to maintain the federal navigation channels into Norfolk Harbor and to deepen the channels to the authorized 55 foot depth in the future. The Channels are a lifeline for regional economic growth and the future success of Virginia's ports and supply chain industries.

The Eastward Expansion of Craney Island will generate over 54,000 jobs in the region and $155 million in annual state and local tax revenue. 26,000 jobs and $788 million in annual wages are expected from regional distribution center operations that will benefit from expanded port services. The recommended improvements to Craney Island coupled with other federal and state initiatives, like the Heartland Corridor, will improve the efficiency of the nation's transportation system and provide economic benefits to millions of Americans.

The Craney Island Eastward Expansion is vitally important to the future of Hampton Roads and the nation. I support the District's findings and encourage you to approve the recommended plan. As always, it is an honor to serve you in the Senate of Virginia. If I can be of service to you in the future, please call my Norfolk legislative office at 757-855-7044.

Sincerely,

Nick

Nick Rerras
Senator, 6th District

NR: dh

Have a great and happy New Year in 2006

COMMONWEALTH OF VIRGINIA
HOUSE OF DELEGATES
RICHMOND

TERRIE L. SUIT
POST OFFICE BOX 7031
VIRGINIA BEACH, VIRGINIA 23457

EIGHTY-FIRST DISTRICT

COMMITTEE ASSIGNMENTS:
GENERAL LAWS
COUNTIES, CITIES AND TOWNS
COMMERCE AND LABOR

November 1, 2005

Colonel Yvonne J. Prettyman-Beck
District Engineer
U. S. Army Corps of Engineers
Norfolk District
803 Front Street
Norfolk, VA 23510

Dear Colonel Prettyman-Beck:

I am writing to express my support of the eastward expansion of Craney Island to provide additional acreage for construction of a fourth marine terminal. The island will also be the location for additional dredge material, (which will provide for the needed acreage), and offer a solution for the maintenance and deepening of navigation channels and maritime facilities in Hampton Roads.

The recommended expansion will not only benefit the Hampton Roads region, but the entire Commonwealth as the expansion will generate thousands of jobs and thus annual state and local tax revenues. The economic benefits to the Commonwealth will increase as the development of the project continues.

This initiative, coupled with other federal and state initiatives like the Heartland Corridor, will vastly improve the port services and create nation-wide opportunities for our workforce and businesses alike.

The Craney Island expansion is of vital importance not only to Hampton Roads and the Commonwealth, but also to our entire nation. I support the project and encourage you to approve the plan.

Sincerely,

Terrie L. Suit

DISTRICT: (757) 421-3309 • FAX: (757) 421-0195 • RICHMOND: (804) 698-1081 • E-MAIL: DEL_SUIT@HOUSE.STATE.VA.US

COMMONWEALTH OF VIRGINIA
HOUSE OF DELEGATES
RICHMOND

G. GLENN ODER
POST OFFICE BOX 6161
NEWPORT NEWS, VIRGINIA 23606

NINETY-FOURTH DISTRICT

October 25, 2005

COMMITTEE ASSIGNMENTS:
GENERAL LAWS
TRANSPORTATION
COUNTIES, CITIES AND TOWNS

Colonel Yvonne J. Prettyman – Beck
District Engineer
U.S. Army Corps of Engineers
Norfolk District
803 Front Street
Norfolk, VA 23510

Re: Craney Island Eastward Expansion, Draft Feasibility Report
And Environmental Impact Statement

Dear Colonel Prettyman:

I write today to express my support for the recommendation to construct an expansion of Craney Island for additional dredge material disposal and future port development. I strongly believe that this new expansion is critical to meet future dredge material disposal needs and to encourage economic growth in the region.

The lack of suitable disposal sites for dredge material is a serious concern. Dredging is absolutely critical to the maintenance of the navigation channels. Through the expansion, a place for dredge material to be disposed becomes available that enables the region to improve the efficiency and effectiveness of Federal navigation channels in the area. The expansion will also allow for the deepening of channels to the authorized 55-foot depth level.

In addition, the Eastward Expansion of Craney Island will generate over 54,000 jobs in the region and $155 million in annual state and local tax revenues. Regional distribution centers will also benefit from this expansion. They are expected to add 26, 000 jobs and $788 million in annual wages. This is clearly a project that offers great economic development opportunities.

The Craney Island Eastward Expansion is vitally important to the future of Hampton Roads and the Nation. I support the District's findings and encourage you to approve the recommended plan. Thank you for your consideration of this request. If I can be of any assistance, please let me know.

Sincerely,

G. Glenn Oder, ASLA
Delegate, 94th District

C: J. Robert Bray, Executive Director, Virginia Port Authority

DISTRICT: (757) 930-8683 • RICHMOND: 698-1094

COMMONWEALTH OF VIRGINIA
HOUSE OF DELEGATES
RICHMOND

JOHN A. COSGROVE
POST OFFICE BOX 15483
CHESAPEAKE, VIRGINIA 23328

SEVENTY-EIGHTH DISTRICT

COMMITTEE ASSIGNMENTS:
PRIVILEGES AND ELECTIONS
GENERAL LAWS
TRANSPORTATION
SCIENCE AND TECHNOLOGY

October 18, 2005

Colonel Yvonne J. Prettyman-Beck
District Engineer
U.S. Army Corps of Engineers
Norfolk District
803 Front Street
Norfolk, VA 23510

Re: Craney Island Eastward Expansion, Draft Feasibility Report and Environmental Impact Statement

Dear Colonel Prettman:

I wish to express my support for the conclusions and recommendations reported in the Draft Feasibility Report and Environment Impact Statement for the Eastward Expansion of Craney Island. I am greatly encouraged by the Norfolk District's recommendation to construct an expansion of Craney Island for additional dredge material disposal and future port development.

The recommended expansion addresses many regional concerns including the critical need for future dredge material disposal capacity to maintain the Federal navigation channels into Norfolk Harbor and to deepen the channels to the authorized 55-foot depth in the future. The channels are a lifeline for regional economic growth and the future success of Virginia's ports and supply chain industries.

The Eastward Expansion of Craney Island will generate over 54,000 jobs in the region and $15 million in annual state and local tax revenues. 26,000 jobs and $788 million in annual wages are expected from regional distribution center operations that will benefit from expanded port services. The recommended improvements to Craney Island couple with other Federal and State initiatives, like the Heartland Corridor will improve the efficiency of the Nation's transportation system and provide economic benefits to millions of Americans.

DISTRICT: (757) 547-3422 • RICHMOND: (804) 698-1078 • E-MAIL: DEL_COSGROVE@HOUSE.STATE.VA.US

The Craney Island Eastward Expansion is vitally important to the future of Hampton Roads and the Nation. I support the District's findings and encourage you to approve the recommended plan.

Thank you for the opportunity to comment on this proposal.

Sincerely,

John A. Cosgrove

JAC:cnc

COMMONWEALTH OF VIRGINIA
HOUSE OF DELEGATES
RICHMOND

PHILLIP A. HAMILTON
POST OFFICE BOX 1585
NEWPORT NEWS, VIRGINIA 23601

NINETY-THIRD DISTRICT

COMMITTEE ASSIGNMENTS:
HEALTH, WELFARE AND INSTITUTIONS (CHAIRMAN)
EDUCATION
APPROPRIATIONS

October 18, 2005

Colonel Yvonne J. Prettyman-Beck
U.S. Army Corps of Engineers, Norfolk District
803 Front Street
Norfolk, Virginia 23510

Dear Colonel Prettyman-Beck:

I am writing to endorse the conclusions and recommendations in the *Draft Feasibility Report and Environmental Impact Statement for the Eastward Expansion of Craney Island.* I am encouraged by the recommendation to construct an expansion of Craney Island for additional dredge material disposal and future port development.

The recommended expansion addresses the critical need for future dredge disposal capacity to maintain the federal navigation channels into Norfolk Harbor and to deepen the channels to the authorized 55-foot depth. The channels are critical to for future economic growth of the ports and the region as a whole.

The expansion of Craney Island will generate thousands of jobs and millions of dollars in additional state and local tax revenues. In addition to the positive economic benefits, the expansion will improve the efficiency of the transportation system.

I support the District's findings and encourage you to approve the recommended plan.

Sincerely,

Phillip Hamilton

Phillip Hamilton

DISTRICT: (757) 249-2580 • FAX: (757) 595-5008 • RICHMOND: (804) 698-1093 • E-MAIL: DPHR93NN@AOL.COM

COMMONWEALTH OF VIRGINIA

FREDERICK M. QUAYLE
13TH SENATORIAL DISTRICT
ALL OF SURRY COUNTY; PART OF ISLE OF WIGHT,
PRINCE GEORGE, AND SOUTHAMPTON COUNTIES;
AND PART OF THE CITIES OF CHESAPEAKE,
FRANKLIN, HOPEWELL, PORTSMOUTH, AND SUFFOLK
3808 POPLAR HILL ROAD, SUITE E
CHESAPEAKE, VIRGINIA 23321

COMMITTEE ASSIGNMENTS:
LOCAL GOVERNMENT, CHAIR
COURTS OF JUSTICE
EDUCATION AND HEALTH
FINANCE
RULES

SENATE

October 24, 2005

Colonel Yvonne J. Prettyman-Beck
District Engineer
U.S. Army Corps of Engineers, Norfolk District
803 Front Street
Norfolk, Virginia 23510

RE: Craney Island Eastward Expansion
Draft Feasibility Report and Environmental Impact Statement

Dear Colonel Pettyman-Beck:

I was excited by the Norfolk District's recommendation to construct an expansion of Craney Island for additional dredge material disposal and future port development. I want to express my support for the conclusions and recommendations reported in the Draft Feasibility Report and Environmental Impact Statement for the Eastward Expansion of Craney Island.

The Eastward Expansion of Craney Island will generate thousands of jobs in the region and millions in annual state and local tax revenues. Additional jobs and wages are expected from regional distribution center operations that will benefit from expanded port services. The recommended improvements to Craney Island coupled with other Federal and State initiatives, like the Heartland Corridor, will improve the efficiency of the Nation's transportation system and provide economic benefits to millions of Americans.

The Craney Island Eastward Expansion is vitally important to the future of Hampton Roads and the Nation. I support the District's findings and encourage you to approve the recommended plan.

Yours very truly,

Frederick M. Quayle

FMQ:mk

CC: J. Robert Bray, Virginia Port Authority

# COUNTY of ISLE OF WIGHT

THE COURTHOUSE

November 3, 2005

Colonel Yvonne J. Prettyman-Beck
District Engineer, USACOE
Norfolk District
803 Front Street
Norfolk, VA 23510

RE: Craney Island Eastward Expansion, Draft Feasibility Report and EIS

Dear Colonel Prettyman,

Please include the endorsement of the Isle of Wight County Board of Supervisors with the other expressions of support for the conclusions and recommendations in the Draft Feasibility Report and Environmental Impact Statement for the Eastward Expansion of Craney Island.

This expansion will result in addressing the critical need for future dredge disposal material capacity to maintain the Federal navigation channels into Hampton Roads and to deepen the channels to their authorized depth of 55 feet. These channels are a lifeline for regional economic growth and the future success of Virginia's ports and supply chain industries. Beyond the immediate impact on the region, the sustained viability and expansion of these terminals has national implications for trade and commerce.

As you are aware, the expansion of Craney Island will create over 54,000 jobs in the region and generate $155 million in annual state and local tax revenues. 26,000 jobs and $788 million in annual wages are expected from regional distribution center operations that will benefit from expanded port services. This and other initiatives like the Heartland Corridor project and rebuilt US Route 460 project will improve the efficiency of our National transportation system and benefit millions of Americans. Locally, Isle of Wight County is dependent on the Port of Virginia for its economic future. The County has invested millions of local tax dollars to prepare its civil and industrial infrastructure to accommodate future logistics operations.

The Craney Island eastward expansion is critical to the future of Isle of Wight County, Hampton Roads and America. The Board of Supervisors supports the District's findings and we encourage you to approve the recommended plan. Thank you for the opportunity to express the pleasure of Isle of Wight County and her citizens.

Sincerely,

Phillip A. Bradshaw, Chairman
Isle of Wight County Board of Supervisors

C: J. Robert Bray, Executive Director, VPA

P.O. BOX 80 • ISLE OF WIGHT • VIRGINIA 23397 • (757) 357-3191

CITY OF NEWPORT NEWS

JOE S. FRANK
MAYOR

October 27, 2005

Colonel Yvonne J. Prettyman-Beck
District Engineer
U. S. Army Corps of Engineers
Norfolk District
803 Front Street
Norfolk, Virginia

Dear Colonel Prettyman:

As Mayor of the City of Newport News, I wish to express my support for the conclusions and recommendations reported in the Draft Feasibility Report and Environmental Impact Statement for the Eastward Expansion of Craney Island. We are greatly encouraged by the Norfolk District's recommendation to construct an expansion of Craney Island for additional dredge material disposal and future port development.

The recommended expansion addresses many regional concerns including the critical need for future dredge material disposal capacity to maintain the federal navigation channels into Hampton Roads and to deepen the channels to the authorized 55-foot depth in the future. The channels are a lifeline for regional economic growth and the future success of Virginia's ports, shipbuilding and military facilities.

According to projections, the Eastward Expansion of Craney Island will generate over 54,000 jobs in the region and $155 million in annual state and local tax revenues. Twenty-six thousand jobs and $788 million in annual wages are expected from regional distribution center operations that will benefit from expanded port services. The recommended improvements to Craney Island, coupled with other federal and state initiatives, will enhance the efficiency of the nation's transportation system and provide economic benefits to millions of Americans.

The Craney Island Eastward Expansion is vitally important to the future of Hampton Roads and the nation. I support the District's findings and encourage you to approve the recommended plan. Thank you for the opportunity to comment on this proposal.

Very truly yours,

Joe S. Frank
Mayor

JSF:rsw

2400 WASHINGTON AVENUE NEWPORT NEWS VIRGINIA 23607 TEL (757) 926-8403

# *CITY of NORFOLK*

*Office of the Mayor*

Paul D. Fraim
Mayor

October 20, 2005

Colonel Yvonne J. Prettyman-Beck
District Engineer
U.S. Army Corps of Engineers
Norfolk District
803 Front street
Norfolk, VA 23510

Dear Colonel Prettyman-Beck:

The City of Norfolk wishes to express its support for the conclusions and recommendations reported in the *Draft Feasibility Report and Environmental Impact Statement for the Eastward Expansion of Craney Island.* We are greatly encouraged by the Norfolk District's recommendation to construct an expansion of Craney Island for additional dredge material disposal and future port development.

The recommended expansion addresses many regional concerns including the critical need for future dredge material disposal capacity to maintain the federal navigation channels into Norfolk Harbor and to deepen the channels to the authorized 55 foot depth in the future. The channels are a lifeline for regional economic growth and the future success of Virginia's ports and supply chain industries.

The eastward expansion of Craney Island will generate over 54,000 jobs in the region and $155 million in annual state and local tax revenues. Twenty-six thousand jobs and $788 million in annual wages are expected from regional distribution center operations that will benefit from expanded port services. The recommended improvements to Craney Island coupled with other federal and state initiatives, like the Heartland Corridor, will improve the efficiency of the nation's transportation system and provide economic benefits to millions of Americans.

The Craney Island eastward expansion is vitally important to the future of Hampton Roads and the nation. We support the District's findings and encourage you to approve the recommended plans. Thank you for the opportunity to comment on this proposal.

Sincerely,

Paul D. Fraim
Mayor

810 Union Street • Suite 1109 • Norfolk, Virginia 23510 • (757) 664-4679 • Fax (757) 441-2909 • paul.fraim@norfolk.gov

**COUNTY ADMINISTRATOR**
James O. McReynolds

**BOARD OF SUPERVISORS**
Walter C. Zaremba
District 1
Sheila S. Noll
District 2
Kenneth L. Bowman
District 3
James S. Burgett
District 4
Thomas G. Shepperd, Jr.
District 5

November 1, 2005

Colonel Yvonne J. Prettyman-Beck
District Engineer
U.S. army Corps of Engineers
Norfolk District
803 Front Street
Norfolk, VA 23510

Dear Colonel Prettyman:

On behalf of the York County Board of Supervisors, I am writing to express support for the eastward expansion of Craney Island, as reported in the conclusions and recommendations contained in the Draft Feasibility Report and Environmental Impact Statement. The expansion of Craney Island as a dredge material disposal site will address a critical need in terms of maintaining the Federal navigation channels into the Norfolk Harbor and future deepening of the channels to the authorized 55-foot depth. The channels are a lifeline for regional economic growth and the future success of Virginia's ports and supply chain industries.

The eastward expansion of Craney Island is projected to generate over 54,000 jobs in the region and an estimated $155 million in annual state and local tax revenues. Regional distribution center operations that will benefit from expanded port services are projected to generate 26,000 jobs and $788 million in annual wages. Coupled with other Federal and State initiatives, such as the Heartland Corridor, the recommended Craney Island improvements will enhance the efficiency of the Nation's transportation system and provide benefits to millions of Americans.

Because the Craney Island Eastward Expansion is vitally important to the future of Hampton Roads, we support the District's findings and encourage you to approve the recommended plan. Thank you for the opportunity to comment on this proposal.

Sincerely,

James S. Burgett, Chairman
York County Board of Supervisors

**224 Ballard Street • P.O. Box 532 • Yorktown, Virginia 23690-0532 • (757) 890-3320**
**Fax: (757) 890-4000 •TDD (757) 890-3300 • Email: ctyadm@yorkcounty.gov**
***A Hampton Roads Community***

# City of Virginia Beach

MEYERA E. OBERNDORF
MAYOR

MUNICIPAL CENTER
BUILDING 1
2401 COURTHOUSE DRIVE
VIRGINIA BEACH, VA 23456-9000
(757) 427-4581
FAX (757) 426-5699
MOBERNDO@CITY.VIRGINIA-BEACH.VA.US

November 4, 2005

Colonel Yvonne J. Prettyman-Beck
District Engineer
Norfolk District, Corps of Engineers
803 Front Street
Norfolk, Virginia 23510

RE: Craney Island Eastward Expansion
Draft Feasibility Report and EIS

Dear Colonel Prettyman-Beck:

This is to express our support and agreement with the conclusions and recommendations in the Draft Feasibility Report and Environmental Impact Statement for the Eastward Expansion of Craney Island. The eastern expansion of Craney Island would provide much needed capacity for dredged material disposal for the region's navigation projects and the potential for future expansion of the region's port facilities, with acceptable environmental consequences.

We believe the eastward expansion of Craney Island is vitally important to the future of Hampton Roads, and the Nation. We thank the Norfolk District for their work on this report, and we appreciate the opportunities you have provided for our staff to participate in the process.

Sincerely,

Meyera E. Oberndorf

Meyera E. Oberndorf
Mayor

MEO/pjr

Cc: Members of City Council

The attached letter was faxed to the Virginia Port Authority at 4:00pm November 7, 2005
V/R
Renee Lear
563-1948

VIRGINIA
CHAMBER OF COMMERCE
Business Leadership for Virginia's Future

November 7, 2005

Colonel Yvonne J. Prettyman-Beck
District Engineer
U.S. Army Corps of Engineers
Norfolk District
803 Front Street
Norfolk, Virginia 23510

Re: Craney Island Eastward Expansion, Draft Feasibility Report
And Environmental Impact Statement

Dear Colonel Prettyman:

The Virginia Chamber of Commerce wishes to express its support for the conclusions and recommendations reported in the Draft Feasibility Report and Environmental Impact Statement for the Eastward Expansion of Craney Island. We are greatly encouraged by the Norfolk District's recommendation to construct an expansion of Craney Island for additional dredge material disposal and future port development.

The recommended expansion addresses many regional concerns including the critical need for future dredge material disposal capacity to maintain the Federal navigation channels into Norfolk Harbor and to deepen the channels to the authorized 55-foot depth in the future. The channels are a lifeline for regional economic growth and the future success of Virginia's ports and supply chain industries.

The Eastward Expansion of Craney Island will generate over 54,000 jobs in the region and $155 million in annual state and local tax revenues. 26,000 jobs and $788 million in annual wages are expected from regional distribution center operations that will benefit from expanded port services. The recommended improvements to Craney Island coupled with other Federal and State initiatives, like the Heartland Corridor will improve the efficiency of the Nation's transportation system and provide economic benefits to millions of Americans.

The Craney Island Eastward Expansion is vitally important to the future of Hampton Roads and the Nation. We support the District's findings and encourage you to approve the recommended plan. Thank you for the opportunity to comment on this proposal.

Sincerely,

Hugh D. Keogh
President & CEO

**Chesapeake Port Authority**

November 1, 2005

Colonel Yvonne J. Prettyman-Beck
District Engineer
U.S. Army Corps of Engineers
Norfolk District
803 Front Street
Norfolk, Virginia 23510

Re: Craney Island Eastward Expansion, Draft Feasibility Report and Environmental Impact Statement

Dear Colonel Prettyman:

The Chesapeake Port Authority wishes to express its support for the conclusions and recommendations reported in the Draft Feasibility Report and Environmental Impact Statement for the Eastward Expansion of Craney Island. We are greatly encouraged by the Norfolk District's recommendation to construct an expansion of Craney Island for additional dredge material disposal and future port development.

The recommended expansion addresses many regional concerns including the critical need for future dredge material disposal capacity to maintain the Federal navigation channels into Norfolk Harbor and to deepen the channels to the authorized 55-foot depth in the future. The channels are a lifeline for regional economic growth and the future success of Virginia's ports and supply chain industries.

The Eastward Expansion of Craney Island will generate over 54,000 jobs in the region and $155 million in annual state and local tax revenues. 26,000 jobs and $788 million in annual wages are expected from regional distribution center operations that will benefit from expanded port services. The recommended improvements to Craney Island coupled with other Federal and State initiatives, like the Heartland Corridor will improve the efficiency of the Nation's transportation system and provide economic benefits to millions of Americans.

The Craney Island Eastward Expansion is vitally important to the future of Hampton Roads and the Nation. We support the District's findings and encourage you to approve the recommended plan. Thank you for the opportunity to comment on this proposal.

Sincerely,

Paul Horsboll
Chairman

501 Independence Parkway, Suite 200 • Chesapeake, VA 23320-5117
Telephone (757) 382-8040 • Fax (757) 382-8050

November 1, 2005

Colonel Yvonne J. Prettyman-Beck
District Engineer
U.S. Army Corps of Engineers
Norfolk District
803 Front Street
Norfolk, Virginia 23510

Re: Craney Island Eastward Expansion, Draft Feasibility Report
And Environmental Impact Statement

Dear Colonel Prettyman:

Quality Coatings of Virginia, Inc. wishes to express its support for the conclusions and recommendations reported in the Draft Feasibility Report and Environmental Impact Statement for the Eastward Expansion of Craney Island. We are greatly encouraged by the Norfolk District's recommendation to construct an expansion of Craney Island for additional dredge material disposal and future port development.

The recommended expansion addresses many regional concerns including the critical need for future dredge material disposal capacity to maintain the Federal navigation channels into Norfolk Harbor and to deepen the channels to the authorized 55-foot depth in the future. The channels are a lifeline for regional economic growth and the future success of Virginia's ports and supply chain industries.

The Eastward Expansion of Craney Island will generate over 54,000 jobs in the region and $155 million in annual state and local tax revenues. 26,000 jobs and $788 million in annual wages are expected from regional distribution center operations that will benefit from expanded port services. The recommended improvements to Craney Island coupled with other Federal and State initiatives, like the Heartland Corridor will improve the efficiency of the Nation's transportation system and provide economic benefits to millions of Americans.

The Craney Island Eastward Expansion is vitally important to the future of Hampton Roads and the Nation. We support the District's findings and encourage you to approve the recommended plan. Thank you for the opportunity to comment on this proposal.

Sincerely,

Warren R Weidrick

Warren Weidrick
President, Quality Coatings of Virginia, Inc.

**Hampton Roads Maritime Association**
INCORPORATED
228-236 E. PLUME STREET P.O. BOX 3487
NORFOLK, VIRGINIA 23514-3487
PHONE (757) 622-2639
FAX (757) 622-6302

Recipient of the Presidential "E" and "E Star" Awards for Excellence in Export Service

October 28, 2005

Colonel Yvonne J. Prettyman-Beck
District Engineer
U.S. Army Corps of Engineers
Norfolk District
803 Front Street
Norfolk, Virginia 23510

Re: Craney Island Eastward Expansion, Draft Feasibility Report And Environmental Impact Statement

Dear Colonel Prettyman-Beck:

The Hampton Roads Maritime Association (HRMA) wishes to express its support for the conclusions and recommendations reported in the Draft Feasibility Report and Environmental Impact Statement for the Eastward Expansion of Craney Island. The HRMA is a non-profit trade association founded in 1920 with the mission of promoting, protecting, and encouraging commercial shipping through the Port of Virginia. The HRMA boasts a membership of over 550 parties directly or indirectly involved in the flow of waterborne commerce. As the "Voice of the Port", representing these interested parties we are greatly encouraged by the Norfolk District's recommendation to construct an expansion of Craney Island for additional dredge material disposal and future port development.

The recommended expansion addresses many regional concerns including the critical need for future dredge material disposal capacity to maintain the Federal navigation channels into Norfolk Harbor and to deepen the channels to the authorized 55-foot depth in the future. The channels are a lifeline for regional economic growth and the future success of Virginia's ports and supply chain industries.

The Eastward Expansion of Craney Island will generate over 54,000 jobs in the region and $155 million in annual state and local tax revenues. 26,000 jobs and $788 million in annual wages are expected from regional distribution center operations that will benefit from expanded port services. The recommended improvements to Craney Island coupled with other Federal and State initiatives, like the Heartland Corridor will

improve the efficiency of the Nation's transportation system and provide economic benefits to millions of Americans.

The Craney Island Eastward Expansion is vitally important to the future of Hampton Roads and the Nation. We support the District's findings and encourage you to approve the recommended plan. Thank you for the opportunity to comment on this proposal.

Sincerely,

Arthur W. Moye, Jr.
Executive Vice President

AWM/jml

Cc: Meade G. Stone, Jr., President

HAMPTON ROADS
PLANNING DISTRICT COMMISSION

JEANNE ZEIDLER, CHAIR • PAUL D. FRAIM, VICE CHAIRMAN • JAMES O. McREYNOLDS, TREASURER
ARTHUR L. COLLINS, EXECUTIVE DIRECTOR/SECRETARY

**CHESAPEAKE**
Clarence V. Cuffee, *City Manager*
Amar Dwarkanath, *Deputy City Manager*
Dalton S. Edge, *Mayor*
W. Joe Newman, *Council Member*
Debbie Ritter, *Council Member*

**FRANKLIN**
Mark S. Fetherolf, *Council Member*
Rowland L. Taylor, *City Manager*

**GLOUCESTER COUNTY**
John J. Adams, Sr., *Chairman*
William H. Whitley, *County Administrator*

**HAMPTON**
Randall A. Gilliland, *Council Member*
Ross A. Kearney, II, *Mayor*
Jesse T. Wallace, Jr., *City Manager*

**ISLE OF WIGHT COUNTY**
W. Douglas Caskey, *County Administrator*
Stan D. Clark, *Board Member*

**JAMES CITY COUNTY**
Michael J. Brown, *Chairman*
Sanford B. Wanner, *County Administrator*

**NEWPORT NEWS**
Charles C. Allen, *Vice Mayor*
Joe S. Frank, *Mayor*
Edgar E. Maroney, *City Manager*

**NORFOLK**
Paul D. Fraim, *Mayor*
Donald L. Williams, *Council Member*
Regina V.K. Williams, *City Manager*
Barclay C. Winn, *Council Member*
W. Randy Wright, *Council Member*

**POQUOSON**
Charles W. Burgess, Jr., *City Manager*
Gordon C. Heisel, Jr., *Mayor*

**PORTSMOUTH**
James B. Oliver, Jr., *City Manager*
Charles B. Whitehurst, Sr., *Council Member*

**SOUTHAMPTON COUNTY**
Anita T. Felts, *Board Member*
Michael W. Johnson, *County Administrator*

**SUFFOLK**
R. Steven Herbert, *City Manager*
Bobby L. Ralph, *Mayor*

**SURRY COUNTY**
Tyrone W. Franklin, *County Administrator*
Judy S. Lyttle, *Board Member*

**VIRGINIA BEACH**
Harry E. Diezel, *Council Member*
Robert M. Dyer, *Council Member*
Louis R. Jones, *Vice Mayor*
Meyera E. Oberndorf, *Mayor*
Jim Reeve, *Council Member*
Peter W. Schmidt, *Council Member*
James K. Spore, *City Manager*

**WILLIAMSBURG**
Jackson C. Tuttle, II, *City Manager*
Jeanne Zeidler, *Mayor*

**YORK COUNTY**
James O. McReynolds, *County Administrator*
Thomas G. Shepperd, Jr., *Board Member*

October 27, 2005

Colonel Yvonne J. Prettyman-Beck
District Engineer
U.S. Army Corps of Engineers
Norfolk District, Fort Norfolk
803 Front Street
Norfolk, Virginia 23510

Re: Craney Island Eastward Expansion (THY:Craney Island)

Dear Colonel Prettyman-Beck:

Pursuant to your request of September 13, 2005, the staff of the Hampton Roads Planning District Commission has reviewed the Draft Feasibility Report and Environmental Impact Statement for the Craney Island Eastward Expansion, Norfolk Harbor and Channels, Hampton Roads, Virginia. The HRPDC staff is pleased to have had the opportunity to participate in the Stakeholder Group and various technical teams as this study has been undertaken.

Based on this review, the Eastward Expansion and associated terminal development is consistent with local and regional plans. It supports the continued economic development of the Hampton Roads region and the Commonwealth of Virginia in a number of ways.

- The Eastward Expansion provides expanded capacity for disposal of dredged material, which is essential for the continued maintenance and deepening of navigation channels throughout the port complex.
- The long-term plan for development of port facilities on the expansion area supports the continued viability and competitiveness of the Port of Hampton Roads.
- While they are separable projects, there is a close synergistic relationship between the Eastward Expansion and the Third Crossing of Hampton Roads Project.
- This comprehensive project, as shown in the Feasibility Study and EIS will have considerable positive economic impacts in terms of job creation, increases in income levels and state and local tax revenues.

HEADQUARTERS • THE REGIONAL BUILDING • 723 WOODLAKE DRIVE • CHESAPEAKE, VIRGINIA 23320 • (757) 420-8300
PENINSULA OFFICE • 2101 EXECUTIVE DRIVE • SUITE C • HAMPTON, VIRGINIA 23666 • (757) 262-0094

As is to be expected from a project of this magnitude, adverse environmental impacts will result from both project construction and operation. The comprehensive mitigation plan, which has been developed to address the anticipated impacts, appears to provide adequate compensation for those impacts. Concurrently, it appears to address critical environmental restoration needs in both the Elizabeth River and James River watersheds. In at least some instances, mitigation measures will enhance environmental quality in existing sensitive environmental areas. Literature and experience show that environmental enhancements improve the region's quality of life and will further support the positive economic benefits of the Eastward Expansion Project.

The staff of the Hampton Roads Planning District Commission appreciates the opportunity to review and comment on this important project. If you have any questions or need further information, please do not hesitate to call me or John Carlock of the staff.

Sincerely,

Arthur L. Collins
Executive Director/Secretary

JMC:fh

Copy: Mr. J. Robert Bray, VPA
Mr. Mark T. Mansfield, COE
Mr. Charles Ellis, DEQ

VIRGINIA'S HAMPTON ROADS
ECONOMIC DEVELOPMENT ALLIANCE

500 Main Street Suite 1300
Norfolk, VA 23510 USA
main 757 . 627 . 2315
fax 757 . 623 . 3081

21 Enterprise Parkway Suite 200
Hampton, VA 23666 USA
main 757 . 627 . 2315
fax 757 . 826 . 6706

132 Ebury Street
London, SW1W 9QQ, UK
main 44 . 020 . 7823 . 6003

World Trade Center
Birkenstrasse 15
28195 Bremen, Germany
main 49 . 421 . 17466-0
www.hreda.com

October 26, 2005

Colonel Yvonne J. Prettyman-Beck
District Engineer
U.S. Army Corps of Engineers
Norfolk District
803 Front Street
Norfolk, Virginia 23510

Re: Craney Island Eastward Expansion, Draft Feasibility Report And Environmental Impact Study

Dear Colonel Prettyman:

The Hampton Roads Economic Development Alliance wishes to express its support for the conclusions and recommendations reported in the Draft Feasibility Report and Environmental Impact Statement for the Eastward Expansion of Craney Island. We are greatly encouraged by the Norfolk District's recommendation to construct an expansion of Craney Island for additional dredge material disposal and future port development.

The recommended expansion addresses many regional concerns including the critical need for future dredge material disposal capacity to maintain the Federal navigation channels into Norfolk Harbor and to deepen the channels to the authorized 55-foot depth in the future. The channels are a lifeline for regional economic growth and the future success of Virginia's ports and supply chain industries.

The Eastward Expansion of Craney Island will generate over 54,000 jobs in the region and $155 million in annual state and local tax revenues. 26,000 jobs and $788 million in annual wages are expected from regional distribution center operations that will benefit from expanded port services. The recommended improvements to Craney Island coupled with other Federal and State initiatives, like the Heartland Corridor will improve the efficiency or the Nation's transportation system and provide economic benefits to millions of Americans.

The Craney Island Eastward Expansion is vitally important to the future of Hampton Roads and the Nation. We support the District's findings and encourage you to approve the recommended plan. Thank you for the opportunity to comment on this proposal.

Sincerely,

C. Jones Hooks
President

Avenues for INNOVATION & Imagination

Virginia Pilot Association

TELEPHONE: 757-496-0995
FACSIMILE: 757-496-9324
email: dispatch@vapilotassn.com
3329 SHORE DRIVE
VIRGINIA BEACH, VA 23451

October 24, 2005

Colonel Yvonne J. Prettyman-Beck
District Engineer
U.S. Army Corps of Engineers
Norfolk District
803 Front Street
Norfolk, Virginia 23510

Dear Colonel Prettyman-Beck,

On behalf of the entire membership of the Virginia Pilot Association, I want to express our support for the conclusions and recommendations reported in the ***Draft Feasibility Report and Environmental Impact Statement for the Eastward Expansion of Craney Island.***

The pilots have been active stakeholders in this project for many years and are very pleased by the recommendation for eastward expansion of Craney Island for future port development. Having the vision to recognize that our ports will be the gateway for the economic vitality of our country puts this project on the forefront as we continue to look to deepen our channels to the authorized 55-foot depth in the future.

We recognize the positive impact on Hampton Roads and the Commonwealth on this project, but the ultimate impact is our country's opportunity to be positioned with responding to the global economy. Besides the enormous number of jobs that will be generated by the completion of this project, we believe the eastward expansion of Craney Island represents the foundation for a transportation infrastructure that will positively impact our citizens for generations to come.

The Virginia Pilot Association wholeheartedly supports the Norfolk District's findings and encourage you to approve the recommended plan.

Sincerely,

J. William Cofer

J. William Cofer
President

JWC:bb

cc: J. Robert Bray, Virginia Port Authority
Arthur Moye, Hampton Roads Maritime Association

HAMPTON ROADS PARTNERSHIP

*Co-Chairman*
Thomas R. Frantz
Deborah K. Stearns

E. Dana Dickens, III
*President & CEO*

October 17, 2005

Colonel Yvonne J. Prettyman-Beck
District Engineer
U.S. Army Corps of Engineers
Norfolk District
803 Front Street
Norfolk, VA 23510

Re: Craney Island Eastward Expansion, Draft Feasibility Report and Environmental Impact Statement

Dear Colonel Prettyman-Beck:

The Hampton Roads Partnership wishes to express its support for the conclusions and recommendations reported in the Draft Feasibility Report and Environmental Impact Statement for the Eastward Expansion of Craney Island. We are greatly encouraged by the Norfolk District's recommendation to construct an expansion of Craney Island for additional dredge material disposal and future port development.

The recommended expansion addressed many regional concerns including the critical need for future dredge material disposal capacity to maintain the Federal navigation channels into Norfolk Harbor and to deepen the channels to the authorized 55-foot depth in the future. The channels are a lifeline for regional economic growth and the future success of Virginia's ports and supply chain industries.

The Eastward Expansion of Craney Island will generate over 54,000 jobs in the region and $155 million in annual state and local tax revenues. 26,000 jobs and $788 million in annual wages are expected from regional distribution center operations that will benefit from expanded port services. The recommended improvements to Craney Island coupled with other Federal and State initiatives, like the heartland Corridor will improve the efficiency of the Nation's transportation system and provide economic benefits to millions of Americans.

The Craney Island Eastward Expansion is vitally important to the future of Hampton Roads and the Nation. We support the District's findings and encourage you to approve the recommended plan. Thank you for the opportunity to comment on this proposal.

Sincerely,

E. Dana Dickens

430 World Trade Center | Norfolk, VA 23510 | 757.625.4696 | Fax 757.625.4684 | www.hrp.org

HOFFLER CREEK
WILDLIFE FOUNDATION
www.hofflercreek.org

October 28, 2005

Mark T. Mansfield, Chief
Planning and Policy Branch
Army Corps of Engineers
Fort Norfolk, 803 Front Street
Norfolk, VA 23510-1096

Dear Mr. Mansfield:

Thank you for the opportunity to review and comment on the draft Environmental Impact Statement for the proposed Craney Island Dredged Material Management Area Eastward Expansion, Norfolk Harbor and Channels, Hampton Roads, Virginia. Our interest in the outcome is profound since Hoffler Creek Wildlife Foundation is responsible for managing natural resources in the Hoffler Creek watershed, adjacent to the western side of Craney Island at the mouth of the James River. After assessing the alternatives presented, Hoffler Creek Wildlife Foundation's Board of Directors supports the recommended plan of expanding CIDMMA eastward to increase port facilities and to serve as a logistical and tactical area for national defense.

Hoffler Creek Wildlife Foundation is a non-profit organization formed in 1995 with the mission to conserve the last parcel of wilderness in the Hoffler Creek watershed for environmental education, research, and recreation consistent with good stewardship. The 142-acre parcel we manage offers four distinct habitats for wildlife native to Hampton Roads and includes one of the areas largest and most productive salt marsh communities. Through funding and programmatic partnerships, the Foundation has developed a facility and program that benefits the citizens and ecology of Hampton Roads. The recommended plan would protect and enhance the preserve's value to the region. The proposed oyster reef at Hoffler Creek would positively impact oyster restoration goals by improving water quality in this Bay tributary and by promoting oyster replenishment in the Chesapeake Bay through public exposure and interpretation.

Hoffler Creek Wildlife Preserve (HCWP) is a place unique for its accessibility, its diverse wildlife populations, and its programs. The National Park Service includes HCWP in its Chesapeake Bay Gateways Network. The Virginia Department of Game and Inland Fisheries includes HCWP on its Coastal Birding and Wildlife Trail. The National Fish and Wildlife Federation certifies HCWP as a Schoolyard Habitats Site. Last year, more than 2,500 people visited the preserve for education, research, and recreation. The

4510 Twin Pines Rd., Portsmouth, VA 23703 • Phone & Fax: 686-8684 • E-mail: hofflercreek@hofflercreek.org

potential to develop Hoffler Creek Wildlife Preserve into a premiere center for nature education and recreation exists within the recommended plan.

Please accept our compliments on a report that is thorough, well organized, and comprehensible. Those responsible should be commended for a job well done.

Sincerely,

Randi Strutton
Executive Director

cc: Craig Seltzer, Army Corps of Engineers
Heather Wood, Virginia Port Authority
A. James English, President, Hoffler Creek Wildlife Foundation

ABERCROMBIE, SIMMONS & GILLETTE OF VIRGINIA, INC.

*Adjusters - Investigators -Claim Managers*

P.O. BOX 13367 • NORFOLK, VIRGINIA 23506 • PHONE/757-473-8281 • FAX/757-473-8233

*Affiliated Corporations*

TEXAS

BEAUMONT
Phone/409-832-9777
Fax/409-832-4228

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Fax/979-693-3339

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Fax/361-992-9427

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Fax/956-683-0807

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Phone/210-824-3941
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Fax/954-567-0826

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Phone/904-367-0863
Fax/904-367-0868

TAMPA
Phone/813-269-7787
Fax/813-269-0966

GEORGIA

ATLANTA
Phone/770-956-7071
Fax/770-956-7049

SAVANNAH
Phone/912-233-2407
Fax/912-233-1956

LOUISIANA

NEW ORLEANS
Phone/504-780-8111
Fax/504-780-8188

SOUTH CAROLINA

CHARLESTON
Phone/843-849-0951
Fax/843-881-6372

October 20, 2005

Colonel Yvonne J. Prettyman-Beck
District Engineer
U.S. Army Corps of Engineers
Norfolk District
803 Front Street
Norfolk, Virginia 23510

Re: Craney Island Eastward Expansion, Draft Feasibility Report
And Environmental Impact Statement

Dear Colonel Prettyman-Beck:

I wish to express my support for the conclusions and recommendations reported in the Draft Feasibility Report and Environmental Impact Statement for the Eastward Expansion of Craney Island. I am greatly encouraged by the Norfolk District's recommendation to construct an expansion of Craney Island for additional dredge material disposal and future port development.

The recommended expansion addresses many regional concerns including the critical need for future dredge material disposal capacity to maintain the Federal navigation channels into Norfolk Harbor and to deepen the channels to the authorized 55-foot depth in the future. The channels are a lifeline for regional economic growth and the future success of Virginia's ports and supply chain industries.

The Eastward Expansion of Craney Island will generate over 54,000 jobs in the region and $155 million in annual state and local tax revenues. 26,000 jobs and $788 million in annual wages are expected from regional distribution center operations that will benefit from expanded port services. The recommended improvements to Craney Island coupled with other Federal and State initiatives, like the Heartland Corridor will improve the efficiency of the Nation's transportation system and provide economic benefits to millions of Americans.

The Craney Island Eastward Expansion is vitally important to the future of Hampton Roads and the Nation. I support the District's findings and encourage you to approve the recommended plan. Thank you for the opportunity to comment on this proposal.

Sincerely,

James A. Parsons

James A. Parsons

**ACS**
**Atlantic Container Service, Inc.**

October 20, 2005

Colonel Yvonne J. Prettyman-Beck
District Engineer
U.S. Army Corps of Engineers
Norfolk District
803 Front Street
Norfolk, Virginia 23510

Re: Craney Island Eastward Expansion, Draft Feasibility Report and Environmental Impact Statement

Dear Colonel Prettyman:

Atlantic Container Service, Inc. wishes to express its support for the conclusions and recommendations reported in the Draft Feasibility Report and Environmental Impact Statement for the Eastward Expansion of Craney Island. We are greatly encouraged by the Norfolk District's recommendation to construct an expansion of Craney Island for additional dredge material disposal and future port development.

The recommended expansion addresses many regional concerns including the critical need for future dredge material disposal capacity to maintain the Federal navigation channels into Norfolk Harbor and to deepen the channels to the authorized 55-foot depth in the future. The channels are a lifeline for regional economic growth and the future success of Virginia's ports and supply chain industries.

The Eastward Expansion of Craney Island will generate over 54,000 jobs in the region and $155 million in annual state and local tax revenues. Twenty-six thousand jobs and $788 million in annual wages are expected from regional distribution center operations that will benefit from expanded port services. The recommended improvements to Craney Island coupled with other Federal and State initiatives, like the Heartland Corridor will improve the efficiency of the Nation's transportation system and provide economic benefits to millions of Americans.

The Craney Island Eastward Expansion is vitally important to the future of Hampton Roads and the Nation. We support the District's findings and encourage you to approve the recommended plan. Thank you for the opportunity to comment on this proposal.

Sincerely,

ATLANTIC CONTAINER SERVICE, INC.

Steven G. Miller, President

SGM:clm


- **Corporate Headquarters** 124 Prosperity Dr., Garden City, GA 31408-9550, Phone: 912-964-0933, Fax: 912-964-2220
- **Atlanta** 465 Sawtell Ave., S.E., Atlanta, GA 30315, Phone: 404-624-8240, Fax: 404-624-8246
- **Charleston** Riverside Center, Suite 103, 537 Long Point Road, Mt. Pleasant, SC 29464, Phone: 843-971-1785, Fax: 843-971-1790
- **Huntsville** 2850 Wall Triana Highway, Suite 303, Box #9, Huntsville, AL 35824, Phone: 256-772-7084, Fax: 256-461-8252
- **Memphis** 7212 Maygan Drive, Olive Branch, MS 38654, Phone: 662-890-9760, Fax: 662-890-9765
- **Norfolk** 25th Street and Warwick Boulevard, Newport News, VA 23607, Phone: 757-244-1185 Fax: 757-244-0033

**APM TERMINALS**

November 3, 2005

Colonel Yvonne J. Prettyman-Beck
District Engineer
U.S. Army Corps of Engineers
Norfolk District
803 Front Street
Norfolk, Virginia 23510

Re: Craney Island Eastward Expansion, Draft Feasibility Report
And Environmental Impact Statement

Dear Colonel Prettyman-Beck:

APM Terminals, part of the A. P. Moller- Maersk Group wishes to express its support for the U.S. Army Corps of Engineers, Norfolk District recommendation to construct an eastward expansion of Craney Island. As you know, APM Terminals is making a significant capital investment in the future of the Port of Virginia with the construction of the 280-acre APM Terminal facility in Portsmouth. It is our hope that our venture, combined with the efforts of the Norfolk District and the Virginia Port Authority, will assist in alleviating the capacity constraints faced by many U.S. ports.

The operation of the Craney Island Dredge Material Management Area and the authorization of the 50-foot navigation channel were pivotal in our decision to construct a terminal in Virginia. Maintenance of the depths adjacent to our future facility and within the Federal navigation channel is crucial to the success of our business. The recommended expansion ensures that Craney Island will be available for the disposal of dredge material from our Portsmouth terminal and the Federal navigation channels leading into Norfolk Harbor.

We are encouraged by the District's foresight for the need for future cargo capacity and dredge material disposal in the region. This project, coupled with other regional and national transportation initiatives, substantiate our decision to invest in Virginia. We support the District's findings and await approval of the recommended plan. Thank you for the opportunity to comment on this proposal.

Sincerely,

UNIVERSAL MARITIME SERVICE CORPORATION, AN APM TERMINALS COMPANY

Nicholas P. Taro
Senior Vice President

Universal Maritime Service Corp.
5080 McLester Street, P.O. Box 2000, Elizabeth, NJ 07207-2000
Telephone: 908-558-6001 Fax: 908-558-6596.

**Bay Container Services, Incorporated**
Marine Container Maintenance, Repair and Transportation
2601-M Trade Street • Chesapeake, VA 23323
Telephone (757) 487-9770
FAX (757) 487-3744

Mailing Address:
P.O. Box 6028
Chesapeake, VA 23323

October 20, 2005

Colonel Yvonne J. Prettyman-Beck
District Engineer
U.S. Army Corps of Engineers
Norfolk District
803 Front Street
Norfolk, VA 23510

RE: Craney Island Eastward Expansion, Draft Feasibility Report and Environmental Impact Statement

Dear Colonel Prettyman-Beck:

Bay Container Services, Inc., wishes to express its support for the conclusions and recommendations reported in the DRAFT FEASIBILITY REPORT AND ENVIRONMENTAL IMPACT STATEMENT FOR THE EASTWARD EXPANSION OF CRANEY ISLAND. We are greatly encouraged by the Norfolk District's recommendation to construct an expansion of Craney Island for additional dredge material disposal and future port development.

The recommended expansion addresses many regional concerns including the critical need for future dredge material disposal capacity to maintain the Federal navigation channels into Norfolk Harbor and to deepen the channels to the authorized 55' depth in the future. The channels are a lifeline for regional economic growth and the future success of Virginia's ports and supply chain industries.

The Eastward Expansion of Craney Island will generate over 54,000 jobs in the region and $155 million in annual state and local tax revenues. 26,000 jobs and $788 million in annual wages are expected from regional distribution center operations that will benefit from expanded port services. The recommended improvements to Craney Island coupled with the other Federal and State initiatives, like the Heartland Corridor will improve the efficiency of the Nation's transportation system and provide economic benefits to millions of Americans.

The Craney Island Eastward Expansion is vitally important to the future of Hampton Roads and the Nation. We support the District's findings and encourage you to approve the recommended plan. Thank you for the opportunity to comment on this proposal.

Sincerely,

Timothy J. Gibson, President

CAPES
SHIPPING AGENCIES

October 20, 2005

Colonel Yvonne J. Prettyman-Beck
District Engineer
U.S. ARMY CORPS OF ENGINEERS
Norfolk District
803 Front Street
Norfolk, Virginia 23510

Re: CRANEY ISLAND – EASTWARD EXPANSION
Draft Feasibility Report And Environmental Impact Statement

Dear Colonel Prettyman-Beck,

We are ships agency company headquartered in Norfolk, a division of C.V. International, Inc, also based in Norfolk employing approx 45 persons. We are engaged in various facets of international commerce through the ports including the dynamic activities of the container shipping business.

We fully endorse and support the conclusions and recommendations reported in the Draft Feasibility Report and Environmental Impact Statement for the Eastward Expansion of Craney Island. We appreciate your willingness and efforts to revisit this issue over the last couple of years and are encouraged by the Norfolk District's recommendation to construct an expansion of Craney Island for additional dredge material disposal and future port development.

The recommended expansion addresses many regional concerns including the critical need for future dredge material disposal capacity to maintain the Federal navigation channels into Norfolk Harbor and to deepen the channels to the authorized 55-foot depth in the future. The channels are a lifeline for regional economic growth and the future success of Virginia's ports and supply chain industries.

We understand that studies indicate that the Eastward Expansion of Craney Island will generate over 54,000 jobs in the region and $155 million in annual state and local tax revenues. 26,000 jobs and $788 million in annual wages are expected from regional distribution center operations that will benefit from expanded port services. The recommended improvements to Craney Island coupled with other Federal and State initiatives, like the Heartland Corridor will improve the efficiency of the Nation's transportation system and provide economic benefits to millions of Americans.

1128 West Olney Road • Norfolk, VA 23507 • Phone: (757) 625-3658 • Fax: (757) 625-6942
www.capesshipping.net

We firmly believe that the Craney Island Eastward Expansion is vitally important to the future of Hampton Roads, Virginia and the Nation.

We support the District's findings and encourage you to approve the recommended plan. Thank you for the opportunity to comment on this proposal.

Yours Sincerely,

CAPES SHIPPING AGENCIES

Colin Macpherson
President

Cc: Mr. B. Wayne Coleman, President, C.V. International, Inc., Norfolk.
Mr. Arthur W. Moye, Executive Vice President, HRMA., Norfolk.

1128 West Olney Road • Norfolk, VA 23507 • Phone: (757) 625-3658 • Fax: (757) 625-6942
www.capesshipping.net

# COSCO Container Lines Americas, Inc.

November 4, 2005

Colonel Yvonne J. Prettyman-Beck
District Engineer
U.S. Army Corps of Engineers
Norfolk District
803 Front Street
Norfolk, Virginia 23510

Re: Craney Island Eastward Expansion, Draft Feasibility Report
And Environmental Impact Statement

Dear Colonel Prettyman:

COSCO Container Lines Americas, Inc. wishes to express its support for the conclusions and recommendations reported in the Draft Feasibility Report and Environmental Impact Statement for the Eastward Expansion of Craney Island. We are greatly encouraged by the Norfolk District's recommendation to construct an expansion of Craney Island for additional dredge material disposal and future port development.

The recommended expansion addresses many regional concerns including the critical need for future dredge material disposal capacity to maintain the Federal navigation channels into Norfolk Harbor and to deepen the channels to the authorized 55-foot depth in the future. The channels are a lifeline for regional economic growth and the future success of Virginia's ports and supply chain industries.

The Eastward Expansion of Craney Island will generate over 54,000 jobs in the region and $155 million in annual state and local tax revenues. 26,000 jobs and $788 million in annual wages are expected from regional distribution center operations that will benefit from expanded port services. The recommended improvements to Craney Island coupled with other Federal and State initiatives, like the Heartland Corridor will improve the efficiency of the Nation's transportation system and provide economic benefits to millions of Americans.

The Craney Island Eastward Expansion is vitally important to the future of Hampton Roads and the Nation. We support the District's findings and encourage you to approve the recommended plan. Thank you for the opportunity to comment on this proposal.

Sincerely,

COSCO Container Lines Americas, Inc.

Mike V. Abbott
General Manager, Norfolk

MVA/s

355 Crawford Street, Suite 708 • Portsmouth, VA 23704 • Tel: (757) 393-2611 • Fax: (757) 393-2618
www.cosco-usa.com

COLONNA'S SHIPYARD INC

400 East Indian River Road
Norfolk, Virginia, U.S.A. 23523
(757) 545-2414
Fax#: 757-543-2480
www.colonnaship.com
E-Mail: colonna@colonnaship.com

October 20, 2005

Colonel Yvonne J. Prettyman-Beck
District Engineer
U.S. Army Corps of Engineers
Norfolk District
803 Front Street
Norfolk, VA 23510

Reference: Craney Island Eastward Expansion, Draft Feasibility Report and Environmental Impact Study.

Dear Colonel Prettyman:

Colonna's Shipyard, Inc., wishes to express its support for recommendations reported in the Draft Feasibility Report and Environmental Impact Statement for the Eastward Expansion of Craney Island. We are greatly encouraged by the Norfolk District's recommendation to construct an expansion of Craney Island for additional dredge material disposal and future port development.

The recommended expansion addresses many regional concerns including the critical need for future dredge disposal capacity to maintain the federal navigation channels into Norfolk Harbor and to deepen the channels to the authorized 55-foot depth in the future. The channels are critical for regional economic growth and the future success of Virginia's ports and supply chain industries.

The Craney Island Eastward Expansion is vitally important to the future of Hampton Roads and our business. We support the District's findings and encourage you to approve the recommended plan. Thank you for the opportunity on this proposal.

Sincerely,

Thomas W. Godfrey, Jr.
President/CEO

TWGjr/jac

***Dominion Terminal Associates***

P.O. Box 967 A
Newport News, VA 23607
(757) 245-2275

Charles E. Brinley
President and Chief Operating Officer

November 10, 2005

DTA

Colonel Yvonne J. Prettyman-Beck
District Engineer
U.S. Army Corps of Engineers
Norfolk District
803 Front Street
Norfolk, Virginia 23510

Re: Craney Island Eastward Expansion, Draft Feasibility Report
And Environmental Impact Statement

Dear Colonel Prettyman:

Dominion Terminal Associates wishes to express its support for the conclusions and recommendations reported in the Draft Feasibility Report and Environmental Impact Statement for the Eastward Expansion of Craney Island. We are greatly encouraged by the Norfolk District's recommendation to construct an expansion of Craney Island for additional dredge material disposal and future port development.

The recommended expansion addresses many regional concerns including the critical need for future dredge material disposal capacity to maintain the Federal navigation channels into Norfolk Harbor and to deepen the channels to the authorized 55-foot depth in the future. The channels are a lifeline for regional economic growth and the future success of Virginia's ports and supply chain industries. This is vital to DTA also, because we are forced to dredge approximately every 18 months to maintain an ability to load vessels to a 50 foot depth. We depend on Craney Island as an economically viable site for placement of dredged materials.

The Eastward Expansion of Craney Island will generate over 54,000 jobs in the region and $155 million in annual state and local tax revenues. 26,000 jobs and $788 million in annual wages are expected from regional distribution center operations that will benefit from expanded port services. The recommended improvements to Craney Island coupled with other Federal and State initiatives, like the Heartland Corridor will improve the efficiency of the Nation's transportation system and provide economic benefits to millions of Americans.

The Craney Island Eastward Expansion is vitally important to the future of Hampton Roads and the Nation. We support the District's findings and encourage you to approve the recommended plan. Thank you for the opportunity to comment on this proposal.

Sincerely yours,

Charles E. Brinley

# LIBERTY

PROPERTY TRUST

October 20, 2005

Colonel Yvonne J. Prettyman-Beck
District Engineer
U.S. Army Corps of Engineers
Norfolk District
803 Front Street
Norfolk, Virginia 23510

**Re: Craney Island Eastward Expansion, Draft Feasibility Report And Environmental Impact Statement**

Dear Colonel Prettyman:

Liberty Property Trust wishes to express its support for the conclusions and recommendations reported in the Draft Feasibility Report and Environmental Impact Statement for the Eastward Expansion of Craney Island. We are greatly encouraged by the Norfolk District's recommendation to construct an expansion of Craney Island for additional dredge material disposal and future port development.

The recommended expansion addresses many regional concerns including the critical need for future dredge material disposal capacity to maintain the Federal navigation channels into Norfolk Harbor and to deepen the channels to the authorized 55-foot depth in the future. The channels are a lifeline for regional economic growth and the future success of Virginia's ports and supply chain industries.

The Eastward Expansion of Craney Island will generate over 54,000 jobs in the region and $155 million in annual state and local tax revenues. 26,000 jobs and $788 million in annual wages are expected from regional distribution center operations that will benefit from expanded port services. The recommended improvements to Craney Island coupled with other Federal and State initiatives, like the Heartland Corridor will improve the efficiency of the Nation's transportation system and provide economic benefits to millions of Americans.

The Craney Island Eastward Expansion is vitally important to the future of Hampton Roads and the Nation. We support the District's findings and encourage you to approve the recommended plan. Thank you for the opportunity to comment on this proposal.

Sincerely,

Craig Cope
Senior Vice President

208 Golden Oak Court • Suite 220 • Virginia Beach, VA 23452 • (757) 498-4800 • Fax: (757) 498-5880 • Tenant Services: (757) 498-5808

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# Virginia Ship Repair Association

150 Boush Street, Suite 802 Norfolk, VA 23510 Voice : 757.233.7034 Fax : 757.233.7035

October 21, 2005

Colonel Yvonne J. Prettyman-Beck, USA
District Engineer, Norfolk District
U.S. Army Corps of Engineers
803 Front Street
Norfolk, Virginia 23510

**Re: Craney Island Eastward Expansion, Draft Feasibility Report and Environmental Impact Statement**

Dear Colonel Prettyman:

The Virginia Ship Repair Association adds its support for the conclusions and recommendations reported in the Draft Feasibility Report and Environmental Impact Statement for the Eastward Expansion of Craney Island. We support the Norfolk District's recommendation to construct an expansion of Craney Island for additional dredge material disposal and future port development.

The recommended expansion addresses many regional concerns including the critical need for future dredge material disposal capacity to maintain the Federal navigation channels into and out of Norfolk Harbor and to deepen the channels to the authorized 55-foot depth in the future. The channels are a vital lifeline for regional economic growth and the future success of Virginia's ports and maritime industries.

The Virginia Ship Repair Association is a regional trade association that represents more than 170 companies engaged in or supporting major ship repair in Virginia and the Mid-Atlantic region. Clearly, the Eastward Expansion of Craney Island will generate significant new jobs in the region and millions in annual state and local tax revenues. The increased commercial traffic will generate significant opportunities for growth in our vital ship repair industry. The recommended improvements to Craney Island, coupled with other Federal and State initiatives like the Heartland Corridor, will improve the efficiency of the Nation's transportation system and provide economic benefits to millions of Americans.

The Craney Island Eastward Expansion is vitally important to the future of Hampton Roads and the Nation. We support the District's findings and encourage you to approve the recommended plan. We also appreciate the opportunity to comment on this proposal.

Sincerely yours,

Malcolm P. Branch
President

Copy to: Mr. Jerry Miller, Chairman of the Board

Chick Packaging of Virginia, Inc.
499 Export Circle
P.O. Box 1878
Newport News, VA 23601-0878
Ph 757.595.0541
Toll Free 866.332.4425
Fax 757.596.0895

October 19, 2005

Colonel Yvonne J. Prettyman-Beck
District Engineer
U.S. Army Corps of Engineers
Norfolk District
803 Front Street
Norfolk, Virginia 23510

Re: Craney Island Eastward Expansion, Draft Feasibility Report
And Environmental Impact Statement

Dear Colonel Prettyman:

Chick Packaging of Virginia, Inc. wishes to express its support for the conclusions and recommendations reported in the Draft Feasibility Report and Environmental Impact Statement for the Eastward Expansion of Craney Island. We are greatly encouraged by the Norfolk District's recommendation to construct an expansion of Craney Island for additional dredge material disposal and future port development.

The recommended expansion addresses many regional concerns including the critical need for future dredge material disposal capacity to maintain the Federal navigation channels into Norfolk Harbor and to deepen the channels to the authorized 55-foot depth in the future. The channels are a lifeline for regional economic growth and the future success of Virginia's ports and supply chain industries.

The Eastward Expansion of Craney Island will generate over 54,000 jobs in the region and $155 million in annual state and local tax revenues. 26,000 jobs and $788 million in annual wages are expected from regional distribution center operations that will benefit from expanded port services. The recommended improvements to Craney Island coupled with other Federal and State initiatives, like the Heartland Corridor will improve the efficiency of the Nation's transportation system and provide economic benefits to millions of Americans.

The Craney Island Eastward Expansion is vitally important to the future of Hampton Roads and the Nation. We support the District's findings and encourage you to approve the recommended plan. Thank you for the opportunity to comment on this proposal.

Sincerely,

Ken Fletcher
General Manager

NORTON LILLY
INTERNATIONAL

October 19, 2005

Colonel Yvonne J. Prettyman-Beck
District Engineer
U. S. Army Corps of Engineers
Norfolk District
803 Front Street
Norfolk, Virginia 23510

Re: Craney Island Eastward Expansion, Draft Feasibility Report And Environmental Impact Statement

Dear Colonel Prettyman-Beck:

Norton Lilly International wishes to express its support for the conclusions and recommendations reported in the Draft Report and Environmental Impact Statement for the Eastward Expanion of Craney Island. We are greatly encouraged by the Norfolk District's recommendation to construct an expansion of Craney Island for additional dredge material disposal and future port development.

The recommended expansion addresses many regional concerns including the critical need for future dredge material disposal capacity to maintain the Federal navigation channels into Norfolk Harbor and to deepen the channels to the authorized 55-foot depth in the future. The channels are a lifeline for regional economic growth and the future success of Virginia's ports and supply chain industries.

The Eastward Expanion of Craney Island will generate over 54,000 jobs in the region and $155 million in annual state and local tax revenues. 26,000 jobs and $788 million in annual wages are expected from regional distribution center operations that will benefit from expanded port services. The recommended improvements to Craney Island coupled with other Federal and State initatives, like the Heartland Corridor will improve the efficiency of the Nation's transportation system and provide economic benefits to millions of Americans.

The Craney Island Eastward Expanion is vitally important to the future of Hampton Roads and the Nation. We support the District's findings and encourage you to approve the recommended plan. Thank you for the opportunity to comment on this proposal.

Sincerely,

Frank A. Johnson, Jr.
General Manager

S
SS AGENCY WORLD LTD

3800 Poplar Hill Road, Suite AA • Chesapeake, Virginia 23321
Phone: 757.484.4979 • Fax: 757.484.2170 • Telex: 6737629 • E-mail: nor-ops@nortonlilly.com
www.nortonlilly.com

**RJR Elite Trucking, Inc.**
*1211 E. Olney Rd.*
*Norfolk, Virginia 23504*

**Agents for Dallas Mavis Specialized Carrier Co. LLC**

*Bill Jackson*
*Chairman of the Board*
*Director of Safety*

10/19/05

Colonel Yvonne J. Prettyman-Beck
District Engineer
U.S. Army Corps of Engineers
Norfolk District
803 Front Street
Norfolk, Virginia 23510

Re: Craney Island Eastward Expansion

Dear Colonel Prettyman-Beck,

On behalf of the Tidewater trucking community of which I am a long time member and which I serve as Chairman of the Pier Committee of the Tidewater Motor Truck Association and as Vice-Chairman of the Virginia Port Authority Advisory Group, I write in support of the U.S. Army Corps of Engineers Draft Feasibility Report and Environmental Impact Statement and to encourage you to approve the recommended plan.

The Port of Virginia is the economic engine that drives the southern part of our Commonwealth. As it prospers, so does the community and the region at large. The proposed Eastward Expansion would generate thousands of new jobs and many millions in tax revenues for the state and the region and in addition, together with other Federal and State initiatives, will improve the efficiency of the Nation s transportation system with major economic benefits to millions of Americans.

It is vital that our Port maintain and continue to improve its competitive position on the East Coast of the United States. One only has to look a relatively few miles north to see what happens when a Port (Baltimore) fails to plan and execute not only for the present, but for the future. Our Port has grown dramatically in recent years and we must make definitive and dynamic plans for that growth to continue.

The proposed expansion would address the need for future dredge material disposal needed in order to maintain and deepen the Federal navigation channels into the Port. These channels are the vital marine arterial lifeline for the regional and national economy.

The expansion would greatly help in dealing with the daunting challenges to our transportation infrastructure. Our streets and highways are already carrying traffic loads well beyond their intended levels with resultant congestion, accidents and injuries. The proposed Craney Island

1211 E. Olney Rd.
Norfolk VA 23504
Tel: 757-627-7012 Fax: 757-627-7331 Cell: 757/328-1818 Email greyegl@rjrelite.com

Eastward Expansion and the Marine Terminal to be located there would allow a substantial amount of marine cargo and attendant traffic to flow on the other side of the Elizabeth River, with far less adverse impact on the community.

Thank you for the opportunity to comment on this proposal.

Sincerely,

Bill Jackson
Chairman of the Board
RJR Elite Trucking, Inc.

1211 E. Olney Rd.
Norfolk VA 23504
Tel: 757-627-7012 Fax: 757-627-7331 Cell: 757/328-1818 Email greyegl@rjrelite.com

SGS

October 19, 2005

Colonel Yvonne J. Prettyman-Beck
District Engineer
U.S. Army Corps of Engineers
Norfolk District
803 Front Street
Norfolk, Virginia 23510

Re: Craney Island Eastward Expansion, Draft Feasibility Report
And Environmental Impact Statement

Dear Colonel Prettyman:

SGS North America Inc. wishes to express its support for the conclusions and recommendations reported in the Draft Feasibility Report and Environmental Impact Statement for the Eastward Expansion of Craney Island. We are greatly encouraged by the Norfolk District's recommendation to construct an expansion of Craney Island for additional dredge material disposal and future port development.

The recommended expansion addresses many regional concerns including the critical need for future dredge material disposal capacity to maintain the Federal navigation channels into Norfolk Harbor and to deepen the channels to the authorized 55-foot depth in the future. The channels are a lifeline for regional economic growth and the future success of Virginia's ports and supply chain industries.

The Eastward Expansion of Craney Island will generate over 54,000 jobs in the region and $155 million in annual state and local tax revenues. 26,000 jobs and $788 million in annual wages are expected from regional distribution center operations that will benefit from expanded port services. The recommended improvements to Craney Island coupled with other Federal and State initiatives, like the Heartland Corridor will improve the efficiency of the Nation's transportation system and provide economic benefits to millions of Americans.

The Craney Island Eastward Expansion is vitally important to the future of Hampton Roads and the Nation. We support the District's findings and encourage you to approve the recommended plan. Thank you for the opportunity to comment on this proposal.

Sincerely,

Mark D. Metivier
Branch Manager

SGS Oil, Gas & Chemicals | 12650 McManus Blvd. Suite 103 Newport News, VA 23602 t (757) 874 9430 f (757) 874 9439 www.sgs.com



Member of the SGS Group

**T. Parker Host, Inc.**
Ship Agents and Brokers
500 Plume Street East
Suite 600
Norfolk, Virginia 23510

Since 1923

Hampton Roads, Virginia
Hopewell, Virginia
Richmond, Virginia
Baltimore, Maryland
Philadelphia, Pennsylvania
Wilmington, Delaware
Brunswick, Georgia
Fernandina, Florida
Jacksonville, Florida

October 19, 2005

Colonel Yvonne J. Prettyman-Beck
District Engineer
U.S. Army Corps of Engineers
Norfolk District
803 Front Street
Norfolk, Virginia 23510

Re: Craney Island Eastward Expansion, Draft Feasibility Report
And Environmental Impact Statement

Dear Colonel Prettyman:

T. Parker Host, Inc. wishes to express its support for the conclusions and recommendations reported in the Draft Feasibility Report and Environmental Impact Statement for the Eastward Expansion of Craney Island. We are greatly encouraged by the Norfolk District's recommendation to construct an expansion of Craney Island for additional dredge material disposal and future port development.

The recommended expansion addresses many regional concerns including the critical need for future dredge material disposal capacity to maintain the Federal navigation channels into Norfolk Harbor and to deepen the channels to the authorized 55-foot depth in the future. The channels are a lifeline for regional economic growth and the future success of Virginia's ports and supply chain industries.

The Eastward Expansion of Craney Island will generate over 54,000 jobs in the region and $155 million in annual state and local tax revenues. 26,000 jobs and $788 million in annual wages are expected from regional distribution center operations that will benefit from expanded port services. The recommended improvements to Craney Island coupled with other Federal and State initiatives, like the Heartland Corridor will improve the efficiency of the Nation's transportation system and provide economic benefits to millions of Americans.

The Craney Island Eastward Expansion is vitally important to the future of Hampton Roads and the Nation. We support the District's findings and encourage you to approve the recommended plan. Thank you for the opportunity to comment on this proposal.

Sincerely,

David F. Host
President & CEO

:DFH:kdj

*Mailing Address:* Post Office Box 3729/Customhouse Station/Norfolk, Virginia 23514
*Telephone:* 757-627-6286 *Telex:* 6734694 Host Va *Fax:* 757-627-3948
*E-mail:* ops@tparkerhost.com
www.tparkerhost.com

**Gilco Trucking Company, Inc.**
2413 Wesley Street
Portsmouth, VA 23707
Ph: 757-398-0679 Fax: 757-398-9346
EMAIL tl@gilcotrucking.com
October 18, 2005

Colonel Yvonne J. Prettyman-Beck
District Engineer
U.S. Army Corps of Engineers
Norfolk District
803 Front Street
Norfolk, VA 23510

Re: Craney Island Eastward Expansion, Draft Feasibility Report
And Environmental Impact Statement

Dear Colonel Prettyman:

Gilco Properties Inc., dba Gilco Trucking, wishes to express its support for the conclusions and recommendations reported in the Draft Feasibility Report and Environmental Impact Statement for the Eastward Expansion of Craney Island. We are greatly encouraged by the Norfolk District's recommendation to construct an expansion of Craney Island for additional dredge material disposal and future port development.

The recommended expansion addresses many regional concerns including the critical need for future dredge material disposal capacity to maintain the Federal navigation channels into Norfolk Harbor and to deepen the channels to the authorized 55-foot depth in the future. The channels are a lifeline for regional economic growth and the future success of Virginia's ports and supply chain industries.

The Eastward Expansion of Craney Island will generate over 54,000 jobs in the region and $155 million in annual state and local tax revenues. 26,000 jobs and $788 million in annual wages are expected from regional distribution center operations that will benefit from expanded port services. The recommended improvements to Craney Island coupled with other Federal and State initiatives, like the Heartland Corridor, will improve the efficiency of the Nation's transportation system and provide economic benefits to millions of Americans.

The Craney Island Eastward Expansion is vitally important to the future of Hampton Roads and the Nation. We support the District's findings and encourage you to approve the recommended plan. Thank you for the opportunity to comment on this proposal.

Sincerely,

Shirley G. Roebuck
President
Gilco Properties

**M & S SHIPPING LIMITED**
NVOCC (NON VESSEL OPERATING COMMON CARRIER)

October 18, 2005

Colonel Yvonne J. Prettyman-Beck
District Engineer
U.S. Army Corps of Engineers
Norfolk District
803 Front Street
Norfolk, Virginia 23510

Re: Craney Island Eastward Expansion, Draft Feasibility Report
And Environmental Impact Statement

Dear Colonel Prettyman:

M & S Shipping Ltd. wishes to express its support for the conclusions and recommendations reported in the Draft Feasibility Report and Environmental Impact Statement for the Eastward Expansion of Craney Island. We are greatly encouraged by the Norfolk District's recommendation to construct an expansion of Craney Island for additional dredge material disposal and future port development.

The recommended expansion addresses many regional concerns including the critical need for future dredge material disposal capacity to maintain the Federal navigation channels into Norfolk Harbor and to deepen the channels to the authorized 55-foot depth in the future. The channels are a lifeline for regional economic growth and the future success of Virginia's ports and supply chain industries.

The Eastward Expansion of Craney Island will generate over 54,000 jobs in the region and $155 million in annual state and local tax revenues. 26,000 jobs and $788 million in annual wages are expected from regional distribution center operations that will benefit from expanded port services. The recommended improvements to Craney Island coupled with other Federal and State initiatives, like the Heartland Corridor will improve the efficiency of the Nation's transportation system and provide economic benefits to millions of Americans.

The Craney Island Eastward Expansion is vitally important to the future of Hampton Roads and the Nation. We support the District's findings and encourage you to approve the recommended plan. Thank you for the opportunity to comment on this proposal.

Sincerely,

Peter W. Simmons
President

*CORPORATE OFFICES:* 1391 AIR RAIL AVENUE, SUITE 201, VIRGINIA BEACH, VA 23455-3301
TEL: 757/466-8899, FAX: 757/466-9481 • E-MAIL: info@mandsusa.com
ATLANTA, GA • BALTIMORE, MD • CHARLESTON, SC • CHARLOTTE, NC • RICHMOND, VA • SAVANNAH, GA • WILMINGTON, NC
*OVERSEAS OFFICES:* LONDON, ENGLAND • ROTTERDAM, NETHERLANDS • HONG KONG • BUDAPEST, HUNGARY • WARSAW, POLAND

PANALPINA, INC.
NORFOLK

PANALPINA
on 6 continents

October 18, 2005

18 Interstate Corporate Center
6325 N Center Drive
Ste. 105
Norfolk, VA 23502

Phone (757) 461-8025
Telefax (757) 461-5520
www.panalpina.com

Colonel Yvonne J. Prettyman-Beck
District Engineer
U.S. Army Corps of Engineers
Norfolk District
803 Front Street
Norfolk, Virginia 23510

Re: Craney Island Eastward Expansion, Draft Feasibility Report
And Environmental Impact Statement

Dear Colonel Prettyman:

The Norfolk, VA business unit of Panalpina, Inc wishes to express its support for the conclusions and recommendations reported in the Draft Feasibility Report and Environmental Impact Statement for the Eastward Expansion of Craney Island. We are greatly encouraged by the Norfolk District's recommendation to construct an expansion of Craney Island for additional dredge material disposal and future port development.

The recommended expansion addresses many regional concerns including the critical need for future dredge material disposal capacity to maintain the Federal navigation channels into Norfolk Harbor and to deepen the channels to the authorized 55-foot depth in the future. The channels are a lifeline for regional economic growth and the future success of Virginia's ports and supply chain industries.

The Eastward Expansion of Craney Island will generate over 54,000 jobs in the region and $155 million in annual state and local tax revenues. 26,000 jobs and $788 million in annual wages are expected from regional distribution center operations that will benefit from expanded port services. The recommended improvements to Craney Island coupled with other Federal and State initiatives, like the Heartland Corridor will improve the efficiency of the Nation's transportation system and provide economic benefits to millions of Americans.

The Craney Island Eastward Expansion is vitally important to the future of Hampton Roads and the Nation. We support the District's findings and encourage you to approve the recommended plan. Thank you for the opportunity to comment on this proposal.

Sincerely,
Panalpina, Inc. – Norfolk, VA

Vincent Di Costanzo
Branch Unit Manager

Anchorage, AK - Atlanta, GA - Baltimore, MD - Boston, MA - Bradley, CT - Charleston, SC - Charlotte, NC - Chicago, IL - Cincinnati, OH - Cleveland, OH - Columbus, OH - Dallas, TX - Denver, CO - Detroit, MI - El Paso, TX Greenville, SC - Houston, TX - Huntsville, AL - Indianapolis, IN - Laredo, TX - Los Angeles, CA - Memphis, TN - Miami, FL - Milwaukee, WI - Minneapolis, MN - Morristown, NJ - Nashville, TN - New Orleans, LA - New York, NY Norfolk, VA - Orlando, FL - Philadelphia, PA - Phoenix, AR - Portland, OR - Raleigh, NC - St. Louis, MO - San Diego, CA - San Francisco, CA - San Juan, PR - Seattle, WA - Sterling, VA - Ti Juana, Mexico - Tulsa, OK - Washington, D.C.
All quotations are subject to confirmation and contracts contingent upon strikes, delay in delivery and other causes beyond our control. No insurance coverage is effected except upon express instructions given in writing by the customer. Rates subject to change without notice. All shipments handled as per Terms and Conditions of Service as printed on the reverse side. FMC No. 375.

AD007 5/04

PEMCCO
Incorporated

October 18, 2005

Colonel Yvonne J. Prettyman-Beck
District Engineer
U.S. Army Corps of Engineers
Norfolk District
803 Front Street
Norfolk, Virginia 23510

Re: Craney Island Eastward Expansion, Draft Feasibility Report
And Environmental Impact Statement

Dear Colonel Prettyman:

PEMCCO, Inc. wishes to express its support for the conclusions and recommendations reported in the Draft Feasibility Report and Environmental Impact Statement for the Eastward Expansion of Craney Island. We are greatly encouraged by the Norfolk District's recommendation to construct an expansion of Craney Island for additional dredge material disposal and future port development.

The recommended expansion addresses many regional concerns including the critical need for future dredge material disposal capacity to maintain the Federal navigation channels into Norfolk Harbor and to deepen the channels to the authorized 55-foot depth in the future. The channels are a lifeline for regional economic growth and the future success of Virginia's ports and supply chain industries.

The Eastward Expansion of Craney Island will generate over 54,000 jobs in the region and $155 million in annual state and local tax revenues. 26,000 jobs and $788 million in annual wages are expected from regional distribution center operations that will benefit from expanded port services. The recommended improvements to Craney Island coupled with other Federal and State initiatives, like the Heartland Corridor will improve the efficiency of the Nation's transportation system and provide economic benefits to millions of Americans.

The Craney Island Eastward Expansion is vitally important to the future of Hampton Roads and the Nation. We support the District's findings and encourage you to approve the recommended plan. Thank you for the opportunity to comment on this proposal.

Sincerely,

Prescott Sherrod
President

621 Lynnhaven Parkway, Suite 408, Virginia Beach, VA 23452 | Phone 757.437.8862 | Fax 757.437.8835

**TLS**

**Truck Lease Services, Inc.**
4350 Idlewild Industrial Drive
Winston-Salem, NC 27105

October 18, 2005

Colonel Yvonne J. Prettyman-Beck
District Engineer
U.S. Army Corps of Engineers
Norfolk District
803 Front Street
Norfolk, Virginia 23510

Re: Craney Island Eastward Expansion, Draft Feasibility Report
And Environmental Impact Statement

Dear Colonel Prettyman:

Truck Lease Services, Inc. wishes to express its support for the conclusions and recommendations reported in the Draft Feasibility Report and Environmental Impact Statement for the Eastward Expansion of Craney Island. We are greatly encouraged by the Norfolk District's recommendation to construct an expansion of Craney Island for additional dredge material disposal and future port development.

The recommended expansion addresses many regional concerns including the critical need for future dredge material disposal capacity to maintain the Federal navigation channels into Norfolk Harbor and to deepen the channels to the authorized 55-foot depth in the future. The channels are a lifeline for regional economic growth and the future success of Virginia's ports and supply chain industries.

The Eastward Expansion of Craney Island will generate over 54,000 jobs in the region and $155 million in annual state and local tax revenues. 26,000 jobs and $788 million in annual wages are expected from regional distribution center operations that will benefit from expanded port services. The recommended improvements to Craney Island coupled with other Federal and State initiatives, like the Heartland Corridor will improve the efficiency of the Nation's transportation system and provide economic benefits to millions of Americans.

The Craney Island Eastward Expansion is vitally important to the future of Hampton Roads and the Nation. We support the District's findings and encourage you to approve the recommended plan. Thank you for the opportunity to comment on this proposal.

Sincerely,

Wendell L. Butler

President
Truck Lease Services, Inc.

Tel: (336) 661-1305 • Dispatch: (336) 661-1355 • Acct. Fax: (336) 661-9199 • Fax: (336)-661-1505

CAVANAUGH, NELSON & CO., PLC
CERTIFIED PUBLIC ACCOUNTANTS AND CONSULTANTS

October 18, 2005

Colonel Yvonne J. Prettyman-Beck
District Engineer
U.S. Army Corps of Engineers
Norfolk District
803 Front Street
Norfolk, Virginia 23510

Re: Craney Island Eastward Expansion, Draft Feasibility Report
And Environmental Impact Statement

Dear Colonel Prettyman:

Cavanaugh, Nelson & Co., PLC wishes to express its support for the conclusions and recommendations reported in the Draft Feasibility Report and Environmental Impact Statement for the Eastward Expansion of Craney Island. We are greatly encouraged by the Norfolk District's recommendation to construct an expansion of Craney Island for additional dredge material disposal and future port development.

The recommended expansion addresses many regional concerns including the critical need for future dredge material disposal capacity to maintain the Federal navigation channels into Norfolk Harbor and to deepen the channels to the authorized 55-foot depth in the future. The channels are a lifeline for regional economic growth and the future success of Virginia's ports and supply chain industries.

The Eastward Expansion of Craney Island will generate thousands of additional jobs in the region. The recommended improvements to Craney Island coupled with other Federal and Commonwealth initiatives, like the Heartland Corridor, will improve the efficiency of the Nation's transportation system and provide economic benefits to millions of Americans.

The Craney Island Eastward Expansion is vitally important to the future of Hampton Roads and the Nation. We support the District's findings and encourage you to approve the recommended plan. Thank you for the opportunity to comment on this proposal.

Very truly yours,

John D. Cavanaugh

150 WEST MAIN STREET, SUITE 1750 · NORFOLK, VIRGINIA · 23510
PHONE: 757-578-4900 · FAX: 757-578-4719

*Waterway*

**Surveys & Engineering, Ltd.**

321 Cleveland Place, Virginia Beach, Virginia 23462
Tel: (757) 490-1691 FAX: (757) 490-1348

October 24, 2005

**Colonel Yvonne J. Prettyman-Beck**
**District Engineer**
**Norfolk District, Corps of Engineers**
**803 Front Street**
**Norfolk, Virginia 23510**

RE: Craney Island Eastward Expansion, Draft Feasibility Report and Environmental Impact Statement

Dear Colonel Prettyman-Beck:

**Waterway Surveys & Engineering** wishes to express its support for the conclusions and recommendations reported in the Draft Feasibility Report and Environmental Impact Statement for the Eastward Expansion of Craney Island. We are greatly encouraged by the Norfolk District's recommendation to construct an expansion of Craney Island for additional dredged material disposal and future port development.

The recommended expansion addresses many regional concerns including the critical need for future dredged material disposal capacity critical to economically maintain the Federal, State and private navigation projects in Norfolk Harbor and to deepen the facilities in the future. These channels and facilities are essential for regional economic growth and the future success of Virginia's ports in competing with other deep-water seaports.

The Eastward Expansion of Craney Island will generate over 54,000 jobs in the region and $155 million in annual state and local tax revenues. 26,000 jobs and $788 million in annual wages are expected from regional distribution center operations that will benefit from expanded port services. The recommended improvements to Craney Island coupled with other Federal and State initiatives, like the Heartland Corridor will improve the efficiency of the Nation's transportation system and provide economic benefits to millions of Americans.

The Craney Island Eastward Expansion is vitally important to the future of Hampton Roads and the Nation. We support the District's findings and encourage you to approve the recommended plan. Thank you for the opportunity to comment on this proposal.

Sincerely,

John B. Walsh

John B. Walsh, P.E.
President

# D & H CORPORATION
## T/A C & P TUG AND BARGE COMPANY

444 Crawford Street, Second Floor
Portsmouth, Virginia 23704
Phone: (757) 397-6833
Fax: (757) 397-3333


October 25, 2005

Colonel Yvonne J. Prettyman-Beck
District Engineer
U.S. Army Corps of Engineers
Norfolk District
803 Front Street
Norfolk, Virginia 23510

Re: Craney Island Eastward Expansion, Draft Feasibility Report
And Environmental Impact Statement

Dear Colonel Prettyman:

C & P Tug and Barge Company wishes to express its support for the conclusions and recommendations reported in the Draft Feasibility Report and Environmental Impact Statement for the Eastward Expansion of Craney Island. We are greatly encouraged by the Norfolk District's recommendation to construct an expansion of Craney Island for additional dredge material disposal and future port development.

The recommended expansion addresses many regional concerns including the critical need for future dredge material disposal capacity to maintain the Federal navigation channels into Norfolk Harbor and to deepen the channels to the authorized 55-foot depth in the future. The channels are a lifeline for regional economic growth and the future success of Virginia's ports and supply chain industries.

The Eastward Expansion of Craney Island will generate over 54,000 jobs in the region and $155 million in annual state and local tax revenues. 26,000 jobs and $788 million in annual wages are expected from regional distribution center operations that will benefit from expanded port services. The recommended improvements to Craney Island coupled with other Federal and State initiatives, like the Heartland Corridor will improve the efficiency of the Nation's transportation system and provide economic benefits to millions of Americans.

The Craney Island Eastward Expansion is vitally important to the future of Hampton Roads and the Nation. We support the District's findings and encourage you to approve the recommended plan.

C & P Tug and Barge operates four (4) tugboats and three (3) barges which depend on the import/exports trade that the local marine terminals provide. Thank you for the opportunity to comment on this proposal.

Sincerely yours,

C&P TUG AND BARGE COMPANY

Stephen R. Furlough
President

Canon

CANON VIRGINIA, INC.
12000 CANON BOULEVARD
NEWPORT NEWS, VIRGINIA 23606-4299
TELEPHONE: (757) 881-6000
FAX: (757) 881-9507

October 26, 2005

Colonel Yvonne J. Prettyman-Beck
District Engineer
U.S. Army Corps of Engineers
Norfolk District
803 Front Street
Norfolk, Virginia 23510

Re: Craney Island Eastward Expansion, Draft Feasibility Report
And Environmental Impact Statement

Dear Colonel Prettyman:

Canon Virginia, Inc., wishes to express its support for the conclusions and recommendations reported in the Draft Feasibility Report and Environmental Impact Statement for the Eastward Expansion of Craney Island. We are greatly encouraged by the Norfolk District's recommendation to construct an expansion of Craney Island for additional dredge material disposal and future port development.

The recommended expansion addresses many regional concerns including the critical need for future dredge material disposal capacity to maintain the Federal navigation channels into Norfolk Harbor and to deepen the channels to the authorized 55-foot depth in the future. The channels are a lifeline for regional economic growth and the future success of Virginia's ports and supply chain industries.

The Eastward Expansion of Craney Island will generate over 54,000 jobs in the region and $155 million in annual state and local tax revenues. 26,000 jobs and $788 million in annual wages are expected from regional distribution center operations that will benefit from expanded port services. The recommended improvements to Craney Island coupled with other Federal and State initiatives, like the Heartland Corridor will improve the efficiency of the Nation's transportation system and provide economic benefits to millions of Americans.

The Craney Island Eastward Expansion is vitally important to the future of Hampton Roads and the Nation. We support the District's findings and encourage you to approve the recommended plan. Thank you for the opportunity to comment on this proposal.

Sincerely,

David A. Herring SPHR
Associate Director HR/GA

**California Multimodal Incorporated**

2875 Temple Avenue, Long Beach, CA 90806 Telephone (562) 490-3800 Fax (562) 490-3480

October 27, 2005

Colonel Yvonne J. Prettyman-Beck
District Engineer
U.S. Army Corps of Engineers
Norfolk District
803 Front Street
Norfolk, Virginia 23510

Re: The Craney Island Eastward Expansion, Draft Feasibility Report
And Environmental Impact Statement

Dear Colonel Prettyman:

California Multimodal Inc. wholeheartedly supports the conclusions and recommendations of the Draft Feasibility Report and Environmental Impact Statement for the Eastward Expansion of Craney Island. The recommendation to construct an expansion of Craney Island for additional dredge material disposal and future port development is **the only practical and reasonable option** towards securing a substantial transportation infrastruture capable to advance globalized trading.

As introduction, California Multimodal Inc is a highly successful Trucking, Warehousing and Distribution Company established over fifty years ago, on the West Coast of the United States of America.

Recently, CMI decided to extend its services to the Hampton Roads Region. We are convinced that Hampton Roads, our Country's East Coast "DEEP WATER PORT" is strategically vital to the USA's future global-trade position.

The plan as provided will secure that Hampton Roads will be environmentally responsible to our citizens while yielding economic benefits for generations, to come.

We urge the U.S. Army Corps of Engineers to approve the recommended plan that will progress the development of Craney Island.

Thank you for the opportunity to comment on this proposal.

Sincerely,

Robert Curry, Jr.
CEO

1724 South Military Highway • Chesapeake, VA 23320-2612

(757) 233-4300

FAX (757) 420-0478

GIVENS TRANSPORTATION, INC.

October 27, 2005

Colonel Yvonne J. Prettyman-Beck
District Engineer
U.S. Army Corps of Engineers
Norfolk District
803 Front Street
Norfolk, Virginia 23510

Re: Craney Island Eastward Expansion, Draft Feasibility Report
And Environmental Impact Statement

Dear Colonel Prettyman:

The (*organization name*) wishes to express its support for the conclusions and recommendations reported in the Draft Feasibility Report and Environmental Impact Statement for the Eastward Expansion of Craney Island. We are greatly encouraged by the Norfolk District's recommendation to construct an expansion of Craney Island for additional dredge material disposal and future port development.

The recommended expansion addresses many regional concerns including the critical need for future dredge material disposal capacity to maintain the Federal navigation channels into Norfolk Harbor and to deepen the channels to the authorized 55-foot depth in the future. The channels are a lifeline for regional economic growth and the future success of Virginia's ports and supply chain industries.

The Eastward Expansion of Craney Island will generate over 54,000 jobs in the region and $155 million in annual state and local tax revenues. 26,000 jobs and $788 million in annual wages are expected from regional distribution center operations that will benefit from expanded port services. The recommended improvements to Craney Island coupled with other Federal and State initiatives, like the Heartland Corridor will improve the efficiency of the Nation's transportation system and provide economic benefits to millions of Americans.

The Craney Island Eastward Expansion is vitally important to the future of Hampton Roads and the Nation. We support the District's findings and encourage you to approve the recommended plan. Thank you for the opportunity to comment on this proposal.

Sincerely,

SemMaterials

October 27, 2005

Colonel Yvonne J. Prettyman-Beck
District Engineer
U.S. Army Corps of Engineers
Norfolk District
803 Front Street
Norfolk, Virginia 23510

Re: Craney Island Eastward Expansion, Draft Feasibility Report
And Environmental Impact Statement

Dear Colonel Prettyman:

SemMaterials L.P. wishes to express its support for the conclusions and recommendations reported in the Draft Feasibility Report and Environmental Impact Statement for the Eastward Expansion of Craney Island. We are greatly encouraged by the Norfolk District's recommendation to construct an expansion of Craney Island for additional dredge material disposal and future port development.

The recommended expansion addresses many regional concerns including the critical need for future dredge material disposal capacity to maintain the Federal navigation channels into Norfolk Harbor and to deepen the channels to the authorized 55-foot depth in the future. The channels are a lifeline for regional economic growth and the future success of Virginia's ports and supply chain industries.

The Eastward Expansion of Craney Island will generate over 54,000 jobs in the region and $155 million in annual state and local tax revenues. 26,000 jobs and $788 million in annual wages are expected from regional distribution center operations that will benefit from expanded port services. The recommended improvements to Craney Island coupled with other Federal and State initiatives, like the Heartland Corridor will improve the efficiency of the Nation's transportation system and provide economic benefits to millions of Americans.

The Craney Island Eastward Expansion is vitally important to the future of Hampton Roads and the Nation. We support the District's findings and encourage you to approve the recommended plan. Thank you for the opportunity to comment on this proposal.

Sincerely,

Hayden Williams

Hayden Williams

801 Terminal Avenue • Newport News, VA 23607-6141 • Tel: 757.244.6545 • Fax: 757.244.2748 • www.semgrouplp.com
**SemMaterials, L.P., a Member of SemGroup, L.P.**

Specialty Products, Inc.
5660 E. Virginia Beach Blvd.
First Floor
Norfolk, Virginia 23502

October 27, 2005

Colonel Yvonne J. Prettyman-Beck
U. S. Army Corps. Of Engineers
803 Front Street
Norfolk, Virginia 23510

Re: Craney Island Eastward Expansion, Draft Feasibility Report
And Environmental Impact Statement

Dear Colonel Prettyman:

Specialty Products, Inc. supports the recommendations of the Draft Feasibility Report and Environmental Impact Statement for the Eastward Expansion of Craney Island.

The Craney Island Eastward Expansion is important to Hampton Roads and the Nation, with its generation of additional jobs and additional state and regional tax revenues. We urge you to approve this plan.

Very truly yours,

Leonard A. Swann, Jr.

(757) 461-6301
(800) 637-2264
FAX (757) 461-4669
www.specialtyproducts.net

Colonel Yvonne J. Prettyman-Beck
District Engineer
U.S. Army Corps of Engineers
Norfolk District
803 Front Street
Norfolk, Virginia 23510

October 28, 2005

Re: Craney Island Eastward Expansion, Draft Feasibility Report
And Environmental Impact Statement

Dear Colonel Prettyman:

United Arab Agencies, Inc. wishes to express its support for the conclusions and recommendations reported in the Draft Feasibility Report and Environmental Impact Statement for the Eastward Expansion of Craney Island. We are greatly encouraged by the Norfolk District's recommendation to construct an expansion of Craney Island for additional dredge material disposal and future port development.

The recommended expansion addresses many regional concerns including the critical need for future dredge material disposal capacity to maintain the Federal navigation channels into Norfolk Harbor and to deepen the channels to the authorized 55-foot depth in the future. The channels are a lifeline for regional economic growth and the future success of Virginia's ports and supply chain industries.

The Eastward Expansion of Craney Island will generate over 54,000 jobs in the region and $155 million in annual state and local tax revenues. 26,000 jobs and $788 million in annual wages are expected from regional distribution center operations that will benefit from expanded port services. The recommended improvements to Craney Island coupled with other Federal and State initiatives, like the Heartland Corridor will improve the efficiency of the Nation's transportation system and provide economic benefits to millions of Americans.

The Craney Island Eastward Expansion is vitally important to the future of Hampton Roads and the Nation. We support the District's findings and encourage you to approve the recommended plan. Thank you for the opportunity to comment on this proposal.

Sincerely,

Vernon Chilton

Vernon Chilton
United Arab Agencies, Inc.
Chesapeake, Virginia Office

**UNITED ARAB AGENCIES, INC.** One Greenbrier Point • 1403 Greenbrier Parkway • Suite 550 • Chesapeake, VA 23320
Phone 757-420-7340 • Fax 757-420-6342

**Bank of America.**

October 28, 2005

Bank of America, N.A.
Commercial Banking
VA6-100-03-01
One Commercial Place, 3rd Floor
Norfolk, VA 23510-2103

Colonel Yvonne J. Prettyman-Beck
District Engineer
U.S. Army Corps of Engineers
Norfolk District
803 Front Street
Norfolk, Virginia 23510

Re: Craney Island Eastward Expansion, Draft Feasibility Report
And Environmental Impact Statement

Dear Colonel Prettyman:

The Bank of America, Hampton Roads Market, wishes to express its support for the conclusions and recommendations reported in the Draft Feasibility Report and Environmental Impact Statement for the Eastward Expansion of Craney Island. We are greatly encouraged by the Norfolk District's recommendation to construct an expansion of Craney Island for additional dredge material disposal and future port development.

The recommended expansion addresses many regional concerns including the critical need for future dredge material disposal capacity to maintain the Federal navigation channels into Norfolk Harbor and to deepen the channels to the authorized 55-foot depth in the future. The channels are a lifeline for regional economic growth and the future success of Virginia's ports and supply chain industries.

The Eastward Expansion of Craney Island will generate over 54,000 jobs in the region and $155 million in annual state and local tax revenues. 26,000 jobs and $788 million in annual wages are expected from regional distribution center operations that will benefit from expanded port services. The recommended improvements to Craney Island coupled with other Federal and State initiatives, like the Heartland Corridor will improve the efficiency of the Nation's transportation system and provide economic benefits to millions of Americans.

The Craney Island Eastward Expansion is vitally important to the future of Hampton Roads and the Nation. We support the District's findings and encourage you to approve the recommended plan. Thank you for the opportunity to comment on this proposal.

Sincerely,

Franklin P. Earley
President, Hampton Roads Market
Bank of America

USA
2000-2004
US Olympic Teams

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*Chesapeake Marine Training Institute, Inc.*
**3566 George Washington Memorial Highway**
**Post Office Box 1153**
**Hayes, VA 23072**
**Phone: (804) 642-0123 FAX: (804) 642-1743**
***www.chesapeakemarineinst.com***

October 28, 2005

Colonel Yvonne J. Prettyman-Beck
District Engineer
U.S. Army Corps of Engineers
Norfolk District
803 Front Street
Norfolk, Virginia 23510

Re: Craney Island Eastward Expansion, Draft Feasibility Report
And Environmental Impact Statement

Dear Colonel Prettyman:

The Chesapeake Marine Training Institute, Inc., wishes to express its support for the conclusions and recommendations reported in the Draft Feasibility Report and Environmental Impact Statement for the Eastward Expansion of Craney Island. We are greatly encouraged by the Norfolk District's recommendation to construct an expansion of Craney Island for additional dredge material disposal and future port development.

The recommended expansion addresses many regional concerns including the critical need for future dredge material disposal capacity to maintain the Federal navigation channels into Norfolk Harbor and to deepen the channels to the authorized 55-foot depth in the future. The channels are a lifeline for regional economic growth and the future success of Virginia's ports and supply chain industries.

The Eastward Expansion of Craney Island will generate over 54,000 jobs in the region and $155 million in annual state and local tax revenues. 26,000 jobs and $788 million in annual wages are expected from regional distribution center operations that will benefit from expanded port services. The recommended improvements to Craney Island coupled with other Federal and State initiatives, like the Heartland Corridor will improve the efficiency of the Nation's transportation system and provide economic benefits to millions of Americans.

The Craney Island Eastward Expansion is vitally important to the future of Hampton Roads and the Nation. We support the District's findings and encourage you to approve the recommended plan. Thank you for the opportunity to comment on this proposal.

Sincerely,

Captain Guy R.A. Sorensen
President

***Your Source For Professional Marine Educational Services***

EASTPORT
CUSTOMS BROKERS, INC.
Established 1985

October 28, 2005

Colonel Yvonne J. Prettyman-Beck
District Engineer
U.S. Army Corps of Engineers
Norfolk District
803 Front Street
Norfolk, Virginia 23510

Re: Craney Island Eastward Expansion, Draft Feasibility Report
And Environmental Impact Statement

Dear Colonel Prettyman:

The Eastport Customs Brokers, Inc., wishes to express its support for the conclusions and recommendations reported in the Draft Feasibility Report and Environmental Impact Statement for the Eastward Expansion of Craney Island. We are greatly encouraged by the Norfolk District's recommendation to construct an expansion of Craney Island for additional dredge material disposal and future port development.

The recommended expansion addresses many regional concerns including the critical need for future dredge material disposal capacity to maintain the Federal navigation channels into Norfolk Harbor and to deepen the channels to the authorized 55-foot depth in the future. The channels are a lifeline for regional economic growth and the future success of Virginia's ports and supply chain industries.

The Eastward Expansion of Craney Island will generate over 54,000 jobs in the region and $155 million in annual state and local tax revenues. 26,000 jobs and $788 million in annual wages are expected from regional distribution center operations that will benefit from expanded port services. The recommended improvements to Craney Island coupled with other Federal and State initiatives, like the Heartland Corridor will improve the efficiency of the Nation's transportation system and provide economic benefits to millions of Americans.

The Craney Island Eastward Expansion is vitally important to the future of Hampton Roads and the Nation. We support the District's findings and encourage you to approve the recommended plan. Thank you for the opportunity to comment on this proposal.

Sincerely,
Eastport Customs Brokers, Inc.

Linda D. Jennings, President

732 Thimble Shoals Blvd., Suite 302A • Newport News, Virginia 23606
Tel: 757-873-2215 • Fax: 757-873-2130 • Email: info@eastportcb.com

# ELECTRIC MOTOR & CONTRACTING CO., INC.

Established 1960

**CORPORATE OFFICE:**
3703 Cook Boulevard
Chesapeake, Virginia 23323
(757) 487-2121 Phone • (757) 487-5983 Fax

**BRANCH OFFICE:**
28064 Southampton Parkway
Courtland, Virginia 23837
(757) 653-9331 Phone • (757) 653-0415 Fax

ISO 9001 Registered


October 28, 2005

Colonel Yvonne J. Prettyman-Beck
District Engineer
U.S. Army Corps of Engineers
Norfolk District
803 Front Street
Norfolk, Virginia 23510

Re: Craney Island Eastward Expansion, Draft Feasibility Report
And Environmental Impact Statement

Dear Colonel Prettyman:

Electric Motor & Contracting Co., Inc. wishes to express its support for the conclusions and recommendations reported in the Draft Feasibility Report and Environmental Impact Statement for the Eastward Expansion of Craney Island. We are greatly encouraged by the Norfolk District's recommendation to construct an expansion of Craney Island for additional dredge material disposal and future port development.

The recommended expansion addresses many regional concerns including the critical need for future dredge material disposal capacity to maintain the Federal navigation channels into Norfolk Harbor and to deepen the channels to the authorized 55-foot depth in the future. The channels are a lifeline for regional economic growth and the future success of Virginia's ports and supply chain industries.

The Eastward Expansion of Craney Island will generate over 54,000 jobs in the region and $155 million in annual state and local tax revenues. 26,000 jobs and $788 million in annual wages are expected from regional distribution center operations that will benefit from expanded port services. The recommended improvements to Craney Island coupled with other Federal and State initiatives, like the Heartland Corridor will improve the efficiency of the Nation's transportation system and provide economic benefits to millions of Americans.

The Craney Island Eastward Expansion is vitally important to the future of Hampton Roads and the Nation. We support the District's findings and encourage you to approve the recommended plan. Thank you for the opportunity to comment on this proposal.

Sincerely,

Cheryl L. Taylor

(For) James Lee King
President

# HASLER & COMPANY, INC.

**121 WEST TAZEWELL STREET**
**NORFOLK, VA. 23510**
**TEL: 757-6253641 FAX: 757-640857**


October 28, 2005

Colonel Yvonne J. Prettyman-Beck
District Engineer
U.S. Army Corps of Engineers
Norfolk District
803 Front Street
Norfolk, Virginia 23510

Re: Craney Island Eastward Expansion, Draft Feasibility Report
And Environmental Impact Statement

Dear Colonel Prettyman:

Hasler & Company, Inc. wishes to express its support for the conclusions and recommendations reported in the Draft Feasibility Report and Environmental Impact Statement for the Eastward Expansion of Craney Island. We are greatly encouraged by the Norfolk District's recommendation to construct an expansion of Craney Island for additional dredge material disposal and future port development.

The recommended expansion addresses many regional concerns including the critical need for future dredge material disposal capacity to maintain the Federal navigation channels into Norfolk Harbor and to deepen the channels to the authorized 55-foot depth in the future. The channels are a lifeline for regional economic growth and the future success of Virginia's ports and supply chain industries.

The Eastward Expansion of Craney Island will generate over 54,000 jobs in the region and $155 million in annual state and local tax revenues. 26,000 jobs and $788 million in annual wages are expected from regional distribution center operations that will benefit from expanded port services. The recommended improvements to Craney Island coupled with other Federal and State initiatives, like the Heartland Corridor will improve the efficiency of the Nation's transportation system and provide economic benefits to millions of Americans.

Con't Page 2

The Craney Island Eastward Expansion is vitally important to the future of Hampton Roads and the Nation. We support the District's findings and encourage you to approve the recommended plan. Thank you for the opportunity to comment on this proposal.

Sincerely,

**Hasler & Company, Inc.**

Carl D. Parker, III
President

CDP,III/ms
CC: Hampton Roads Maritime Association

The Taylor Companies

• Norfolk Warehouse Distribution Centers, Inc.
• Norfolk Warehouse Management Company, Inc.
• Taylor Logistics, Inc.
• Taylor Real Estate, Inc.

October 28, 2005

Colonel Yvonne J. Prettyman-Beck
District Engineer
U.S. Army Corps of Engineers
Norfolk District
803 Front Street
Norfolk, VA 23510

Re: Craney Island Eastward Expansion, Draft Feasibility Report And Environmental Impact Statement

Dear Colonel Prettyman:

The Taylor Companies wishes to express its support for the conclusions and recommendations reported in the Draft Feasibility Report and Environmental Impact Statement for the Eastward Expansion of Craney Island. We are greatly encouraged by the Norfolk District's recommendation to construct an expansion of Craney Island for additional dredge material disposal and future port development.

The recommended expansion addresses many regional concerns including the critical need for future dredge material disposal capacity to maintain the Federal navigation channels into Norfolk Harbor and to deepen the channels to the authorized 55-foot depth in the future. The channels are a lifeline for regional economic growth and the future success of Virginia's Ports and supply chain industries.

The Eastward Expansion of Craney Island will generate over 54,000 jobs in the region and the $155 million in annual state and local tax revenues. Twenty-six thousand jobs and $788 million in annual wages are expected from regional distribution center operations that will benefit from expanded port services. The recommended improvements to Craney Island coupled with other Federal and State initiatives, like the Heartland Corridor will improve the efficiency of the Nation's transportation system and provide economic benefits to millions of Americans.

As a public warehouse and logistics company the Craney Island Eastward Expansion is vitally important to the future of Hampton Roads and the Nation. We support the District's findings and encourage you to approve the recommended plan. Thank you for the opportunity to comment on this proposal.

Sincerely,

Robert T. Taylor
President

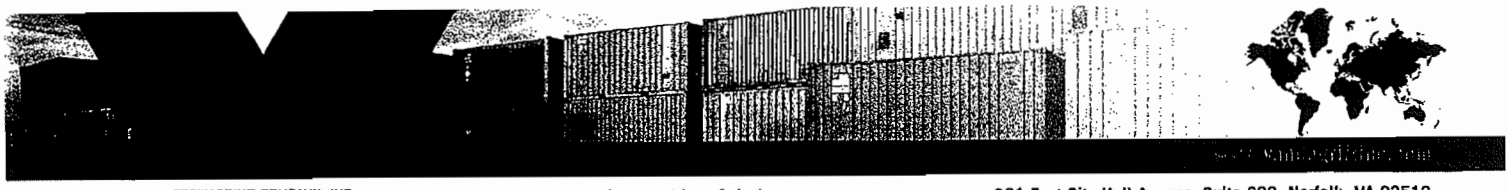
Complete Warehouse, Logistics, & Transportation Services

**Street Address:**
6969 Tidewater Drive, Norfolk, VA 23509-1628

**Mailing Address:**
P. O. Box 2556, Norfolk, VA 23501-2556

**Phone:** (757) 857-6081
**Fax:** (757) 855-1740

**Web Site: www.taylorcompanies.com**



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*the provider of choice*

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voice 757.457.5500 •• fax 757.457.5515

October 28, 2005

Colonel Yvonne J. Prettyman-Beck
District Engineer
U.S. Army Corps of Engineers
Norfolk District
803 Front Street
Norfolk, Virginia 23510

Re: Craney Island Eastward Expansion, Draft Feasibility Report
And Environmental Impact Statement

Dear Colonel Prettyman:

Our firm, Vandegrift Forwarding Company, Inc. wishes to express its support for the conclusions and recommendations reported in the Draft Feasibility Report and Environmental Impact Statement for the Eastward Expansion of Craney Island. We are greatly encouraged by the Norfolk District's recommendation to construct an expansion of Craney Island for additional dredge material disposal and future port development.

The recommended expansion addresses many regional concerns including the critical need for future dredge material disposal capacity to maintain the Federal navigation channels into Norfolk Harbor and to deepen the channels to the authorized 55-foot depth in the future. The channels are a lifeline for regional economic growth and the future success of Virginia's ports and supply chain industries.

The Eastward Expansion of Craney Island will generate over 54,000 jobs in the region and $155 million in annual state and local tax revenues. 26,000 jobs and $788 million in annual wages are expected from regional distribution center operations that will benefit from expanded port services. The recommended improvements to Craney Island, coupled with other Federal and State initiatives like the Heartland Corridor, will improve the efficiency of the Nation's transportation system and provide economic benefits to millions of Americans.

The Craney Island Eastward Expansion is vitally important to the future of Hampton Roads and the Nation. We support the District's findings and encourage you to approve the recommended plan. Thank you for the opportunity to comment on this proposal.

Sincerely,

Vandegrift Forwarding Company, Inc.
Norfolk, VA

Dan Magee
General Manager

**Don McLellan**

9008 River Crescent
Suffolk, VA. 23433
Phone: 757-238-2638

October 31, 2005

Colonel Yvonne J. Prettyman-Beck
District Engineer
U. S. Army Corps of Engineers
Norfolk District
803 Front Street
Norfolk, Virginia 23510

Ref: Craney Island Eastward Expansion, Draft Feasibility Report And Environmental Impact Statement for the Eastward Expansion of Craney Island

Dear Colonel Prettyman:

The Norfolk District's recommendations in the report demonstrate the practicality of harbor deepening, maintenance, and port expansion in a manner that also provides an economical, straightforward program leading to an even more successful future for Hampton Roads as a most capable and major world-class port.

To further ensure Hampton Roads' increased efficiency, other improvements have been recommended which serve the land-side collection and distribution of freight. When in place, these improvements will have greater capability to shorten all-in cargo transit time between origin and ultimate user.

In order to lend some credence the above statements, I have worked in management capacities at, or have in-depth understanding of, ten major U. S. ports, eight Asian major ports, one major Australian port, and seven major ports in Europe.

Sincerely,

Don McLellan

NORFOLK SOUTHERN

Norfolk Southern Corporation
Three Commercial Place
Norfolk, Virginia 23510-9251
Telephone: 757/629-2748
FAX: 757/629-2849
remartin@nscorp.com

**Robert E. Martínez**
Vice President
Business Development

October 31, 2005

Colonel Yvonne J. Prettyman-Beck
District Engineer
U.S. Army Corps of Engineers
Norfolk District
803 Front Street
Norfolk, Virginia 23510

Re: Craney Island Eastward Expansion, Draft Feasibility Report
And Environmental Impact Statement

Dear Colonel Prettyman:

Norfolk Southern Corporation wishes to express its support for the conclusions and recommendations reported in the Draft Feasibility Report and Environmental Impact Statement for the Eastward Expansion of Craney Island. We are greatly encouraged by the Norfolk District's recommendation to construct an expansion of Craney Island for additional dredge material disposal and future port development. This is critical to the future of the Commonwealth of Virginia, to its continued economic well-being, and is in the national interest.

The recommended expansion addresses many regional concerns including the critical need for future dredge material disposal capacity to maintain the Federal navigation channels and to deepen the channels to the authorized 55-foot depth in the future. The channels are a lifeline for regional economic growth and the future success of Virginia's ports and supply chain industries.

The Eastward Expansion of Craney Island will eventually lead to a huge growth in good jobs in the region and substantial increases in state and local tax revenues. The recommended improvements to Craney Island coupled with other Federal and State initiatives, like the Heartland Corridor will improve the efficiency of the Nation's transportation system and provide economic benefits to millions of Americans.

The Craney Island Eastward Expansion is vitally important to the future of the region, the state and the nation. I do not believe that is an over-statement. We support the District's findings and encourage you to approve the recommended plan.

Thank you for allowing me the opportunity to comment on this proposal. Please contact me if you require additional statements or detail regarding Norfolk Southern's support of this critical project.

Sincerely,

Robert E. Martínez
Vice President Business Development

ZEL TECHNOLOGIES, LLC

October 18, 2005

Colonel Yvonne J. Prettyman-Beck
District Engineer
U.S. Army Corps of Engineers
Norfolk District
803 Front Street
Norfolk, Virginia 23510

Dear Colonel Prettyman-Beck:

Zel Technologies, LLC wishes to express its support for the conclusions and recommendations reported in the Draft Feasibility Report and Environmental Impact Statement for the Eastward Expansion of Craney Island. We are greatly encouraged by the Norfolk District's recommendation to construct an expansion of Craney Island for additional dredge material disposal and future port development.

The recommended expansion addresses many regional concerns including the critical need for future dredge material disposal capacity to maintain the Federal navigation channels into Norfolk Harbor and to deepen the channels to the authorized 55-foot depth in the future. The channels are a lifeline for regional economic growth and the future success of Virginia's ports and supply chain industries.

The Eastward Expansion of Craney Island will generate over 54,000 jobs in the region and $155 million in annual state and local tax revenues. 26,000 jobs and $788 million in annual wages are expected from regional distribution center operations that will benefit from expanded port services. The recommended improvements to Craney Island coupled with other Federal and State initiatives, like the Heartland Corridor will improve the efficiency of the Nation's transportation system and provide economic benefits to millions of Americans.

The Craney Island Eastward Expansion is vitally important to the future of Hampton Roads and the Nation. We support the District's findings and encourage you to approve the recommended plan. Thank you for the opportunity to comment on this proposal.

Sincerely,

Joseph F. Bouchard

Joseph F. Bouchard, Ph.D.
Captain, U.S. Navy (Ret.)
Senior Program Executive

54 Old Hampton Lane • Hampton, Virginia 23669 • TEL (757) 722-5565 • FAX (757) 722-8516

# APPENDIX G

# PART 3
# FROM FINAL EIS COORDINATION

RCVD
Snj

JUL 3 1 2006

# COMMONWEALTH of VIRGINIA

**Virginia Port Authority**
**600 World Trade Center**
**Norfolk, Virginia 23510-1679**
**Telephone (757) 683-8000**
**Fax (757) 683-8500**

**BOARD OF COMMISSIONERS**
John G. Milliken, *Chairman*
E. Massie Valentine, Jr., *Vice Chairman*
Robert C. Barclay, IV
Joe B. Fleming
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William M. Grace
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Ranjit K. Sen
Deborah K. Stearns
J. Braxton Powell, *State Treasurer*

**J. Robert Bray**
*Executive Director*

July 27, 2006

Colonel Dionysios Anninos
District Commander
Norfolk District
U.S. Army Corps of Engineers
803 Front Street
Norfolk, Virginia 23510-1096

Dear Colonel Anninos:

The Virginia Port Authority has reviewed the final Feasibility Study and Environmental Impact Statement for the Craney Island Eastward Expansion, Hampton Roads, VA study dated April 2006, and strongly supports its findings and conclusions. It is our intent to enter into a Design Agreement with the Federal Government at the appropriate time.

We also understand the project cost sharing requirements contained in the Water Resources Development Act of 1986 (Public Law 99-662), as amended, and intend to enter into a Project Cooperation Agreement with the Federal Government and to provide all required items of local cooperation prior to project construction in accordance with the Act. The Virginia Port Authority fully understands the Corps recommendation for cost sharing for the Craney Island Eastern Expansion as described in the final Feasibility Study and Environmental Impact Statement for the Craney Island Eastward Expansion, Hampton Roads, VA, and is in agreement with those recommendations.

We acknowledge that several State and Federal agencies have requested additional information and regulatory coordination prior to the construction and operation of the marine terminal. It is our intent to submit a supplemental EIS that more fully describes the environmental impacts associated with the operation and construction of the terminal and to obtain the appropriate permits during the design phase of the marine terminal.

Further, VPA has in place a Master Plan for capital improvements that includes the construction of the Eastward Expansion of Craney Island and the construction of a marine terminal on the dredge material placement site. We have analyzed the construction cost and are confident we will be able to obtain the necessary non-federal funds for the project. We intend to issue bonds to be supported by the Commonwealth Port Fund (CPF) and terminal revenues. We also plan to receive state appropriations for a portion of the work.

Please call me if I can be of further assistance in moving this project closer to implementation.

Sincerely

J. Robert Bray
Executive Director

George Kuccy

# United States Department of the Interior

OFFICE OF THE SECRETARY
Washington, DC 20240

TAKE PRIDE IN AMERICA

JUL 12 2006

ER 06/509

Mr. Thomas W. Waters
Chief, Policy and Policy Compliance Division
Directorate of Civil Works
Headquarters, U.S. Army Corps of Engineers
CECW-P (SA)
7701 Telegraph Road
Alexandria, VA 22315-3860

Dear Mr. Waters:

As requested, the U.S. Department of the Interior has reviewed the Chief of Engineers' Proposed Report on Craney Island Eastward Expansion, Norfolk Harbor and Channels, Hampton Roads, VA.

The Department does not object to the proposed project and has no comments to offer. The point of contact is Ms. Loretta Sutton, 202-208-7565. We appreciate the opportunity to review the Chief's Proposed Report and supporting documents.

Sincerely,

Willie R. Taylor

Willie R. Taylor
Director, Office of Environmental
Policy and Compliance

Preston Bryant, Jr.
Secretary of Natural Resources

Joseph H. Maroon
Director

# COMMONWEALTH of VIRGINIA

DEPARTMENT OF CONSERVATION AND RECREATION
101 N. 14th Street, 17th Floor, James Monroe Building
Richmond, Virginia 23219-3665
Phone: (804) 225-3440 TOLL-FREE/TDD: 1-800-243-7229
FAX: 804-225-3447 WEBSITE: www.cblad.virginia.gov

July 11, 2006

Mr. Mark T. Mansfield
Chief, Planning and Policy Branch
Department of the Army
Norfolk District, Corps of Engineers
Fort Norfolk, 803 Front Street
Norfolk, Virginia 23510-1096

Dear Mr. Mansfield,

We have reviewed the Finding of No Significant Impact and the Environmental Assessment for the proposed maintenance of the Virginia Beach Hurricane Protection Project and have determined that this project is not within the jurisdiction of the *Chesapeake Bay Preservation Act & Regulations*. We therefore have no comments with regards to this project.

We appreciate the opportunity to provide comments on this project. Please do not hesitate to contact us at 1-800-CHESBAY should you have any questions.

Sincerely,

Alice R. T. Baird

Alice R. T. Baird, LA, ASLA
Chesapeake Bay
Special Projects Coordinator

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
NORTHEAST REGION
One Blackburn Drive
Gloucester, MA 01930-2298

JUL 3 2006

Mark T. Mansfield
Chief, Planning and Policy Branch
Department of the Army
U.S. Army Corps of Engineers
Fort Norfolk, 803 Front Street
Norfolk, VA 23510-1096

Dear Mr. Mansfield:

NOAA's National Marine Fisheries Service (NMFS), Northeast Region, Habitat Conservation Division, has reviewed the *Final Environmental Impact Statement* (FEIS) for the *Craney Island Eastward Expansion, Norfolk Harbor and Channels, Hampton Roads, Virginia.* The proposed project is located in the Port of Hampton Roads between the Cities of Portsmouth and Norfolk, Virginia. The alternative preferred by the Norfolk District Army Corps of Engineers (ACOE) and the non-federal sponsor, the Virginia Port Authority (VPA), is a 580-acre eastward expansion of the existing Craney Island Dredged Material Management Area (CIDMMA) into the Elizabeth River, and the subsequent construction of a container terminal. In a letter dated November 4, 2005 from NOAA's Office of Program Planning and Integration, we provided comments in the draft EIS. We offer the following comments on the FEIS.

## GENERAL COMMENTS

Some of our comments and concerns about the project purpose and need have been addressed in the FEIS and in the response to comments. We appreciate the ACOE's effort in preparing its detailed response from which we have clearer understanding of the external constraints placed upon the project purpose and rationale for the analysis of alternatives. However, we maintain our statements on the DEIS that the consideration of less environmentally damaging alternatives that may afford the maximum practicable habitat protection for NOAA trust resources, and allow the project purpose to be achieved, has not been fully investigated. Therefore, we remain concerned about the environmental consequences of the proposed project. Moreover, the project will result in the permanent loss of 580 acres of aquatic habitat which cannot be replaced with the proposed mitigation, such that we cannot endorse its construction as proposed.

## ESSENTIAL FISH HABITAT

We have reviewed the EFH assessment included in the FEIS. We do not agree with the ACOE's determination that there is little or no EFH in the project area due to degraded habitat and anthropogenic impacts. Nor can we concur that the adverse effects on EFH species from the loss

of 580 acres of aquatic habitat and the subsequent construction of a container terminal will be temporary and minimal. Habitat characteristics of the CIDMMA expansion area, including salinities, depths, sediment types, water quality, and the benthic community, indicate that this area is EFH for summer flounder (*Paralichthys dentatus*), black sea bass (*Centropristus striata*), red drum, (*Sciaenops occelatus*), bluefish (*Pomatomus saltatrix*), Atlantic butterfish (*Peprilus triacanthus*), and windowpane flounder (*Scopthalmus aquosus*). The exclusion of windowpane flounder from consideration in the EFH assessment based upon the ACOE's designation of the sediments as muddy clays is not appropriate as the designated EFH for windowpane flounder includes muddy bottoms, and the salinities and depths are consistent with the EFH defined for this species. The benthic organisms and forage species found at CIDMMA expansion site are components of the diet of windowpane. Also, windowpane have been caught in sampling done in the project area (Birdsong et. al 1984 in USACOE 2006).

Because the CIDMMA expansion and Phase I of the container terminal construction are expected to take five years to construct, and because the facility and fill will be permanent, we cannot agree that all of the impacts of the proposed project on EFH will be temporary. Elevated levels of suspended sediment will occur within the vicinity of the project area for the expected five years of construction. Such suspended sediment levels can reduce dissolved oxygen, can mask pheromones used by migratory fishes, and can smother immobile benthic organisms and newly-settled demersal juvenile fish (Auld and Schubel 1978; Breitburg 1988; Newcombe and MacDonald 1991; Burton 1993; Nelson and Wheeler 1997). Further, the 580-acre fill will be permanent and the facility will need maintenance dredging on a regular basis to maintain the access navigation channel. This will create long-term potential adverse impacts on EFH due to the suspended sediment level increases from the increased shipping traffic and the maintenance dredging activities.

The permanent loss of 580 acres of benthic habitat supplies a food source for both federally managed species and species managed by the Atlantic States Fisheries Commission such as striped bass and weakfish. According to the information in the FEIS and the USFWS Planning Aid Report included in the FEIS, the benthic community at the CIDMMA expansion area includes benthic invertebrates such as *Neries succinea*, *Sabellaira vulgarus,* and *Ampelisca abdita.* Steimle *et al.* (2000) report that *Ampelisca abdita* is particularly important to the diets of winter flounder (*Pseudopluronectes americanus*), windowpane flounder, juvenile scup (*Stenotomus chrysops*), juvenile weakfish (*Cynoscion regalis*), striped searobins (*Prionotus evolans*), juvenile black sea bass, and juvenile silver hake (*Merluccius bilinearis*), all of which have been documented to occur around the CIDMMA. *Paraprionospio pinnata,* the second most abundant benthic invertebrate species collected adjacent to Craney Island by Dauer and Ewing (1986 in FWS 2002), and *Neries succinea*, the seventh most abundant species, were found to be prey species of spot in the Chesapeake Bay by Homer and Boynton (1978).

The Elizabeth River portion of the project is an important nursery area for many commercial and recreational species including spot, Atlantic croaker, Atlantic menhaden, weakfish, striped bass, black sea bass, and summer flounder. The most intensive use for spawning is by forage fish, including bay anchovy and Atlantic silversides (Priest 1981 in ACOE 2005). Bay anchovy has

been shown as a prey species for windowpane flounder (Kimmel 1973; Carlson 1991 in Packer *et al.* 1999) for striped bass (Homer and Boynton 1978; Hollis 1952) and weakfish (Chao and Musick 1977; Hartman and Brandt 1995). Both species are also important to the diets of summer flounder (Homer and Boynton 1978; Smith and Daiber 1977). Juvenile spot and Atlantic menhaden are also components of the diets of weakfish and bluefish (Hartman and Brandt 1995), summer flounder and spotted hake (*Urophycis regia*) (Homer and Boynton 1978). As a result, we cannot consider the loss of this habitat to have been minimized or be a minimal adverse effect on EFH, federally managed species or other resources of concern to NMFS.

In addition, the Elizabeth River has been designated as a Confirmed Anadromous Fish Use Area by the State of Virginia. Species found in the area include alewife (*Alosa pseudoharengus*), American shad (*Alosa sapidissima*), blueback herring (*Alosa aestivalis*), hickory shad (*Alosa mediocris*), striped bass (*Morone saxatilis*), and white perch (*Morone americana*). The upstream portions of the Elizabeth River and its tributaries provide spawning and nursery habitat for these species. Disturbance of the sediments caused by dredging could create undesirable turbidity levels and can mask pheromones used by migratory fishes, impeding their migration. Buckel and Conover (1997) in Fahey et al. (1999) report that diet items of juvenile bluefish includes *Alosa* species such as these. These species are also prey items of summer flounder (*Paralichthys dentatus*) and windowpane flounder (*Scopthalmus aquosus*) (Steimle et. al. 2000). Thus, activities that adversely affect the spawning success and the quality for the nursery habitat of these anadromous fish will adversely affect the EFH for juvenile bluefish by reducing the availability of prey items. Therefore, dredging operations should take into account these evaluations and avoid impacts on anadromous fish migration and spawning and the associated impacts on EFH and the prey species of federally managed fish.

The proposed compensatory mitigation plan for the permanent loss of 580 acres of aquatic habitat includes the creation of 20 acres of oyster reefs, 56 acres of wetlands restoration, and the remediation of 67 acres of contaminated sediment. The FEIS states that the 67 acres of sediment remediation will improve 411 acres of bottom habitat. While the mitigation plan included in the FEIS will have ecological benefits to fishery resources, it does not justify the forfeited acreage. The FEIS acknowledges that in-kind replacement of the habitat to be lost is not practicable. We recognize the efforts made to develop the proposed compensatory mitigation plan, but we remain concerned that all of the direct, indirect, individual, and cumulative impacts of the proposed project have not been addressed or adequately compensated. There is lack of detailed analysis and plans in the FEIS for all of the components of the mitigation and baseline data on the proposed mitigation sites. Therefore, it is not possible to assess fully the benefits of the proposed mitigation, its likelihood of success, and the consequence of lost and impaired habitat functions for a robust assemblage of living marine resources under NOAA authority.

We understand that all of the proposed mitigation will be subject to final review and approval by the ACOE and the federal and state regulatory agencies, and that this review process will help to ensure the success of the planned mitigation. More detailed plans, baseline data, and monitoring and maintenance plans for each site are necessary to avoid impacts and determine if the mitigation will offset the remaining impacts on EFH.

**Essential Fish Habitat Conservation Recommendations**

The recommendations are pursuant to Section 305 (b) (4) (A) of the Magnuson Stevens Act. The proposed project will have a substantial adverse effect on EFH by filling 580 acres of aquatic habitat, dredging 127 acres of the Elizabeth River for the construction of a navigation access channel, and impeding the migration and spawning of anadromous fish.

We recommend that the project not be constructed, as proposed. Consideration of less environmentally damaging alternatives that may afford maximum practicable habitat protection for NOAA trust resources should be investigated further. In addition, the mitigation plan should undergo further development to ensure that it compensates for all unavoidable project impacts.

Should the project proceed as proposed, we recommend:

No dredging be permitted between February 15 and June 30 of any year to protect migrating and spawning anadromous fish that are prey species of federally managed fish such as bluefish and summer flounder.

Detailed plans for all compensatory mitigation projects be provided to us for review including baseline data on each site (benthic sampling, contaminant sampling, existing hydrology, vegetation elevations, as appropriate, for each site), as well as monitoring and maintenance plans for each site. All success criteria and monitoring and maintenance plans should be developed for each site. These plans should include the site specific goals of the proposed mitigation project, criteria for success, remedial actions that may be taken, and long-term management plans. All mitigation plans must be developed fully and approved by the ACOE. The ACOE should review and approve these plans prior to work on the mitigation sites. These plans should be in place prior to any construction on the CIDMMA expansion or on the mitigation site.

Construction of the mitigation projects should be prior to, or concurrent with, the construction of the CIDMMA expansion.

Section 305(b)(4)(B) of the MSA requires the ACOE to provide NMFS with a detailed written response to these EFH conservation recommendations, including a description of measures adopted by the ACOE for avoiding, mitigating, or offsetting the impact of the project on EFH. In the case of a response that is inconsistent with NMFS' recommendations, the ACOE must explain its reasons for not following the recommendations, including the scientific justification for any disagreements with NMFS over the anticipated effects of the proposed action, and the measures needed to avoid, minimize, mitigate, or offset such effects pursuant to 50 CFR 600.920(k).

If new information becomes available or the project is revised in such a manner that affects the basis for the above EFH conservation recommendations, the EFH consultation must be reinitiated pursuant to 50 CFR 600.920(l).

If you wish to discuss this matter further, please contact Karen Greene or Stan Gorski at our Sandy Hook Field Office at (732) 872-3037.

Sincerely,

Peter Colosi, Jr.

Peter D. Colosi, Jr.
Assistant Regional Administrator
for Habitat Conservation

cc: NMFS NERO HCD – Kurkul, Mantzaris
NMFS NERO HCD - Gloucester, Sandy Hook, Annapolis
NMFS NERO PRD – Gloucester
NMFS, HQ - Bigford
NOAA-PPI – S. Kennedy
NOAA OCRM – R. Schnieder
FWS – Annapolis
EPA – Region III
MAFMC- T. Hoff
NEFMC - L. MacGee
VMRC- W. Pruitt

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**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY**
**REGION III**
**1650 Arch Street**
**Philadelphia, Pennsylvania 19103-2029**

June 30, 2006

Headquarters, U.S. Army Corps of Engineers
Attn: CECW-P (IP),
7701 Telegraph Road
Alexandria, VA. 22315-3860

**Re: Final Environmental Impact Statement (FEIS), Craney Island Eastward Expansion, Construction of a 580-acre Eastward Expansion of the Existing Dredged Material Management Area, Port of Hampton Roads, Norfolk Harbor and Channels, VA. CEQ # 20060219**

Dear Mr. Walters:

In accordance with the National Environmental Policy Act (NEPA), Section 309 of the Clean Air Act, Section 404 of the Clean Water Act (Section 404), and the Council on Environmental Quality (CEQ) regulations implementing NEPA (40 CFR 1500-1508), the U.S. Environmental Protection Agency (EPA) has reviewed the Final Environmental Impact Statement (FEIS) for the proposed 580-acre Craney Island Eastward Expansion of the Existing Dredged Material Management Area, and construction of a Port for Hampton Roads. The FEIS has been developed by the U.S. Army Corps f Engineers based on the Draft Environmental Impact Statement (DEIS) presented to the public and the regulatory agencies in November 2005.

The Craney Island Eastward Expansion is a proposed extension of the existing Craney Island Dredged Material Management Area (CIDMMA) and the development of a port container terminal. By expanding the CIDMMA, the project proponent's objectives are to extend the useful life of the dredged material management area as well as to build long term berthing and land side port facilities. Our comment letter of November, 2005 on the DEIS discussed the EPA's issues and concerns on the proposed project.

The FEIS has adequately assessed the affected environment and environmental consequences of this project; however, EPA continues to have concerns regarding the environmental impacts anticipated in the construction of the project. Our concerns are based primarily on the success of the mitigation in compensating for the environmental loss. As described in the mitigation plan developed for the FEIS, the mitigation was based on a habitat evaluation approach that assesses the functional productivity lost due to the projects impacts. This approach concluded that approximately 487 acres of

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mitigation made up of a mix of wetlands restoration and conservation, oyster reef restoration and sediment clean up and restoration would provide a large scale ecosystem benefit for the affected area. EPA was part of the mitigation committee and agrees that this plan goes a long way in mitigating for the lost environmental resources due to this project. To assure that the mitigation is successful EPA recommended in the comments to the DEIS that an adaptive management approach be implemented to assure the success of the mitigation plan. In the FEIS the Corps has agreed to this approach. We would further recommend that along with the VDEQ and VMRC that any other interested resource agency be invited to participate in the monitoring and adaptive management approach. In addition any approach that would increase the mitigation for this project would be strongly recommended. For example if the cost of sediment remediation could be lowered by allowing the sediment to be placed in the Craney Island expansion cell it should be pursued even though now prohibited by law. Furthermore in light of the enormous economic benefits that will be realized by the port the current mitigation costs are not unreasonable. Additional acres of conservation should be considered.

Our comments on the DEIS indicated our concern that the impacts due to the construction of the port facility portion of the project were not completely developed. We understand that additional NEPA documents will be prepared when more detail on the port development design is completed. This additional EIS will complete the impact assessment of this project and will further detail the issues that need to be addressed.

Thank you for the opportunity to participate in this study, and to provide comments and recommendations on the environmental issues of this project. We look forward to continued participation in this project.

Sincerely,

William Arguto
NEPA Team Leader

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June 29, 2006

Col. Yvonne Prettyman-Beck
District Engineer
US Army Corps of Engineers, Norfolk District
803 Front Street
Norfolk, VA 23510

**Re: Comments, Final Environmental Impact Statement and Feasibility Study, proposed Craney Island Dredged Material Management Area Eastward Expansion**

Dear Col. Prettyman,

On review of the Final EIS and Feasibility Study, The Elizabeth River Project reiterates our appreciation of the Corps of Engineers, Norfolk District, and Virginia Port Authority for their commitment to seeking win-win in the form of appropriate mitigation for the proposed Craney Island expansion, despite the challenges of addressing the largest potential impacts to the Elizabeth River in modern history. Col. Prettyman, as you leave the district, we underscore our appreciation for your personal leadership on this issue. We salute the degree of diverse stakeholder participation in the mitigation planning process was important and unprecedented.

As a result of more than three years of dialogue with stakeholder and technical experts from across the community, the final mitigation plan represents a dramatic improvement over earlier iterations. The plan incorporates a number of key recommendations that The Elizabeth River Project has advocated as essential to achieving appropriate mitigation. In fact, the plan represents one of the largest mitigation packages in history for the East Coast. **We continue to believe that, overall, the current plan offers the potential to achieve the win-win for the river and the economy that has been our long-held goal, offsetting the huge impacts with at least equally large environmental gains.**

**<u>Specific areas of the mitigation plan that we find encouraging include:</u>**

1) Most importantly, we are encouraged to see a significant amount of funds earmarked for sediment restoration, which we believe is the most appropriate way to offset the impacts. The plan proposes cleanup of all known toxic hot-spots in the sediments of the Southern Branch of the Elizabeth River, with the potential for significant ecological improvement to offset the losses in the impact area.

We do believe it is very important to provide an accurate representation of the science that supports this reliance on sediment cleanup in the mitigation plan. Your final report still underestimates the health of the river bottom at the impact site. Seven out of 11

monitoring stations in the impact area meet Chesapeake Bay Program goals for benthic, or bottom-life, health (Daniel M. Dauer, Old Dominion University, 2001-2005). These include some of the few scores within the entire Elizabeth River watershed which meet the bay goals set for the Benthic Index of Biological Integrity (B-IBI), which gauges benthic, or bottom-dwelling, community health (Daniel M. Dauer, Old Dominion University, 2001-2005). The B-IBI is a standardized, agreed upon assessment tool used throughout the Chesapeake Bay for characterizing the overall health of the benthic habitat. These scores indicate a higher species diversity and abundance, and a higher ecological value to the Elizabeth River system, than would be indicated by the (Lipicus and Seitz, 2002) bi-valve study which you reference (B. Mitigation Analysis, Project-Related Adverse Impacts, pages 6 & 7). In fact, the B-IBI studies would indicate the bottom-dwelling community in the impact area is some of the most valuable to the ecology of the Elizabeth River.

Sediment clean-up was recognized by the mitigation sub-committee as offering the "nearest in-kind relatedness" of all the mitigation options under consideration (table 3, Mitigation Option Weighting Factor Evaluation, p. 15 of your study). The in-kind relatedness of this mitigation option, now more clearly affirmed in your study, is the primary reason that The Elizabeth River Project recommends sediment clean-up as the most appropriate form of mitigation. We agree it is not practical to create 580 acres of new river bottom elsewhere on the system. Returning contaminated river bottom to ecological function through remediation efforts is the nearest in-kind replacement for what will be lost.

2) The Elizabeth River Project is also encouraged that the plan takes a landscape approach to achieve ecosystem benefits through placing sediment cleanup projects in near proximity to wetland and oyster reef projects, maximizing the potential cumulative habitat functions. The draft plan includes some large, promising wetland mitigation sites on the Southern Branch, which, coupled with the nearby sediment cleanups, strengthen the potential to off-set losses to the ecosystem at the site of impact.

3) The percent of the mitigation plan intended for oyster reefs strikes an appropriate balance between this still experimental, while promising, mitigation measure and other mitigation approaches.

**At the same time, given the importance of this mitigation plan for the future of the Elizabeth River, it appears that several issues, mentioned also in our review of your draft plan, still have not been addressed and <u>remain significant for achieving an appropriate mitigation plan</u>.**

1) As mentioned in our comments on your draft plan, The Elizabeth River Project believes it remains practical and appropriate to seek 1:1 mitigation, in acreage, of the 580 acres of river to be lost. As mentioned in previous discussions; assuming that your landscape approach does, in fact, provide ecological improvement for a total of 487 acres, as presented in your draft plan, a minimal cost of $10,000 per acre could achieve an additional 93 acres of mitigation in vegetated buffer adjacent to wetland restoration areas

(total estimated cost, $930,000). Replacement habitat for threatened/endangered bird species should be considered in these buffer areas, as the project area includes habitat of the federally threatened Piping Plover.

2) As recommended in comments on the draft plan, there remains a need to complete the investigation of the feasibility of some key sites and to maintain a list of alternative sites. We have noted in the Corps' response that an on-going list of sites is being maintained and that further feasibility investigations will be conducted as needed.

3) We reiterate concerns that mitigation does not appear to address the impacts of dredging 3.7 million cubic yards of Elizabeth River bottom to create an access channel to the port facility. While we agree that this does not convert shallow water habitat to deep water habitat, with lesser impacts, with maintenance dredging over time this habitat is unlikely to recover. As a result, the mitigation plan should address these losses, which we understand to equate to more than 120 acres not currently mitigated.

4) Regarding impacts during construction and impacts from on-going port operations, to elaborate on prior comments:

a) We are concerned to see that air emissions from terminal facilities and associated cargo ships are likely to result in long-term violations of air quality guidelines and are termed "potentially significant" in your study. In addition, the emissions from construction are "potentially significant" but short-term. We reiterate our strong recommendation that the Virginia Port Authority continue to pursue the maximum possible reductions in emissions through use of the latest and emerging technologies and equipment and alternative fuels. The Virginia Port Authority has voluntarily reduced emissions by 30 percent in its current port operations and should work stringently to continue to reduce emissions in the future. During construction of the facility, we continue to recommend state-of-the-art controls to limit impacts related to suspended sediments and dissolved oxygen during the construction of the cells, and monitoring of the same, as this activity will suspend a large amount of sediments.

3) In pursuing the oyster reefs:

a) As with wetland and sediment sites, it remains advisable to identify specific, potential habitat restoration areas in the Elizabeth River for oyster and/or clam restoration. One spot that should be considered is the sand flat immediately south of Amerada Hess and adjacent to the Elizabeth River Terminals wetland restoration site. This site would support a landscape approach. Other sites could include former Baylor grounds.
b) We reiterate that your draft plan may have under-estimated costs of 3-D oyster reef construction in the Elizabeth River (costs estimated at $100,000 per acre, p. 64, B. Mitigation Analysis). VA Marine Resources Commission's current estimate for construction costs, using shucking-house oysters, is $191,000 per

acre ($1.91 per bushel, with 100,000 bushels needed per acre), plus seeding costs.

4) The Elizabeth River Project reiterates support of the recommendation of the Cumulative Effects Assessment by Larry Canter (April 2004), p. 206, for the Corps to take the lead in "establishing a Hampton Roads Area Environmental Management Committee" to review monitoring information about the 17 referenced projects with related cumulative impacts, for the purposes of adaptive environmental management.

Please do not hesitate to call me or Marjorie Mayfield Jackson, Executive Director, with any questions you may have.

Sincerely,

Col. J.J. Thomas, USA, Ret.
Board President

# COMMONWEALTH of VIRGINIA

L. Preston Bryant, Jr.
Secretary of Natural Resources

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June 28, 2006

Headquarters
U.S. Army Corps of Engineers
CECW-P (SA)
7701 Telegraph Road
Alexandria, Virginia 22315

RE: Final EIS and Proposed Report of the Chief of Engineers, Craney Island Eastward Expansion, Hampton Roads, Virginia
DEQ-06-105F

Ladies and Gentlemen:

The Commonwealth of Virginia has completed its review of the above Final Environmental Impact Statement. The Department of Environmental Quality is responsible for coordinating Virginia's review of federal environmental documents prepared pursuant to the National Environmental Policy Act and responding to appropriate federal officials on behalf of the Commonwealth. In addition, DEQ's Office of Environmental Impact Review (this Office) coordinates Virginia's federal consistency reviews pursuant to the Coastal Zone Management Act. The following state agencies, regional planning district commission, and localities participated in this review:

Department of Environmental Quality (hereinafter "DEQ")
Department of Game and Inland Fisheries
Department of Conservation and Recreation
Department of Transportation
Department of Historic Resources
Hampton Roads Planning District Commission
City of Newport News
City of Portsmouth
City of Norfolk.

In addition, the Virginia Institute of Marine Science, the Marine Resources Commission, and the City of Hampton were invited to comment.

Our comments on the Final Environmental Impact Statement ("Final EIS") take into account our earlier review, last year, of the Draft EIS (DEQ-05-244F, comments mailed to the Corps of Engineers, Norfolk District on November 17, 2005).

Project Description

The Corps of Engineers and the Virginia Port Authority (the non-federal project sponsor) propose a 580-acre eastward expansion of the Craney Island Dredged Material Management Area, and to develop a container terminal thereon. The proposed expansion is located in the Port of Hampton Roads between Portsmouth and Norfolk. The Corps and the Port Authority propose to use the 580-acre expansion for a new dredged material placement cell, including a main dike and perimeter dikes, and then the Port Authority would construct a container terminal complex. (Final EIS, pages ES-6 and ES-7).

Environmental Impacts and Mitigation

*1. Natural Heritage Resources.* The Department of Conservation and Recreation has searched its Biotics Data System for occurrences of natural heritage resources in the project area. "Natural heritage resources" are defined as the habitat of rare, threatened, or endangered species of plants and animals, unique or exemplary natural communities, and significant geologic resources. The Department of Conservation and Recreation ("DCR") reports that there are natural heritage resources in the vicinity of the project. The following information reflects latest updates from the Biotics Data System, according to DCR (Bedwell/Ellis, 6/21/06).

*(a) Animal species.* (See also item 2(a)(i), below.) The piping plover, least tern, and black-necked stilt have been documented in the project vicinity.

*(i) Piping Plover.* The piping plover (*Charadrius melodus*) inhabits coastal areas, using the flat, sandy beaches of barrier islands for breeding. Threats to this species include predation of eggs and young, and the development and disturbance of barrier island breeding sites (Cross, 1991). The piping plover was last observed breeding on Craney Island in 1997; however, it is currently using the island for migration and foraging from early spring to late August.

The piping plover is listed as threatened by the U.S. Fish and Wildlife Service and the Virginia Department of Game and Inland Fisheries.

*(ii) Least Tern.* The least tern (*Sterna antillarum*) nests on broad, flat beaches with minimal vegetation, and forages in salt water near the shore. Threats to this species include loss of nesting habitat due to development and disturbance of breeding colonies by human activities and high numbers of predators (Beck, 1991).

The least tern is listed as a species of special concern by the Department of Game and Inland Fisheries.

*(iii) Black-necked Stilt.* The black-necked stilt (*Himantopus mexicanus*) occur primarily near shallow salt- or fresh-water bodies with soft muddy bottoms, including grassy marshes, wet savannas, mudflats, shallow ponds, flooded fields, and the borders of salt ponds. These birds nest along the shallow water of ponds, lakes, swamps, or lagoons and may nest on the ground or in shallow water on a plant tussock. Black-necked stilts feed on insects, crustaceans, and small fish as well as the seeds of aquatic plants.

*(b) Plant and Insect Species.* Under a memorandum of agreement between DCR and the Department of Agriculture and Consumer Services (VDACS), DCR represents VDACS in commenting on potential project impacts on state-listed threatened and endangered plant and insect species. The proposed eastward expansion and development of Craney Island will not affect any documented state-listed plants or insects, according to DCR.

*(c) Recommendations.* Because of the legal status of the piping plover, DCR recommends that the Corps of Engineers coordinate with the Fish and Wildlife Service and the Department of Game and Inland Fisheries to ensure compliance with the Endangered Species Act and state protected species legislation. See "Regulatory and Coordination Needs," item 1, below.

DCR also recommends that coordination with the Department of Game and Inland Fisheries be undertaken with regard to the Craney Island Bird Long-Term Management Plan contemplated as part of the proposed mitigation plan (see "Regulatory and Coordination Needs," item 1, below).

*2. Wildlife Resources.* The Department of Game and Inland Fisheries, as the Commonwealth's wildlife and freshwater fish management agency, exercises enforcement and regulatory jurisdiction over wildlife and freshwater fish, including state or federally listed endangered or threatened species, but excluding listed insects. The Department (hereinafter "DGIF") is a consulting agency under the U.S. Fish and Wildlife Coordination Act (16 U.S.C. sections 661 et seq.), and provides environmental analysis of projects or permit applications coordinated

through the Department of Environmental Quality and several other state and federal agencies. DGIF determines likely impacts upon fish and wildlife resources and habitat, and recommends appropriate measures to avoid, reduce, or compensate for those impacts.

*(a) Findings.*

*(i) Effects on Marine Mammals.* The Final EIS indicates that increases in vessel traffic attributable to this project are not likely to affect marine mammals listed by the state or federal governments as endangered or threatened (page IV-34, section IV.1.3.1.4). The Department of Game and Inland Fisheries disagrees with this conclusion. The increase in container ship operations in Virginia's coastal waters may adversely affect marine mammals. In the last several years, marine mammal vessel strikes have increased in these waters. These strikes have included two northern right whales (listed by federal and state governments as endangered) that sustained mortal injuries after colliding with vessels near the mouth of the Chesapeake Bay. Marine mammals are known to occur in Virginia's ocean and in-shore shipping channels, though their densities and temporal/spatial distributions remain largely unknown.

*(ii) Selected Mitigation Plan.* The Department of Game and Inland Fisheries supports the selected mitigation plan. See item 2(b), next.

*(b) Selected Mitigation Plan.* The selected mitigation plan consists of 20 acres of oyster reef restoration, 56 acres of wetland restoration, and 67 acres of bottom sediment clean-up that will result in 411 acres of bottom restoration. The wetland and oyster reef restoration includes a site at Ragged Island Wildlife Management Area. The mitigation plan also includes development of a Craney Island Bird Long-Term Management Plan.

*(c) Recommendations.*

*(i) Marine Mammal Protection.* The Department of Game and Inland Fisheries understands that the Port Authority is a member of the Northeast Implementation Team for the Recovery of the North Atlantic Right Whale (Final EIS, page IV-34). Accordingly, the Port Authority should address the issue of marine mammal mortality by assessing the spatial and temporal distribution and abundance of marine mammals in Virginia's nearshore and in-shore shipping channels. The Port Authority should also examine measures to minimize the potential for vessel strikes.

*(ii) Coordination.* The Corps, and/or the Port Authority, should coordinate activities at Ragged Island Wildlife Management Area with the Department of Game and Inland Fisheries. Similarly, the bird management plan should be coordinated. See "Regulatory and Coordination Needs," item 1, below.

*(d) Additional Wildlife Information.* DGIF maintains a data base of wildlife locations, including threatened and endangered species, trout streams, and anadromous fish waters, that may contain information not documented by DCR (item 1, above). Access to this data base may be obtained through the DGIF web site:

http://www.dgif.virginia.gov/wildlife/info_map/index.html

Questions on this web site may be addressed to the Department of Game and Inland Fisheries (Shirl Dresser, telephone (804) 367-6913).

3. *Air Quality.* DEQ's Division of Air Program coordination reiterated the guidance it provided in our comments on the Draft EIS. This guidance follows.

According to DEQ's Division of Air Program Coordination, Craney Island is in an ozone non-attainment area. For this reason, emissions of volatile organic compounds (VOCs) and oxides of nitrogen ($NO_x$) to project construction and operation should be kept to a minimum. VOCs and $NO_x$ are precursors to atmospheric ozone ($O_3$).

*(a) Open Burning.* If project activities include the burning of construction or demolition material, this activity must meet the requirements of the Regulations for open burning (9 VAC 5-40-5600 et seq.), and it may require a permit (see "Regulatory and Coordination Needs, item 3). The Regulations provide for, but do not require, the local adoption of a model ordinance concerning open burning. The Corps and the Port Authority should contact appropriate local officials to determine what local requirements, if any, exist. The model ordinance includes, but is not limited to, the following provisions:

- All reasonable effort shall be made to minimize the amount of material burned, with the number and size of the debris piles;
- The material to be burned shall consist of brush, stumps and similar debris waste and clean burning demolition material;
- The burning shall be at least 500 feet from any occupied building unless the occupants have given prior permission, other than a building located on the property on which the burning is conducted;
- The burning shall be conducted at the greatest distance practicable from

highways and air fields;

- The burning shall be attended at all times and conducted to ensure the best possible combustion with a minimum of smoke being produced;
- The burning shall not be allowed to smolder beyond the minimum period of time necessary for the destruction of the materials; and
- The burning shall be conducted only when the prevailing winds are away from any city, town or built-up area.

*(b) Fugitive Dust Control.* During construction, fugitive dust must be kept to a minimum by using control methods outlined in 9 VAC 5-50-60 et seq. of the Regulations for the Control and Abatement of Air Pollution. These precautions include, but are not limited to, the following:

- Use, where possible, of water or chemicals for dust control; Installation and use of hoods, fans, and fabric filters to enclose and vent the handling of dusty materials;
- Covering of open equipment for conveying materials; and
- Prompt removal of spilled or tracked dirt or other materials from paved streets and removal of dried sediments resulting from soil erosion.

*(c) Fuel-burning Machinery.* Fuel-burning machinery used in the expansion of Craney Island, the resulting construction of a shipping terminal, and the operation and maintenance of the terminal may require air pollution control permits from DEQ. See "Regulatory and Coordination Needs," item 3, below.

*4. Solid and Hazardous Waste Management.* DEQ's Waste Division has nothing to add to its comments on the Draft EIS. Those comments follow.

*(a) Finding.* The Waste Division performed a cursory review of its data files and determined that the Craney Island Dredged Material Management Area is listed by EPA as a small-quantity generator of hazardous wastes (SQG) under identification number VAR000006569. (The Draft EIS states that the area is a conditionally-exempt small-quantity generator of hazardous wastes; see page III-44). The following web site may be helpful in locating additional information for this identification number:

- http://www.epa.gov/echo/search_by_permit.html.

*(b) Guidance.* Any sediment suspected of contamination, or hazardous or solid wastes that are generated, transported, disposed, stored, or treated in Virginia must be tested and handled in accordance with applicable federal, state, and local laws and regulations. Dredge spoils, when managed in accordance

with requirements of the State Water Control Board or other Virginia agencies with similar authority, are conditionally exempt from the Virginia Solid Waste Management Regulations (9 VAC 20-80-60.E.), and are excluded from the waste barging regulations (9 VAC 20-170-10).

In addition, any storage, treatment, or disposal of hazardous wastes must be conducted in accordance with applicable state laws and regulations. These include, but are not limited to, the following:

- Virginia Waste Management Act (*Virginia Code* sections 10-1400 et seq.);
- Virginia Hazardous Waste Management Regulations (9 VAC 20-60);
- Virginia solid Waste Management Regulations (9 VAC 20-80); and
- Virginia Regulations for the Transportation of Hazardous Materials (9 VAC 20-110).

Applicable federal laws include, but are not limited to:

- Resource Conservation and Recovery Act (RCRA) (42 U.S.C. 6901 et seq.);
- U.S. Department of Transportation's Rules for Transportation of Hazardous Materials, 49 Code of Federal Regulations, Part 107.

*(c) Pollution Prevention.* DEQ encourages the Corps to implement pollution prevention principles, including the reduction of solid wastes at the source, re-use of materials, and recycling of waste materials.

*5. Water Quality and Wetlands.*

*(a) Project Impacts and Documentation.* DEQ's Tidewater Regional Office states that the project will involve significant impacts to surface waters and wetlands. The Joint Federal-State Permit Application ("JPA") should document that these impacts have been avoided and minimized to the maximum extent practicable, and that remaining unavoidable impacts have been properly compensated. The JPA should be completed and submitted prior to the beginning of work on the project; see "Regulatory and Coordination Needs," item 2, below.

*(b) Mitigation Plan.* While the mitigation plan in the Final EIS represents the consensus of a diverse group of stakeholders, it is not sufficiently detailed for regulatory purposes. Significantly more detail will be required for each component of the plan, and adjustments to the plan may be required depending on the nature of the details presented. See "Regulatory and Coordination Needs," item 2, below.

*(c) The Document.* In its comments on the Draft EIS, DEQ's Tidewater Regional Office questioned the use of the term "negligible impacts" in Table II-2 (Draft EIS, page II-27). The "Response to Comments" section of the Final EIS (Appendix K, CD version) indicates that table II-3 has been revised to reflect "minor" impacts. However, this change does not appear to be reflected in that table in the Final EIS (Final EIS, Table II-3, pages 2-29 through 2-32). In addition, the footnoted legend has been omitted from the Final EIS. As the only link between Table II-2 (criteria, pages II-27 and II-28) and Table II-3 (impacts), the legend should be an integral part of both tables.

*6. Historic Structures and Archaeological Resources.* The Department of Historic Resources expects to continue its direct consultation with the Corps of Engineers, pursuant to section 106 of the National Historic Preservation Act.

*7. Road Transportation.* In its response to the Draft EIS, the Department of Transportation ("VDOT") indicated that the proposed project would not affect the local road and highway network, but that the project might be affected by planned road projects such as the "Third Crossing" with its connection through the Craney Island Expansion to Route 164 (Western Highway). VDOT has no additional comments.

*8. Natural Area Preserves.* According to the Department of Conservation and Recreation, there are no state Natural Area Preserves in the vicinity of the project.

*9. Local and Regional Comments.*

*(a) Hampton Roads Planning District Commission.* The Commission finds, on the basis of its consultation with the Cities of Hampton, Newport News, Norfolk, and Portsmouth, that the proposed project is generally consistent with local and regional plans and policies. The project would be advantageous to the continued economic development of the region and the state. The Commission staff indicates that the proposed mitigation plan appears adequate to compensate for the environmental impacts of the project (see also "Environmental Impacts and Mitigation," items 2(b) and 5(b), above).

*(b) Individual Cities.* The City of Newport News supports the recommended plan in the Final EIS, because expansion of the dredged material spoil capacity of Craney Island is critical to keeping navigation routes open for the Navy and commercial shipping. Development of the project will also provide money for the Third Crossing of Hampton Roads Harbor (see item 8, above).

According to the City of Portsmouth, the project will require a permit from the Portsmouth Wetlands Board. The permit may require an on-site mitigation plan.

The City of Norfolk has no comments on the Final EIS (Ballard/Ellis, 6/26/06).

Federal Consistency under the Coastal Zone Management Act

Pursuant to the Coastal Zone Management Act of 1972, as amended, federal activities taking place inside or outside of Virginia's designated coastal management area that can have reasonably foreseeable effects on coastal resources or coastal uses must, to the maximum extent practicable, be implemented in a manner consistent with the Virginia Coastal Resources Management Program (VCP). The VCP consists of a network of programs administered by several agencies. The DEQ coordinates the review of federal consistency determinations with agencies administering the Enforceable and Advisory Policies of the VCP.

Based on the information submitted and the comments of reviewing agencies, we concur that the proposed eastward expansion of Craney Island is consistent with the Virginia Coastal Resources Management Program, **provided** that the Corps, the Port Authority, and their contractors obtain all approvals not yet secured that are applicable to the enforceable policies, and adhere to all the conditions of the Virginia Water Protection Permit, the Marine Resources Commission Permit (if that is required), and carry out the subsequent development consistently with the Chesapeake Bay Preservation Act (*Virginia* Code sections 10.1-2100 et seq.). In accordance with the Federal Consistency Regulations at 15 CFR Part 930, section 930.4, this conditional concurrence is based on the Corps, the Port Authority, and their contractors obtaining necessary authorizations prior to any ground disturbance. If the requirements of section 930.4, sub-paragraphs (a) through (a)(3) are not met, this conditional concurrence becomes an objection under 15 CFR Part 930, section 940.43.

*1. Wetlands Management.* According to DEQ's Tidewater Regional Office, the project will be consistent with the wetlands management enforceable policy of the Virginia Coastal Resources Management Program if a Virginia Water Protection Permit is issued and complied with, and if all required compensatory mitigation is provided.

*2. Subaqueous Lands Management.* As stated in our comments on the Draft EIS, the project will require a permit from the Marine Resources Commission unless there is a legal or regulatory exemption, and compliance with that permit will be necessary for consistency of the project with this component of the Enforceable Policies.

*3. Coastal Lands Management.* As indicated in our comments on the Draft EIS, the eastward expansion of Craney Island takes place on open water that is not under the jurisdiction of the Chesapeake Bay Preservation Act (*Virginia Code* sections 10.1-2100 et seq.) or the Chesapeake Bay Preservation Area Designation and Management Regulations (9 VAC 10-20-10 et seq.) which implement the Act. However, subsequent development of the 580-acre expansion must be consistent with the Act and the Regulations. Specifically, development of the marine terminal facility must be consistent with the stormwater management criteria that meet the water quality protection provisions of the Virginia Stormwater Management Regulations (4 VAC 3-20 et seq.; see 4 VAC 3-20-71). In addition, for land disturbance of 2,500 square feet or more, the development of the terminal must comply with the Virginia Erosion and Sediment Control Regulations and the *Erosion and Sediment Control Handbook* (third edition, 1992).

Regulatory and Coordination Needs

*1. Wildlife Resources Protection.* Any activities at Ragged Island Wildlife Management Area should be coordinated with the Department of Game and Inland Fisheries (Glen Askins, Regional Wildlife Manager, telephone (804) 843-5966). The bird management plan should be coordinated with the Department as well (Ruth Boettcher, Eastern Shore Biologist, telephone (757) 787-5911); the Department of Conservation and Recreation concurs in this recommendation.

The Corps should also coordinate with the Department of Game and Inland Fisheries (above) and with the U.S. Fish and Wildlife Service (Karen Mayne, Virginia Field Office Supervisor, telephone (804) 698-6694) concerning protection of the piping plover, a threatened species (see "Environmental Impacts and Mitigation," item 1(a)(i), above).

2. *Water and Wetland Permitting.* The Corps and the Virginia Port Authority should prepare and submit Joint Permit Applications covering the eastward expansion of Craney Island, as well as for the proposed terminal development thereon. The JPAs should be submitted to the Marine Resources Commission (2600 Washington Avenue, Newport News, Virginia 23607), which will distribute copies of it to appropriate regulatory agencies including DEQ's Tidewater Regional Office, the Portsmouth Wetlands Board, the Corps Regulatory Branch if appropriate, and the Commission itself. As indicated above ("Environmental Impacts and Mitigation," item 5), the JPA should be accompanied by a more detailed mitigation plan. Questions on this point may be directed to DEQ's Tidewater Regional Office (Bert Parolari, telephone (757) 518-2166). Questions on the joint permitting process may be directed to the Marine Resources Commission (Tony Watkinson, telephone 247-2200).

3. *Air Quality Regulation.* As indicated above ("Environmental Impacts and Mitigation," item 3(a)), any open burning contemplated in connection with the project may require an open burning permit from DEQ. Similarly, fuel-burning equipment may require air pollution control permits from DEQ. Questions on both types of permitting requirements should be directed to DEQ's Tidewater Regional Office (Jane Workman, Air Permits Manager, telephone (757) 518-2112).

Thank you for the opportunity to review the Final EIS. If you have questions, please feel free to contact me (telephone (804) 698-4325) or Charles Ellis of this Office (telephone (804) 698-4488).

Sincerely,

Ellie L. Irons
Program Manager
Office of Environmental Impact Review

Enclosures

cc: (next page)

cc: Andrew K. Zadnik, DGIF
Scott A. Bedwell, DCR
Paul W. Kohler, DEQ-Waste
Kotur S. Narasimhan, DEQ-Air
Bert W. Parolari, Jr., DEQ-TRO
Mary T. Stanley, VDOT
Roger W. Kirchen, DHR
David L. O'Brien, VIMS
Alice R. T. Baird, DCR-DCBLA
John M. Carlock, Hampton Roads PDC
Randy W. Hildebrandt, City of Newport News
Amy Crum, City of Portsmouth
James Freas, City of Hampton
Brian Ballard, City of Norfolk
Mark T. Mansfield, ACOE
Lee Ware, ACOE

## Ellis,Charles

**From:** Andrew Zadnik [Andrew.Zadnik@dgif.virginia.gov]
**Sent:** Wednesday, June 07, 2006 9:23 AM
**To:** Ellis,Charles
**Cc:** nhreview@dcr.virginia.gov; Askins Glen.DGIF_Williamsburg.CCMail_DM@dgif.state.va.us; John Kleopfer; Ruth Boettcher
**Subject:** 05-105F_ESSLOG 19857_Craney Island Expansion_Final EIS

Charlie,

Here are some comments on the Final EIS for this project. Glen, Ruth, and JD, please let me know if you have any additional comments. Thanks.

We have reviewed the Final EIS for this project and offer the following comments. We previously provided comments on the Draft EIS on Oct. 20, 2005 and Nov. 2, 2005.

This project involves a proposed 580-ac eastward expansion and development of a container terminal at the Craney Island Dredged Material Management Area (Craney Island). Adverse impacts will include the loss of approximately 580 ac of open water and benthic habitat. We understand that no vegetated wetlands will be adversely impacted during the expansion or terminal construction.

The Final EIS states (Page IV-34) that this project is not likely to affect listed marine mammals. We disagree with this conclusion. We remain concerned that the increase in container ships operating in Virginia's coastal waters, as a result of this project, may result in adverse impacts upon marine mammals. Over the last several years, marine mammal vessel strikes have increased in Virginia's coastal waters. This has included two Federal/State Endangered northern right whales that sustained mortal injuries after colliding with vessels near the mouth of Chesapeake Bay. Marine mammals are known to occur in Virginia's ocean and inshore shipping channels, though their densities and temporal/spatial distribution in these waters remain largely unknown. We understand that the Virginia Port Authority (VPA) is a member of the Northeast Implementation Team for the Recovery of the North Atlantic Right Whale (Page IV-34 ). Therefore, we recommend that the VPA address the issue of potential marine mammal mortality by assessing the spatial and temporal distribution and abundance of marine mammals in Virginia's nearshore and inshore shipping channels. The VPA also should examine measures to minimize the potential for vessel strikes.

The selected mitigation plan for this project consists of 20 ac of oyster reef restoration, 56 ac of wetland restoration, and 67 ac of bottom sediment cleanup that will result in 411 ac of bottom restoration. The wetland/oyster reef restoration includes a site at Ragged Island Wildlife Management Area. Development of a Craney Island Bird Long-term Management Plan also is included.

We support the overall mitigation plan. We recommend strict monitoring of all mitigation sites. To assess the functional value of the mitigation, we recommend developing measurable success criteria, including biological (vegetation, benthos, fishery, wildlife) components. Any activities at Ragged Island Wildlife Management Area should be coordinated with this department (contact: Glen Askins, Regional Wildlife Manager, 804-843-5966). The bird management plan should be coordinated with DGIF Eastern Shore Biologist Ruth Boettcher (757-787-5911).

Thank you,

Andrew K. Zadnik
Environmental Services Section Biologist
Department of Game and Inland Fisheries
4010 West Broad Street
Richmond, VA 23230

(804) 367-2733
(804) 367-2427 (fax)

L. Preston Bryant, Jr.
Secretary of Natural Resources

Joseph H. Maroon
Director

# COMMONWEALTH of VIRGINIA

## DEPARTMENT OF CONSERVATION AND RECREATION

203 Governor Street, Suite 326
Richmond, Virginia 23219-2010
(804) 786-2556 FAX (804) 371-7899

## MEMORANDUM

DATE: June 20, 2006

TO: Mr. Charles H. Ellis, III
Department of Environmental Quality
Office of Environmental Impact Review
629 East Main Street, Sixth Floor
Richmond, Va. 23219
chellis@deq.state.va.us
(804) 698-4488

FROM: Robert Munson, Planning Bureau Manager
Virginia Department of Conservation and Recreation

SUBJECT: DEQ-05-105F Craney Island Eastward Expansion

The Department of Conservation and Recreation's Division of Natural Heritage (DCR) has searched its Biotics Data System for occurrences of natural heritage resources from the area outlined on the submitted map. Natural heritage resources are defined as the habitat of rare, threatened, or endangered plant and animal species, unique or exemplary natural communities, and significant geologic formations.

According to the information currently in our files, the Piping Plover (*Charadrius melodus*, G3/S2B,S1N/LT/LT), Least Tern (*Sterna antillarum*, G4/S2B/NL/SC), and Black-necked Stilt (*Himantopus mexicanus*, G5/S1B/NL/NL) have been documented in the project vicinity.

The Piping Plover inhabits coastal areas, utilizing the flat, sandy beaches of barrier islands for breeding. Threats to this species include predation of eggs and young and the development and disturbance of barrier island breeding sites (Cross, 1991). The Piping Plover was last observed breeding on Craney Island in 1997. However it is currently using the island for migration and foraging from early spring to late August. Please note that this species is listed as threatened by the United States Fish and Wildlife Service (USFWS) and the Virginia Department of Game and Inland Fisheries (VDGIF).

The Least Tern nests on broad, flat beaches with minimal vegetation and forages in saltwater near the shore. Threats to this species include loss of nesting habitat due to development and

disturbance of breeding colonies by human activities and high numbers of predators (Beck, 1991). Please note that the Least Tern is listed as a special concern species by VDGIF.

Black-necked Stilts primarily occur near shallow salt or fresh water bodies with soft muddy bottoms, including grassy marshes, wet savannas, mudflats, shallow ponds, flooded fields, and the borders of salt ponds. They nest along the shallow water of ponds, lakes, swamps, or lagoons and may nest on the ground or in the shallow water on a plant tussock. Black-necked Stilts feed on insects, crustaceans, and small fish, as well as the seeds of aquatic plants.

Due to the legal status of the piping plover, DCR recommends continued coordination with USFWS and VDGIF to ensure compliance with protected species legislation. In addition, DCR recommends the Craney Island Bird Long-Term Management Plan be coordinated with VDGIF Eastern Shore Biologist Ruth Boettcher and avoidance of the nesting sites for the Least Tern (April 15-August 1) and Black-necked Stilt (April 15-July 15).

Our files do not indicate the presence of any State Natural Area Preserves under DCR's jurisdiction in the project vicinity.

Under a Memorandum of Agreement established between the Virginia Department of Agriculture and Consumer Services (VDACS) and the Virginia Department of Conservation and Recreation (DCR), DCR represents VDACS in comments regarding potential impacts on state-listed threatened and endangered plant and insect species. The current activity will not affect any documented state-listed plants or insects.

Any absence of data may indicate that the project area has not been surveyed, rather than confirm that the area lacks natural heritage resources. New and updated information is continually added to Biotics. Please contact DCR for an update on this natural heritage information if a significant amount of time passes before it is utilized.

The Virginia Department of Game and Inland Fisheries maintains a database of wildlife locations, including threatened and endangered species, trout streams, and anadromous fish waters that may contain information not documented in this letter. Their database may be accessed from www.dgif.virginia.gov/wildlife/info_map/index.html, or contact Shirl Dressler at 804-367-6913.

DCR's Division of Chesapeake Bay Local Assistance has reviewed the proposed Craney Island Eastward Expansion Environmental Impact Statement and offers the following comments with respect to the Chesapeake Bay Preservation Act & Regulations:

The eastward expansion of Craney Island through construction of a new dredged material placement cell including a main dike and perimeter dikes takes place on marine bottom and open water that is not under the jurisdiction of the *Chesapeake Bay Preservation Act & Regulations*. However, subsequent development of the 580-acre cell for a container terminal complex will require consistency with the *Chesapeake Bay Preservation Act & Regulations*. The development of the facility will have to comply with the Stormwater management criteria consistent with water quality protection provisions (§4 VAC 3-20-71 et seq.) of the *Virginia Stormwater*

*Management Regulations* (§ 4 VAC 3-20), and for land disturbance over 2,500 square feet, the project must comply with the requirements of the *Virginia Erosion & Sediment Control Handbook*, Third Edition, 1992.

Thank you for the opportunity to comment on this project.

Sincerely,

Robert S. Munson
Planning Bureau Manager

cc: Eric Davis, USFWS
Andy Zadnik, VDGIF

## Literature Cited

Beck, R. A. 1991. Least Tern. In Virginia's Endangered Species: Proceedings of a Symposium. K. Terwilliger ed. The McDonald and Woodward Publishing Company, Blacksburg, Virginia. pp. 505-506.

Cross, R.R. 1991. Piping Plover. In Virginia's Endangered Species: Proceedings of a Symposium. K. Terwilliger ed. The McDonald and Woodward Publishing Company, ***Blacksburg, Virginia. pp. 501-502.***

If you cannot meet the deadline, please notify CHARLIE ELLIS at 804/698-4488 prior to the date given. Arrangements will be made to extend the date for your review if possible. An agency will not be considered to have reviewed a document if no comments are received (or contact is made) within the period specified.

REVIEW INSTRUCTIONS:

A. Please review the document carefully. If the proposal has been reviewed earlier (i.e. if the document is a federal Final EIS or a state supplement), please consider whether your earlier comments have been adequately addressed.

B. Prepare your agency's comments in a form which would be acceptable for responding directly to a project proponent agency.

C. Use your agency stationery or the space below for your comments. **IF YOU USE THE SPACE BELOW, THE FORM MUST BE SIGNED AND DATED.**

Please return your comments to:

**MR.CHARLES H. ELLIS III**
**DEPARTMENT OF ENVIRONMENTAL QUALITY**
**OFFICE OF ENVIRONMENTAL IMPACT REVIEW**
**629 EAST MAIN STREET, SIXTH FLOOR**
**RICHMOND, VA 23219**
**FAX #804/698-4319**

Charles H. Ellis III
**CHARLES H. ELLIS III**
**ENVIRONMENTAL PROGRAM PLANNER**

COMMENTS

We have reviewed the document and find no changes to the comments that were made to the initial document.

(signed) R. W. Kable (date) 6/5/06
(title) DEQ Env Waste Division Review Coordinator
(agency) VDEQ

**PROJECT # 05-105F** 8/98

# DEPARTMENT OF ENVIRONMENTAL QUALITY
## DIVISION OF AIR PROGRAM COORDINATION

## ENVIRONMENTAL REVIEW COMMENTS APPLICABLE TO AIR QUALITY

**TO: Charles H. Ellis III** **DEQ - OEIA PROJECT NUMBER: 05 – 105F**

RECEIVED
JUN 09 2006
DEQ-Office of Environmental Impact Review

**PROJECT TYPE:** ☐ STATE EA / EIR / FONSI **X FEDERAL EA / EIS** ☐ SCC

☐ CONSISTENCY DETERMINATION/CERTIFICATION

**PROJECT TITLE: CRANEY ISLAND EASTWARD EXPANSION**

**PROJECT SPONSOR: DOD / DEPARTMENT OF THE ARMY / ARMY CORPS OF ENGINEERS**

**PROJECT LOCATION: X OZONE NON ATTAINMENT AREA**

**REGULATORY REQUIREMENTSMAY BE APPLICABLE TO:** X **CONSTRUCTION**
☐ OPERATION

**STATE AIR POLLUTION CONTROL BOARD REGULATIONS THAT MAY APPLY:**

1. ☐ 9 VAC 5-40-5200 C & 9 VAC 5-40-5220 E – STAGE I
2. ☐ 9 VAC 5-40-5200 C & 9 VAC 5-40-5220 F – STAGE II Vapor Recovery
3. ☐ 9 VAC 5-40-5490 et seq. – Asphalt Paving operations
4. **X 9 VAC 5-40-5600 et seq. – Open Burning**
5. **X 9 VAC 5-50-60 et seq. Fugitive Dust Emissions**
6. ☐ 9 VAC 5-50-130 et seq. - Odorous Emissions; Applicable to_____
7. ☐ 9 VAC 5-50-160 et seq. – Standards of Performance for Toxic Pollutants
8. ☐ 9 VAC 5-50-400 Subpart_____, Standards of Performance for New Stationary Sources, designates standards of performance for the_____
9. ☐ 9 VAC 5-80-10 et seq. of the regulations – Permits for Stationary Sources
10. ☐ 9 VAC 5-80-1700 et seq. Of the regulations – Major or Modified Sources located in PSD areas. This rule may be applicable to the _____
11. ☐ 9 VAC 5-80-2000 et seq. of the regulations – New and modified sources located in non-attainment areas
12. ☐ 9 VAC 5-80-800 et seq. Of the regulations – Operating Permits and exemptions. This rule may be applicable to _____

**COMMENTS SPECIFIC TO THE PROJECT:**

**Being in an area of ozone non-attainment, all precautions are necessary to restrict the emissions of volatile organic compounds (VOC) and oxides of nitrogen (NOx) during implementation.**

K. S. Narasimhan

**(Kotur S. Narasimhan)**
**Office of Air Data Analysis**

**DATE: June 9, 2006**

**Ellis,Charles**

**From:** Winer,Harold
**Sent:** Tuesday, June 13, 2006 8:02 AM
**To:** Ellis,Charles
**Cc:** Parolari,Bert
**Subject:** EIR #06-105F, Craney Island Eastward Expansion

As requested, TRO staff has reviewed the supplied information and has the following comments:

**Regarding VWP issues,** as we noted in our review of the Draft EIS for this project in November of 2005 (comments 11/2/05), this proposed project will clearly involve significant impacts to surface waters, including wetlands. As such, a Joint Permit Application (JPA) documenting that impacts to these areas have been avoided and minimized to the maximum extent practicable and that remaining unavoidable impacts have been properly compensated should be prepared and submitted to DEQ and other state/local regulatory bodies for review and authorization prior to commencing work. Provided that a Virginia Water Protection Permit is issued and complied with and that all required compensatory mitigation is provided, the project should be consistent with the requirements of this program. It should also be noted that while the mitigation plan presented in this document represents a consensus of a diverse group of stakeholders, it is not sufficiently detailed for regulatory purposes. Significantly more detail will be required for each discrete component of the plan as a part of the VWP permitting process. Depending on the nature of the details presented, adjustments to the plan may be required.

Also, in response to our earlier comments on the Draft EIS, Appendix K (Response to Comments) of the final EIS indicates that Table II-3 has been revised to reflect "minor" impacts to hydrology/water quality instead of "negligible" as defined in Table II-2 with respect to the three eastward expansion alternatives. This change does not appear to be reflected in the referenced table. Moreover, the footnoted legend at the bottom of each page of this table indicating what the numerical ratings represent has been omitted from the final document. Since this legend is the only link between Table II-2 (criteria) and Table II-3 (impacts), it should be an integral part of the table(s).

ıanks for the opportunity to comment.

Harold J. Winer
Deputy Regional Director
Virginia DEQ, Tidewater Regional Office
Phone: 757-518-2153/Fax: 757-518-2003
Email: hjwiner@deq.virginia.gov

**Ellis,Charles**

---

**From:** Stanley, Mary T. [Mary.Stanley@VDOT.Virginia.gov]
**Sent:** Wednesday, June 14, 2006 7:43 AM
**To:** Ellis,Charles
**Subject:** RE: comments on Final EIS for Craney Island Eastward Expansion (DEQ-06-105F)

Charlie,

We received the Final with a cover letter form the Army - no cover letter from DEQ. We responded to the draft in October. There are no additional comments.

---

**From:** Ellis,Charles [mailto:chellis@deq.virginia.gov]
**Sent:** Tuesday, June 13, 2006 1:17 PM
**To:** Scott Bedwell; Stanley, Mary T.; Tony Watkinson; Roger Kirchen; David O'Brien; Alice Baird; Goetz, Greg
**Subject:** comments on Final EIS for Craney Island Eastward Expansion (DEQ-06-105F)

Everybody - I need your comments on this project when you get a chance. Thanks very much.

Charlie

If you cannot meet the deadline, please notify CHARLIE ELLIS at 804/698-4488 prior to the date given. Arrangements will be made to extend the date for your review if possible. An agency will not be considered to have reviewed a document if no comments are received (or contact is made) within the period specified.

REVIEW INSTRUCTIONS:

A. Please review the document carefully. If the proposal has been reviewed earlier (i.e. if the document is a federal Final EIS or a state supplement), please consider whether your earlier comments have been adequately addressed.

B. Prepare your agency's comments in a form which would be acceptable for responding directly to a project proponent agency.

C. Use your agency stationery or the space below for your comments. **IF YOU USE THE SPACE BELOW, THE FORM MUST BE SIGNED AND DATED.**

Please return your comments to:

→ MR.CHARLES H. ELLIS III
DEPARTMENT OF ENVIRONMENTAL QUALITY
OFFICE OF ENVIRONMENTAL IMPACT REVIEW
629 EAST MAIN STREET, SIXTH FLOOR
RICHMOND, VA 23219
FAX #804/698-4319

Charles H. Ellis III
CHARLES H. ELLIS III
ENVIRONMENTAL PROGRAM PLANNER

COMMENTS

**Pursuant Section 106 of the National Historic Preservation Act, we have received directly from the Corps the Final EIS for comment. We will continue consultation with and provide our comments directly to the Corps. Thank you for requesting our comment through DEQ's OEIR.**

(signed) [signature] (date) 6/13/06

(title) ARCHAEOLOGIST

(agency) DHR (FILE # 2004-1428)

PROJECT # 05-105F 8/98

HAMPTON ROADS
PLANNING DISTRICT COMMISSION

JEANNE ZEIDLER, CHAIR • PAUL D. FRAIM, VICE CHAIRMAN • JAMES O. McREYNOLDS, TREASURER
ARTHUR L. COLLINS, EXECUTIVE DIRECTOR/SECRETARY

CHESAPEAKE
Clarence V. Cuffee, *City Manager*
Amar Dwarkanath, *Deputy City Manager*
Dalton S. Edge, *Mayor*
W. Joe Newman, *Council Member*
Debbie Ritter, *Council Member*

FRANKLIN
Marks S. Fetherolf, *Council Member*
Rowland L. Taylor, *City Manager*

GLOUCESTER COUNTY
John J. Adams, Sr., *Board Member*
Williams H. Whitley, *County Administrator*

HAMPTON
Randall A. Gilliland, *Council Member*
Ross A. Kearney, II, *Mayor*
Jesse T. Wallace, Jr., *City Manager*

ISLE OF WIGHT COUNTY
W. Douglas Caskey, *County Administrator*
Stan D. Clark, Vice Chairman

JAMES CITY COUNTY
Bruce C. Goodson, *Chairman*
Sanford B. Wanner, *County Administrator*

NEWPORT NEWS
Charles C. Allen, *Vice Mayor*
Joe S. Frank, *Mayor*
Randy W. Hildebrandt, *City Manager*

NORFOLK
Paul D. Fraim, *Mayor*
Donald L. Williams, *Council Member*
Regina V.K. Williams, *City Manager*
Barclay C. Winn, *Council Member*
W. Randy Wright, *Council Member*

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Peter W. Schmidt, *Council Member*
James K. Spore, *City Manager*

WILLIAMSBURG
Jackson C. Tuttle, II, *City Manager*
Jeanne Zeidler, *Mayor*

YORK COUNTY
James O. McReynolds, *County Administrator*
Thomas G. Shepperd, Jr., *Board Member*

June 15, 2006

RECEIVED
JUN 19 2006
DEQ-Office of Environmental Impact Review

Headquarters, U.S. Army Corps of Engineers.
ATTN: CECW-P (IP)
7701 Telegraph Road
Alexandria, VA 22315-3860

Re: Craney Island Eastward Expansion, DEQ# 05-105F
(THY: Craney Island)

Dear Sir or Madam:

Pursuant to your request of May 17, 2006, the staff of the Hampton Roads Planning District Commission has reviewed the Final Environmental Impact Statement and Final Feasibility Report for the Craney Island Expansion, Norfolk Harbor and Channels, Virginia. We have contacted the cities of Hampton, Newport News, Norfolk, and Portsmouth regarding this project.

Based on this review, it appears that the proposal is generally consistent with local and regional plans and policies. The staff of the Hampton Roads Planning District Commission continues to view the Eastward Expansion and associated terminal development as advantageous to the continued economic development of the Hampton Roads region and the Commonwealth of Virginia. A previous letter of support, sent to the Army Corps of Engineers and dated October 27, 2005, outlines the potential benefits of the project.

As is to be expected from a project of this magnitude, adverse environmental impacts will result from both project construction and operation. The comprehensive mitigation plan, which has been developed to address the anticipated impacts, appears to provide adequate compensation for those impacts.

The City of Portsmouth emphasizes the need for a wetland permit as a part of this project. On site mitigation is preferred, when possible.

We appreciate the opportunity to review and comment on this important project. If you have any questions, please do not hesitate to call.

Sincerely,

Arthur L. Collins
Executive Director/Secretary

LMW/kg

Copy: Mr. James Freas, HA
Ms. Kathy James-Webb, NN
Mr. Brian Ballard, NO
Ms. Amy Crum, PO
[redacted]

# City of Newport News

Virginia 23607

2400 Washington Avenue
(757) 926-8411
Fax (757) 926-3503

Office Of The City Manager

June 2, 2006

RECEIVED
JUN 07 2006
DEQ-Office of Environmental Impact Review

Mr. Charles Ellis, III
Office of Environmental Impact Review
Virginia Department of Environmental Quality
629 East Main Street, Suite 644
Richmond, VA 23219

Dear Mr. Ellis:

The Department of Planning has reviewed the Final Feasibility Report and Environmental Impact Statement for the Craney Island Eastward Expansion. As stated previously in our review of the drafts, we have no objection to the project and favor the recommended plan supported by the Virginia Port Authority and the Army Corps of Engineers.

Increasing the dredge spoil capacity of Craney Island is critical to keep our navigation routes open for the Navy and commercial shipping. The expansion of the port facilities as part of this expansion will permit the larger vessels used for container shipping to dock at a state owned port facility. In addition, development of this project will give the region a necessary ingredient to fund the Third Crossing of Hampton Roads Harbor.

Thank you for this opportunity to comment on the Final Feasibility Report and Environmental Impact Statement for the Craney Island Eastward Expansion Study.

Sincerely,

Randy W. Hildebrandt
City Manager

RWH:kej
P:\Plan05-06\Env.Impact Review Comments\Final EIS Craney Island Eastward Expansion

Copy to: Assistant City Manager, NAM
Director of Planning

## Ellis,Charles

**From:** Ballard, Brian [Brian.Ballard@norfolk.gov]
**Sent:** Monday, June 26, 2006 10:28 AM
**To:** Ellis,Charles
**Subject:** RE: comments on Final EIS for Craney Island Eastward Expansion (DEQ-06-105F)

Charlie –

In regards to Greg's comment from below - I am the EIS point of contact for the City of Norfolk which I believe I am already listed as such in your EIS contact list.

In regards to the City's comments for the Final EIA for the Craney Island Eastward Expansion - we have no additional comments.

Thanks-
Brian

**Brian Ballard**, AICP
Senior Planner
City of Norfolk Planning Dept.
Bureau of Environmental Services
508 City Hall Building
Norfolk, VA 23510

**P:** 757.664.4751
**F:** 757.664.4370

http://www.norfolk.gov/

-----Original Message-----
**From:** Goetz, Greg [mailto:ggoetz@hampton.gov]
**Sent:** Tuesday, June 20, 2006 10:00 AM
**To:** Ellis,Charles; Tony Watkinson; David O'Brien; Ballard, Brian
**Subject:** RE: comments on Final EIS for Craney Island Eastward Expansion (DEQ-06-105F)

Charles, please update your contact information for the city of Hampton. Brian Ballard and I are not involved in EIS reviews; in fact, Brian no longer works for the city of Hampton. Please contact the Hampton Planning Dept. for correct point of contact information. I recommend that you speak with Mr. James Freas (757-728-5233; jfreas@hampton.gov ), City Planner or Mr. Keith Cannady (757-728-5239; kcannady@hampton.gov) Chief Planner.
Thank you,
Greg Goetz

---

**From:** Ellis,Charles [mailto:chellis@deq.virginia.gov]
**Sent:** Tuesday, June 20, 2006 8:34 AM
**To:** Tony Watkinson; David O'Brien; Ballard, Brian; Goetz, Greg
**Subject:** comments on Final EIS for Craney Island Eastward Expansion (DEQ-06-105F)

Everybody – I need your comments on this Final EIS if you have any. Thanks very much.

Charlie Ellis
DEQ, Office of Envieonmental Impact Review
June 20, 2006

**Ellis,Charles**

---

**From:** Crum, Amy [CrumA@portsmouthva.gov]
**Sent:** Thursday, June 15, 2006 10:22 AM
**To:** Ellis,Charles
**Subject:** Craney Island Expansion Project

Mr. Ellis,

I am the Wetlands Board Secretary for the City of Portsmouth. My only comment on the Craney Island Expansion Project is that it will require a JPA and wetlands permit with a mitigation plan (preferably onsite).

Thank you,

Amy Crum, Senior Planner
Department of Planning
801 Crawford Street
Portsmouth, VA 23704
757-393-8836 ext 4213
cruma@portsmouthva.gov

# COMMONWEALTH of VIRGINIA

L. Preston Bryant, Jr.
Secretary of Natural Resources

**Department of Historic Resources**
2801 Kensington Avenue, Richmond, Virginia 23221

Kathleen S. Kilpatrick
Director

Tel: (804) 367-2323
Fax: (804) 367-2391
TDD: (804) 367-2386
www.dhr.virginia.gov

June 23, 2006

Mr. Mark T. Mansfield
US Army Corps of Engineers
Planning and Policy Branch
803 Front Street
Norfolk, VA 23510-1096

Re: Craney Island Eastward Expansion Study
DEQ No. 05-244F
DHR File No. 2004-1428

Dear Mr. Mansfield:

We have received for review a copy of the final report and Environmental Impact Statement for the above referenced project. As you know, on October 17, 2005, we provided comments regarding the potential for the project to affect archaeological resources within the river channel. We concurred with the Corps' recommendation that no historic properties that may be damaged by proposed activities exist within surveyed area, and that no further archaeological investigation within the channel was necessary. We have also reviewed the survey records for adjacent structural properties and have no further concerns regarding visual effects to historic properties adjacent to the facility. It is our opinion that the proposed expansion will have no adverse effect upon historic properties.

We have not been provided with adequate information regarding the construction of access roadways or rail corridors, and recommend that the Corps continue to consult with DHR as preferred alternatives are established.

We appreciate the opportunity to be of assistance to you in this matter. If you have questions about our comments, please call me at (804) 367-2323, Ext. 140.

Sincerely,

Joanna Wilson, Archaeologist
Office of Review and Compliance

Administrative Services
10 Courthouse Avenue
Petersburg, VA 23803
Tel: (804) 863-1624
Fax: (804) 862-6196

Capital Region Office
2801 Kensington Ave.
Richmond, VA 23221
Tel: (804) 367-2323
Fax: (804) 367-2391

Tidewater Region Office
14415 Old Courthouse Way, 2nd Floor
Newport News, VA 23608
Tel: (757) 886-2807
Fax: (757) 886-2808

Roanoke Region Office
1030 Penmar Ave., SE
Roanoke, VA 24013
Tel: (540) 857-7585
Fax: (540) 857-7588

Winchester Region Office
107 N. Kent Street, Suite 203
Winchester, VA 22601
Tel: (540) 722-3427
Fax: (540) 722-7535

HAMPTON ROADS
PLANNING DISTRICT COMMISSION

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**JAMES CITY COUNTY**
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Jackson C. Tuttle, II, *City Manager*
Jeanne Zeidler, *Mayor*

**YORK COUNTY**
James O. McReynolds, *County Administrator*
Thomas G. Shepperd, Jr., *Board Member*

June 21, 2006

Colonel Yvonne J. Prettyman-Beck
District Engineer
U.S. Army Corps of Engineers
Norfolk District
803 Front Street
Norfolk, Virginia 23510

Re: Craney Island Eastward Expansion (THY: Craney Island)

Dear Colonel Prettyman-Beck:

As you are aware, the HRPDC has been a long-term participant in the Final Feasibility Report and Environmental Impact Statement of the Eastward Expansion of Craney Island. We are confident that federal participation in the above referenced project is the key to the success of the project. Expansion to the east will provide invaluable capability to keeping Hampton Roads harbor dredged to depths sufficient for the port's future needs. In addition, this action will insure that Virginia's Port will remain competitive in national as well as international markets.

We trust that the Corps will continue to aggressively pursue this project, protect its interests in providing a site for future dredge material and provide the capability for this region to provide additional port capacity to leverage this gateway of national significance for global trade. We support the District's recommendations and encourage approval of the project as proposed. Thank you for this opportunity to comment.

Sincerely,

Jeanne Zeidler
Chair

DLF/ALC:kp

HEADQUARTERS • THE REGIONAL BUILDING • 723 WOODLAKE DRIVE • CHESAPEAKE, VIRGINIA 23320 • (757) 420-8300
PENINSULA OFFICE • 2101 EXECUTIVE DRIVE • SUITE C • HAMPTON, VIRGINIA 23666 • (757) 262-0094

**COUNTY ADMINISTRATOR**
James O. McReynolds

York County
VIRGINIA
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District 4
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District 5

June 21, 2006

Colonel Yvonne J. Prettyman-Beck
District Engineer
U.S. Army Corps of Engineers
Norfolk District
803 Front Street
Norfolk, Virginia 23510

Re: Craney Island Eastward Expansion, Draft Feasibility Report
And Environmental Impact Statement

Dear Colonel Prettyman-Beck:

The County of York fully endorses and concurs with the findings and recommendations reported by the Norfolk District in the Final Feasibility Report and Environmental Impact Statement for the Eastward Expansion of Craney Island. The District's efforts over the last several years to thoroughly study and evaluate the economic and environmental aspects of this vitally important project are greatly appreciated.

We applaud the District for proposing a comprehensive and progressive plan that not only provides $260 million in annual national net economic benefits, but also addresses many regional concerns including the critical need for future dredge material disposal, environmental restoration of the Southern Branch of the Elizabeth River, and expanded port facilities. The port has proven beneficial for economic development for York County and the entire region. The Eastward Expansion of Craney Island will generate over 54,000 jobs in the region and $155 million in annual state and local tax revenues. 26,000 jobs and $788 million in annual wages are expected from regional distribution center operations that will benefit from expanded port services.

The Eastward Expansion of Craney Island not only provides additional dredge material disposal but will be constructed in a manner that provides additional port capacity to leverage this gateway of national significance for global trade. We support the District's recommendations and encourage approval of the project as proposed. Thank you for the opportunity to comment.

Sincerely,

Walter Zaremba

Walter C. Zaremba, Chairman
York County Board of Supervisors

**224 Ballard Street • P.O. Box 532 • Yorktown, Virginia 23690-0532 • (757) 890-3320**
**Fax: (757) 890-4002 •TDD (757) 890-3300 • Email: bos@yorkcounty.gov**
***A Hampton Roads Community***

**GEORGE ALLEN**
VIRGINIA

204 RUSSELL SENATE OFFICE BUILDING
WASHINGTON, DC 20510-4604

(202) 224-4024
(202) 224-5432 (FAX)

http://allen.senate.gov/email.html

COMMITTEES:
COMMERCE, SCIENCE, AND TRANSPORTATION
ENERGY
FOREIGN RELATIONS
SMALL BUSINESS AND ENTREPRENEURSHIP

# United States Senate

June 20, 2006

Colonel Yvonne J. Prettyman-Beck
District Engineer
U.S. Army Corps of Engineers
Norfolk District
803 Front Street
Norfolk, Virginia 23510

Dear Colonel Prettyman-Beck:

I am writing to communicate my strong support for the findings and recommendations reported by the Norfolk District in the Final Feasibility Report and Environmental Impact Statement for the Eastward Expansion of Craney Island. I appreciate the District's efforts over the last several years to thoroughly study and evaluate the economic and environmental aspects of this vitally important project to both the region of Hampton Roads and the nation.

In addition, I applaud the District for proposing a comprehensive and progressive plan that not only provides $260 million in annual national net economic benefits, but also addresses many regional concerns, including the serious need for future dredge material disposal, expanded port facilities, and environmental restoration of the Southern Branch of the Elizabeth River. I am told that the Eastward Expansion of Craney Island will also generate over 54,000 jobs in the region and $155 million in annual state and local tax revenues. Further, it is my understanding that 26,000 jobs and $788 million in annual wages are expected from regional distribution center operations that will benefit from expanded port services.

The Eastward Expansion of Craney Island not only provides additional dredge material disposal, but will be constructed in a manner that provides additional port capacity to leverage this gateway of national significance for global trade. I support the District's recommendations and encourage approval of the project as proposed. Please treat this letter in conformance with all applicable procedural rules and ethical guidelines.

Sincerely,

George Allen

George Allen

☐ CENTRAL VIRGINIA
507 EAST FRANKLIN STREET
RICHMOND, VA 23219
(804) 771-2221
(804) 771-8313 (FAX)

☐ HAMPTON ROADS
222 CENTRAL PARK AVENUE, #120
VIRGINIA BEACH, VA 23462
(757) 518-1674
(757) 518-1679 (FAX)

☐ WESTERN AND VALLEY
3140 CHAPARRAL DRIVE, #C-101
ROANOKE, VA 24018
(540) 772-4236
(540) 772-6870 (FAX)

☐ SOUTHWEST VIRGINIA
332 CUMMINGS STREET, SUITE C
ABINGDON, VA 24210
(276) 676-2646
(276) 676-2588 (FAX)

☐ NORTHERN VIRGINIA
2214 ROCK HILL ROAD, SUITE 100
HERNDON, VA 20170
(703) 435-0039
(703) 435-3446 (FAX)

BB&T

Branch Banking & Trust Co.
of Virginia

500 E. Main Street, 2nd Floor
Norfolk, VA 23510

Robert M. Boyd
Regional President

June 20, 2006

Colonel Yvonne J. Prettyman-Beck
District Engineer
U.S. Army Corps of Engineers
Norfolk District
803 Front Street
Norfolk, Virginia 23510

Dear Colonel Prettyman:

BB&T fully endorses and concurs with the finding and recommendations reported by the Norfolk District in the Final Feasibility Report and Environmental Impact Statement for the Eastward Expansion of Craney Island. We appreciate the District's efforts over the last several years to thoroughly study and evaluate the economic and environmental aspects of this vitally important project.

In addition, we applaud the District for proposing a comprehensive and progressive plan that not only provides $260 million in annual national net economic benefits, but also addresses many regional concerns including the critical need for future dredge material disposal, expanded port facilities, and environmental restoration of the Southern Branch of the Elizabeth River. The Eastward Expansion of Craney Island will also generate over 54,000 jobs in the region and $155 million in annual state and local tax revenues. 26,000 jobs and $788 million in annual wages are expected from regional distribution center operations that will benefit from expanded port services.

The Eastward Expansion of Craney Island not only provides additional dredge material disposal but will be constructed in a manner that provides additional port capacity to leverage this gateway of national significance for global trade. We support the District's recommendations and encourage approval of the project as proposed.

Thank you for the opportunity to comment.

Sincerely,

Bob Boyd

Robert M. Boyd

COMMONWEALTH OF VIRGINIA

FREDERICK M. QUAYLE
13TH SENATORIAL DISTRICT
ALL OF SURRY COUNTY; PART OF ISLE OF WIGHT,
PRINCE GEORGE, AND SOUTHAMPTON COUNTIES;
AND PART OF THE CITIES OF CHESAPEAKE,
FRANKLIN, HOPEWELL, PORTSMOUTH, AND SUFFOLK
3808 POPLAR HILL ROAD, SUITE E
CHESAPEAKE, VIRGINIA 23321

SENATE

COMMITTEE ASSIGNMENTS:
LOCAL GOVERNMENT, CHAIR
COURTS OF JUSTICE
EDUCATION AND HEALTH
FINANCE
RULES

June 20, 2006

Colonel Yvonne J. Prettyman-Beck
District Engineer, Norfolk
U.S. Army Corps of Engineers
803 Front Street
Norfolk, Virginia 23510

RE; Craney Island Eastward Expansion
Draft Feasibility Report and Environment Impact Statement

Dear Colonel Prettyman-Beck:

I fully endorse and concur with the findings and recommendations reported by the Norfolk District in the Final Feasibility Report and Environmental Impact Statement for the Eastward Expansion of Craney Island. I appreciate the district's efforts over the last several years to thoroughly study and evaluate the economic and environmental aspects of this project, which is important to my district.

I applaud the district for proposing a comprehensive and progressive plan that not only provides $260 million in annual net economic benefits, but also addresses many regional concerns, including the critical need for future dredge material disposal, expanded port facilities, and environmental restoration of the Southern Branch of the Elizabeth River. The Eastward Expansion of Craney Island will also generate over 54,000 jobs in the region and $155 million in annual state and local tax revenues, which likewise affects my district.

- continued -

The Eastward Expansion of Craney Island not only provides additional dredge material disposal but will be constructed in a manner that provides additional port capacity to leverage this gateway of national significance for global trade. I support the district's recommendations and encourage approval of the project as proposed.

Thank you for the opportunity to provide my comments.

Yours very truly,

Frederick M. Quayle

FMQ:mk

CC: J. J. Keever, Virginia Port Authority

COMMONWEALTH OF VIRGINIA
HOUSE OF DELEGATES
RICHMOND

G. GLENN ODER
POST OFFICE BOX 6161
NEWPORT NEWS, VIRGINIA 23606

NINETY-FOURTH DISTRICT

June 19, 2006

COMMITTEE ASSIGNMENTS:
GENERAL LAWS
TRANSPORTATION
COUNTIES, CITIES AND TOWNS

Colonel Yvonne J. Prettyman-Beck
District Engineer
U.S. Army Corps of Engineers
Norfolk District
803 Front Street
Norfolk, VA 23510

RE: Craney Island Eastward Expansion, Draft Feasibility Report
And Environmental Impact Statement

Dear Colonel Prettyman:

I write today to fully endorse and concur with the findings and recommendations reported in the Final Feasibility Report and Environmental Impact Statement for the Eastward Expansion of Craney Island. I sincerely appreciate all of the hard work that the District put into this report over the last few years to thoroughly study and evaluate the economic and environmental aspects of this critically important project.

I also applaud the District for its proposal of a comprehensive plan that would provide $260 million in annual national net economic benefits and address key regional concerns including the critical need for future dredge material disposal, expanded port facilities, and restoration of the Southern Branch of the Elizabeth River. This exciting project promises to generate over 54,000 jobs in the region and $155 million in annual state and local tax revenues. 26,000 jobs and $788 million in annual wages are expected from regional distribution center operations that will benefit from expanded port services.

The Eastward Expansion of Craney Island not only provides additional dredge material disposal but will be constructed in a manner that provides additional port capacity to leverage this gateway of national significance for global trade. Again, I fully support the District's recommendations and encourage approval of the project as proposed.

I sincerely appreciate the opportunity to comment on this vital project for our region. If I can be of any assistance on this matter, please let me know.

Sincerely,

G. Glenn Oder, ASLA
Member, Virginia House of Delegates, 94th District

C: J. J. Keever, Virginia Port Authority

DISTRICT: (757) 930-8683 • RICHMOND: 698-1094 • E-MAIL: DELGODER@HOUSE.STATE.VA.US

GVA Advantis

June 15, 2006

Advantis Real Estate Services Company
101 West Main Street, Suite 900
Norfolk, VA 23510-1653
Tel 757.627.0661
Fax 757.627.1901
www.gvaadvantis.com

Colonel Yvonne J. Prettman-Beck
District Engineer
U.S. Army Corps of Engineers
Norfolk District
803 Front Street
Norfolk, VA 23510

RE: Craney Island Eastward Expansion, Draft Feasibility Report
And Environmental Impact Statement

Dear Colonel Prettyman:

As a member of the Board of Commissioners of the Virginia Port Authority, and an engaged active citizen of Hampton Roads, I fully endorse and concur with the findings and recommendations reported by the Norfolk District in the Final Feasibility Report and Environmental Impact Statement for the Eastward Expansion of Craney Island. We appreciate the District's efforts over the last several years to thoroughly study and evaluate the economic and environmental aspects of this vitally important project.

In addition, we applaud the District for proposing a comprehensive and progressive plan that non only provides $260 million in annual national net economic benefits, but also addresses many regional concerns including the critical need for future dredge material disposal, expanded port facilities, and environmental restoration of the Southern Branch of the Elizabeth River. The Eastward Expansion of Craney Island will also generate over 54,000 jobs in the region and $155 million in annual state and local tax revenues. 26,000 jobs and $788 million in annual wages are expected from regional distribution center operations that will benefit from expanded port services.

The Eastward Expansion of Craney Island no only provides additional dredge material disposal but will be constructed in a manner that provides additional port capacity to leverage this gateway of national significance for global trade. We support the District's recommendations and encourage approval of the project as proposed. Thank you for the opportunity to comment.

Sincerely,

Deborah K. Stearns, CPM, SIOR
Managing Director
Greater Virginia Region

rlv

L. Preston Bryant, Jr.
Secretary of Natural Resources

Joseph H. Maroon
Director

# COMMONWEALTH of VIRGINIA

## DEPARTMENT OF CONSERVATION AND RECREATION

217 Governor Street
Richmond, Virginia 23219-2010
(804) 786-7951 FAX (804) 371-2674

June 15, 2006

Thomas Waters
Headquarters, U.S. Army Corps of Engineers
7701 Telegraph Road
Alexandria, VA 22315-3860

Re: CECW-P (IP): Craney Island Eastward Expansion

Dear Mr. Waters:

The Department of Conservation and Recreation's Division of Natural Heritage (DCR) has searched its Biotics Data System for occurrences of natural heritage resources from the area outlined on the submitted map. Natural heritage resources are defined as the habitat of rare, threatened, or endangered plant and animal species, unique or exemplary natural communities, and significant geologic formations.

According to the information currently in our files, the Piping Plover (*Charadrius melodus*, G3/S2B,S1N/LT/LT), Least Tern (*Sterna antillarum*, G4/S2B/NL/SC), and Black-necked Stilt (*Himantopus mexicanus*, G5/S1B/NL/NL) have been documented on Craney Island within the dredge disposal site.

The Piping Plover inhabits coastal areas, utilizing the flat, sandy beaches of barrier islands for breeding. Threats to this species include predation of eggs and young and the development and disturbance of barrier island breeding sites (Cross, 1991). The Piping Plover was last observed breeding on Craney Island in 1997. However it is currently using the island for migration and foraging from early spring to late August. Please note that this species is listed as threatened by the United States Fish and Wildlife Service (USFWS) and the Virginia Department of Game and Inland Fisheries (VDGIF).

The Least Tern nests on broad, flat beaches with minimal vegetation and forages in saltwater near the shore. Threats to this species include loss of nesting habitat due to development and disturbance of breeding colonies by human activities and high numbers of predators (Beck, 1991). Please note that the Least Tern is listed as a special concern species by VDGIF.

Black-necked Stilts primarily occur near shallow salt or fresh water bodies with soft muddy bottoms, including grassy marshes, wet savannas, mudflats, shallow ponds, flooded fields, and the borders of salt ponds. They nest along the shallow water of ponds, lakes, swamps, or lagoons and may nest on the ground or in the shallow water on a plant tussock. Black-necked Stilts feed on insects, crustaceans, and small fish, as well as the seeds of aquatic plants.

Due to the legal status of the piping plover, DCR recommends continued coordination with USFWS and VDGIF to ensure compliance with protected species legislation. In addition, DCR recommends the Craney Island Bird Long-Term Management Plan be coordinated with VDGIF Eastern Shore Biologist Ruth Boettcher and avoidance of the nesting sites for the Least Tern (April 15-August 1) and Black-necked Stilt (April 15-July 15).

Our files do not indicate the presence of any State Natural Area Preserves under DCR's jurisdiction in the project vicinity.

Under a Memorandum of Agreement established between the Virginia Department of Agriculture and Consumer Services (VDACS) and the Virginia Department of Conservation and Recreation (DCR), DCR represents VDACS in comments regarding potential impacts on state-listed threatened and endangered plant and insect species. The current activity will not affect any documented state-listed plants or insects.

Any absence of data may indicate that the project area has not been surveyed, rather than confirm that the area lacks natural heritage resources. New and updated information is continually added to Biotics. Please contact DCR for an update on this natural heritage information if a significant amount of time passes before it is utilized.

The Virginia Department of Game and Inland Fisheries maintains a database of wildlife locations, including threatened and endangered species, trout streams, and anadromous fish waters, that may contain information not documented in this letter. Their database may be accessed from www.dgif.virginia.gov/wildlife/info_map/index.html, or contact Shirl Dressler at 804-367-6913.

Should you have any questions or concerns, feel free to contact me at 804-371-2708. Thank you for the opportunity to comment on this project.

Sincerely,

S. Rene' Hypes
Project Review Coordinator

cc: Kim Marbain, USFWS
Andy Zadnik, VDGIF

## Literature Cited

Beck, R. A. 1991. Least Tern. In Virginia's Endangered Species: Proceedings of a Symposium. K. Terwilliger ed. The McDonald and Woodward Publishing Company, Blacksburg, Virginia. pp. 505-506.

Cross, R.R. 1991. Piping Plover. In Virginia's Endangered Species: Proceedings of a Symposium. K. Terwilliger ed. The McDonald and Woodward Publishing Company, Blacksburg, Virginia. pp. 501-502.

COMMONWEALTH OF VIRGINIA
HOUSE OF DELEGATES
RICHMOND

JOHN A. COSGROVE
POST OFFICE BOX 15483
CHESAPEAKE, VIRGINIA 23328

SEVENTY-EIGHTH DISTRICT

COMMITTEE ASSIGNMENTS:
PRIVILEGES AND ELECTIONS
GENERAL LAWS
TRANSPORTATION
SCIENCE AND TECHNOLOGY

June 14, 2006

Colonel Yvonne J. Prettyman-Beck
District Engineer
U.S. Army Corps of Engineers
Norfolk District
803 Front Street
Norfolk, VA 23510

Re: Craney Island Eastward Expansion, Draft Feasibility Report and Environmental Impact Statement

Dear Colonel Prettyman:

I fully endorse and concur with the findings and recommendations reported by the Norfolk District in the Final Feasibility Report and Environmental Impact Statement for the Eastward Expansion of Craney Island. I appreciate the District's efforts over the last several years to thoroughly study and evaluate the economic and environmental aspects of this vitally important project.

In addition, I applaud the District for proposing a comprehensive and progressive plan that not only provides $260 million in annual national net economic benefits, but also addresses many regional concerns including the critical need for future dredge material disposal, expanded port facilities, and environmental restoration of the Southern Branch of the Elizabeth River. The Eastward Expansion of Craney Island will also generate over 54, 000 jobs in the region and $155 million in annual state and local tax revenues. 26,000 jobs and $788 million in annual wages are expected from regional distribution center operations that will benefit from expanded port services.

The Eastward Expansion of Craney Island not only provides additional dredge material disposal, but will be constructed in a manner that provides additional port capacity to leverage this gateway of national significance for global trade. I support the District's recommendations and encourage approval of the project as proposed. Thank you for the opportunity to comment.

Sincerely,

John A. Cosgrove

DISTRICT: (757) 547-3422 • RICHMOND: (804) 698-1078 • E-MAIL: DELJCOSGROVE@HOUSE.STATE.VA.US

# T. Parker Host, Inc.
Ship Agents and Brokers

500 Plume Street East
Suite 600
Norfolk, Virginia 23510

Since 1923

Hampton Roads, Virginia
Hopewell, Virginia
Richmond, Virginia
Baltimore, Maryland
Philadelphia, Pennsylvania
Wilmington, Delaware
Brunswick, Georgia
Fernandina, Florida
Jacksonville, Florida


June 14, 2006

Colonel Yvonne J. Prettyman-Beck
District Engineer
U.S. Army Corps of Engineers
Norfolk District
803 Front Street
Norfolk, VA 23510

Re: Craney Island Eastward Expansion, Final Feasibility Report
And Environmental Impact Statement

Dear Colonel Prettyman:

I refer to the referenced Final Feasibility Report and Environmental Impact Statement for the eastward expansion of Craney Island. T. Parker Host, Inc., local ship agents and brokers since 1923, fully supports this project and agrees with the findings and recommendations reported by the Norfolk District. The ongoing success of the growth of the Port of Hampton Roads is dependent on this project as well as being able to support the growth of the region of Hampton Roads with jobs, taxes, and associated revenues. Promotion of commerce is a responsibility of our government and I applaud the District's efforts in their thorough study and evaluation over the last several years in determining the significance of this important project both from an economical and environmental standpoint.

To highlight this it has been projected that the eastward expansion of Craney Island will also generate over 54,000 jobs in the region, and $155 million in annual state and local tax revenues. Regional distribution center operations will benefit from expanded port services resulting in approximately 26,000 jobs and $788 million in annual wages. The Corps used much foresight in proposing a comprehensive and progressive plan that not only provides $260 million in annual national net economic benefits, but also addresses many regional concerns including the critical need for future dredge material disposal, a key ingredient for expanding port facilities, as well as future improvements to the southern branch of the Elizabeth River.

The Ports of Hampton Roads are well on their way to becoming the leader of the U.S. East Coast and the eastward expansion of Craney Island is a milestone in making this a reality. The Corps should be credited for their vision is seeing Hampton Roads as a gateway of national significance for global trade. In conclusion, we at T. Parker Host, Inc. support the District's recommendations and encourage approval of the project as proposed. It is with great pride that we had the opportunity to comment on this and stand ready to offer any assistance should we be called upon.

Sincerely,

David F. Host
President and CEO

DFH: an
Bc: Arthur W. Moyer, Jr.
Executive Vice President
Hampton Roads Maritime Association


*Mailing Address:* Post Office Box 3729/Customhouse Station/Norfolk, Virginia 23514
*Telephone:* 757-627-6286 *Telex:* 6734694 Host Va *Fax:* 757-627-3948
*E-mail:* ops@tparkerhost.com
www.tparkerhost.com

AFL - CIO

OFFICE OF

**EDWARD L. BROWN, SR.**

*INTERNATIONAL VICE PRESIDENT*
*and A.C.D. VICE PRESIDENT*

*INTERNATIONAL LONGSHOREMEN'S*
*.....ASSOCIATION.....*
**HAMPTON ROADS AND VICINITY**

Affiliated with AFL-CIO and Canadian Labour Congress

REG. U.S. PATENT OFFICE

Phone: (804) 440-9426 / Fax: (804) 440-9434

1355 International Terminal Boulevard • Suite 201
Norfolk, Virginia 23505

June 14, 2006

Colonel Yvonne J. Prettyman-Beck
District Engineer
U.S. Army Corps of Engineers
Norfolk District
803 Front Street
Norfolk, VA 23510

**RE: Craney Island Eastward Expansion, Final Feasibility Report And Environmental Impact Statement**

Dear Colonel Prettyman-Beck:

Please be advised the International Longshoremen's Association, AFL-CIO fully endorses and concurs with the findings and recommendations reported by the Norfolk District in the Final Feasibility Report and Environmental Impact Statement for the Eastward Expansion of Craney Island. We appreciate the District's efforts over the last several years to thoroughly study and evaluate the economic and environmental aspects of this vitally important project. From our standpoint, it is the future of our Port.

In addition, we applaud the District for proposing a comprehensive and progressive plan that not only provides $260 million in annual national net economic benefits, but also addresses many regional concerns including the critical need for future dredge material disposal, expanded port facilities, and environmental restoration of the Southern Branch of the Elizabeth River. The Eastward Expansion of Craney Island will also generate over 54,000 jobs in the region and $155 million in annual state and local tax revenues. 26,000 jobs and $788 million in annual wages are expected from regional distribution center operations that will benefit from expanded port services.

The Eastward Expansion of Craney Island not only provides additional dredge material disposal but will be constructed in a manner that provides additional port capacity to ensure the Port of Hampton Roads as a gateway of national significance

for global trade. We support the District's recommendations and encourage approval of the project as proposed. Thank you for the opportunity to comment, and please advise if we can be of any further assistance.

Yours truly,

Edward L. Brown Sr

Edward L. Brown, Sr.
International Vice President
Port of Hampton Roads

VIRGINIA'S
ROADS
ECONOMIC DEVELOPMENT ALLIANCE

500 Main Street Suite 1300
Norfolk, VA 23510 USA
main 757 . 627 . 2315
fax 757 . 623 . 3081

21 Enterprise Parkway Suite 200
Hampton, VA 23666 USA
main 757 . 627 . 2315
fax 757 . 826 . 6706

132 Ebury Street
London, SW1W 9QQ. UK
main 44 . 020 . 7823 . 6003

World Trade Center
Birkenstrasse 15
28195 Bremen. Germany
main 49 . 421 . 17466-0

www.hreda.com

June 13, 2006

Colonel Yvonne J. Prettyman-Beck
District Engineer
U.S. Army Corps of Engineers
Norfolk District
803 Front Street
Norfolk, VA 23510

Re: Craney Island Eastward Expansion, Draft Feasibility Report and Environmental Impact Statement

Dear Colonel Prettyman-Beck:

The Hampton Roads Economic Development Alliance fully endorses and concurs with the findings and recommendations reported by the Norfolk District in the Final Feasibility Report and Environmental Impact Statement for the Eastward Expansion of Craney Island. We appreciate the District's effort over the last several years to thoroughly study and evaluate the economic and environmental aspects of this vitally important project.

In addition, we applaud the District for proposing a comprehensive and progressive plan that not only provides $260 million in annual national net economic benefits, but also addresses many regional concerns including the critical need for future dredge material disposal, expanded port facilities, and environmental restoration of the Southern Branch of the Elizabeth River. The Eastward Expansion of Craney Island will also generate over 54,000 jobs in the region and $155 million in annual state and local tax revenues. 26,000 jobs and $788 million in annual wages are expected from regional distribution center operations that will benefit from expanded port services.

The Eastward Expansion of Craney Island not only provides additional dredge material disposal but will be constructed in a manner that provides additional port capacity to leverage this gateway of national significance for global trade. We support the District's recommendations and encourage approval of the project as proposed. Thank you for the opportunity to comment.

Sincerely,

C. Jones Hooks
President & CEO

EVERGREEN AMERICA CORPORATION
NORFOLK OFFICE
Lynnwood Plaza • Suite 300 • 621 Lynnhaven Parkway • Virginia Beach, VA 23452
(757) 448-6900 • www.evergreen-america.com

June 13, 2006

Colonel Yvonne J. Prettyman-Beck
District Engineer
U.S.Army Corps of Engineers
Norfolk District
803 Front Street
Norfolk, Virginia 23510

Re: Craney Island Eastward Expansion, Final Feasibility Report
And Environmental Impact Statement

Dear Colonel Prettyman-Beck:

Evergreen America Corporation fully endorses and concurs with the findings and recommendations reported by the Norfolk District in the Final Feasibility Report and Environmental Impact Statement for the Eastward Expansion of Craney Island. We appreciate the District's efforts over the last several years to thoroughly study and evaluate the economic and environmental aspects of this vitally important project. From our standpoint, it is the future of our Port.

In addition, we applaud the District for proposing a comprehensive and progressive plan that not only provides $260 million in annual national net economic benefits, but also addresses many regional concerns including the critical need for future dredge material disposal, expanded port facilities, and environmental restoration of the Southern Branch of the Elizabeth River. The Eastward Expansion of Craney Island will also generate over 54,000 jobs in the region and $155 million in annual state and local tax revenues. 26,000 jobs and $788 million in annual wages are expected from regional distribution center operations that will benefit from expanded port services.

The Eastward Expansion of Craney Island not only provides additional dredge material disposal, but will be constructed in a manner that provides additional port capacity to ensure the Port of Hampton Roads a gateway of national significance for global trade.

The Evergreen Group is one of the leading shipping companies in the world and has been a customer of the Port of Hampton Roads for over 23 years. We support the District's recommendations and encourage approval of the project as proposed. Thank you for the opportunity to comment, and please advise if we can be any further assistance.

Sincerely,

John Hudgins
Evergreen America Corporation ( Norfolk )
As Agents For:
Evergreen Marine Corp. (Taiwan)
Hatsu Marine Ltd. (UK)
Italia Marittima SpA.

CC: Capt. Koo-Sun Tsuei
Mr. Mitchell Hsu

# SENATE OF VIRGINIA

YVONNE B. MILLER
5TH SENATORIAL DISTRICT
PART OF THE CITIES OF CHESAPEAKE, NORFOLK,
AND VIRGINIA BEACH
555 FENCHURCH STREET, SUITE 403
NORFOLK, VIRGINIA 23510

COMMITTEE ASSIGNMENTS:
COMMERCE AND LABOR
GENERAL LAWS AND TECHNOLOGY
REHABILITATION AND SOCIAL SERVICES
TRANSPORTATION

June 13, 2006

Colonel Yvonne J. Prettyman-Beck
District Engineer
U.S. Army Corps of Engineers
Norfolk District
803 Front Street
Norfolk, VA 23510

Re: Craney Island Eastward Expansion, Draft Feasibility Report and Environmental Impact Statement

Dear Colonel Prettyman:

I fully endorse and concur with the findings and recommendations reported by the Norfolk District in the Final Feasibility Report and Environmental Impact Statement for the Eastward Expansion of Craney Island. I appreciate the District's efforts over the last several years to thoroughly study and evaluate the economic and environmental aspects of this vitally important project.

In addition, we applaud the District for proposing a comprehensive and progressive plan that not only provides $260 million in annual national net economic benefits, but also addresses many regional concerns including the critical need for future dredge material disposal, expanded port facilities, and environmental restoration of the Southern Branch of the Elizabeth River. The Eastward Expansion of Craney Island will also generate over 54,000 jobs in the region and $155 million in annual state and local tax revenues. 26,000 jobs and $788 million in annual wages are expected from regional distribution center operations that will benefit from expanded port services.

The Eastward Expansion of Craney Island not only provides additional dredge material disposal but will be constructed in a manner that provides additional port capacity to leverage this gateway of national significance for global trade. We support the District's recommendations and encourage approval of the project as proposed. Thank you for the opportunity to comment.

Sincerely,

Yvonne B. Miller

Yvonne B. Miller

PENINSULA PORTS AUTHORITY OF VIRGINIA
21 Enterprise Parkway, Suite 200
Hampton, VA 23666
(757) 826-3327

June 12, 2006

Colonel Yvonne J. Prettyman-Beck
District Engineer
U.S. Army Corps of Engineers
Norfolk District
803 Front Street
Norfolk, Virginia 23510

Re: Craney Island Eastward Expansion, Draft Feasibility Report
And Environmental Impact Statement

Dear Colonel Prettyman:

The Peninsula Council for Workforce Development fully endorses and concurs with the findings and recommendations reported by the Norfolk District in the Final Feasibility Report and Environmental Impact Statement for the Eastward Expansion of Craney Island. We appreciate the District's efforts over the last several years to thoroughly study and evaluate the economic and environmental aspects of this vitally important project.

In addition, we applaud the District for proposing a comprehensive and progressive plan that not only provides $260 million in annual national net economic benefits, but also addresses many regional concerns including the critical need for future dredge material disposal, expanded port facilities, and environmental restoration of the Southern Branch of the Elizabeth River. The Eastward Expansion of Craney Island will also generate over 54,000 jobs in the region and $155 million in annual state and local tax revenues. 26,000 jobs and $788 million in annual wages are expected from regional distribution center operations that will benefit from expanded port services.

The Eastward Expansion of Craney Island not only provides additional dredge material disposal but will be constructed in a manner that provides additional port capacity to leverage this gateway of national significance for global trade. We support the District's recommendations and encourage approval of the project as proposed.

Thank you for the opportunity to comment.

Sincerely,

Matthew James
President/CEO

# COMMONWEALTH of VIRGINIA

## Office of the Governor

L. Preston Bryant, Jr.
Secretary of Natural Resources

P.O. Box 1475
Richmond, Virginia 23218

June 9, 2006

Mr. Thomas W. Waters
Chief, Policy and Policy Compliance Division
Directorate of Civil Works
U.S. Army Corps of Engineers
441 G Street NW
Washington, DC 20314-1000

Dear Mr. Waters:

This letter will acknowledge your recent letter to Governor Kaine regarding the proposed report of the Chief of Engineers and the report of the district engineer on Craney Island, Hampton Roads, Virginia. The Governor has asked that I respond to you on his behalf.

The report is under review by Ms. Ellie Irons, the Environmental Program Manager of the Virginia Department of Environmental Quality.

Sincerely,

L. Preston Bryant, Jr.

LPBJr/cbd

Patrick Henry Building • 1111 East Broad Street • Richmond, Virginia 23219 • (804) 786-0044 • TTY (800) 828-1120
Fax (804) 371-8333 • Web: www.naturalresources.virginia.gov

TORRENTIAL DATA
Shelter From the Storm

June 9, 2006

Colonel Yvonne J. Prettyman-Beck
District Engineer
U.S. Army Corps of Engineers
Norfolk District
803 Front Street
Norfolk, Virginia 23510

Re: Craney Island Eastward Expansion, Final Feasibility Report and Environmental Impact Statement

Dear Colonel Prettyman:

Torrential Data Solutions, Inc. fully endorses and concurs with the findings and recommendations reported by the Norfolk District in the *Final Feasibility Report and Environmental Impact Statement for the Eastward Expansion of Craney Island.* We appreciate the District's efforts over the last several years to study and evaluate the economic and environmental aspects of this vitally important project. From our standpoint as a vendor to the transportation industry generally and Virginia International Terminals, Inc. specifically, it is the future of our Port. We also applaud the District for proposing a comprehensive and progressive plan that provides $260 million in annual national net economic benefits and addresses regional concerns including the critical need for future dredge material disposal, expanded port facilities, and environmental restoration of the Southern Branch of the Elizabeth River.

The Eastward Expansion of Craney Island not only generates significant economic benefits, it provides additional dredge material disposal and will be constructed in a manner that provides additional port capacity to ensure the Port of Hampton Roads as a gateway of national significance for global trade. We support the District's recommendations and encourage approval of the project as proposed. Thank you for the opportunity to comment, and please let me know if we can be of assistance.

Sincerely,

Bradford D. Bimson
President

5604A Virginia Beach Blvd. / Suite 201 / Virginia Beach, VA 23462 / t. 757.222.2000 / f. 757.222.2001
www.torrentialdata.com

# *CITY of NORFOLK*

*Office of the Mayor*

Paul D. Fraim
Mayor

June 8, 2006

Colonel Yvonne J. Prettyman-Beck
District Engineer
U.S. Army Corps of Engineer
Norfolk District
803 Front Street
Norfolk, VA 23510

Re: Craney Island Eastward Expansion, Draft Feasibility Report
And Environmental Impact Statement

Dear Colonel Prettyman-Beck:

The City of Norfolk fully endorses and concurs with the findings and recommendations reported by the Norfolk District in the Final Feasibility Report and Environmental Impact Statement for the Eastward Expansion of Craney Island. We appreciate the District's efforts over the last several years to thoroughly study and evaluate the economic and environmental aspects of this vitally important project.

In addition, we applaud the District for proposing a comprehensive and progressive plan that not only provides $260 million in annual national net economic benefits, but also addresses many regional concerns including the critical need for future dredge material disposal, expanded port facilities, and environmental restoration of the Southern Branch of the Elizabeth River. The Eastward Expansion of Craney Island will also generate over 54,000 jobs in the region and $155 million in annual state and local tax revenues. Twenty-six thousand jobs and $788 million in annual wages are expected from regional distribution center operations that will benefit from expanded port services.

The Eastward Expansion of Craney Island not only provides additional dredge material disposal but will be constructed in a manner that provides additional port capacity to leverage this gateway of national significance for global trade. We support the District's recommendations and encourage approval of the project as proposed. Thank you for the opportunity to comment.

Sincerely,

Paul D. Fraim
Mayor

810 Union Street • Suite 1109 • Norfolk, Virginia 23510 • (757) 664-4679 • Fax (757) 441-2909 • paul.fraim@norfolk.gov

CAPES
SHIPPING AGENCIES

June 8, 2006

Colonel Yvonne J. Prettyman-Beck
District Engineer
U.S. ARMY CORPS OF ENGINEERS
Norfolk District
803 Front Street
Norfolk, Virginia 23510

Re: CRANEY ISLAND – EASTWARD EXPANSION
Draft Feasibility Report And Environmental Impact Statement

Dear Colonel Prettyman-Beck,

We are ships agency company headquartered in Norfolk, a division of C.V. International, Inc, also based in Norfolk employing approx 45 persons. We are engaged in various facets of international commerce through the ports including the dynamic activities of the container shipping business.

We fully endorse and support the conclusions and recommendations reported in the Final Feasibility Report and Environmental Impact Statement for the Eastward Expansion of Craney Island. We appreciate your willngness and efforts to revisit this issue over the last couple of years and are encouraged by the Norfolk District's recommendation to construct an expansion of Craney Island for additional dredge material disposal and future port development.

The recommended expansion addresses many regional concerns including the critical need for future dredge material disposal capacity to maintain the Federal navigation channels into Norfolk Harbor and to deepen the channels to the authorized 55-foot depth in the future. The channels are a lifeline for regional economic growth and the future success of Virginia's ports and supply chain industries.

We understand that studies indicate that the Eastward Expansion of Craney Island will generate over 54,000 jobs in the region and $155 million in annual state and local tax revenues. 26,000 jobs and $788 million in annual wages are expected from regional distribution center operations that will benefit from expanded port services. The recommended improvements to Craney Island coupled with other Federal and State initiatives, like the Heartland Corridor will improve the efficiency of the Nation's transportation system and provide economic benefits to millions of Americans.

1128 West Olney Road • Norfolk, VA 23507 • Phone: (757) 625-3658 • Fax: (757) 625-6942
www.capesshipping.net

We firmly believe that the Craney Island Eastward Expansion is vitally important to the future of Hampton Roads, Virginia and the Nation.

We support the District's findings and encourage you to approve the recommended plan. Thank you for the opportunity to comment on this proposal.

Yours Sincerely,

CAPES SHIPPING AGENCIES

Colin Macpherson
President

Cc: Mr. B. Wayne Coleman, President, C.V. International, Inc., Norfolk.
Mr. Arthur W. Moye, Executive Vice President, HRMA., Norfolk.

1128 West Olney Road • Norfolk, VA 23507 • Phone: (757) 625-3658 • Fax: (757) 625-6942
www.capesshipping.net

# BARTHCO

June 8, 2006

Colonel Yvonne J. Prettyman-Beck
District Engineer
U.S. Army Corps of Engineers
Norfolk District
803 Front Street
Norfolk, Virginia 23510

Re: Craney Island Eastward Expansion, Final Feasibility Report
And Environmental Impact Statement

Dear Colonel Prettyman:

Please be advised that Barthco International fully endorses and concurs with the findings and recommendations reported by the Norfolk District in the Final Feasibility Report and Environmental Impact Statement for the Eastward Expansion of Craney Island. We appreciate the District's efforts over the last several years to thoroughly study and evaluate the economic and environmental aspects of this vitally important project. From our standpoint, it is the future of our Port.

In addition, we applaud the District for proposing a comprehensive and progressive plan that not only provides $260 million in annual national net economic benefits, but also addresses many regional concerns including the critical need for future dredge material disposal, expanded port facilities, and environmental restoration of the Southern Branch of the Elizabeth River. The Eastward Expansion of Craney Island will also generate over 54,000 jobs in the region and $155 million in annual state and local tax revenues. 26,000 jobs and $788 million in annual wages are expected from regional distribution center operations that will benefit from expanded port services.

The Eastward Expansion of Craney Island not only provides additional dredge material disposal, but will be constructed in a manner that provides additional port capacity to ensure the Port of Hampton Roads as a gateway of national significance for global trade. We support the District's recommendations and encourage approval of the project as proposed. Thank you for the opportunity to comment, and please advise if we can be any further assistance.

Sincerely,

Jennifer Josten
Assistant Vice President

**Barthco International Inc.**
223 E. City Hall Avenue, Suite 208
City Centre
Norfolk, VA 23510
Main: (757) 314-4300 | Fax: (757) 625-3335

THE A.P. MOLLER GROUP

**APM TERMINALS**

June 8, 2006

Colonel Yvonne J. Prettyman-Beck
District Engineer
U.S. Army Corps of Engineers
Norfolk District
803 Front Street
Norfolk, Virginia 23510

Re: Craney Island Eastward Expansion, Draft Feasibility Report and Environmental Impact Statement

Dear Colonel Prettyman-Beck:

The APM Terminals organization fully supports the findings and recommendations reported by the Norfolk District in the Final Feasibility Report and Environmental Impact Statement for the Eastward Expansion of Craney Island.

As you are well aware, the APM Terminals-Virginia facility, when it opens next year, will help meet the anticipated growth in container traffic in Hampton Roads as international trade continues to expand. Additional developments, including rail and road improvements, will only improve the attractiveness of the Hampton Roads area for international cargo. While our facility will feature state of the art technology and processes to quickly and efficiently handle container traffic, the physical limitations of the site will be reached quickly if current trade growth continues.

Therefore, moving forward with the expansion of Craney Island, not only to continue to handle dredge material, but also to facilitate plans by the Virginia Port Authority for additional terminal space, are essential to the continued growth of the ports in Hampton Roads, which results in much needed port infrastructure, jobs and tax revenue.

We support the District's recommendations and encourage approval of the project as proposed. Your continued support of these efforts will strongly contribute to this country maintaining its global competitiveness and to local economic growth.

Sincerely,

Nick Taro
Senior Vice President
Universal Maritime Service Corporation
an APM Terminals company

**Universal Maritime Service Corp.**
Giralda Farms, Madison Avenue, P.O. Box 882, Madison, NJ 07940-0882
Telephone: 973-514-5479. Fax: 973-514-5034.

CITY OF NEWPORT NEWS

JOE S. FRANK
MAYOR

June 8, 2006

Colonel Yvonne J. Prettyman-Beck
District Engineer
U. S. Army Corps of Engineers
Norfolk District
803 Front Street
Norfolk, Virginia 23510

Dear Colonel Prettyman:

On May 26, 2006, the U. S. Army Corps of Engineers, Norfolk District will publish the Final Feasibility Report and Environmental Impact Statement for the Eastward Expansion of Craney Island. This much-needed expansion of Craney Island will provide 580 acres for construction of a fourth marine terminal and additional dredge material disposal capacity for maintaining and deepening navigation channels and maritime facilities in Hampton Roads.

The expansion of the port facilities as part of this extension will permit the larger vessels used for container shipping to dock at a state-owned port facility. In addition, development of this project will give the region a necessary ingredient to fund the Third Crossing of Hampton Roads Harbor. We welcome the addition of the 26,000 jobs and $778 million in annual wages expected from the expanded port services.

Thank you for the opportunity to comment. We support the District's recommendations and encourage approval of the project as proposed.

Very truly yours,

Joe S. Frank
Mayor

JSF:rsw
Copy to: City Manager

2400 WASHINGTON AVENUE NEWPORT NEWS VIRGINIA 23607 TEL (757) 926-8403

ZEL TECHNOLOGIES, LLC

June 8, 2006

Colonel Yvonne J. Prettyman-Beck
District Engineer
U.S. Army Corps of Engineers
Norfolk District
803 Front Street
Norfolk, Virginia 23510

Dear Colonel Prettyman-Beck:

Zel Technologies, LLC fully endorses and concurs with the findings and recommendations reported in the Final Feasibility Report and Environmental Impact Statement for the Eastward Expansion of Craney Island. We are greatly encouraged by the Norfolk District's recommendation to construct an expansion of Craney Island for additional dredge material disposal and future port development.

The Norfolk district is to be commended for proposing a comprehensive plan that provides $260 million in annual national net economic benefit. The recommended expansion also addresses many regional concerns, including the critical need for future dredge material disposal capacity, expanded port facilities, and environmental restoration of the Southern Branch of the Elizabeth River.

The Eastward Expansion of Craney Island will generate over 54,000 jobs in the region and $155 million in annual state and local tax revenues. Additionally, 26,000 jobs and $788 million in annual wages are expected from regional distribution center operations that will benefit from expanded port services. The recommended improvements to Craney Island coupled with other Federal and State initiatives will improve the efficiency of the Nation's intermodal transportation system and provide economic benefits to millions of Americans.

The Craney Island Eastward Expansion is vitally important to the future of Hampton Roads and the Nation. We support the District's findings and encourage approval of the recommended plan. Thank you for the opportunity to comment on this report.

Sincerely,

Jack L. Ezzell, Jr.
Chief Executive Officer

54 Old Hampton Lane • Hampton, Virginia 23669 • TEL (757) 722-5565 • FAX (757) 722-8516

# LIBERTY

PROPERTY TRUST

June 8, 2006

Colonel Yvonne J. Prettyman-Beck
District Engineer
U.S. Army Corps of Engineers
Norfolk District
803 Front Street
Norfolk, Virginia 23510

***RE: Craney Island Eastward Expansion, Final Feasibility Report and Environmental Impact Statement***

Dear Colonel:

Please be advised. Liberty Property Trust fully endorses and concurs with the findings and recommendations reported by the Norfolk District in the Final Feasibility Report and Environmental Impact Statement for the Eastward Expansion of Craney Island. We appreciate the District's efforts over the last several years to thoroughly study and evaluate the economic and environmental aspects of this vitally important project. From our standpoint, it is the future of our Port.

In addition, we applaud the District for proposing a comprehensive and progressive plan that not only provides $260 million in annual national net economic benefits, but also addresses many regional concerns including the critical need for future dredge material disposal, expanded port facilities, and environmental restoration of the Southern Branch of the Elizabeth River. The Eastward Expansion of Craney Island will also generate over 54,000 jobs in the region and $155 million in annual state and local tax revenues. Approximately 26,000 jobs and $788 million in annual wages are expected from regional distribution center operations that will benefit from expanded port services.

The Eastward Expansion of Craney Island not only provides additional dredge material disposal, but will be constructed in a manner that provides additional port capacity to ensure the Port of Hampton Roads as a gateway of national significance for global trade. We support the District's recommendations and encourage approval of the project as proposed.

Thank you for the opportunity to comment, and please advise if we can be any further assistance.

Sincerely,

Craig Cope
Vice President and City Manager

208 Golden Oak Court • Suite 220 • Virginia Beach, VA 23452 • (757) 498-4800 • Fax: (757) 498-5880 • Tenant Services: (757) 498-5808

Thalhimer
commercial real estate

*Oyster Point*
827 Diligence Drive, Suite 102
Newport News, Virginia 23606
757.873.2900 / Fax: 757.873.3445
thalhimer.com

Robert L. Phillips, Jr.
Vice President
757.873-4124 Direct
bobby.phillips@thalhimer.com

June 8, 2006

Colonel Yvonne J. Prettyman-Beck
District Engineer
U.S. Army Corps of Engineers
Norfolk District
803 Front Street
Norfolk, Virginia 23510

Re: Craney Island Eastward Expansion, Final Feasibility Report and Environmental Impact Statement

Dear Colonel Prettyman:

Please be advised the Thalhimer/Cushman & Wakefield fully endorses and concurs with the findings and recommendations reported by the Norfolk District in the Final Feasibility Report and Environmental Impact Statement for the Eastward Expansion of Craney Island. We appreciate the District's efforts over the last several years to thoroughly study and evaluate the economic and environmental aspects of this vitally important project. From our standpoint, it is the future of our Port.

In addition, we applaud the District for proposing a comprehensive and progressive plan that not only provides $260 million in annual national net economic benefits, but also addresses many regional concerns including the critical need for future dredge material disposal, expanded port facilities, and environmental restoration of the Southern Branch of the Elizabeth River. The Eastward Expansion of Craney Island will also generate over 54,000 jobs in the region and $155 million in annual state and local tax revenues. 26,000 jobs and $788 million in annual wages are expected from regional distribution center operations that will benefit from expanded port services.

The Eastward Expansion of Craney Island not only provides additional dredge material disposal, but will be constructed in a manner that provides additional port capacity to ensure the Port of Hampton Roads as a gateway of national significance for global trade. We support the District's recommendations and encourage approval of the project as proposed. Thank you for the opportunity to comment, and please advise if we can be any further assistance.

Very truly yours,

**THALHIMER/CUSHMAN & WAKEFIELD**

Robert L. Phillips, Jr.
Vice President

cc: Patrick L. Mumey, SIOR
Kevin S. Hegg

**C V INTERNATIONAL, INC.**

*International Freight Forwarder Lic. 3454 N/F*
*Customhouse Broker Lic. 2757*
*Air Freight Forwarder*

June 8, 2006

Colonel Yvonne J. Prettyman-Beck
District Engineer
U.S. Army Corps of Engineers
Norfolk District
803 Front Street
Norfolk, VA 23510

**Re: Craney Island Eastward Expansion, Final Feasibility Report and Environmental Impact Statement**

Dear Colonel Prettyman-Beck,

CV International, Inc. as a logistics and agency company is part of a much larger contingent industry whose existence is linked to the success of Hampton Roads as a port. The Craney Island Project in our opinion as well as many others is vital to the competitive edge necessary to continue on a path to supply port facilities to carriers in this global economy. We only have to look at the workers at the Ford Plant to validate the need to be proactive in forecasting and acting on future needs well before they become reality.

Therefore my company fully supports the Eastward Expansion of Craney Island. We are thankful for your efforts in the past few years to recognize the critical need for future dredge material disposal and expansion of port facilities. We understand that this expansion will create thousands of jobs within the region and millions in annual state and local tax revenues as well as ensuring that the Port of Hampton Roads is an important destination for global trade.

We appreciate the opportunity to comment on this proposal and sincerely support the District's recommendations and encourage you to support this project.

Warm Regards,

B. Wayne Coleman
CEO

BWC/cdf

1128 West Olney Road Norfolk, Virginia 23507 (757) 466-1170 FAX (757) 466-1823
1800 A Associates Lane Charlotte, North Carolina 28217 (704) 357-1444 FAX (704) 357-1848

**McALLISTER TOWING of VIRGINIA, INC.**
MARINE TRANSPORTATION
2600 WASHINGTON AVENUE * SUITE 1004 * NEWPORT NEWS, VA. 23607
TELEPHONE (757) 247-7800 * FAX (757) 245-5836 * www.mcallistertowing.com

June 7, 2006

Colonel Y. J. Prettyman-Beck
District Engineer
U.S. Army Corps of Engineers
Norfolk District
803 Front Street
Norfolk, Virginia 23510

Re: Craney Island Eastward Expansion, Final Feasibility Report
And Environmental Impact Statement

Dear Colonel Prettyman:

Please count McAllister Towing of Virginia among the Corp's supporters as we fully endorse and agree with the findings and recommendations reported by the Norfolk District in the above referenced report and statement. We appreciate the District's efforts over the last several years to thoroughly study and evaluate the economic and environmental aspects of this vitally important project. From our standpoint, it is the future of our Port.

We applaud the District for proposing a plan that not only provides ample economic benefits, but also addresses many regional concerns including future dredge material disposal, expanded port facilities, and environmental restoration of the Southern Branch. This Eastward Expansion will also generate over 54,000 jobs locally and $155 million in annual state and local tax revenues. Another 26,000 jobs and $788 million in annual wages are expected from regional distribution center operations that will benefit from expanded port services.

We support the District's recommendations and encourage approval of the project as proposed. Thank you for the opportunity to comment, and please advise if we can be any further assistance.

Sincerely,
McAllister Towing
of Virginia

William Douglas
Vice President/ General Manager

# Hampton Roads Maritime Association

INCORPORATED

228-236 E. PLUME STREET P.O. BOX 3487

NORFOLK, VIRGINIA 23514-3487
PHONE (757) 622-2639
FAX (757) 622-6302


Recipient of the Presidential "E" and "E Star" Awards for Excellence in Export Service

June 7, 2006

Colonel Yvonne J. Prettyman-Beck
District Engineer
U.S. Army Corps of Engineers
Norfolk District
803 Front Street
Norfolk, Virginia 23510

Re: Craney Island Eastward Expansion, Final Feasibility Report
And Environmental Impact Statement

Dear Colonel Prettyman:

Please be advised the Hampton Roads Maritime Association fully endorses and concurs with the findings and recommendations reported by the Norfolk District in the Final Feasibility Report and Environmental Impact Statement for the Eastward Expansion of Craney Island. We appreciate the District's efforts over the last several years to thoroughly study and evaluate the economic and environmental aspects of this vitally important project. From our standpoint, it is the future of our Port.

In addition, we applaud the District for proposing a comprehensive and progressive plan that not only provides $260 million in annual national net economic benefits, but also addresses many regional concerns including the critical need for future dredge material disposal, expanded port facilities, and environmental restoration of the Southern Branch of the Elizabeth River. The Eastward Expansion of Craney Island will also generate over 54,000 jobs in the region and $155 million in annual state and local tax revenues. 26,000 jobs and $788 million in annual wages are expected from regional distribution center operations that will benefit from expanded port services.

The Eastward Expansion of Craney Island not only provides additional dredge material disposal, but will be constructed in a manner that provides additional port capacity to leverage this gateway of national significance for global trade. We support the District's recommendations and encourage approval of the project as proposed. Thank you for the opportunity to comment, and please advise if we can be of any further assistance.

Sincerely,

Arthur W. Moye, Jr.
Executive Vice President

AWM,Jr/jsk

PANALPINA, INC.
NORFOLK

PANALPINA
on 6 continents

June 7, 2006

18 Interstate Corporate Center
6325 N Center Drive
Ste. 105
Norfolk, VA 23502

Phone (757) 461-8025
Telefax (757) 461-5520
www.panalpina.com

Colonel Yvonne J. Prettyman-Beck
District Engineer
U.S. Army Corps of Engineers
Norfolk District
803 Front Street
Norfolk, Virginia 23510

Re: Craney Island Eastward Expansion, Final Feasibility Report
And Environmental Impact Statement

Dear Colonel Prettyman:

Please be advised that Panalpina, Inc. fully endorses and concurs with the findings and recommendations reported by the Norfolk District in the Final Feasibility Report and Environmental Impact Statement for the Eastward Expansion of Craney Island. We appreciate the District's efforts over the last several years to thoroughly study and evaluate the economic and environmental aspects of this vitally important project. From our standpoint, it is the future of our Port.

In addition, we applaud the District for proposing a comprehensive and progressive plan that not only provides $260 million in annual national net economic benefits, but also addresses many regional concerns including the critical need for future dredge material disposal, expanded port facilities, and environmental restoration of the Southern Branch of the Elizabeth River. The Eastward Expansion of Craney Island will also generate over 54,000 jobs in the region and $155 million in annual state and local tax revenues. 26,000 jobs and $788 million in annual wages are expected from regional distribution center operations that will benefit from expanded port services.

The Eastward Expansion of Craney Island not only provides additional dredge material disposal, but will be constructed in a manner that provides additional port capacity to ensure the Port of Hampton Roads as a gateway of national significance for global trade. We support the District's recommendations and encourage approval of the project as proposed. Thank you for the opportunity to comment, and please advise if we can be any further assistance.

Sincerely,

Panalpina, Inc.

Vincent Di Costanzo
Branch Manager

Anchorage, AK - Atlanta, GA - Baltimore, MD - Boston, MA - Bradley, CT - Charleston, SC - Charlotte, NC - Chicago, IL - Cincinnati, OH - Cleveland, OH - Columbus, OH - Dallas, TX - Denver, CO - Detroit, MI - El Paso, TX
Greenville, SC - Houston, TX - Huntsville, AL - Indianapolis, IN - Laredo, TX - Los Angeles, CA - Memphis, TN - Miami, FL - Milwaukee, WI - Minneapolis, MN - Morristown, NJ - Nashville, TN - New Orleans, LA - New York, NY
Norfolk, VA - Orlando, FL - Philadelphia, PA - Phoenix, AR - Portland, OR - Raleigh, NC - St. Louis, MO - San Diego, CA - San Francisco, CA - San Juan, PR - Seattle, WA - Sterling, VA - Ti Juana, Mexico - Tulsa, OK - Washington, D.C.
All quotations are subject to confirmation and contracts contingent upon strikes, delay in delivery and other causes beyond our control. No insurance coverage is effected except upon express instructions given in writing by the customer.
Rates subject to change without notice. All shipments handled as per Terms and Conditions of Service as printed on the reverse side. FMC No. 375.

Norfolk Southern Corporation
Three Commercial Place
Norfolk, Virginia 23510-9251
Telephone: 757/629-2748
FAX: 757/629-2849
remartin@nscorp.com

**Robert E. Martínez**
Vice President
Business Development

June 7, 2006

Colonel Yvonne J. Prettyman-Beck
District Engineer
U.S. Army Corps of Engineers
Norfolk District
803 Front Street
Norfolk, VA 23510

Re: Craney Island Eastward Expansion, Draft Feasibility Report and Environmental Impact Statement

Dear Colonel Prettyman:

On behalf of Norfolk Southern Corporation, please accept this letter as our full endorsement and concurrence with the findings and recommendations reported by the Norfolk District in the Final Feasibility Report and Environmental Impact Statement for the Eastward Expansion of Craney Island. We applaud the District's efforts and diligence over these past many years to get us to where we are today on this project, and your evident interest in promoting both the economic prosperity of this region as well as its environmental well-being.

The planned eastward expansion of Craney Island is indispensable for the future growth of the Port of Virginia and for our maritime industry. This region cannot survive economically without this maritime engine of growth. It is what drives our economy and maintains our jobs. An eastward expansion for Craney is the means by which we can facilitate that continued role but achieve it in a manner that is environmentally beneficent. In reality, this eastward expansion is not only important to the region of Hampton Roads and the Commonwealth of Virginia, but is also an improvement with national, highly beneficial significance. So, again, my congratulations on having gotten this far, and our endorsement of the same.

Kindly feel free to contact me if you require any further input on Norfolk Southern's position regarding this very important project.

Sincerely,

cc: Mr. Charles W. Moorman
Mr. Donald W. Seale

City of Franklin
VIRGINIA
*Growth • Community • Spirit*

OFFICE OF THE MAYOR

June 6, 2006

Colonel Yvonne J. Prettyman-Beck
District Engineer
U.S. Army Corps. of Engineers
Norfolk District
803 Front Street
Norfolk VA 23510

RE: Craney Island Eastward Expansion, Draft Feasibility Report and Environmental Impact Statement

Dear Colonel Prettyman:

The City of Franklin fully endorses and concurs with the findings and recommendations reported by the Norfolk District in the Final Feasibility Report and Environmental Impact Statement for the Eastward Expansion of Craney Island. We appreciate the District's efforts over the last several years to thoroughly study and evaluate the economic and environmental aspects of this vitally important project.

In addition, we applaud the District for proposing a comprehensive and progressive plan that not only provides $260 million in annual national net economic benefits, but also addresses many regional concerns including the critical need for future dredge material disposal, expanded port facilities, and environmental restoration of the Southern Branch of the Elizabeth River. The Eastward Expansion of Craney Island will also generate over 54,000 jobs in the region and $155 million in annual state and local tax revenues. 26,000 jobs and $788 million in annual wages are expected from regional distribution center operations that will benefit from expanded port services.

The Eastward Expansion of Craney Island not only provides additional dredge material disposal but will be constructed in a manner that provides additional port capacity to leverage this gateway of national significance for global trade. We support the District's recommendations and encourage approval of the project as proposed. Thank you for the opportunity to comment.

Sincerely,

James P. Counceill, III
Mayor

207 W. Second Avenue, Franklin, VA 23851, Office 757-562-6154, Fax 757-562-6517, franklinmayor@franklinva.com, www.franklinva.com

# CITY OF SUFFOLK

P. O. BOX 1858, SUFFOLK, VIRGINIA 23439-1858 PHONE: (757) 923-2085

CITY MANAGER


June 5, 2006

Colonel Yvonne J. Prettyman-Beck
District Engineer
U.S. Army Corps of Engineers
Norfolk District
803 Front Street
Norfolk, VA 23510

Re: Craney Island Eastward Expansion, Draft Feasibility Report and Environmental Impact Statement

Dear Colonel Prettyman:

The City of Suffolk supports the findings and recommendations of the Norfolk District in the Final Feasibility Report and Environmental Impact Statement for the Eastward Expansion of Craney Island. While other options initially under consideration for the expansion of Craney Island created environmental and neighborhood concerns in north Suffolk, the plan for eastward expansion does not create similar impacts.

The eastward expansion of Craney Island will meet several critical needs by allowing for future dredge material disposal, expansion of our port facilities and environmental restoration of the Southern Branch of the Elizabeth River. As an economic driver for the region, it is critical that our port remain internationally competitive. The expansion of Craney Island will help Hampton Roads retain its competitive edge.

The City of Suffolk supports the proposed eastward expansion of Craney Island and encourages approval of the project as proposed.

Sincerely,

Steve Herbert

R. Steven Herbert
City Manager

Pc: J.J. Keever, Deputy Executive Director, Va. Port Authority

COMMONWEALTH OF VIRGINIA
HOUSE OF DELEGATES
RICHMOND

ROBERT TATA
4536 GLENEAGLE DRIVE
VIRGINIA BEACH, VIRGINIA 23462

EIGHTY-FIFTH DISTRICT

June 5, 2006

COMMITTEE ASSIGNMENTS:
EDUCATION (CHAIRMAN)
APPROPRIATIONS
COMMERCE AND LABOR

Colonel Yvonne J. Prettyman-Beck
District Engineer
U. S. Army Corps of Engineers
Norfolk District
803 Front Street
Norfolk, VA 23510

RE: Craney Island Eastward Expansion, Draft Feasibility Report
And Environmental Impact Statement

Dear Colonel Prettyman:

I, Delegate Robert Tata, fully endorse and concur with the findings and recommendations reported by the Norfolk District in the Final Feasibility Report and Environmental Impact Statement for the Eastward Expansion of Craney Island. We appreciate the District's efforts over the last several years to thoroughly study and evaluate the economic and environmental aspects of this vitally important project.

In addition, we applaud the District for proposing a comprehensive and progressive plan that not only provides $260 million in annual national net economic benefits, but also addresses many regional concerns including the critical need for future dredge material disposal, expanded port facilities, and environmental restoration of the Southern Branch of the Elizabeth River. The Eastward Expansion of Craney Island will also generate over 54,000 jobs in the region and $155 million in annual state and local tax revenues. 16,000 jobs and $788 million in annual wages are expected from regional distribution center operations that will benefit from expanded port services.

The Eastward Expansion of Craney Island not only provides additional dredge material disposal but will be constructed in a manner that provides additional port capacity to leverage this gateway of national significance for global trade. We support the District's recommendations and encourage approval of the project as proposed. Thank you for the opportunity to comment.

Sincerely,

Robert Tata

DISTRICT: (757) 340-3510 • RICHMOND: (804) 698-1085

HAMPTON ROADS PARTNERSHIP

*Co-Chairman*
Thomas R. Frantz
Deborah K. Stearns

E. Dana Dickens, III
*President & CEO*

June 5, 2006

Colonel Yvonne J. Prettyman-Beck
District Engineer
U.S. Army Corps of Engineers
Norfolk District
803 Front Street
Norfolk, VA 23510

Re: Craney Island Eastward Expansion, Draft Feasibility Report and Environmental Impact Statement

Dear Colonel Prettyman-Beck:

The Hampton Roads Partnership fully endorses and concurs with the findings and recommendations reported by the Norfolk District in the Final Feasibility Report and Environmental Impact Statement for the Eastward Expansion of Craney Island. We appreciate the District's efforts over the last several years to thoroughly study and evaluate the economic and environmental aspects of this vitally important project.

In addition, we applaud the District for proposing a comprehensive and progressive plan that not only provides $260 million in annual national net economic benefits, but also addresses many regional concerns including the critical need for future dredge material disposal, expanded port facilities, and environmental restoration of the Southern Branch of the Elizabeth River. The Eastward Expansion of Craney Island will generate over 54,000 jobs in the region and $155 million in annual state and local tax revenues. Twenty-six thousand jobs and $788 million in annual wages are expected from regional distribution center operations that will benefit from expanded port services.

The Eastward Expansion of Craney Island not only provides additional dredge material disposal but will be constructed in a manner that provides additional port capacity to leverage this gateway of national significance for global trade. We support the District's recommendations and encourage approval for the project as proposed. Thank you for the opportunity to comment.

Sincerely,

E. Dana Dickens

430 World Trade Center | Norfolk, VA 23510 | 757.625.4696 | Fax 757.625.4684 | www.hrp.org

# COMMONWEALTH of VIRGINIA

L. Preston Bryant, Jr.
Secretary of Natural Resources

*DEPARTMENT OF ENVIRONMENTAL QUALITY*
*Street address:* 629 East Main Street, Richmond, Virginia 23219
*Mailing address:* P. O. Box 10009, Richmond, Virginia 23240
Fax (804) 698-4500 TDD (804) 698-4021
www.deq.virginia.gov

David K. Paylor
Director

(804) 698-4000
1-800-592-5482

June 5, 2006

Mr. Lee Ware
U.S. Army Corps of Engineers
Department of the Army
441 G Street, N.W.
Washington, D.C. 20314

RE: Final Feasibility Report and Final Environmental Impact Statement, Craney Island Eastward Expansion: Comment Period
DEQ-06-105F

Dear Mr. Ware:

This will confirm our June 5, 2006 telephone conversation, in which you indicated that Virginia's comments on the documents would be accepted as late as June 30, 2006 (instead of the June 16 deadline indicated by Mr. Thomas Waters's May 17 cover letter for the document).

Thank you very much for your consideration in this matter.

Sincerely,

Charles H. Ellis III
Environmental Impact Review Coordinator
Office of Environmental Impact Review

cc: Ellie L. Irons, DEQ-OEIR
Headquarters, U.S. ACE, CECW-P (SA)
Craig Seltzer, U.S. ACE, Norfolk

# *COMMONWEALTH of VIRGINIA*

*Office of the Governor*

Pierce R. Homer
Secretary of Transportation

P.O. Box 1475
Richmond, Virginia 23218

(804) 786-8032
Fax: (804) 786-6683
TTY: (800) 828-1120

June 2, 2006

Colonel Yvonne J. Prettyman-Beck
District Engineer
U.S. Army Corps of Engineers
Norfolk District
803 Front Street
Norfolk, Virginia 23510

Re: Craney Island Eastward Expansion, Draft Feasibility Report And Environmental Impact Statement

Dear Colonel Prettyman:

On behalf of the Commonwealth of Virginia, I endorse and concur with the findings and recommendations reported by the Norfolk District in the Final Feasibility Report and Environmental Impact Statement for the Eastward Expansion of Craney Island. The Commonwealth appreciates the District's efforts over the last several years to thoroughly study and evaluate the economic and environmental aspects of this important project.

In addition, I applaud the District for proposing a comprehensive and progressive plan that not only provides $260 million in annual national net economic benefits, but also addresses many regional concerns including the critical need for future dredge material disposal, expanded port facilities, and environmental restoration of the Southern Branch of the Elizabeth River. The Eastward Expansion of Craney Island will also generate over 54,000 jobs in the region and $155 million in annual state and local tax revenues. 26,000 jobs and $788 million in annual wages are expected from regional distribution center operations that will benefit from expanded port services.

The Eastward Expansion of Craney Island not only provides additional dredge material disposal but will be constructed in a manner that provides additional port capacity to leverage this gateway of national significance for global trade. We support the District's recommendations and encourage approval of the project as proposed. Thank you for the opportunity to comment.

Sincerely,

Pierce R. Homer

Pierce R. Homer

PRH:jgc

Copy: Mr. J. Robert Bray

Virginia Pilot Association

TELEPHONE: 757-496-0995
FACSIMILE: 757-496-9324
email: dispatch@vapilotassn.com
3329 SHORE DRIVE
VIRGINIA BEACH, VA 23451

June 2, 2006

Colonel Yvonne J. Prettyman-Beck
District Engineer
U.S. Army Corps of Engineers
Norfolk District
803 Front Street
Norfolk, Virginia 23510

Re: Craney Island Eastward Expansion
Feasibility Report and Environmental
Impact Statement

Dear Colonel Prettyman-Beck,

The Virginia Pilot Association concurs and fully supports the conclusions and recommendations reported in the ***Feasibility Report and Environmental Impact Statement for the Eastward Expansion of Craney Island.***

The pilots have been active stakeholders in this project for many years and are very pleased by the recommendation for eastward expansion of Craney Island for future port development. Having the vision to recognize that our ports will be the gateway for the economic vitality of our country puts this project on the forefront as we continue to look to deepen our channels to the authorized 55-foot depth in the future.

We recognize the positive impact on Hampton Roads and the Commonwealth on this project, but the ultimate impact is our country's opportunity to be positioned with responding to the global economy. Besides the enormous number of jobs that will be generated by the

completion of this project, we believe the eastward expansion of Craney Island represents the foundation for a transportation infrastructure that will positively impact our citizens for generations to come.

The Virginia Pilot Association wholeheartedly supports the Norfolk District's findings and encourage approval of the project as proposed.

Sincerely,

J. William Cofer

J. William Cofer
President

JWC:bb

cc: J. Robert Bray, Virginia Port Authority
J. Jeff Keever, Virginia Port Authority
Arthur Moye, Hampton Roads Maritime Association

# SENATE OF VIRGINIA

KENNETH W. STOLLE
SENATE MAJORITY WHIP
8TH SENATORIAL DISTRICT
PART OF THE CITY OF VIRGINIA BEACH
2101 PARKS AVENUE, SUITE 700
VIRGINIA BEACH, VIRGINIA 23451
(757) 486-5700 VIRGINIA BEACH
(804) 698-7508 RICHMOND
EMAIL: VASENATE08@KENSTOLLE.COM

COMMITTEE ASSIGNMENTS:
COURTS OF JUSTICE, CHAIR
COMMERCE AND LABOR
FINANCE
PRIVILEGES AND ELECTIONS
RULES

June 1, 2006

Colonel Yvonne J. Prettyman-Beck
District Engineer
U.S. Army Corps of Engineers
Norfolk District
803 Front Street
Norfolk, VA 23510

Dear Colonel Prettyman:

I endorse and concur with the findings and the recommendations reported by the Norfolk District in the Final Feasibility Report and the Environmental Impact Statement for the Eastward Expansion of Craney Island. I appreciate the District's efforts over the last several years to thoroughly study and evaluate the economic environmental aspects of this vitally important project.

In addition, I applaud the District for proposing a comprehensive and progressive plan that not only provides $260 million in annual national net economic benefits, but also addresses many regional concerns including the critical need for future dredge material disposal, expanded port facilities, and environmental restoration of the Southern Branch of the Elizabeth River. The Eastward Expansion of Craney Island will also generate over 54,000 jobs in the region and $155 million state and local tax revenues, 26,000 jobs and $788 million in annual wages are expected from regional distribution center operations that will benefit from expanded port services.

The Eastward expansion of Craney Island not only provides additional dredge material disposal but will be constructed in a manner that provides additional port capacity to leverage this gateway of national significance for global trade. I support the District's recommendations and encourage approval of the project as proposed. Thank you for the opportunity to comment. With kindest regards I am

Very truly yours,

Kenneth W. Stolle

KWS/kcs

NORFOLK STATE UNIVERSITY®

*Vice President for Finance and Business*
700 Park Avenue, Suite 310, Norfolk, Virginia 23504-8004
**Tel:** (757) 823-8011 **Fax:** (757) 823-8084
**Email:** finance&business@nsu.edu
**Web:** www.nsu.edu

June 1, 2006

Colonel Yvonne J. Prettyman-Beck
District Engineer
U.S. Army Corps of Engineers
Norfolk District
803 Front Street
Norfolk, VA 23510

Re: Craney Island Eastward Expansion, Draft Feasibility Report
And Environmental Impact Statement

Dear Colonel Prettyman:

Norfolk State University fully endorses and concurs with the findings and recommendations reported by the Norfolk District in the Final Feasibility Report and Environmental Impact Statement for the Eastward Expansion of Craney Island. We appreciate the District's efforts over the last several years to thoroughly study and evaluate the economic and environmental aspects of this vitally important project.

In addition, we applaud the District for proposing a comprehensive and progressive plan that not only provides $260 million in annual national net economic benefits, but also addresses many regional concerns including the critical need for future dredge material disposal, expanded port facilities, and environmental restoration of the Southern Branch of the Elizabeth River. The Eastward Expansion of Craney Island will also generate over 54,000 jobs in the region and $155 million in annual state and local tax revenues. 26,000 jobs and $788 million in annual wages are expected from regional distribution center operations that will benefit from expanded port services.

The Eastward Expansion of Craney Island not only provides additional dredge material disposal but will be constructed in a manner that provides additional port capacity to leverage this gateway of national significance for global trade. We support the District's recommendations and encourage approval of the project as proposed. Thank you for the opportunity to comment.

Sincerely,

Kevin Appleton

Kevin Appleton
Vice President for Finance and Business

SUNTRUST

William K. Butler, II
President and CEO

SunTrust Bank, Hampton Roads
Post Office Box 2600
Norfolk, VA 23501-2600
Tel 757.624.5454
Fax 757.640.5875

May 31, 2006

Colonel Yvonne J. Prettyman-Beck
District Engineer
U.S. Army Corps of Engineers
Norfolk District
803 Front Street
Norfolk, VA 23510

Re: Craney Island Eastward Expansion, Draft Feasibility Report
And Environmental Impact Statement

Dear Colonel Prettyman:

The SunTrust Bank Hampton Roads fully endorses and concurs with the findings and recommendations report by the Norfolk District in the Final Feasibility Report and Environmental Impact Statement for the Eastward Expansion of Craney Island. We appreciate the District's efforts over the last several years to thoroughly study and evaluate the economic and environmental aspects of this vitally important project.

In addition, we applaud the District for proposing a comprehensive and progressive plan that not only provides $260 million in annual national net economic benefits, but also addresses many regional concerns including the critical need for future dredge material disposal, expanded port facilities and environmental restoration for the Southern Branch of the Elizabeth River. The Eastward Expansion of Craney Island will also generate over 54,000 jobs in the region and $255 million in annual state and local tax revenues. 26,000 jobs and $788 million in annual wages are expected from regional distribution center operations that will benefit from expanded port services.

The Eastward Expansion of Craney Island not only provides annual dredge material disposa, but will be constructed in a manner that provides annual port capacity to leverage this gateway of national significance for global trade. We support the District's recommendations and encourage approval of the project as proposed. Thank you for the opportunity to comment.

Sincerely,

William K. Butler II

**CHECKERED FLAG**

*Where Winners Buy*

May 31, 2006

EXECUTIVE OFFICES

5225 Virginia Beach Blvd.
Virginia Beach, VA 23462
Phone (757) 490-1111
Fax (757) 687-3433

Colonel Yvonne J. Prettyman-Beck
District Engineer
U.S. Army Corps of Engineers
Norfolk District
803 Front Street
Norfolk, Virginia 23510

Re: Craney Island Eastward Expansion, Draft Feasibility Report and Environmental Impact Statement

Dear Colonel Prettyman:

Checkered Flag Motor Car Company, Inc. fully supports The Eastward Expansion of Craney Island as proposed by the Norfolk District in the Final Feasibility Report and Environmental Impact Statement for the Eastward Expansion of Craney Island. Being a locally owned company, and the largest dealer of import automobiles in the area, we recognize the need for port expansion. We are pleased with the efforts of the District to thoroughly study and evaluate the economic and environmental aspects of this project.

The District has proposed an all encompassing plan that not only provides economic benefits, but also addresses many regional concerns such as the need for future dredge material disposal, expanded port facilities, and environmental restoration of the Elizabeth River. The project is also expected to generate several thousand jobs in the area and millions of dollars in tax revenues.

Not only is this expansion crucial to our region's standing in the global marketplace, it has the potential to benefit our community in several other ways. Checkered Flag endorses and encourages the approval of the proposal put forth by the Norfolk District for the Expansion of Craney Island.

Thank you for the opportunity to comment on this important issue.

Sincerely,

Edward B. Snyder
President

EBS/pb

# CITY OF CHESAPEAKE

OFFICE OF THE MAYOR
306 CEDAR ROAD
CHESAPEAKE, VA 23322

PHONE 1-757-382-6462
FAX 1-757-382-6678
PHONE MAIL 1-757-382-6974

May 31, 2006

Colonel Yvonne J. Prettyman-Beck
Commander, Norfolk District
U.S. Army Corps of Engineers
803 Front Street
Norfolk, Virginia 23510

Dear Colonel Prettyman-Beck:

The City of Chesapeake fully endorses and concurs with the findings and recommendations reported by the Norfolk District in the Final Feasibility Report and Environmental Impact Statement for the Eastward Expansion of Craney Island. We appreciate the District's efforts over the last several years to thoroughly study and evaluate the economic and environmental aspects of this vitally important project.

In addition, we applaud the District for proposing a comprehensive and progressive plan that not only provides $260 million in annual national net economic benefits, but also addresses many regional concerns including the critical need for future dredge material disposal, expanded port facilities, and environmental restoration of the Southern Branch of the Elizabeth River. The Eastward Expansion of Craney Island will also generate 54,000 jobs in the region and $155 million in annual state and local revenues. 26,0000 jobs and $788 million in annual wages are expected from regional distribution center operations that will benefit from expanded port services.

The Eastward Expansion of Craney Island not only provides additional dredge material disposal but will be constructed in a manner that provides additional port capacity to leverage this gateway of national significance for global trade. We support the District's recommendations and encourage approval of the project as proposed. Thank you for the opportunity to comment.

Sincerely,

Dalton S. Edge
Mayor

DSE/rjc

xc: City Council

S:\Mayor Edge\Correspondence\2006\ColP-BeckACOEExpansionCraneyIsland.doc

Bank of America

CHARLES R. HENDERSON, JR.
President
Hampton Roads Market

May 31, 2006

Colonel Yvonne J. Prettyman-Beck
District Engineer
U.S. Army Corps of Engineers
Norfolk District
803 Front Street
Norfolk, Virginia 23510

Re: Craney Island Eastward Expansion, Draft Feasibility Report And Environment Impact Statement

Dear Colonel Prettyman:

The Bank of America fully endorses and concurs with the findings and recommendations reported by the Norfolk District in the Final Feasibility Report and Environmental Impact Statement for the Eastward Expansion of Craney Island. We appreciate the District's efforts over the last several years to thoroughly study and evaluate the economic and environmental aspects of this vitally important project.

In addition, we applaud the District for proposing a comprehensive and progressive plan that not only provides $260 million in annual national net economic benefits, but also addresses many regional concerns including the critical need for future dredge material disposal, expanded port facilities, and environmental restoration of the Southern Branch of the Elizabeth River. The Eastward Expansion of Craney Island will also generate over 54,000 jobs in the region and $155 million in annual state and local tax revenues. 26,000 jobs and $788 million in annual wages are expected from regional distribution center operations that will benefit from expanded port services.

The Eastward Expansion of Craney Island not only provides additional dredge material disposal but will be constructed in a manner that provides additional port capacity to leverage this gateway of national significance for global trade. We support the District's recommendations and encourage approval of the project as proposed. Thank you for the opportunity to comment.

Sincerely,

Charles R. Henderson Jr.

Charles R. Henderson, Jr.
President

Tel: 757.441.8661 · Fax: 757.441.8237
charlie.henderson@bankofamerica.com

Bank of America, VA6-100-03-01
One Commercial Place, 3rd Flr., Norfolk, VA 23510-2103

Recycled Paper

# SENATE OF VIRGINIA

MARTIN E. WILLIAMS
1ST SENATORIAL DISTRICT
ALL OF THE CITY OF POQUOSON; PART OF
YORK COUNTY; AND PART OF THE CITIES OF
HAMPTON AND NEWPORT NEWS
POST OFFICE BOX 1096
NEWPORT NEWS, VIRGINIA 23601

COMMITTEE ASSIGNMENTS:
TRANSPORTATION, CHAIR
COMMERCE AND LABOR
REHABILITATION AND SOCIAL SERVICES
RULES

May 31, 2006

Colonel Yvonne J. Prettyman-Beck
District Engineer
U.S. Army Corps of Engineers
Norfolk District
803 Front Street
Norfolk, VA 23510

Re: Craney Island Eastward Expansion, Draft Feasibility Report
And Environmental Impact Statement

Dear Colonel Prettyman-Beck:

I am writing to endorse and concur with the findings and recommendations reported by the Norfolk District in the Final Feasibility Report and Environmental Impact Statement for the Eastward Expansion of Craney Island. I appreciate the District's efforts over the last several years to thoroughly study and evaluate the economic and environmental aspects of this vitally important project.

In addition, I applaud the District for proposing a comprehensive and progressive plan that not only provides $260 million in annual national net economic benefits, but also addresses many regional concerns including the critical need for future dredge material disposal, expanded port facilities, and environmental restoration of the Southern Branch of the Elizabeth River. The Eastward Expansion of Craney Island will also generate over 54,000 jobs in the region and $155 million in annual state and local tax revenues. 26,000 jobs and $788 million in annual wages are expected from regional distribution center operations that will benefit from expanded port services.

The Eastward Expansion of Craney Island not only provides additional dredge material disposal but will be constructed in a manner that provides additional port capacity to leverage this gateway of national significance for global trade. I support the District's recommendations and encourage approval of the project as proposed. If you have any questions, please contact my office at (757) 599 8683.

Sincerely,

Senator Marty Williams

# SENATE OF VIRGINIA

FRANK W. WAGNER
7TH SENATORIAL DISTRICT
PART OF THE CITY OF VIRGINIA BEACH
POST OFFICE BOX 68008
VIRGINIA BEACH, VIRGINIA 23471

COMMITTEE ASSIGNMENTS:
COMMERCE AND LABOR
GENERAL LAWS
REHABILITATION AND SOCIAL SERVICES
TRANSPORTATION

May 29, 2006

Colonel Yvonne J. Prettyman-Beck, District Engineer
U.S. Army Corps of Engineers, Norfolk District
803 Front Street
Norfolk, Virginia 23510

Dear Colonel Prettyman-Beck:

I am in complete agreement with the findings and recommendations reported by the Norfolk District in the Final Feasibility Report and Environmental Impact Statement for the Eastward Expansion of Craney Island. I appreciate the District's efforts over the last several years to thoroughly study and evaluate the economic and environmental aspects of this vitally important project.

In addition, I applaud the District for proposing a comprehensive and progressive plan that not only provides $260 million in annual national net economic benefits, but also addresses many regional concerns including the critical need for future dredge material disposal, expanded port facilities, and environmental restoration of the Southern Branch of the Elizabeth River. The Eastward Expansion of Craney Island will also generate over 54,000 jobs in the region and $155 million in annual state and local tax revenues. 26,000 jobs and $788 million in annual wages are expected from regional distribution center operations that will benefit from expanded port services.

The Eastward Expansion of Craney Island not only provides additional dredge material disposal but also will be constructed in a manner that provides additional port capacity to leverage this gateway of national significance for global trade. I fully support the District's recommendations and encourage approval of the project as proposed. Thank you for the opportunity to comment.

On a personal note, on behalf of the citizens of the Commonwealth, I thank you for your service here and wish you the best in your next assignment.

Kindest regards,

Frank W. Wagner

Frank W. Wagner

# HAMPTON ROADS SHIPPING ASSOCIATION

236 E. Plume Street

P. O. Box 3487

Norfolk, Virginia 23514-3487
Phone 757-622-2639
Fax 757-622-6302

May 26, 2006

Colonel Yvonne J. Prettyman-Beck
District Engineer
U.S. Army Corps of Engineers
Norfolk District
803 Front Street
Norfolk, Virginia 23510

Re: Craney Island Eastward Expansion, Draft Feasibility Report
And Environmental Impact Statement

Dear Colonel Prettyman:

Please be advised the Hampton Roads Maritime Association fully endorses and concurs with the findings and recommendations reported by the Norfolk District in the Final Feasibility Report and Environmental Impact Statement for the Eastward Expansion of Craney Island. We appreciate the District's efforts over the last several years to thoroughly study and evaluate the economic and environmental aspects of this vitally important project. From our standpoint, it is the future of our Port.

In addition, we applaud the District for proposing a comprehensive and progressive plan that not only provides $260 million in annual national net economic benefits, but also addresses many regional concerns including the critical need for future dredge material disposal, expanded port facilities, and environmental restoration of the Southern Branch of the Elizabeth River. The Eastward Expansion of Craney Island will also generate over 54,000 jobs in the region and $155 million in annual state and local tax revenues. 26,000 jobs and $788 million in annual wages are expected from regional distribution center operations that will benefit from expanded port services.

The Eastward Expansion of Craney Island not only provides additional dredge material disposal but will be constructed in a manner that provides additional port capacity to ensure the Port of Hampton Roads as a gateway of national significance for global trade. We support the District's recommendations and encourage approval of the project as proposed. Thank you for the opportunity to comment, and please advise if we can be any further assistance.

Sincerely,

Arthur W. Moye, Jr.
Executive Vice President

AWM,Jr/jsk

DRUCKER & FALK, LLC
REAL ESTATE

9286 Warwick Boulevard, Newport News, VA 23607-1500 Tel: (757) 245-1541 FAX: (757) 244-1974

May 26, 2006

Colonel Yvonne J. Prettyman-Beck
District Engineer
U.S. Army Corps of Engineers
Norfolk District
803 Front Street
Norfolk, VA 23510

RE: Craney Island Eastward Expansion, Draft Feasibility Report, and Environmental Impact Statement

Dear Colonel Prettyman:

Drucker & Falk, LLC fully endorses and concurs with the findings and recommendations reported by the Norfolk District in the Final Feasibility Report and Environmental Impact Statement for the Eastward Expansion of Craney Island. We appreciate the District's efforts over the last several years to thoroughly study and evaluate the economic and environmental aspects of this vitally important project.

In addition, we applaud the District for proposing a comprehensive and progressive plan that not only provides $260 million in annual national net economic benefits, but also addresses many regional concerns including the critical need for future dredge material disposal, expanded port facilities, and environmental restoration of the Southern Branch of the Elizabeth River. The Eastward Expansion of Craney Island will also generate over 54,000 jobs in the region and $155 million in annual state and local tax revenues. Twenty-six thousand jobs and $788 million in annual wages are expected from regional distribution center operations that will benefit from expanded port services.

The Eastward Expansion of Craney Island not only provides additional dredge material disposal but will be constructed in a manner that provides additional port capacity to leverage this gateway of national significance for global trade. We support the District's recommendations and encourage approval of the project as proposed. Thank you for the opportunity to comment.

Most sincerely,

DRUCKER & FALK, LLC

Wendy C. Drucker
Co-CEO & Member

# COMMONWEALTH of VIRGINIA

L. Preston Bryant, Jr.
Secretary of Natural Resources

*DEPARTMENT OF ENVIRONMENTAL QUALITY*
*Street address:* 629 East Main Street, Richmond, Virginia 23219
*Mailing address:* P. O. Box 10009, Richmond, Virginia 23240
Fax (804) 698-4500 TDD (804) 698-4021
www.deq.virginia.gov

David K. Paylor
Director

(804) 698-4000
1-800-592-5482

June 28, 2006

Headquarters
U.S. Army Corps of Engineers
CECW-P (SA)
7701 Telegraph Road
Alexandria, Virginia 22315

RE: Final EIS and Proposed Report of the Chief of Engineers, Craney Island Eastward Expansion, Hampton Roads, Virginia
DEQ-06-105F

Ladies and Gentlemen:

The Commonwealth of Virginia has completed its review of the above Final Environmental Impact Statement. The Department of Environmental Quality is responsible for coordinating Virginia's review of federal environmental documents prepared pursuant to the National Environmental Policy Act and responding to appropriate federal officials on behalf of the Commonwealth. In addition, DEQ's Office of Environmental Impact Review (this Office) coordinates Virginia's federal consistency reviews pursuant to the Coastal Zone Management Act. The following state agencies, regional planning district commission, and localities participated in this review:

Department of Environmental Quality (hereinafter "DEQ")
Department of Game and Inland Fisheries
Department of Conservation and Recreation
Department of Transportation
Department of Historic Resources
Hampton Roads Planning District Commission
City of Newport News
City of Portsmouth
City of Norfolk.

In addition, the Virginia Institute of Marine Science, the Marine Resources Commission, and the City of Hampton were invited to comment.

*(ii) Least Tern.* The least tern (*Sterna antillarum*) nests on broad, flat beaches with minimal vegetation, and forages in salt water near the shore. Threats to this species include loss of nesting habitat due to development and disturbance of breeding colonies by human activities and high numbers of predators (Beck, 1991).

The least tern is listed as a species of special concern by the Department of Game and Inland Fisheries.

*(iii) Black-necked Stilt.* The black-necked stilt (*Himantopus mexicanus*) occur primarily near shallow salt- or fresh-water bodies with soft muddy bottoms, including grassy marshes, wet savannas, mudflats, shallow ponds, flooded fields, and the borders of salt ponds. These birds nest along the shallow water of ponds, lakes, swamps, or lagoons and may nest on the ground or in shallow water on a plant tussock. Black-necked stilts feed on insects, crustaceans, and small fish as well as the seeds of aquatic plants.

*(b) Plant and Insect Species.* Under a memorandum of agreement between DCR and the Department of Agriculture and Consumer Services (VDACS), DCR represents VDACS in commenting on potential project impacts on state-listed threatened and endangered plant and insect species. The proposed eastward expansion and development of Craney Island will not affect any documented state-listed plants or insects, according to DCR.

*(c) Recommendations.* Because of the legal status of the piping plover, DCR recommends that the Corps of Engineers coordinate with the Fish and Wildlife Service and the Department of Game and Inland Fisheries to ensure compliance with the Endangered Species Act and state protected species legislation. See "Regulatory and Coordination Needs," item 1, below.

DCR also recommends that coordination with the Department of Game and Inland Fisheries be undertaken with regard to the Craney Island Bird Long-Term Management Plan contemplated as part of the proposed mitigation plan (see "Regulatory and Coordination Needs," item 1, below).

2. *Wildlife Resources.* The Department of Game and Inland Fisheries, as the Commonwealth's wildlife and freshwater fish management agency, exercises enforcement and regulatory jurisdiction over wildlife and freshwater fish, including state or federally listed endangered or threatened species, but excluding listed insects. The Department (hereinafter "DGIF") is a consulting agency under the U.S. Fish and Wildlife Coordination Act (16 U.S.C. sections 661 et seq.), and provides environmental analysis of projects or permit applications coordinated

*(ii) Coordination.* The Corps, and/or the Port Authority, should coordinate activities at Ragged Island Wildlife Management Area with the Department of Game and Inland Fisheries. Similarly, the bird management plan should be coordinated. See "Regulatory and Coordination Needs," item 1, below.

*(d) Additional Wildlife Information.* DGIF maintains a data base of wildlife locations, including threatened and endangered species, trout streams, and anadromous fish waters, that may contain information not documented by DCR (item 1, above). Access to this data base may be obtained through the DGIF web site:

http://www.dgif.virginia.gov/wildlife/info_map/index.html

Questions on this web site may be addressed to the Department of Game and Inland Fisheries (Shirl Dresser, telephone (804) 367-6913).

*3. Air Quality.* DEQ's Division of Air Program coordination reiterated the guidance it provided in our comments on the Draft EIS. This guidance follows.

According to DEQ's Division of Air Program Coordination, Craney Island is in an ozone non-attainment area. For this reason, emissions of volatile organic compounds (VOCs) and oxides of nitrogen ($NO_x$) to project construction and operation should be kept to a minimum. VOCs and $NO_x$ are precursors to atmospheric ozone ($O_3$).

*(a) Open Burning.* If project activities include the burning of construction or demolition material, this activity must meet the requirements of the Regulations for open burning (9 VAC 5-40-5600 et seq.), and it may require a permit (see "Regulatory and Coordination Needs, item 3). The Regulations provide for, but do not require, the local adoption of a model ordinance concerning open burning. The Corps and the Port Authority should contact appropriate local officials to determine what local requirements, if any, exist. The model ordinance includes, but is not limited to, the following provisions:

- All reasonable effort shall be made to minimize the amount of material burned, with the number and size of the debris piles;
- The material to be burned shall consist of brush, stumps and similar debris waste and clean burning demolition material;
- The burning shall be at least 500 feet from any occupied building unless the occupants have given prior permission, other than a building located on the property on which the burning is conducted;
- The burning shall be conducted at the greatest distance practicable from

with requirements of the State Water Control Board or other Virginia agencies with similar authority, are conditionally exempt from the Virginia Solid Waste Management Regulations (9 VAC 20-80-60.E.), and are excluded from the waste barging regulations (9 VAC 20-170-10).

In addition, any storage, treatment, or disposal of hazardous wastes must be conducted in accordance with applicable state laws and regulations. These include, but are not limited to, the following:

- Virginia Waste Management Act (*Virginia Code* sections 10-1400 et seq.);
- Virginia Hazardous Waste Management Regulations (9 VAC 20-60);
- Virginia solid Waste Management Regulations (9 VAC 20-80); and
- Virginia Regulations for the Transportation of Hazardous Materials (9 VAC 20-110).

Applicable federal laws include, but are not limited to:

- Resource Conservation and Recovery Act (RCRA) (42 U.S.C. 6901 et seq.);
- U.S. Department of Transportation's Rules for Transportation of Hazardous Materials, 49 Code of Federal Regulations, Part 107.

*(c) Pollution Prevention.* DEQ encourages the Corps to implement pollution prevention principles, including the reduction of solid wastes at the source, re-use of materials, and recycling of waste materials.

*5. Water Quality and Wetlands.*

*(a) Project Impacts and Documentation.* DEQ's Tidewater Regional Office states that the project will involve significant impacts to surface waters and wetlands. The Joint Federal-State Permit Application ("JPA") should document that these impacts have been avoided and minimized to the maximum extent practicable, and that remaining unavoidable impacts have been properly compensated. The JPA should be completed and submitted prior to the beginning of work on the project; see "Regulatory and Coordination Needs," item 2, below.

*(b) Individual Cities.* The City of Newport News supports the recommended plan in the Final EIS, because expansion of the dredged material spoil capacity of Craney Island is critical to keeping navigation routes open for the Navy and commercial shipping. Development of the project will also provide money for the Third Crossing of Hampton Roads Harbor (see item 8, above).

According to the City of Portsmouth, the project will require a permit from the Portsmouth Wetlands Board. The permit may require an on-site mitigation plan.

The City of Norfolk has no comments on the Final EIS (Ballard/Ellis, 6/26/06).

Federal Consistency under the Coastal Zone Management Act

Pursuant to the Coastal Zone Management Act of 1972, as amended, federal activities taking place inside or outside of Virginia's designated coastal management area that can have reasonably foreseeable effects on coastal resources or coastal uses must, to the maximum extent practicable, be implemented in a manner consistent with the Virginia Coastal Resources Management Program (VCP). The VCP consists of a network of programs administered by several agencies. The DEQ coordinates the review of federal consistency determinations with agencies administering the Enforceable and Advisory Policies of the VCP.

Based on the information submitted and the comments of reviewing agencies, we concur that the proposed eastward expansion of Craney Island is consistent with the Virginia Coastal Resources Management Program, **provided** that the Corps, the Port Authority, and their contractors obtain all approvals not yet secured that are applicable to the enforceable policies, and adhere to all the conditions of the Virginia Water Protection Permit, the Marine Resources Commission Permit (if that is required), and carry out the subsequent development consistently with the Chesapeake Bay Preservation Act (*Virginia* Code sections 10.1-2100 et seq.). In accordance with the Federal Consistency Regulations at 15 CFR Part 930, section 930.4, this conditional concurrence is based on the Corps, the Port Authority, and their contractors obtaining necessary authorizations prior to any ground disturbance. If the requirements of section 930.4, sub-paragraphs (a) through (a)(3) are not met, this conditional concurrence becomes an objection under 15 CFR Part 930, section 940.43.

2. *Water and Wetland Permitting.* The Corps and the Virginia Port Authority should prepare and submit Joint Permit Applications covering the eastward expansion of Craney Island, as well as for the proposed terminal development thereon. The JPAs should be submitted to the Marine Resources Commission (2600 Washington Avenue, Newport News, Virginia 23607), which will distribute copies of it to appropriate regulatory agencies including DEQ's Tidewater Regional Office, the Portsmouth Wetlands Board, the Corps Regulatory Branch if appropriate, and the Commission itself. As indicated above ("Environmental Impacts and Mitigation," item 5), the JPA should be accompanied by a more detailed mitigation plan. Questions on this point may be directed to DEQ's Tidewater Regional Office (Bert Parolari, telephone (757) 518-2166). Questions on the joint permitting process may be directed to the Marine Resources Commission (Tony Watkinson, telephone 247-2200).

3. *Air Quality Regulation.* As indicated above ("Environmental Impacts and Mitigation," item 3(a)), any open burning contemplated in connection with the project may require an open burning permit from DEQ. Similarly, fuel-burning equipment may require air pollution control permits from DEQ. Questions on both types of permitting requirements should be directed to DEQ's Tidewater Regional Office (Jane Workman, Air Permits Manager, telephone (757) 518-2112).

Thank you for the opportunity to review the Final EIS. If you have questions, please feel free to contact me (telephone (804) 698-4325) or Charles Ellis of this Office (telephone (804) 698-4488).

Sincerely,

Ellie L. Irons
Program Manager
Office of Environmental Impact Review

Enclosures

cc: (next page)

## Ellis,Charles

**From:** Andrew Zadnik [Andrew.Zadnik@dgif.virginia.gov]
**Sent:** Wednesday, June 07, 2006 9:23 AM
**To:** Ellis,Charles
**Cc:** nhreview@dcr.virginia.gov; Askins Glen.DGIF_Williamsburg.CCMail_DM@dgif.state.va.us; John Kleopfer; Ruth Boettcher
**Subject:** 05-105F_ESSLOG 19857_Craney Island Expansion_Final EIS

Charlie,

Here are some comments on the Final EIS for this project. Glen, Ruth, and JD, please let me know if you have any additional comments. Thanks.

We have reviewed the Final EIS for this project and offer the following comments. We previously provided comments on the Draft EIS on Oct. 20, 2005 and Nov. 2, 2005.

This project involves a proposed 580-ac eastward expansion and development of a container terminal at the Craney Island Dredged Material Management Area (Craney Island). Adverse impacts will include the loss of approximately 580 ac of open water and benthic habitat. We understand that no vegetated wetlands will be adversely impacted during the expansion or terminal construction.

The Final EIS states (Page IV-34) that this project is not likely to affect listed marine mammals. We disagree with this conclusion. We remain concerned that the increase in container ships operating in Virginia's coastal waters, as a result of this project, may result in adverse impacts upon marine mammals. Over the last several years, marine mammal vessel strikes have increased in Virginia's coastal waters. This has included two Federal/State Endangered northern right whales that sustained mortal injuries after colliding with vessels near the mouth of Chesapeake Bay. Marine mammals are known to occur in Virginia's ocean and inshore shipping channels, though their densities and temporal/spatial distribution in these waters remain largely unknown. We understand that the Virginia Port Authority (VPA) is a member of the Northeast Implementation Team for the Recovery of the North Atlantic Right Whale (Page IV-34 ). Therefore, we recommend that the VPA address the issue of potential marine mammal mortality by assessing the spatial and temporal distribution and abundance of marine mammals in Virginia's nearshore and inshore shipping channels. The VPA also should examine measures to minimize the potential for vessel strikes.

The selected mitigation plan for this project consists of 20 ac of oyster reef restoration, 56 ac of wetland restoration, and 67 ac of bottom sediment cleanup that will result in 411 ac of bottom restoration. The wetland/oyster reef restoration includes a site at Ragged Island Wildlife Management Area. Development of a Craney Island Bird Long-term Management Plan also is included.

We support the overall mitigation plan. We recommend strict monitoring of all mitigation sites. To assess the functional value of the mitigation, we recommend developing measurable success criteria, including biological (vegetation, benthos, fishery, wildlife) components. Any activities at Ragged Island Wildlife Management Area should be coordinated with this department (contact: Glen Askins, Regional Wildlife Manager, 804-843-5966). The bird management plan should be coordinated with DGIF Eastern Shore Biologist Ruth Boettcher (757-787-5911).

Thank you,

Andrew K. Zadnik
Environmental Services Section Biologist
Department of Game and Inland Fisheries
4010 West Broad Street
Richmond, VA 23230

(804) 367-2733
(804) 367-2427 (fax)

disturbance of breeding colonies by human activities and high numbers of predators (Beck, 1991). Please note that the Least Tern is listed as a special concern species by VDGIF.

Black-necked Stilts primarily occur near shallow salt or fresh water bodies with soft muddy bottoms, including grassy marshes, wet savannas, mudflats, shallow ponds, flooded fields, and the borders of salt ponds. They nest along the shallow water of ponds, lakes, swamps, or lagoons and may nest on the ground or in the shallow water on a plant tussock. Black-necked Stilts feed on insects, crustaceans, and small fish, as well as the seeds of aquatic plants.

Due to the legal status of the piping plover, DCR recommends continued coordination with USFWS and VDGIF to ensure compliance with protected species legislation. In addition, DCR recommends the Craney Island Bird Long-Term Management Plan be coordinated with VDGIF Eastern Shore Biologist Ruth Boettcher and avoidance of the nesting sites for the Least Tern (April 15-August 1) and Black-necked Stilt (April 15-July 15).

Our files do not indicate the presence of any State Natural Area Preserves under DCR's jurisdiction in the project vicinity.

Under a Memorandum of Agreement established between the Virginia Department of Agriculture and Consumer Services (VDACS) and the Virginia Department of Conservation and Recreation (DCR), DCR represents VDACS in comments regarding potential impacts on state-listed threatened and endangered plant and insect species. The current activity will not affect any documented state-listed plants or insects.

Any absence of data may indicate that the project area has not been surveyed, rather than confirm that the area lacks natural heritage resources. New and updated information is continually added to Biotics. Please contact DCR for an update on this natural heritage information if a significant amount of time passes before it is utilized.

The Virginia Department of Game and Inland Fisheries maintains a database of wildlife locations, including threatened and endangered species, trout streams, and anadromous fish waters that may contain information not documented in this letter. Their database may be accessed from www.dgif.virginia.gov/wildlife/info_map/index.html, or contact Shirl Dressler at 804-367-6913.

DCR's Division of Chesapeake Bay Local Assistance has reviewed the proposed Craney Island Eastward Expansion Environmental Impact Statement and offers the following comments with respect to the Chesapeake Bay Preservation Act & Regulations:

The eastward expansion of Craney Island through construction of a new dredged material placement cell including a main dike and perimeter dikes takes place on marine bottom and open water that is not under the jurisdiction of the *Chesapeake Bay Preservation Act & Regulations*. However, subsequent development of the 580-acre cell for a container terminal complex will require consistency with the *Chesapeake Bay Preservation Act & Regulations*. The development of the facility will have to comply with the Stormwater management criteria consistent with water quality protection provisions (§4 VAC 3-20-71 et seq.) of the *Virginia Stormwater*

## Literature Cited

Beck, R. A. 1991. Least Tern. In Virginia's Endangered Species: Proceedings of a Symposium. K. Terwilliger ed. The McDonald and Woodward Publishing Company, Blacksburg, Virginia. pp. 505-506.

Cross, R.R. 1991. Piping Plover. In Virginia's Endangered Species: Proceedings of a Symposium. K. Terwilliger ed. The McDonald and Woodward Publishing Company, ***Blacksburg, Virginia. pp. 501-502.***

# DEPARTMENT OF ENVIRONMENTAL QUALITY
## DIVISION OF AIR PROGRAM COORDINATION

## ENVIRONMENTAL REVIEW COMMENTS APPLICABLE TO AIR QUALITY

**TO: Charles H. Ellis III** **DEQ - OEIA PROJECT NUMBER: 05 – 105F**

RECEIVED
JUN 09 2006
DEQ-Office of Environmental Impact Review

**PROJECT TYPE:** ☐ STATE EA / EIR / FONSI **X FEDERAL EA / EIS** ☐ SCC

☐ CONSISTENCY DETERMINATION/CERTIFICATION

**PROJECT TITLE: CRANEY ISLAND EASTWARD EXPANSION**

**PROJECT SPONSOR: DOD / DEPARTMENT OF THE ARMY / ARMY CORPS OF ENGINEERS**

**PROJECT LOCATION: X OZONE NON ATTAINMENT AREA**

**REGULATORY REQUIREMENTSMAY BE APPLICABLE TO:** **X CONSTRUCTION**
☐ OPERATION

**STATE AIR POLLUTION CONTROL BOARD REGULATIONS THAT MAY APPLY:**

1. ☐ 9 VAC 5-40-5200 C & 9 VAC 5-40-5220 E – STAGE I
2. ☐ 9 VAC 5-40-5200 C & 9 VAC 5-40-5220 F – STAGE II Vapor Recovery
3. ☐ 9 VAC 5-40-5490 et seq. – Asphalt Paving operations
4. **X 9 VAC 5-40-5600 et seq. – Open Burning**
5. **X 9 VAC 5-50-60 et seq. Fugitive Dust Emissions**
6. ☐ 9 VAC 5-50-130 et seq. - Odorous Emissions; Applicable to_____
7. ☐ 9 VAC 5-50-160 et seq. – Standards of Performance for Toxic Pollutants
8. ☐ 9 VAC 5-50-400 Subpart_____, Standards of Performance for New Stationary Sources, designates standards of performance for the_____
9. ☐ 9 VAC 5-80-10 et seq. of the regulations – Permits for Stationary Sources
10. ☐ 9 VAC 5-80-1700 et seq. Of the regulations – Major or Modified Sources located in PSD areas. This rule may be applicable to the _____
11. ☐ 9 VAC 5-80-2000 et seq. of the regulations – New and modified sources located in non-attainment areas
12. ☐ 9 VAC 5-80-800 et seq. Of the regulations – Operating Permits and exemptions. This rule may be applicable to _____

**COMMENTS SPECIFIC TO THE PROJECT:**

**Being in an area of ozone non-attainment, all precautions are necessary to restrict the emissions of volatile organic compounds (VOC) and oxides of nitrogen (NOx) during implementation.**

K. S. Narasimhan

**(Kotur S. Narasimhan)**
**Office of Air Data Analysis**

**DATE: June 9, 2006**

## Ellis,Charles

**From:** Stanley, Mary T. [Mary.Stanley@VDOT.Virginia.gov]
**Sent:** Wednesday, June 14, 2006 7:43 AM
**To:** Ellis,Charles
**Subject:** RE: comments on Final EIS for Craney Island Eastward Expansion (DEQ-06-105F)

Charlie,

We received the Final with a cover letter form the Army - no cover letter from DEQ. We responded to the draft in October. There are no additional comments.

---

**From:** Ellis,Charles [mailto:chellis@deq.virginia.gov]
**Sent:** Tuesday, June 13, 2006 1:17 PM
**To:** Scott Bedwell; Stanley, Mary T.; Tony Watkinson; Roger Kirchen; David O'Brien; Alice Baird; Goetz, Greg
**Subject:** comments on Final EIS for Craney Island Eastward Expansion (DEQ-06-105F)

Everybody - I need your comments on this project when you get a chance. Thanks very much.

Charlie

HAMPTON ROADS
PLANNING DISTRICT COMMISSION

JEANNE ZEIDLER, CHAIR • PAUL D. FRAIM, VICE CHAIRMAN • JAMES O. McREYNOLDS, TREASURER
ARTHUR L. COLLINS, EXECUTIVE DIRECTOR/SECRETARY

**CHESAPEAKE**
Clarence V. Cuffee, *City Manager*
Amar Dwarkanath, *Deputy City Manager*
Dalton S. Edge, *Mayor*
W. Joe Newman, *Council Member*
Debbie Ritter, *Council Member*

**FRANKLIN**
Marks S. Fetherolf, *Council Member*
Rowland L. Taylor, *City Manager*

**GLOUCESTER COUNTY**
John J. Adams, Sr., *Board Member*
Williams H. Whitley, *County Administrator*

**HAMPTON**
Randall A. Gilliland, *Council Member*
Ross A. Kearney, II, *Mayor*
Jesse T. Wallace, Jr., *City Manager*

**ISLE OF WIGHT COUNTY**
W. Douglas Caskey, *County Administrator*
Stan D. Clark, *Vice Chairman*

**JAMES CITY COUNTY**
Bruce C. Goodson, *Chairman*
Sanford B. Wanner, *County Administrator*

**NEWPORT NEWS**
Charles C. Allen, *Vice Mayor*
Joe S. Frank, *Mayor*
Randy W. Hildebrandt, *City Manager*

**NORFOLK**
Paul D. Fraim, *Mayor*
Donald L. Williams, *Council Member*
Regina V.K. Williams, *City Manager*
Barclay C. Winn, *Council Member*
W. Randy Wright, *Council Member*

**POQUOSON**
Charles W. Burgess, Jr., *City Manager*
Gordon C. Helsel, Jr., *Mayor*

**PORTSMOUTH**
James B. Oliver, Jr., *City Manager*
Charles B. Whitehurst, Sr., *Council Member*

**SOUTHAMPTON COUNTY**
Anita T. Felts, *Board Member*
Michael W. Johnson, *County Administrator*

**SUFFOLK**
R. Steven Herbert, *City Manager*
Bobby L. Ralph, *Mayor*

**SURRY COUNTY**
Tyrone W. Franklin, *County Administrator*
Judy S. Lyttle, *Board Member*

**VIRGINIA BEACH**
Harry E. Diezel, *Council Member*
Robert M. Dyer, *Council Member*
Louis R. Jones, *Vice Mayor*
Meyera E. Oberndorf, *Mayor*
Jim Reeve, *Council Member*
Peter W. Schmidt, *Council Member*
James K. Spore, *City Manager*

**WILLIAMSBURG**
Jackson C. Tuttle, II, *City Manager*
Jeanne Zeidler, *Mayor*

**YORK COUNTY**
James O. McReynolds, *County Administrator*
Thomas G. Shepperd, Jr., *Board Member*

June 15, 2006

RECEIVED
JUN 19 2006
DEQ-Office of Environmental Impact Review

Headquarters, U.S. Army Corps of Engineers.
ATTN: CECW-P (IP)
7701 Telegraph Road
Alexandria, VA 22315-3860

Re: Craney Island Eastward Expansion, DEQ# 05-105F
(THY: Craney Island)

Dear Sir or Madam:

Pursuant to your request of May 17, 2006, the staff of the Hampton Roads Planning District Commission has reviewed the Final Environmental Impact Statement and Final Feasibility Report for the Craney Island Expansion, Norfolk Harbor and Channels, Virginia. We have contacted the cities of Hampton, Newport News, Norfolk, and Portsmouth regarding this project.

Based on this review, it appears that the proposal is generally consistent with local and regional plans and policies. The staff of the Hampton Roads Planning District Commission continues to view the Eastward Expansion and associated terminal development as advantageous to the continued economic development of the Hampton Roads region and the Commonwealth of Virginia. A previous letter of support, sent to the Army Corps of Engineers and dated October 27, 2005, outlines the potential benefits of the project.

As is to be expected from a project of this magnitude, adverse environmental impacts will result from both project construction and operation. The comprehensive mitigation plan, which has been developed to address the anticipated impacts, appears to provide adequate compensation for those impacts.

The City of Portsmouth emphasizes the need for a wetland permit as a part of this project. On site mitigation is preferred, when possible.

# City of Newport News

Virginia 23607

2400 Washington Avenue
(757) 926-8411
Fax (757) 926-3503

Office Of The City Manager

June 2, 2006

RECEIVED

JUN 07 2006

DEQ-Office of Environmental Impact Review

Mr. Charles Ellis, III
Office of Environmental Impact Review
Virginia Department of Environmental Quality
629 East Main Street, Suite 644
Richmond, VA 23219

Dear Mr. Ellis:

The Department of Planning has reviewed the Final Feasibility Report and Environmental Impact Statement for the Craney Island Eastward Expansion. As stated previously in our review of the drafts, we have no objection to the project and favor the recommended plan supported by the Virginia Port Authority and the Army Corps of Engineers.

Increasing the dredge spoil capacity of Craney Island is critical to keep our navigation routes open for the Navy and commercial shipping. The expansion of the port facilities as part of this expansion will permit the larger vessels used for container shipping to dock at a state owned port facility. In addition, development of this project will give the region a necessary ingredient to fund the Third Crossing of Hampton Roads Harbor.

Thank you for this opportunity to comment on the Final Feasibility Report and Environmental Impact Statement for the Craney Island Eastward Expansion Study.

Sincerely,

Randy W. Hildebrandt
City Manager

RWH:kej
P:\Plan05-06\Env.Impact Review Comments\Final EIS Craney Island Eastward Expansion

Copy to: Assistant City Manager, NAM
Director of Planning

## Ellis,Charles

**From:** Crum, Amy [CrumA@portsmouthva.gov]
**Sent:** Thursday, June 15, 2006 10:22 AM
**To:** Ellis,Charles
**Subject:** Craney Island Expansion Project

Mr. Ellis,

I am the Wetlands Board Secretary for the City of Portsmouth. My only comment on the Craney Island Expansion Project is that it will require a JPA and wetlands permit with a mitigation plan (preferably onsite).

Thank you,

Amy Crum, Senior Planner
Department of Planning
801 Crawford Street
Portsmouth, VA 23704
757-393-8836 ext 4213
cruma@portsmouthva.gov

# FAX TRANSMISSION

HABITAT CONSERVATION
NATIONAL MARINE FISHERIES SERVICE
One Blackburn Drive
Gloucester, MA 01930
978/281-9102
Fax: 978/281-9301

**To:** MARK MANSFIELD **Date:** 7-7-06

7 pages follow

**Fax #:** 757-201-7646

**Tel #:**

**From:** PETE COLOSI

**Subject:** CRANEY ISLAND FEIS COMMENTS

**COMMENTS:**

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
NORTHEAST REGION
One Blackburn Drive
Gloucester, MA 01930-2298

JUL 3 2006

Mark T. Mansfield
Chief, Planning and Policy Branch
Department of the Army
U.S. Army Corps of Engineers
Fort Norfolk, 803 Front Street
Norfolk, VA 23510-1096

Dear Mr. Mansfield:

NOAA's National Marine Fisheries Service (NMFS), Northeast Region, Habitat Conservation Division, has reviewed the *Final Environmental Impact Statement* (FEIS) for the *Craney Island Eastward Expansion, Norfolk Harbor and Channels, Hampton Roads, Virginia*. The proposed project is located in the Port of Hampton Roads between the Cities of Portsmouth and Norfolk, Virginia. The alternative preferred by the Norfolk District Army Corps of Engineers (ACOE) and the non-federal sponsor, the Virginia Port Authority (VPA), is a 580-acre eastward expansion of the existing Craney Island Dredged Material Management Area (CIDMMA) into the Elizabeth River, and the subsequent construction of a container terminal. In a letter dated November 4, 2005 from NOAA's Office of Program Planning and Integration, we provided comments in the draft EIS. We offer the following comments on the FEIS.

## GENERAL COMMENTS

Some of our comments and concerns about the project purpose and need have been addressed in the FEIS and in the response to comments. We appreciate the ACOE's effort in preparing its detailed response from which we have clearer understanding of the external constraints placed upon the project purpose and rationale for the analysis of alternatives. However, we maintain our statements on the DEIS that the consideration of less environmentally damaging alternatives that may afford the maximum practicable habitat protection for NOAA trust resources, and allow the project purpose to be achieved, has not been fully investigated. Therefore, we remain concerned about the environmental consequences of the proposed project. Moreover, the project will result in the permanent loss of 580 acres of aquatic habitat which cannot be replaced with the proposed mitigation, such that we cannot endorse its construction as proposed.

## ESSENTIAL FISH HABITAT

We have reviewed the EFH assessment included in the FEIS. We do not agree with the ACOE's determination that there is little or no EFH in the project area due to degraded habitat and anthropogenic impacts. Nor can we concur that the adverse effects on EFH species from the loss

of 580 acres of aquatic habitat and the subsequent construction of a container terminal will be temporary and minimal. Habitat characteristics of the CIDMMA expansion area, including salinities, depths, sediment types, water quality, and the benthic community, indicate that this area is EFH for summer flounder (*Paralichthys dentatus*), black sea bass (*Centropristus striata*), red drum, (*Sciaenops occelatus*), bluefish (*Pomatomus saltatrix*), Atlantic butterfish (*Peprilus triacanthus*), and windowpane flounder (*Scopthalmus aquosus*). The exclusion of windowpane flounder from consideration in the EFH assessment based upon the ACOE's designation of the sediments as muddy clays is not appropriate as the designated EFH for windowpane flounder includes muddy bottoms, and the salinities and depths are consistent with the EFH defined for this species. The benthic organisms and forage species found at CIDMMA expansion site are components of the diet of windowpane. Also, windowpane have been caught in sampling done in the project area (Birdsong et. al 1984 in USACOE 2006).

Because the CIDMMA expansion and Phase I of the container terminal construction are expected to take five years to construct, and because the facility and fill will be permanent, we cannot agree that all of the impacts of the proposed project on EFH will be temporary. Elevated levels of suspended sediment will occur within the vicinity of the project area for the expected five years of construction. Such suspended sediment levels can reduce dissolved oxygen, can mask pheromones used by migratory fishes, and can smother immobile benthic organisms and newly-settled demersal juvenile fish (Auld and Schubel 1978; Breitburg 1988; Newcombe and MacDonald 1991; Burton 1993; Nelson and Wheeler 1997). Further, the 580-acre fill will be permanent and the facility will need maintenance dredging on a regular basis to maintain the access navigation channel. This will create long-term potential adverse impacts on EFH due to the suspended sediment level increases from the increased shipping traffic and the maintenance dredging activities.

The permanent loss of 580 acres of benthic habitat supplies a food source for both federally managed species and species managed by the Atlantic States Fisheries Commission such as striped bass and weakfish. According to the information in the FEIS and the USFWS Planning Aid Report included in the FEIS, the benthic community at the CIDMMA expansion area includes benthic invertebrates such as *Neries succinea*, *Sabellaira vulgarus*, and *Ampelisca abdita*. Steimle *et al.* (2000) report that *Ampelisca abdita* is particularly important to the diets of winter flounder (*Pseudopleuronectes americanus*), windowpane flounder, juvenile scup (*Stenotomus chrysops*), juvenile weakfish (*Cynoscion regalis*), striped scarobins (*Prionotus evolans*), juvenile black sea bass, and juvenile silver hake (*Merluccius bilinearis*), all of which have been documented to occur around the CIDMMA. *Paraprionospio pinnata*, the second most abundant benthic invertebrate species collected adjacent to Craney Island by Dauer and Ewing (1986 in FWS 2002), and *Neries succinea*, the seventh most abundant species, were found to be prey species of spot in the Chesapeake Bay by Homer and Boynton (1978).

The Elizabeth River portion of the project is an important nursery area for many commercial and recreational species including spot, Atlantic croaker, Atlantic menhaden, weakfish, striped bass, black sea bass, and summer flounder. The most intensive use for spawning is by forage fish, including bay anchovy and Atlantic silversides (Priest 1981 in ACOE 2005). Bay anchovy has

been shown as a prey species for windowpane flounder (Kimmel 1973; Carlson 1991 in Packer *et al.* 1999) for striped bass (Homer and Boynton 1978; Hollis 1952) and weakfish (Chao and Musick 1977; Hartman and Brandt 1995). Both species are also important to the diets of summer flounder (Homer and Boynton 1978; Smith and Daiber 1977). Juvenile spot and Atlantic menhaden are also components of the diets of weakfish and bluefish (Hartman and Brandt 1995), summer flounder and spotted hake (*Urophycis regia*) (Homer and Boynton 1978). As a result, we cannot consider the loss of this habitat to have been minimized or be a minimal adverse effect on EFH, federally managed species or other resources of concern to NMFS.

In addition, the Elizabeth River has been designated as a Confirmed Anadromous Fish Use Area by the State of Virginia. Species found in the area include alewife (*Alosa pseudoharengus*), American shad (*Alosa sapidissima*), blueback herring (*Alosa aestivalis*), hickory shad (*Alosa mediocris*), striped bass (*Morone saxatilis*), and white perch (*Morone americana*). The upstream portions of the Elizabeth River and its tributaries provide spawning and nursery habitat for these species. Disturbance of the sediments caused by dredging could create undesirable turbidity levels and can mask pheromones used by migratory fishes, impeding their migration. Buckel and Conover (1997) in Fahey et al. (1999) report that diet items of juvenile bluefish includes *Alosa* species such as these. These species are also prey items of summer flounder (*Paralichthys dentatus*) and windowpane flounder (*Scopthalmus aquosus*) (Steimle et. al. 2000). Thus, activities that adversely affect the spawning success and the quality for the nursery habitat of these anadromous fish will adversely affect the EFH for juvenile bluefish by reducing the availability of prey items. Therefore, dredging operations should take into account these evaluations and avoid impacts on anadromous fish migration and spawning and the associated impacts on EFH and the prey species of federally managed fish.

The proposed compensatory mitigation plan for the permanent loss of 580 acres of aquatic habitat includes the creation of 20 acres of oyster reefs, 56 acres of wetlands restoration, and the remediation of 67 acres of contaminated sediment. The FEIS states that the 67 acres of sediment remediation will improve 411 acres of bottom habitat. While the mitigation plan included in the FEIS will have ecological benefits to fishery resources, it does not justify the forfeited acreage. The FEIS acknowledges that in-kind replacement of the habitat to be lost is not practicable. We recognize the efforts made to develop the proposed compensatory mitigation plan, but we remain concerned that all of the direct, indirect, individual, and cumulative impacts of the proposed project have not been addressed or adequately compensated. There is lack of detailed analysis and plans in the FEIS for all of the components of the mitigation and baseline data on the proposed mitigation sites. Therefore, it is not possible to assess fully the benefits of the proposed mitigation, its likelihood of success, and the consequence of lost and impaired habitat functions for a robust assemblage of living marine resources under NOAA authority.

We understand that all of the proposed mitigation will be subject to final review and approval by the ACOE and the federal and state regulatory agencies, and that this review process will help to ensure the success of the planned mitigation. More detailed plans, baseline data, and monitoring and maintenance plans for each site are necessary to avoid impacts and determine if the mitigation will offset the remaining impacts on EFH.

**Essential Fish Habitat Conservation Recommendations**

The recommendations are pursuant to Section 305 (b) (4) (A) of the Magnuson Stevens Act. The proposed project will have a substantial adverse effect on EFH by filling 580 acres of aquatic habitat, dredging 127 acres of the Elizabeth River for the construction of a navigation access channel, and impeding the migration and spawning of anadromous fish.

We recommend that the project not be constructed, as proposed. Consideration of less environmentally damaging alternatives that may afford maximum practicable habitat protection for NOAA trust resources should be investigated further. In addition, the mitigation plan should undergo further development to ensure that it compensates for all unavoidable project impacts.

Should the project proceed as proposed, we recommend:

No dredging be permitted between February 15 and June 30 of any year to protect migrating and spawning anadromous fish that are prey species of federally managed fish such as bluefish and summer flounder.

Detailed plans for all compensatory mitigation projects be provided to us for review including baseline data on each site (benthic sampling, contaminant sampling, existing hydrology, vegetation elevations, as appropriate, for each site), as well as monitoring and maintenance plans for each site. All success criteria and monitoring and maintenance plans should be developed for each site. These plans should include the site specific goals of the proposed mitigation project, criteria for success, remedial actions that may be taken, and long-term management plans. All mitigation plans must be developed fully and approved by the ACOE. The ACOE should review and approve these plans prior to work on the mitigation sites. These plans should be in place prior to any construction on the CIDMMA expansion or on the mitigation site.

Construction of the mitigation projects should be prior to, or concurrent with, the construction of the CIDMMA expansion.

Section 305(b)(4)(B) of the MSA requires the ACOE to provide NMFS with a detailed written response to these EFH conservation recommendations, including a description of measures adopted by the ACOE for avoiding, mitigating, or offsetting the impact of the project on EFH. In the case of a response that is inconsistent with NMFS' recommendations, the ACOE must explain its reasons for not following the recommendations, including the scientific justification for any disagreements with NMFS over the anticipated effects of the proposed action, and the measures needed to avoid, minimize, mitigate, or offset such effects pursuant to 50 CFR 600.920(k).

If new information becomes available or the project is revised in such a manner that affects the basis for the above EFH conservation recommendations, the EFH consultation must be reinitiated pursuant to 50 CFR 600.920(l).

If you wish to discuss this matter further, please contact Karen Greene or Stan Gorski at our Sandy Hook Field Office at (732) 872-3037.

Sincerely,

Peter Colosi, Jr.

Peter D. Colosi, Jr.
Assistant Regional Administrator
for Habitat Conservation

cc: NMFS NERO HCD -- Kurkul, Mantzaris
NMFS NERO HCD - Gloucester, Sandy Hook, Annapolis
NMFS NERO PRD -- Gloucester
NMFS, HQ - Bigford
NOAA-PPI – S. Kennedy
NOAA OCRM – R. Schnieder
FWS – Annapolis
EPA -- Region III
MAFMC- T. Hoff
NEFMC - L. MacGee
VMRC- W. Pruitt

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# APPENDIX H

# SECTION 404 (b) (1) EVALUATION

APPENDIX H

CLEAN WATER ACT

SECTION 404(b)(1) EVALUATION

NORFOLK HARBOR AND CHANNELS

HAMPTON ROADS, VIRGINIA

CRANEY ISLAND EASTWARD EXPANSION

SEPTEMBER 2005

## I. PROJECT DESCRIPTION

a. **Location** – Norfolk Harbor, Norfolk, Virginia; Craney Island Dredged Material Management Area (CIDMMA), Portsmouth, Virginia. See project location map, EIS, Figure I-1.

b. **General Description** - The recommended plan includes the construction of a 580-acre disposal cell in open water of the Elizabeth and lower James Rivers to the east of the existing CIDMMA. Perimeter dikes will be constructed around the area of the new cell to contain dredged material. One third of the expanded cell would be used for potential port construction, and the remaining two-thirds of the cell would be used for large single deposits of dredged material. The western limit of the proposed cell will tie into the existing east dike of the CIDMMA. After filling, the new cell will be turned over to the local sponsor for the construction of a new marine terminal.

See EIS, Figure II-4 - Layout of New Cell

**c. Purpose -** The purpose of the proposed project is to increase dredged material disposal capacity and extend the useful life of CIDMMA as a dredged material containment area. Once filled, CIDMMA would provide additional acreage for the development of projected long-term berthing and landside port facilities adjacent to the Norfolk Harbor Channel.

**d. General Description of Dredged Material -** Sediments proposed for dredging are generally soft to very soft, highly plastic, organic silty clay with occasional fractions of shell or shell fragments, sand, gravel, cobbles, wood pieces, and slag.

**e. Description of the Proposed Discharge Site -** Dredged sediments resulting from the proposed improvements will be placed at the CIDMMA and the Norfolk Ocean Placement Site. Dredged material placement in the Norfolk Ocean Placement site is evaluated separately under the Marine Protection, Research, and Sanctuary Act (MPRSA) which governs transport of dredged material seaward of the baseline (in ocean waters) for the purpose of disposal. This ocean placement will not be evaluated in this Section 401 (b)(1) report . Dredged sediments generated from periodic maintenance dredging of the project features will be placed at CIDMMA or the ocean placement site. CIDMMA is a three-cell, 2,500-acre facility in Hampton Roads harbor near the confluence of the James, Nansemond, and Elizabeth Rivers. The site is projected to have a dredged material capacity of approximately 323,790,000 million cubic yards.

f. **Description of Discharge Method-**

**Foundation Dredging.** Pre-dredging along the (proposed) main dike is anticipated to be completed by a combination of bucket and pipeline cutter-head dredges. 10% of the pre-dredge foundation and access channel dredging material is assumed to go into the existing CIDMMA via a pipeline dredge. The remaining 90%, anticipated to be dredged by bucket dredge, would be disposed of in the Norfolk Ocean Placement Site or overboard in the expansion cell. EIS Figure II-5 shows the limits of pre-dredging.

**Access Channel Dredging**. The Access Channel dredging is defined as the area between the federal navigation channel (Norfolk Harbor and Craney Island Reaches) and the new wharf. The Access Channel is generally 500 feet in width. The Access Channel will be flared at both ends where it adjoins the federal channel. The dredging depth will be to -50 feet MLLW with 2' advance maintenance dredging. Maintenance material within the existing channel template was not included in the estimated quantities. EIS Figure II-5 shows the limits of the Access Channel.

| Area | Estimated Quantity (CY) |
|---|---|
| Pre-Dredge Foundation to -60' | 15,400,000 |
| Access Channel to -52'<br>(50' +2' Advance Maintenance) | 3,700,000 |

**Basis for 10% going to CIDMMA.** The predominately clayey material to be dredged in both locations is likely undisturbed, with contamination transport through layers unlikely. However it is thought that by placing the upper few feet of material in CIDMMA all remaining material will be suitable for ocean disposal. The upper several feet will be defined as 10% of material dredged. At this time it is not known exactly what percent of material going into CIDMMA would be unsuitable for ocean placement, however 10% is thought to capture a conservative upper limit. Environmental testing to verify the material is suitable for ocean placement is anticipated to be completed during PED. The 10%

(estimated to be up to 1.8 MCY) could be placed into CIDMMA without impacting operations.

Production rate for a single bucket dredge is estimated to be 5,000 CY/Day. For this project a minimum of two bucket dredges would be used

**Sand Fill.** In order to construct the dikes, sand will be dredged from offshore channel areas by hopper dredge. Once transported to the eastward expansion site the material will be offloaded using a self-contained offshore transfer station buoy ("SCOTS buoy"). EIS Figure II-6 shows dike layout. EIS Figures II-7 and II-8 show dike geometry for the two dike geometries.

The total amount of sand fill required is estimated to be 19.5 million CY (in-place at dikes), broken down as follows:

| **Phase 1 – 220-acre cell** | |
|---|---|
| Main Dike (3,000 LF) | 5.3 million CY |
| South Dike (2,800 LF) | 1.5 million CY |
| Division Dike (2,800 LF) | 1.5 million CY |
| **Phase 2 to 4 – completes remaining 380-acre cell** | |
| Continue Main Dike (5,500 LF) | 9.7 million CY |
| North Dike (2,800 LF) | 1.5 million CY |
| **Total** | **19.5 million CY** |

**Riprap.** To provide protection to the dikes from erosion, slopes will be protected with riprap.

**Exterior Slope of Main Dikes.** As the dikes are constructed the slopes along the exterior of the dike along the wharf will be protected from +8' to -3' MLLW. The riprap section for this reach will consist of a 4-foot thick layer of VDOT Class III riprap underlain by a 1.5-foot thick layer of VDOT No. 1 stone, underlain by geotextile.

**Interior Slopes of North Cell and Exterior North and South Dike Slopes.** The interior slopes of the dikes in the northern cell, including the division dike, will also be protected. Interior slope riprap will consist of a 2.8-foot thick layer of VDOT Class II riprap underlain by a 1-foot thick layer VDOT No. 1 stone, underlain by geotextile. The riprap will be placed on the exterior of the slopes from elevation +8' to -3'.

**Construct Spillboxes.** To allow dewatering of the dredge fill spillboxes will be installed. Four spillboxes are anticipated, two at the division dike, and two along the north dike.

**Rapidly Fill Phase 1 Cell.** Corps modeling estimated that it would take 12 months to rapidly fill the southern port cell to elevation +15 feet MLLW. Surcharge and ground improvements can begin approximately 3 to 6 months after this rapid filling. After that time a surface crust would form allowing the surcharge and strip drains to be installed.

**Wharf Construction.** Construction of the wharf would start concurrent with filling of the cell, as it is envisioned that shaping the main dike and beginning installation of wick drains could begin soon after the dike has be constructed.

It is expected that the proposed dredged material will be dredged mechanically and placed in barges; the filled barges will be towed or pushed to the proposed placement site where the sediments will be pumped into the containment cells. The dredged material will be allowed to settle and consolidate. Supernatant water will be discharged into the adjacent waters.

## II. FACTUAL DETERMINATIONS

### a. Physical Substrate Determinations

(1) Substrate Elevation and Slope – The proposed placement site at CIDMMA has been used previously for the placement of dredged material. The elevation of the north cell of the CIDMMA is approximately +34 feet MLLW. The proposed placement site east of CIDMMA averages -10-15 feet MLLW with little slope.

(2) Sediment Type - Sediments proposed for dredging in both the access channel and for the dike foundations are generally soft to very soft, highly plastic, organic silty clay with occasional fractions of shell or shell fragments, sand, gravel, cobbles, wood pieces, and slag. The upper layer of sediment in the project area exists primarily in a semi-liquid state generally from ½ to 3 feet thick. Sediments proposed for dredging contain a variety of organic and inorganic contaminants at concentrations at which biological effects are expected.

The soils at the CIDMMA consist of multiple layers of dredged material, primarily silts and clays ranging from low to high moisture content.

(3) Discharge Material Movement - The discharge material will be placed within containment dikes at the proposed placement site and allowed to settle and consolidate. The spillways and weirs will be managed to minimize movement of dredged material solids beyond the containment dikes. Sand discharged for dike construction The main dike will be approximately 8,500 feet in length and constructed to elevation +18 feet MLLW, with a 5H:1V side slope below elevation +5' and 2H:1V side slope above +5 feet. The remaining dikes, which run east-west, will be constructed with a 10H:1V side slope from the mudline to elevation +5 feet MLLW and an 8H:1V side slope from +5 feet to +18 feet.

(4) Physical Effects on Benthos – The area of proposed dredging and cell construction supports a degraded benthic community. Minor impacts are expected at the access channel dredging site and recolonization of dredged areas by the same species or by similar species is likely between maintenance dredging episodes. CIDMMA is an isolated upland site subject to drying during dewatering of the dredged material. Benthos at this site site, if present, will be covered with dredged material. There will be a total and permanent loss of benthos within the footprint of the proposed 580 acre expansion cell.

(5) Other Effects - N/A

(6) Actions Taken to Minimize Impacts - Dredged material will be contained behind the CIDMMA dikes. Best management practices will be implemented for dredging and placement. Actions will comply with the Commonwealth of Virginia water quality standards and the District Regulation (DR 1130-2-4) which governs operation of CIDMMA.

**b. Water Circulation, Fluctuation, and Salinity Determinations**

**See Feasibility Report, Appendix A (Engineering Appendix) for synopsis and full report(s):** Three-Dimensional Hydrodynamic Modeling Study,VIMS, Gloucester Point, Virginia. Prepared for the U.S. Army Corps of Engineers, Craney Island Dredged Material Management Area Expansion Study.

(1) Water - Temporary changes are expected in clarity, color, and quality of Elizabeth River and Hampton Roads Harbor waters in the immediate vicinity of the proposed dredging and cell construction. Supernatant water released from the placement site should not affect clarity or color of nearby waters .

(a) Salinity – Based upon 3-D hydrodynamic modeling, no change in surface or bottom salinity is expected.

(b) Chemistry - Minor and temporary changes are possible in the immediate vicinity of the dredging operations due to the resuspension of sediments. No changes are expected once work is complete. Minor and temporary changes are possible at the placement site outfalls.

(c) Clarity - Minor and temporary changes are expected in the immediate vicinity of the dredging operations due to increased turbidity during dredging operations. Pre-dredge water clarity will return once work is completed. Minor and temporary changes are possible within the allowed mixing zones. Discharge will be in compliance with the CIDMMA District Regulation (DR 1130-2-4).

(d) Color - Minor and temporary changes are possible in the immediate vicinity of the dredging operations due to turbidity normally associated with dredging operations. No permanent change is expected following completion of work. Minor and temporary changes are possible at the placement site.

(e) Odor- Minor and temporary changes are possible in the immediate vicinity of the dredging operations due to resuspension of sediments during dredging operation. Minor and temporary changes are possible in the immediate vicinity of unloading operations at the placement site.

(f) Taste - N/A.

(g) Dissolved Gas Levels - Temporary changes (increase and/or decrease of dissolved oxygen) may occur in the immediate vicinity of the dredging operations due to increased turbidity levels. No permanent change is expected after dredging is complete. No change is expected outside the placement site.

(h) Nutrients - Temporary (24 to 72-hour) localized increase expected at dredging site due to resuspension of sediment during dredging operations. Dredging will occur at any time of year. A slight and also temporary increase in nutrients may occur at placement site outfalls. Neither increase is likely to cause an increase in algal blooms.

(i) Eutrophication - Not expected to occur.

(j) Others as Appropriate - None

(2) Current Patterns and Circulation - Based upon 3-D hydrodynamic modeling, no change is expected

(a) Current Patterns and Flow - Minimal effects are expected under normal conditions.

(b) Velocity – Based on 3-D hydrodynamic modeling, a minor increase of of 1.6 cm/s to 2.4 cm/s in surface and bottom current is expected.

(c) Stratification - No change is expected.

(d) Hydrologic Regime - Little to no change is expected, See Feasibility Report, Appendix A.

(3) Normal Water Level Fluctuations -No change is expected.

(4) Salinity Gradients - No change is expected.

(5) Actions to Minimize Impacts - None.

**c. Suspended Particulate/Turbidity Determinations**

(1) Expected Changes in Suspended Particulate and Turbidity Levels in Vicinity of Project Sites - Minor and temporary increase of suspended particulate and turbidity are expected in the immediate vicinity of the dredging operations, cell construction, and placement site outfalls.

(2) Effects on Chemical and Physical Properties of the Water Column - Minor and temporary changes are expected in the immediate vicinity of the dredging operations, cell construction, and placement site outfalls due to resuspension of the sediments. The placement site will be operated in compliance with DR.

a. Light penetration - A minor, temporary decrease is anticipated in the immediate vicinity of the dredge plant during dredging operations due to increased turbidity. A minor, temporary decrease is possible at the placement site outfalls.
b. Dissolved Oxygen - A minor temporary change is possible in the immediate vicinity of dredging operations. Impacts are expected to be minor because of the tidal flushing which occurs in this area of confluence of 3 major rivers and the Chesapeake Bay.
c. Toxic Metals and Organics - Dredging operations are not expected to cause contaminants in the dredged material to be released in a significant amount of the water column. A minor and temporary change is possible in the immediate vicinity of the dredging operations. Any metals or organics in the dredged material are expected to be sequestered within CIDMMA. Clean sand will be used for dike construction.
d. Pathogens - No change is expected.
e. Aesthetics - No change is expected.
f. Temperature - No change is expected.
g. Others as Appropriate - None.

**d. Contaminant Determinations.**

The predominately clayey material to be dredged is likely undisturbed, with contamination transport through layers unlikely. However it is thought that by placing the upper few feet of material in CIDMMA all remaining material will be suitable for ocean disposal. The upper several feet will be defined as 10% of material dredged. Although no one knows, on average, what percent of material going into CIDMMA would be unsuitable for ocean placement, 10% is thought to capture a conservative upper limit. Environmental testing to verify the material is suitable for ocean placement is anticipated to be completed during PED. The 10% (estimated to be up to 1.8 MCY) could be placed into CIDMMA without impacting operations.

Some priority pollutants, including several heavy metals, are known to be present in the Elizabeth River but are more typically found in the southern reaches of the river.

Discharge from the CIDMMA is authorized by Virginia Department of Environmental Quality (VDEQ). Water quality monitoring is conducted at CIDMMA and the results are reported to VDEQ. Water quality data acquired to date suggests that contaminants remain in the placement site. Sediment quality data within CIDMMA suggest that contaminants degrade within the cell over time due to natural weathering.

**e. Aquatic Ecosystem and Organism Determinations**

(1) Effects on Plankton - Plankton will be preset in the project area, especially during the spring and summer months. Plankton in the immediate vicinity of the dredging site maybe displaced or entrained with the dredged material. These effects are expected to be temporary and are not significant. A significant area of open water will be filled within the 580 acre footprint and existing and future plankton production will be lost within this area.

(2) Effects on Benthos - Benthos in the immediate vicinity of the dredging site will be destroyed, displaced and/or entrained with the dredged material. Effects are expected to be temporary. Benthic re-colonization should begin within three to nine months and should be complete in two years. Benthos within the CIDMMA will be smothered with sediments. The effect to benthos in the CIDMMA is not expected to significant. The site is isolated from the bay environment, and has been used only for placement for many years. Consequently, the benthos are subject to drying out as the site is dewatered.

(3) Effects on Nekton – Some nekton in the immediate vicinity of the dredging site may be displaced or entrained with the dredged material. Most should be able to swim away from the operations. Effects are expected to be temporary and minor. An Essential Fish Habitat Assessment was conducted for the sandbar shark in accordance with the Magnuson-Stevens Fishery Conservation and Management Act. It was determined that there would be no adverse effect to the sandbar shark, its habitat, or prey species.

(4) Effects on Food Web - No significant effects are expected.

(5) Effects on Special Aquatic Sites - The proposed dredging and placement of dredged material will not impact special aquatic sites.

(6) Threatened and Endangered Species - There are no known threatened or endangered species in the immediate project area. Least tern and piping plover have been known to nest on the west side of CIDMMA but construction activities on the east would not affect these birds. No impacts are expected.

(7) Other Wildlife - Impacts to wildlife at CIDMMA are not significant during placement. The site is most valuable as habitat after placement when there is ponded water and mudflats.

(8) Actions to Minimize Impacts - The dredged material placed at the upland site will be confined to the diked area and will be discharged in compliance with the permit. Best management practices will be implemented.

**f. Proposed Placement Site Determinations**

1. Mixing Zone Determinations – N/A.
2. Determination of Compliance with Applicable Water Quality Standards – The proposed work will be performed in accordance with all applicable Commonwealth of Virginia water quality standards. A complete water quality assessment will be conducted during the planning engineering and design (PED) phase.

3. Potential Effects on Human Use Characteristics

(a) Municipal and Private Water Supply - No effects are expected from dredging or placement of dredged material at CIDMMA. No direct public water supply impacts would be associated with the expansion of the CIDMMA. further, there are no groundwater aquifers in the study area that are used for public drinking water supplies

(b) Recreational and Commercial Fisheries – Project actions will occur during the colder months. Very minor temporary and localized effects are possible from tug and barge traffic. There are no significant recreational or commercial fisheries in the area to be dredged.

(c) Water Related Recreation - – Project actions will occur during the colder months. Very minor temporary and localized effects are possible from tug and barge to and from dredge plant operation.

(d) Aesthetics - Very minor local and temporary effects are possible from tug barge traffic and from dredge plant operation.

(e) Parks, National and Historical Monuments, National Seashore, Wilderness Areas, Research Sites, and Similar Preserves –No effect expected.

**g. Determination of Cumulative Effects on the Aquatic Ecosystem** – A total of 17 types of actions have been identified as contributing to cumulative effects in the Hampton Roads area, including the Elizabeth River basin. These actions include those that have occurred since the mid-1950s, are now taking place, or are anticipated to occur in the future to the year 2050. The 17 types of actions include: (1) continuing use of the 3 existing cells at the CIDMMA; (2) an approximate 600-acre eastward expansion of the CIDMMA (the potential proposed action); (3) historical navigation channel deepening and provision of anchorages; (4) presently authorized channel deepening and anchorages (not yet constructed); (5) continuance of maintenance dredging for navigation; (6) planning for future channel deepening and maintenance dredging; (7) water-related laws, regulations, and programs; (8) other existing and continuing industrial and military

projects and facilities in the local area; (9) a new marine terminal (APM Terminals, Inc.); (10) sediment cleanup and (11) wetland restoration components of the Elizabeth River Ecological Restoration Program; (12) Pinner's Point Flyover; (13) Craney Island Terminal (proposed by the Virginia Port Authority for construction on the eastward expansion area of the CIDMMA); (14) the Third Crossing of the Hampton Roads area (a bridge-tunnel connector); (15) pre-authorization studies by the Norfolk District of the Corps; (16) the Midtown Tunnel Project; and (17) the Virginia Intermodal Transportation Center. The Draft EIS describes the respective time periods (past, present, and/or future) for the 17 actions.

The cumulative effects of these 17 types of actions have been addressed for water quality, hydrodynamics, air quality, noise, biological resources (including benthic habitat in the approximate 600-acre eastward expansion area for the CIDMMA), protected species and critical habitat, recreation (boating and fishing), aesthetics, cultural resources, and socioeconomics (including area traffic and environmental justice). The Draft EIS summarizes the connections between these resources ecosystems, and human communities and the major affecting actions from the 17 types of actions. In the absence of appropriate monitoring and mitigation efforts, potentially significant adverse cumulative effects could occur on water quality, benthic habitat, and protected species and critical habitat. Beneficial cumulative effects are anticipated for the socioeconomic conditions of the Hampton Roads area. See EIS, Appendix C, for full Cumulative Impacts Assessment report.

**h. Determination of Secondary Effects on the Aquatic Ecosystem** - No secondary effects to the aquatic ecosystem are anticipated.

## III. FINDING OF COMPLIANCE

No adaptations of the Section 404(b)(l) Guidelines were made relative to this evaluation.

Upland placement of dredged material is not of itself considered a water dependent activity; however, it is water dependent when supernatant waters are returned to the waterways, as is the case for the placement site(s).

An exhaustive search for dredged material placement sites, including sites that could accommodate future port development, has been undertaken in order to meet the long-term needs of the Port.

A Eastward Expansion of CIDMMA has been identified as the most practical, least environmentally damaging site identified to date that can accommodate the volume of dredged material needed to maintain navigability of nearby channels and anchorages and accommodate the construction of a marine terminal .

b. The use of the proposed placement site is not contrary to other state and Federal laws for the protection of water quality, aquatic species, or habitat, as follows:

(1) The proposed dredging and placement of dredged material will be in compliance with State water quality standards.

(2) The proposed dredging and placement of dredged material is not anticipated to violate the toxic effluent standard of Section 307 of the Clean Water Act. If a toxicity issue arises during construction, it will be properly addressed.

(3) The proposed project will not negatively affect any threatened or endangered species.

(4) No marine sanctuaries, as designated in the Marine Protection, Research, and Sanctuaries Act of 1972, are located in the area of the proposed construction.

(5) The proposed project will not result in significant adverse effects on human health and welfare, including municipal and private water supplies, recreation and commercial fishing, plankton, fish, wildlife, and special aquatic sites. The life stages of aquatic life and other wildlife will not be adversely affected. No contaminants will be discharged in toxic concentration in violation of Section 307 of the Clean Water Act.

c. Parts I and II of the analysis (preceding) show that the utilization of the proposed placement site will not contribute to the degradation of waters of the United States.

d. Appropriate steps to minimize potential impacts of the placement of the material in aquatic systems will be followed in accordance with the conditions of the Section 401 water quality certification.

The mandatory sequence of the Section 404(b)(l) guidelines has been applied in evaluation of the proposed action. The proposed dredging of access channels and foundation conditions and the east expansion of the CIDMMA to accommodate dredged material and port development is in compliance with the Section 404(b)(l) guidelines.

# APPENDIX I

# U.S. FISH & WILDLIFE SERVICE COORDINATION ACT REPORT

# United States Department of the Interior

FISH AND WILDLIFE SERVICE
Chesapeake Bay Field Office
177 Admiral Cochrane Drive
Annapolis, MD 21401


November 1, 2005

Colonel Yvonne J. Prettyman-Beck
District Engineer
Norfolk District, Corps of Engineers
Fort Norfolk, 803 Front Street
Norfolk, VA 23510-1096

Attn: Craig Seltzer

***Re: Craney Island Eastward Expansion***

Dear Colonel Prettyman-Beck:

This constitutes the report of the U.S. Fish and Wildlife Service on the proposed Craney Island Eastward Expansion Project, Virginia. It is submitted in accordance with Section 2(b) of the Fish and Wildlife Coordination Act (48 Stat 401, as amended; 16 U.S.C. et seq.) and Section 7 of the Endangered Species Act (87 Stat. 884, as amended; 16 U.S.C. 1513 et seq.). The Service previously submitted a planning aid report dated December 4, 2002, which contained information on the baseline biological conditions, environmental impacts, and mitigation needs. The present report summarizes pertinent information from our previous report and sets forth the Service's official position on the Corps' recommended plan as described in the draft Environmental Impact Statement dated September 2005.

## PROJECT DESCRIPTION

The project entails expanding the Craney Island dredged material containment site by constructing a new 580-acre cell on the east side. After the cell is filled with dredged material, the Virginia Port Authority would use the site to construct a new marine terminal. The filling would proceed in two stages to expedite the initiation of the terminal construction. Construction of the expansion cell would involve dredging of approximately 15,400,000 cubic yards of unsuitable foundation material and approximately 3,700,000 cubic yards of material adjacent to the cell to allow ship access (52 feet deep). The disposal plan for this material has not been fully decided, but it appears that a portion would be discharged at the Norfolk Ocean Disposal Site and the balance would be deposited into the existing Craney Island disposal area. The cell dikes

would be constructed using a total of 19,500,000 cubic yards of sandy material dredged primarily from the Atlantic Ocean Channel. Some of the material may also be dredged from the Thimble Shoal and Cape Henry Channels.

The main purpose of the project is to create land for port facility development. The increase in the disposal capacity of the Craney Island facility, which was a major objective at the start of the study, has been reduced to an incidental benefit. While the expansion cell would have a gross material capacity of 24,400,000 cubic yards, 19,100,000 cubic yards from the foundation and ship access dredging would need to be disposed of. Since a portion of the material would be taken to the ocean disposal site, the Corps is estimating that the project would result in a net increase in disposal capacity at Craney Island of approximately 12,000,000 cubic yards, which would extend the useful life of the disposal facility by approximately three years.

## FISH AND WILDLIFE RESOURCES WITHOUT THE PROJECT

The Craney Island confined disposal area is located at the junction of the Elizabeth River and the lower portion of the James River known as Hampton Roads. The Elizabeth River is the site of a major deep water port supporting commerce, military activities, and industry. This urban estuarine harbor has a long history of extensive dredging and shoreline alteration (Nichols and Howard-Strobel 1991). The Chesapeake Bay Program has designated the Elizabeth River as one of three Regions of Concern because of its toxic chemical contamination problems. The contamination problems tend to be more severe in the branches, especially the Southern Branch.

The site of the expansion cell, which is located at the mouth of the River, is not known to be contaminated. Nonetheless, the bottom invertebrate community within the project footprint is in a moderately unhealthy condition. Fifty percent of the10 total samples collected in 1999 (4 of 7 samples) and 2001 (1 of 3 samples) were found to have Benthic Index of Biotic Integrity scores that failed to meet the minimum goal for good habitat quality (Dauer 2000 and 2002). For comparison, the bay-wide Virginia average for 1999 was 30 percent. The percent of benthic samples below the goal in other areas of the Elizabeth River in 1999 were: 52 % in the main stem, 64 % for the Eastern Branch, 64 % for the Lafayette River, 72 % for the Western Branch, and 92 % for the Southern Branch. This data indicates that the bottom within expansion cell footprint is less healthy than the average for Virginia tidal waters, but it is in better condition than many of the other areas of the Elizabeth River system.

As part of the Corps' effort to develop baseline information for the project, they funded a survey of bivalves in the expansion area. The survey was conducted by investigators from the Virginia Institute of Marine Science during September 2002. The survey report (Seitz and Lipcius 2003) noted that bivalves were selected for this survey because they typically comprise a dominant component of the benthic community, and because their sampling is relatively uncomplicated and accurate. Samples were collected from 41 sites within the proposed expansion area and, for comparison, from 40 deep and 40 shallow (< 4 feet) sites within the Elizabeth River entrance area and the Lafayette River. Only four

species were collected from the expansion area, as compared to 7 species from the deep area sites and 9 species from the shallow sites. No hard clams and oysters, which are commercially important species in the Hampton Roads region, were collected from the expansion area. Previous surveys by Mann (2002) and Dauer and Ewing (1986) had reported the occurrence of very low numbers of these species in the immediate vicinity of the expansion area. The expansion area is included with the State's Baylor Grounds (designated public oyster grounds). The Baylor Grounds were originally naturally productive oyster areas that were surveyed on a state wide basis and set aside for public use in 1894 (Haven and Whitcomb 1983). The grounds in the vicinity of Craney Island have not been productive for many years.

The bivalve survey also found that the expansion area had relatively low abundance (7.8 /$m^2$) and biomass (0.0847 grams ash free dry weight/$m^2$) compared to the deep sites (10.8 /$m^2$ and 0.952 gAFDW/$m^2$ respectively) and the shallow sites (71 /$m^2$ and 6.80 gAFDW/$m^2$ respectively). The differences in the values between the expansion area and the deep area were not statistically different, although the statistical tests showed that both areas were significantly lower than the shallow area. The authors concluded that the expansion area is "not likely to be a significant feeding ground for the blue crab or demersal fish."

There are some reasons to question this conclusion. It appears to have been based on an assumption that bivalve biomass is the dominant component of the benthic community. While this is true in many cases, information from other studies (Dauer and Ewing 1986; Dauer 2000; Dauer 2002) indicates that this is not true in the expansion area. In this area bivalves only make up a minor component of the community, which is instead dominated by small polychaete worms. The mean benthic macrofauna (0.5 mm mesh) biomass from 10 samples collected from the expansion area in 1999 and 2001 was 0.943 g AFDW/$m^2$, which is more than an order of magnitude greater than the bivalve biomass (0.0847 gAFDW/$m^2$ ) reported by Seitz and Lipcius (2003). While this level of benthic invertebrate biomass and associated production is mediocre, it would still provide a useful prey base for some demersal fishes. Fish surveys in and around this area have shown the presence of a diverse assemblage of fishes including a substantial number of demersal species (Table 1), and Service personnel have observed that commercial watermen do set pots there.

The fish fauna in this area is dynamic, with the relative distribution and abundance changing markedly over time (Birdsong et al. 1984). A majority of the species are marine migrants that enter the area at various times and life stages. This group includes many species with commercial or recreational value. They may enter the area as adults, but more often as juveniles. Some of the more important marine species include: Atlantic croaker, spot, Atlantic menhaden, weakfish, bluefish, and summer flounder. Anadromous species such as alewife, blueback herring, American shad, and striped bass pass through the area as adults on their way to and from freshwater spawning areas. The use of the Elizabeth River for anadromous fish spawning appears to be negligible. However, juveniles spend variable amounts of time in the area before eventually returning to the sea.

Some species are permanent residents of Chesapeake Bay. These would include bay anchovy, Atlantic silverside, killifish, blennies, skilletfish, gobies, pipefish, lined seahorse, oyster toadfish, blackcheek tonguefish, hogchoker, windowpane, white perch, yellow perch, and silver perch. These species also often display movements into and out of the area in response to changes in water temperature, other water quality conditions, and food availability. A few species are visitors from freshwater areas.

Fish diversity reaches a maximum in late summer and early fall (Murdy et al. 1997). As fall progresses many species migrate out to the ocean and southward. A few cold-water adapted species such as the spotted and red hakes enter the area during the colder months, but leave before summer.

Birdsong et al. (1984) made monthly trawl collections between January 1982 and January 1984 at 8 stations distributed within the lower Chesapeake Bay, lower James River, and Elizabeth River. He found that the two "Elizabeth River mainstem stations were among the most prolific producers of fishes." Species with relatively high abundance included: bay anchovy, Atlantic croaker, spotted hake, weakfish, blueback herring, Atlantic silverside, silver perch, and spot.

Results of the annual mid-winter waterfowl surveys show that the lower James River including the Nansemond and Elizabeth Rivers supports low to moderate total numbers. No specific surveys for the expansion area are available, but, based on the habitat conditions and the species known to inhabit the vicinity, we would expect occasional use of the area for feeding and loafing by diving ducks such as canvasback, bufflehead, goldeneye, ruddy duck, scaup, oldsquaw, scoters, and mergansers. During the warmer months various gulls, terns, cormorants, and osprey may be present.

## FEDERALLY LISTED ENDANGERED AND THREATENED SPECIES

Immature loggerhead (*Caretta caretta*) and Kemp's ridley (*Lepidochelys kempii*) sea turtles regularly inhabit the lower Chesapeake Bay including the Hampton Roads areas during the summer months. The loggerhead is Federally listed as a threatened species and the ridley is listed as endangered. The endangered green (*Chelonia mydas*) and endangered leatherback (*Dermochelys coriacea*) sea turtles could also occur in the area, but only as rare transients. Sea turtles typically arrive in late May and depart in the fall as the water temperature drops below 20 °C. Loggerhead and Kemp's ridley sea turtles spend a considerable amount of time feeding on the bottom, and they are vulnerable to entrainment by hopper dredges. This is a particular concern given the large amount of dike construction material (19,500,000 cubic yards) that would likely be dredged from the Atlantic Ocean Channel and/or other lower Chesapeake Bay channels using hopper equipment. The Environmental Impact Statement states that Section 7 consultation was completed with the National Marine Fisheries Service and that a Biological Opinion was approved that would allow the work subject to certain conditions. In light of the large amount of dredging involved, it appears that the existing Biological Opinion will need to be revised and updated.

## BIOLOGICAL EFFECTS OF THE PROJECT

The most obvious and significant impact is the loss of approximately 580 acres of estuarine open water habitat. The project includes a substantial plan to compensate for the habitat impacts. The basic components of the plan are: remediation of contaminated bottom sediment in the Southern Branch of the Elizabeth River; wetland restoration and riparian habitat improvements, creation of oyster reefs, and creation of a bird management plan for Craney Island. More specifically, approximately $33,280,000 would be spent to remediate approximately 68 acres of contaminated bottoms at five locations (Wycoff Creosote and Pipe, Republic Creosote, Money Point, Paradise Creek, and Scuffletown Creek). Approximately $12,900,000 would be spent to restore wetlands and make improvements to riparian habitat involving 61.5 acres at 6 sites in the Elizabeth River (Lamberts Point, Shotmeyer property, Paradise Creek Park, Elizabeth River Terminals, Jones Creek/Gilligan's Creek, and St. Julians Annex). Approximately $2,400,000 would be spent to establish 15 acres of oyster reefs within the Elizabeth River and one acre in the James River at Hoffler Creek. Approximately $1,500,000 would be spent to construct a breakwater and 8 acres of salt marsh and oyster/clam habitat at the Ragged Island Wildlife Management Area. Approximately $150,000 would be spent to develop a bird management plan for Craney Island. The total cost of the mitigation plan is approximately $50,230,000 which includes funds for design and monitoring. The costs and feasibility of some of the plan's components, particularly the sediment remediation sites, are not well known. It is our understanding that, if any of the compensation sites become infeasible, alternatives will be pursued in collaboration with the stakeholders.

Because the mitigation plan is primarily composed of components that are not the same as what is being lost (out-of-kind mitigation), it is difficult to evaluate how well it compensates for the habitat impacts. In this case it is helpful to briefly describe the plan development process. The Corps assembled a Mitigation Subcommittee composed of representatives from federal and state agencies, environmental advocacy groups, and universities. A range of potential mitigation options was identified, general prioritization criteria developed, and specific feasible options described. A simple conceptual compensation plan composed of a mix of marsh creation and oyster reef creation options was developed by determining how much wetland and oyster habitat would be needed to offset the loss of secondary production (benthic invertebrates and zooplankton) in the expansion area. For these options, secondary production was viewed as a common metric that would reflect their broader ecological values. Marshes and oyster reefs were selected because there is good information on their invertebrate production values and their costs of construction, in contrast to the other mitigation options. This intermediate plan was used to establish the approximate cost of the ultimate plan. Using cost estimates of the individual options provided by the Corps, the Subcommittee developed the consensus mitigation plan that the Corps is now proposing. It reflects an emphasis on remediation of contaminated sediment hot spots in accordance with the priorities of the Elizabeth River Restoration Watershed Action Plan, but also includes restoration of wetland and oyster habitats.

Quantifying the benefits of the sediment remediation projects is difficult. In most cases there is little information on the existing biological conditions, and the future benefits after the remediation could be limited by other water quality problems or recontamination from neighboring areas. While the mitigation plan would actually remediate a total of 68 acres, the Environmental Impact Statement states that 411 acres of bottom would be restored, apparently assuming that the benefits would extend to adjacent bottom. While this would appear to be an optimistic estimate, it seems reasonable to conclude that a sediment remediation effort of this magnitude should produce a significant improvement in the condition of the Southern Branch, where toxic contamination has been a serious problem.

The wetland restoration plans are clearly beneficial and appropriate in the Elizabeth River where they will help to offset the large historical losses that have occurred there. Some of this effort will also be directed to establishing and protecting vegetated buffers at the upland edges. The oyster restoration plans will be very beneficial if they succeed, but they entail a significant amount of risk. To incorporate a degree of risk into the analysis, the oyster reef production estimate was reduced by 50 percent under the assumption that only half of the attempts would be successful. In addition, the oyster restoration plan specifies the use of disease resistant strains and provides for restocking if the initial attempt is unsuccessful. Despite these precautions, the long-term success of oyster reef restoration is uncertain. Because oyster reef restoration is currently the focus of a great deal of experimentation and applied research in Chesapeake Bay, there is some likelihood that better disease resistant strains and reef construction methods will be developed by the time the mitigation plan is implemented.

Besides the filling of 580 acres of the Elizabeth River, the project also involves a large amount of dredging. The dredging will disrupt the bottom invertebrate community and increase the suspended sediment load in adjacent areas. For the most part, these are temporary effects with turbidity decreasing rapidly after dredging ends and the benthic community repopulating over the subsequent year or so. The dredging of 15,400,000 cubic yards of foundation material would involve deepening the existing bottom from approximately 10 feet deep to 60 feet deep. This would affect a relatively small area of bottom which would be lost anyway when the expansion cell is constructed.

No details are provided on the proposed dredging of the dike construction material except that the Atlantic Ocean Channel is designated as the primary source and the Cape Henry and Thimble Shoal Channels are secondary sources. Obtaining the required material from the navigation channels is advantageous in that these areas already experience some disturbance from deep draft ship traffic and periodic dredging. The primary reliance on the Atlantic Ocean Channel would reduce impacts to Chesapeake Bay bottom habitat. Secondary dredging in the Cape Henry and Thimble Shoal Channels would offer the potential benefit of reducing the need for future maintenance dredging. Despite these advantages, it should be recognized that a substantial amount of bottom would likely be affected. If the dredge removes a 6-foot deep layer of material, the dredging of 19,500,000 cubic yards would affect 2,015 acres.

Approximately 3,700,000 cubic yards of material would be dredged from the ship access and berthing area along the east side of the expansion cell. The area covers approximately 100 acres where the typical 14 to 20-foot depths would be increased to 52 feet. Maintenance dredging of his area would periodically be accomplished as necessary to maintain compatible navigability with the adjacent ship channel. The benthic habitat quality of this area could be somewhat diminished as a result of the deepening and ship terminal operations.

The placement of material to create the dikes will cause elevated levels of suspended sediment and increased sedimentation on neighboring bottoms. This would be stressful to biota in the vicinity, especially benthic organisms. The extent of the impact is difficult to gage, but the biological communities in this area are not particularly sensitive due to past and present anthropomorphic activities that have resulted in dominance by pollution tolerant species.

The disposal of the material from the foundation and ship access dredging would be spilt between the existing Craney Island facility and the Norfolk Ocean Disposal Site. No significant impacts are expected from the use of the Craney Island facility beyond the incremental loss of its disposal capacity. The discharge of this fine grain material at the ocean disposal site would cause a disruption to the benthic community and a transient decline in water quality, but this site was previously selected and approved by the Environmental Protection Agency for disposal of uncontaminated dredge material because investigations indicated that there would not be significant impacts to important biological resources or fishery activities.

The effect of the project on the circulation of the lower James River (Hampton Roads) and the Elizabeth River was evaluated in a three-dimensional hydrodynamic modeling study by Wang et al. (2001). The study investigated potential effects on water surface elevation, current magnitude, surface and bottom salinity, sedimentation potential, and Elizabeth River flushing. It found that there were no significant effects on the circulation of the lower James River or Elizabeth River. The hydrodynamic model was verified and appeared capable of detecting any substantive effects. In fact, it did detect some important effects with other project alternatives. The lack of any notable effects appears to be due to the fact that the decrease in the Elizabeth River's cross sectional area caused by the expansion cell would be offset by the dredging in the ship access and berthing area. In recognition of the apparent importance of this dredging in maintaining circulation after project construction, the project plan stipulates that the dredging will be accomplished regardless of its need for port terminal operations.

The hydrodynamic model was used to make an additional assessment of the potential for circulation changes from the cumulative effects of the Craney expansion project and the dredging for the planned APM (Maersk) terminal and the berthing of large container ships at both facilities. The report (Sisson et al. 2005) found that there were no detectable adverse effects on the flushing of the Elizabeth River. The model results also showed that the ship berthing at the Craney expansion area, if considered permanent, would cause small local increases in current (0.9 cm/sec near the bottom) and salinity (<0.2 ppt).

These changes were less than those of the other expansion options, and they would not be expected to result in significant adverse effects.

The development of port facilities on the expansion cell may affect the avian habitat value of the existing Craney Island disposal facility. The large open expanse and relative isolation make Craney Island attractive to birds that use shallow water, beaches, or open flats. Significant numbers of waterfowl, shorebirds, wading birds, and terns use the area for feeding and/or resting on a seasonal basis. Craney Island is also used as a nesting area by several ground nesting birds including: least tern, willet, blackneck stilt, avocet, horned lark, and night hawk. The port could foster the presence of potential predators such as rats, raccoons, and gulls that would particularly affect the ground nesting birds. The lights, noise, and associated human activity from the port could also have some effect, although birds may be able to acclimate to these potential disturbances. The project mitigation plan includes development of a bird management plan that will hopefully develop recommendations for impact amelioration and habitat enhancement measures. We recommend that some funds be allocated for implementation of the management plan.

## CONCLUSONS

Even though the selected plan appears to be the most feasible option for port expansion, there will be a major environmental impact due to the loss of 580 acres of estuarine open water habitat. However, the project includes a substantial mitigation plan to compensate for the loss of habitat. The mitigation plan focuses on remediation of contaminated bottom in the Southern Branch of the Elizabeth River, but also includes components for establishing marshes, oyster reefs and other habitat improvement measures in the Elizabeth and lower James Rivers. We believe the plan represents a reasonable effort to compensate for the project impacts. Because of the complexity of the mitigation plan, it may become necessary to make some modifications as more advanced planning is conducted. The Service and other interested stakeholders should be kept informed of any proposed changes. If there are any questions, please contact George Ruddy at (410) 573-4528.

Sincerely,

John P. Wolflin
Supervisor

cc: Karen Mayne, VFO

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**Table 1. List of fishes collected by trawl and beach seine surveys in the lower James River and Elizabeth River near Craney Island.**

Freshwater eels - Anguillidae
- American eel - *Anguilla rostrata* (3, 5, 6)

Conger eels - Congridae
- conger eel - *Conger* sp. (6)

Anchovies - Engraulidae
- bay anchovy - *Anchoa mitchilli* (1, 2, 3, 4, 5, 6, 7)
- striped anchovy - *Anchoa hepsetus* (1, 2, 5)
- misc. anchovy - *Anchoa* sp. (7)

Herrings - Clupeidae
- Atlantic thread herring - *Opisthonema oglinum* (2)
- threadfin shad - *Dorosoma petenense* (2, 6)
- gizzard shad - *Dorosoma cepedianum* (2, 3, 5, 6, 7)
- Atlantic menhaden - *Brevoortia tyrannus* (1, 3, 5, 6, 7)
- American shad - *Alosa sapidissima* (3, 5, 6)
- blueback herring - *Alosa aestivalis* (2, 3, 4, 5, 6)
- alewife - *Alosa pseudoharengus* (3, 5, 6)

Lizardfishes - Synodontidae
- inshore lizardfish - *Synodus foetens* (1, 3, 5, 6, 7)

Carps and minnows - Cyprinidae
- common carp - *Cyprinus carpio* (1, 2)

Toadfishes - Batrachoididae
- oyster toadfish - *Opsanus tau* (3, 4, 5, 6)

Clingfishes - Gobiesocidae
- skilletfish - *Gobiesox strumosus* (3, 4, 5, 6)

Cods - Gadidae
- red hake - *Urophycis chuss* (3, 5, 6)
- spotted hake - *Urophycis regia* (3, 4, 5, 6)

Cusk-eels - Ophidiidae
- striped cusk-eel - *Ophidion marginatum* (3, 5, 6)

Needlefishes - Belonidae
- Atlantic needlefish - *Strongylura marina* (2)

Halfbeaks - Hemiramphidae
American halfbeak - *Hyporhamphus meeki* (7)

Killifishes - Cyprinodontidae
mummichog - *Fundulus heteroclitus* (2, 6)
striped killifish - *Fundulus majalis* (2, 3, 5, 7)
banded killifish - *Fundulus diaphanus* (5)

Silversides - Atherinidae
Atlantic silverside - *Menidia menidia* (2, 3, 5, 6, 7)
inland silverside - *Menidia beryllina* (6)

Pipefishes and seahorses - Syngnathidae
northern pipefish - *Syngnathus fuscus* (1, 3, 4, 5, 6, 7)
dusky pipefish - *Syngnathus floridae* (3)
lined seahorse - *Hippocampus erectus* (4)

Searobins - Triglidae
northern searobin - *Prionotus carolinus* (1, 3, 4, 5, 6)
striped searobin - *Prionotus evolans* (3, 5, 7)

Butterfishes - Stromateidae
harvestfish - *Peprilus alepidotus* (1, 2, 3)
butterfish - *Peprilus triacanthus* (1,3, 5)

Snake mackerels - Trichiuridae
cutlassfish - *Trichiurus lepturus* (3)

Jacks - Carangidae
crevalle jack - *Caranx hippos* (2, 3)
lookdown - *Selene vomer* (1)
Atlantic moonfish - *Selene setapinnis* (3)
permit - *Trachinotus falcatus* (2)

Cobia - Rachycentridae
cobia - *Rachycentron canadum* (1, 2)

Mackerels - Scombridae
Spanish mackerel - *Scomberomorus maculatus* (2)

Mullets - Mugulidae
white mullet - *Mugil curema* (2, 5, 7)
striped mullet - *Mugil cephalus* (2, 6)

Stargazers - Uranoscopidae

northern stargazer - *Asroscopus guttatus* (3, 4)

Drums - Sciaenidae
- Atlantic croaker - *Micropogonias undulatus* (1, 2, 4, 5, 6, 7)
- weakfish - *Cynoscion regalis* (1, 3, 4, 5, 6)
- spotted seatrout - *Cynoscion nebulosus* (2, 6)
- spot - *Leiostomus xanthurus* (1, 2, 3, 4, 5, 6, 7)
- southern kingfish - *Menticirrhus americanus* (2)
- silver perch - *Bairdiella chysoura* (2, 3, 6, 7)
- banded drum - *Larimus fasciatus* (3)
- red drum - *Sciaeops occellata* (3, 7)

Spadefishes - Ephippidae
- Atlantic spadefish - *Chaetodipterus faber* (3, 6)

Bluefishes - Pomatomidae
- bluefish - *Pomatomus saltatrix* (1, 2, 3, 4)

Gobies - Gobiidae
- naked goby - *Gobiosoma bosc* (3, 4, 5, 6, 7)
- seaboard goby - *Gobiosoma ginsburgi* (3, 4)
- green goby - *Microgobius thalassinus* (3, 4, 6)

Striped basses - Moronidae
- striped bass - *Morone saxatilis* (2, 3, 5, 6)
- white perch - *Morone americana* (5, 6)

Perches - Percidae
- yellow perch - *Perca flavescens* (5)

Combtooth blennies - Blenniidae
- striped blenny - *Chasmodes bosquianus* (1, 3, 5)
- feather blenny - *Hypsoblennius hentzi* (3, 4, 5, 6)

Mojarras - Gerreidae
- silver jenny - *Eucinostomus gula* (6)

Porgies - Sparidae
- scup - *Stenotomus chrysops* (3)
- pinfish - *Lagodon rhomboides* (7)

Grunts - Haemulidae
pigfish - *Orthopristis chrysoptera* (7)

Sunfishes - Centrarchidae
bluegill - *Lepomis macrochirus* (2)

Wrasses - Labridae
tautog - *Tautoga onitis* (5)

Sea basses and groupers - Serranidae
black sea bass - *Centropristis striata* (1, 3, 5)

Puffers - Tetraodontidae
northern puffer - *Sphoeroides maculatus* (3, 6, 7)

Tonguefishes - Cynoglossidae
blackcheek tonguefish - *Symphurus plagiusa* (2, 3, 4, 5, 6)

American soles - Achiridae
hogchoker - *Trinectes maculatus* (1, 3, 4, 5, 6)

Righteye flounders - Pleuronectidae
winter flounder - *Pleuronectes americanus* (5)

Paralichthyid flounders - Paralichthyidae
summer flounder - *Paralichthys dentatus* (1, 2, 3, 4, 5, 6, 7)
smallmouth flounder - *Etropus microstomus* (3, 5, 6)
windowpane - *Scopthalmus aquosus* (3, 5)

1. Species recorded from a survey by the Virginia Institute of Marine Science consisting of a total of 26 trawls taken near Craney Island and 57 trawls taken near Ragged Island during three summers between 1976 and 1978. A 16-foot otter trawl with a 1.5-inch stretch mesh and a 0.5-inch cod end liner was towed for 5 minutes at approximately 2.5 knots.

2. Species recorded from a VIMS survey consisting of a total of 15 seine hauls taken near Ragged Island during three summers between 1989 and 1991. A 100 by 4 feet flat minnow seine with 0.25-inch bar mesh was set perpendicular to the shore and swept in a quarter circle back to the shore.

3. Species reported by Birdsong et al. (1984) at 3 trawl stations: one at the mouth of the Elizabeth River, just east of Craney Island and west of the ship channel; another in the main stem of the Elizabeth River off Lamberts Point; and the third about 1 nautical mile up the Southern

Branch of the Elizabeth River from its confluence with the Eastern Branch. Each station was sampled monthly from January 1982 through January 1984, excluding February 1982 and December 1983. Three 10-minute tows were made at each station on each sample date with a 16-foot wide, semiballoon otter trawl with a 0.25 inch cod end liner.

4. Species reported by Dauer et al. (1989a) based on a trawl survey at the mouth of the Elizabeth River near the Norfolk International Terminals. Six 10-minute tows were made in April and again in July 1989 with a 3-meter otter trawl.

5. Species reported by Hedgepeth et al. (1981) based on numerous trawls in the lower James River and Elizabeth River conducted during the winter and summer of 1978 and 1979.

6. Species recorded from VIMS trawl surveys at numerous stations within the Elizabeth River in 1985 (20 tows), 1999 (13 tows), and 2000 (28 tows).

7. Species recorded during a survey at the east side of Craney Island by Walter Priest (VIMS) and Randy Owen (VMRC) on September 4, 2002. The survey consisted of two hauls of a 100-foot seine at the beach just north of the rehandling basin, and two 5-minute tows with a 6-foot beam trawl just off the shore.

# APPENDIX J

# U.S. HOUSE OF REPRESENTATIVES DOCUMENT NO. 563, 79TH CONGRESS, 2D SESSION, MAY 6, 1946

Adopted July 24, 1946

79TH CONGRESS } HOUSE OF REPRESENTATIVES { DOCUMENT
2d Session } { No. 563

# NORFOLK HARBOR, VA.

## LETTER

FROM

## THE SECRETARY OF WAR

TRANSMITTING

A LETTER FROM THE CHIEF OF ENGINEERS, UNITED STATES ARMY, DATED MARCH 12, 1946, SUBMITTING A REPORT, TOGETHER WITH ACCOMPANYING PAPERS AND ILLUSTRATIONS, ON A REVIEW OF REPORTS ON NORFOLK HARBOR, VA., REQUESTED BY A RESOLUTION OF THE COMMITTEE ON RIVERS AND HARBORS OF THE HOUSE OF REPRESENTATIVES, ADOPTED ON JUNE 16, 1944

MAY 6, 1946.—Referred to the Committee on Rivers and Harbors and ordered to be printed with two illustrations

WAR DEPARTMENT,
*Washington, May 1, 1946.*

The SPEAKER OF THE HOUSE OF REPRESENTATIVES.

DEAR MR. SPEAKER: I am transmitting herewith a report dated March 12, 1946, from the Chief of Engineers, United States Army, together with accompanying papers and illustrations, on a review of reports on Norfolk Harbor, Va., to determine the advisability of providing a disposal area for dredged material. This investigation was requested by a resolution of the Committee on Rivers and Harbors, House of Representatives, adopted on June 16, 1944.

The Bureau of the Budget advises that there is no objection to the submission of this report.

Sincerely yours,

ROBERT P. PATTERSON,
*Secretary of War.*

WAR DEPARTMENT,
OFFICE OF THE CHIEF OF ENGINEERS,
*Washington, March 12, 1946.*

The CHAIRMAN, COMMITTEE ON RIVERS AND HARBORS,
*House of Representatives, Washington, D. C.*

MY DEAR MR. CHAIRMAN: 1. The Committee on Rivers and Harbors of the House of Representatives by resolution adopted June 16,

# APPENDIX K

# COMMENTS AND RESPONSES FROM THE DRAFT ENVIRONMENTAL IMPACT STATEMENT COORDINATION

**United States Environmental Protection Agency (7 November 2005)**

Comment: The DEIS describes significant environmental impacts from the Craney Island Eastward Expansion. The most notable impacts are related to the loss of 580 acres of open water to construct a new cell for the facility. These impacts are proposed to be mitigated through a conceptual mitigation plan as discussed below. Other notable environmental impacts, however, have not been as clearly defined in the document. For example, there is a lack of defined impacts due to air emissions from the port facility's installation and operation. The DEIS accurately identifies the need to address issues like non-conformity with the State Implementation Plan (SIP), but without such information, the total impacts from this proposal are uncertain. Other informational deficiencies that detract from the completeness of the document are described more fully in the attachment to this letter.

Response: As described in responses to specific comments which follow, additional information will be provided in the FEIS in all of the areas mentioned.

Comment: As noted above the environmental impacts that will result from the open water fill have been proposed to be mitigated through a conceptual mitigation plan in the DEIS. The conceptual mitigation plan developed for this project was based on a landscape approach. The U.S Army Corps of Engineers (USACE) has done a commendable job in developing a consensus among the resource agencies on the appropriate mitigation. We strongly suggest that this mitigation plan be monitored and the functional success be guaranteed through either an Environmental Management System (EMS) approach or adaptive management approach that would be able to modify the mitigation if not successful. This could be accomplished by incorporating such a requirement into a future Record of Decision for the project.

Response: As explained in the mitigation appendix (EIS, Appendix B), mitigation plan components will be monitored following implementation. Specific details regarding monitoring and adaptive management will be developed during the PED phase in consultation with Virginia DEQ and VMRC as part of the permitting of the project.

Comment: As suggested above, the level of detail in assessing the impacts of these two efforts is more clearly defined for the CIDMMA portion of the project. This is in part due to the long planning horizon required for the port development. As a result, EPA recommends that this portion of the document be considered as a tiered EIS in that the additional information required for the port development be evaluated in a subsequent NEPA document. This DEIS refers to just such an approach that we believe could be clarified in the executive summary and clearly described in the main body of the EIS.

Response: A Supplemental EIS will be prepared when more detail on the port development design is completed.

Comment: Related to the preceding point, combining two possible independent components into a single project (CIDMMA expansion and port development) may be problematic. The major environmental impacts of the project appear to be caused primarily by the need for a port container facility. By combining the two distinct components into a single purpose and need formulation, the only alternative that satisfies both needs (dredge material expansion at CIDMMA and port development) is the proposed development at the expansion site. The effect of this formulation eliminates any alternative port locations not located on the current CIDMMA site. Our concern is that since the DEIS did not rigorously explore other port locations due to this narrowing of purpose and need, the DEIS may not have fully considered all other viable locations for the port container terminal location. If other alternatives exist for the development of the port container terminal, then impacts described in this DEIS would result primarily from expanding the facility solely for dredged material management, which may or may not justify the 580 acre expansion.

Response: The Norfolk District was directed by the U.S. House of Representatives, Committee on Transportation and Infrastructure, dated September 24, 1997 to conduct the feasibility study of creating an eastward expansion of CIDMMA to be rapidly filled with dredge material that could accommodate future port expansion. The two objectives are clearly linked.

The Norfolk District, in compliance with NEPA, evaluated ALL alternatives that could satisfy the intent of the U.S. Congress. During the study period it was determined that any combination of alternatives for dredge material placement and port expansion that could satisfy the intent of the directive language would be evaluated. This included off-site dredge material placements that could be combined with off-site port expansion alternatives.

In addition, an extensive analysis was conducted that evaluated the capacity of other east coast ports, such as New York, Baltimore, Charleston, Savannah, and others to determine if the forecast container cargo could be handled in other port locations. Through these analyses and screening, it was determined that other ports have limited capacity to handle diverted cargo, and if they do it would cost the nation over $6 billion in added transportation costs.

Supporting Detailed Comments

The following detailed comments and questions have been prepared by DEIS section.

Executive Summary

Comment: Please provide a discussion of interrelated permits and activities required, especially the role of the 404 process for this project. In addition it may be useful at the end of this section to describe the next steps, for instance a description of the final EIS and the selection of a preferred alternative. For example is the recommended plan, which

is the language used in this document, the preferred alternative?

Response: A discussion of interrelated permits and activities required, especially the role of the 404 process for this project will be included in the Executive Summary. In addition, at the end of the section a description of the next steps will be addressed. The recommended plan is also the preferred alternative. This will be clarified in the summary.

Comment: Table II-1 . What are the national defense criteria that were used that eliminates all of the existing Craney Island Dredged Disposal area alternatives that do not include a port expansion located on this site?

Response: The National Defense objective consisted of continuing to support the training needs for the Army. The Army has, at times, used a portion of the east side of the CIDMMA at the Rehandling Basin to practice landings. The extent to which the Army would use it in the future is unknown; however, the option remains open. Additionally, the National Defense objective is met by the potential of using the future port terminal as a logistical shipping point for military cargo in times of war.

Comment: The reference to House Document 563 of the 79th Congress should be included in the Appendix. This document defines the operation of the CIDMMA and would be an important reference for understanding the operating parameters as defined by Congress.

Response: This will be included in the appendix.

Comment: E2.1 In the first sentence of this paragraph what is the authorizing document referred to in the sentence? Is it House Document 563, or some other document? Also this paragraph mentions that CIDMMA is authorized to handle unsuitable navigational dredged material. Does this include all types of contaminated dredged material?

Response: HD 563 is the referenced document. CIDMMA is authorized to accept material that is unsuitable for ocean disposal. It does not accept contaminated material.

Comment: E2.1 Mention is made on page ES-3 paragraph 3 that the dikes are capable of being raised to a height of 47 feet which will increase capacity of CIDMMA until 2025. However this paragraph does not state the goal and objective for the capacity of this part of the project. This is critical because it addresses purpose and need. What are the criteria for meeting the project objectives for the expansion of the CIDMMA for dredge disposal? The eastward expansion should be described in the context of how it meets this need.

Response: The goal and objectives of the existing site is to operate and maintain it to maximize disposal. The goal and objectives of the study are to study the eastward expansion of Craney Island with consideration given to rapid filling for port development,

while also extending the life of the facility. There is no capacity goal per se. Currently, it is possible to raise the dikes of the existing facility to extend the life of Craney Island to 2025, with an eastward expansion it would extend the life to 2028. Unknown or unforeseen technological advances could extend the life beyond that should they materialize.

Comment: The Virginia Port Authority Master Plan referenced would be useful as an appendix.

Response: The executive summary can be provided.

Comment: E2.2 page ES-4 The proposed Craney Island Terminal which is 580 acres is not large enough in acres to meet the VPA master plan estimate of needed acreage for port capacity. As stated it would be 300 acres short as estimated in the VPA document. However the DEIS states in this paragraph that the 580 acres would meet port facility needs well into the planning horizon? Please clarify this statement. Will additional port facility acreage be needed to meet VPA projections? Or is 580 acres more than is required.

Response: Additional, port capacity would be needed to meet the forecasted demand. But 580 acres is what is available at the moment and will serve to meet the needs of the port for foreseeable future. However, capacity will run out again in the latter stages of the planning horizon as demand grows.

Comment: E3.6 (East port expansion and west berm plan.) What is the purpose of the west berm strengthening? The purpose of this alternative is not fully described in this section of the detailed alternative analysis section. In addition, maps of this might be useful in understanding this alternative in comparison to the recommended plan (just an eastward expansion). It is also mentioned that after filling the new cell it would be turned over to the VPA. Does turned over mean that VPA owns the property?

Response: The purpose of the west berm is to strengthen the existing dikes to permit vertical expansion of the existing CIDMMA. The existing CIDMMA will run out of capacity in 2025, when the existing dikes have been constructed to a height of approximately 47 feet above MHW. During routine operations and maintenance of the existing CIDMMA the dikes are raised each year by a small amount. The dikes cannot be raised higher than 47 feet unless the west berm is installed to strengthen the existing western dike.

After the eastward expansion is constructed and filled, the Corps will convey the land to the Commonwealth of Virginia.

Comment: E3.8 Plan Selection. The eastern port expansion and west berm plan was not selected because it is not supported by the local sponsor but there is no explanation of why it is not supported.

Response: Because the western berm is not required to be in place until 2025 it is not likely to be authorized for construction at this time; therefore, it has been identified as an element to be reevaluated at a future date.

Comment: E4.1.2 What is the source of the potential phosphorus load estimated in the terminal development?

Response: Section has been revised to specify that the Simple Method (Schueler, 1987) was used to estimate phosphorus loads.

Comment: E4.2.1 As stated in this section both VOC and NOx emission estimates exceed the 100 ton per year threshold. The process for developing a new SIP for the Hampton Roads area begins in 2005/2007. How will the issues of air mitigation be resolved before further planning or construction begins? Is it the intent of the USACE to submit an additional NEPA document to address these issues?

Response: To comply with general conformity requirements and to incorporate the construction and operational phases of the proposed project as part of new and future SIPs for the Hampton Roads area, VPA representatives will coordinate with the Virginia Department of Environmental Quality (VDEQ). This process is in the very early stages and air mitigation measures that may be required have not yet been defined. Coordination will continue throughout the planning, construction, and operational phases to ensure the project does not impede VDEQ SIP planning and regional efforts to attain and maintain compliance with applicable ambient air quality standards. Additional NEPA documentation will be developed as part of a supplemental EIS to be prepared in conjunction with the development of preliminary engineering and design data. This additional document is expected to include updated air emissions data and communicate that air quality related requirements are being satisfied.

Comment: E4.2.2 / E4.2.1 Are there any impacts due to hazardous air pollutants generated because of either the CIDMM or Port Development.

Response: The equipment that will be operated during the CIDMMA expansion and port development includes marine vessels, dredges, and on-road and nonroad diesel engines. Emissions of hazardous air pollutants (HAPs) will result from the combustion of fuel in the engines associated with this equipment. HAP emissions will be a fraction of the estimated VOC emissions documented in Section 1.2 of the Draft EIS. Estimated HAP emissions for the major phases of the project are summarized below assuming 20 percent of the total VOC emissions are HAPs (benzene, formaldehyde, acetaldehyde, 1,3-butadiene, and acrolein). A 20 percent value is used based on information from EPA on air toxic emissions from diesel engines (*Final Regulatory Analysis: Control of Emissions from Nonroad Diesel Engines, EPA420-R-04-007, May 2004*).

| VOC & HAP EMISSIONS ESTIMATES<br>Craney Island Eastward Expansion | | |
|---|---|---|
| **Project Phase** | **Estimated VOC Emissions (tons/yr)** | **Estimated HAP Emissions (tons/yr)** |
| Dredging and Dike Construction (2008-2013) | 163.4 | 32.7 |
| Phase I Port Condition (2017) | 82.8 | 16.6 |
| Phase II Port Condition (2050) | 206.2 | 41.2 |
| Note: estimated VOC emissions from dredging and dike construction reflect the highest annual emission value for the construction period (Year 2, 2009) and assume 15 percent of the combined NOx + NMHC emissions are VOC emissions. | | |

Based on data from EPA's AirData internet site, total HAP emissions for the Hampton Roads area is currently estimated to be 18,800 tons per year (1999 inventory year). Consequently, estimated HAP emissions associated with the three major project phases are estimated to be no more than 0.2 percent of the current HAP emissions levels in Hampton Roads. At these levels and considering that the emissions will occur from mobile sources throughout the regional area (emissions will not occur entirely in a concentrated or localized area), no adverse impacts relative to HAP emissions are anticipated.

Comment: E4.5 Is there an estimate of wetland impacts from the potential impacts of the rail corridor that could be quantified. This information would be useful in assessing the total impacts of the project. There is little information provided as to the impacts of the necessary infrastructure needed for the port development portion of this project.

Response: This information is in the approved EIS for the Third Crossing. The road and rail access to Craney Island is provided by a component of the Third Crossing project.

Comment: E4.14 EPA recommends that an adaptive management approach or some form of commitment be adopted that assures the anticipated mitigation is successful in achieving the functional restoration of the environmental loss anticipated by these actions. An adaptive management approach would monitor the efforts of the mitigation and correct mitigation that does not achieve the compensation for the impacted resources.

Response: Adaptive management will be included in the mitigation plan development for mitigation options that can be monitored and for which adaptive management options exist. While monitoring will be a follow-up component to sediment remediation, adaptive management is not proposed as there are no practical and feasible ways to implement adaptive management with this option. Monitoring and adaptive management is discussed fully in the mitigation appendix (EIS, Appendix B).

Purpose and Need

Comment: 1.0 Article I – Is there language that was intended to follow this heading?

Response: The articles will be renumbered in the final version of the document.

Comment: 1.0 Article II. What is the anticipated time required to rapid fill the new cell as described in the study authority?

Response: The initial one-third will be filled in approximately 1 year. The remaining two-thirds will be spread for filling among the existing three cells and will fill in approximately 2017.

Comment: 1.0 Article III – Is there language that was intended to follow this heading?

Response: The articles will be renumbered in the final version of the document.

Comment: 1.0 Article IV page I-6. What is the planning horizon for the CIDMM? After 2025 it is anticipated that CIDMM will be filled to capacity? What is the goal or how long is it intended for this project to extend the life of CIDMM and how does this project fulfill this need?

Response: The planning horizon is 2010-2059. The eastward expansion adds an additional 3 years of capacity to the CIDMMA. The option to study other alternatives for extending the life of the CIDMMA in the future remains. There is no stated or quantified goal of extending the life of the CIDMMA. It is a qualified goal and the eastward expansion meets that objective while meeting the objective of rapid filling for future port development as well.

Evaluation of Alternatives

Comment: 1.0 For clarity purposes please identify who developed the "formulation process". Is it a USACE process in accordance with their NEPA implementing regulations?

Response: The formulation process was developed by the Corps of Engineers and is described in detail in ER 1105-2-100. It is a USACE process that is in accordance with our NEPA implementing regulations.

Comment: 1.1 The decision criteria used to evaluate the alternatives does not seem to address the port project or the Military logistical and tactical deployment. Provide decision criteria used to evaluate these needs.

Response: The port terminal and military logistical and tactical deployment are objectives of the project and not criteria used to evaluate the alternatives. The alternatives must meet the objectives and the criteria are used to evaluate the extent to which they meet them.

Comment: 1.1 Page II-2 The third bullet of the economic criteria is confusing. Please provide some additional clarification of these criteria.

Response: There can be no alternative that meets the study objectives in a more economical manner than the Federal plan but is eliminated because it cannot be physically undertaken due to the Federal plan.

Comment: 2.1.1 Page II-4 Please explain the plan for rapid fill. How long is it anticipated to rapid fill the new cell and how does this extend the life of CDIMM?

Response: The initial one-third will be filled in approximately 1 year. The remaining two-thirds will be spread for filling among the existing three cells and will fill in approximately 2017. By utilizing the additional disposal cells, the life of the CIDMMA is extended by three years.

Comment: 2.1.1 Page II-8. What are the criteria for military training uses? The DEIS states that CIDMM is routinely used for military training but does not provide criteria used to evaluate the various alternatives considered.

Response: National defense needs are served by allowing continued use of Craney Island as a training facility. It is sometimes used to practice small scale landings on the east side in the area of the rehandling basin. Additionally, the port terminal could potentially be used for logistical or tactical deployment. Since the frequency of training and the likelihood of war are unknown, the defense needs were not quantified as benefits. The objectives merely needed to be met.

Comment: Table II-1 Explain that the No Action Alternative also provides a baseline. This analysis provides a benchmark, enabling decision makers to compare the magnitude of environmental effects of the action alternatives.

Response: The No Action plan is the without project condition. This is what will occur if no other alternative is selected. This is the plan to which all other plans are measured. It provides the benchmark to which the alternative costs and benefits are compared against to determine feasibility in addition to comparing the environmental effects those alternatives have on the study area.

Comment: Table II-1 This table compares only solutions for dredging, section 2.1.2 discusses the port alternatives but does not provide the comparative table similar to Table II-1. It might be more comprehensive to add the issues discussed in Section 2.1.2 into this table.

Response: The two discussions involve different aspects of the alternatives analysis. It is not necessarily conducive to apply the same discussion to two separate purposes.

Comment: Section 2.1.2 Page II-33. Please rephrase the second sentence, first

paragraph. In lieu of the word "constructed" perhaps the word "developed" would be more appropriate.

Response: Concur. The suggested change will be made.

Comment: Section 2.1.2 Page II-34. Figure II-3 referred to in the first sentence in the fourth paragraph does not provide the information as described in the sentence. This comment also applies to other references to this figure, Page II-35.

Response: This will be corrected.

Comment: Section 2.1.2 Page II-35 Maersk Sealand property. Other paragraphs in this section have conclusions that evaluate the site as an alternative. There are no conclusions about this site provided.

Response: This site is currently being developed by Maersk as a container terminal; therefore, it was removed from further consideration. It should be noted that the capacity of the new Maersk terminal is included in the overall port analysis to determine how much additional capacity the VPA will require in the planning horizon.

Comment: Section 2.1.2 Page II-38 The second paragraph implies that only alternatives that provide for rapid fill and can build a port meet the criteria. Please explain the criteria in more detail. Can an alternative that extends the CIDMMA and provides a port in a different location be considered? Why not?

Response: Actually the answer is yes. Any combination of alternatives that provides for port expansion and extending the life of CIDMMA would be acceptable. If a large tract of land could be identified off-site, it could be considered; however, the screening process determined that no sites are reasonably available that are close to the 50-ft channel, and major road and rail connections.

Comment: Section 3.0 Please add language describing the No Action Alternative as a baseline condition to which all the alternatives can be compared. This section continues with the negative economic effects of the No Action Alternative. This is a little misleading in that if economic benefits are the sole evaluation criteria then there could be several other alternatives besides building a port that could be considered.

Response: The No Action plan is the without project condition. This is what will occur if no other alternative is selected. This is the plan to which all other plans are measured. It provides the benchmark to which the alternative costs and benefits are compared against to determine feasibility in addition to comparing the environmental effects those alternatives have on the study area. The discussion on the economic effects will be revised.

Comment: Section 4.0 Page II-40. Please provide an explanation of why the western dike needs to be strengthened. A figure that differentiates this alternative from the alternative of eastern expansion without the strengthening would be helpful.

Response: The purpose of the west berm is to strengthen the existing dikes to permit vertical expansion of the existing CIDMMA. The existing CIDMMA will run out of capacity in 2025, when the existing dikes have been constructed to a height of approximately 47 feet above MHW. During routine operations and maintenance of the existing CIDMMA the dikes are raised each year by a small amount. The dikes cannot be raised higher than 47 feet unless the west berm is installed to strengthen the existing western dike. A figure can be found in Plate 8 of the Feasibility Report.

Comment: Section 5.0 Page II-41. Please provide further explanation of cost credit

Response: The name "cost credit" is a misnomer. The salvage value of the existing facility was included in determine economic costs of the without project condition and the with project conditions. As the with project conditions extended the life of the CIDMMA, they also extended the time in which the salvage value could be realized. Thus with project alternatives have a net economic cost due to differences in the discounting period. In a least cost analysis, the salvage value is a "cost credit" in that it reduces the overall economic cost of that particular alternative while when compared to other alternatives it may be more or less.

Comment: Section 6.0 The second paragraph provides some excellent points. However the same concerns about selecting an alternative that has uncertainty because of a projected need in 2028 of strengthening the western dike could also be used to argue that the estimates projected in 2050 for port demand are also uncertain.

Response: This is true. However, the effect of the uncertainty from forecasts out to 2050 is greatly reduced due to discounting of the cost and benefits that occur at that time. Thus, giving the short-term occurrences more weight. Additionally, this uncertainty is applied to each of the alternatives in the same manner. However, the uncertainty of whether to recommend a plan now to be built in 2028 or not, is not affected by discounting nor is it affecting all plans in the same manner. Additionally, the near term forecast for containerized cargo drives the port need. The economic benefits analysis identified a need for port capacity in 2011. The project will require a minimum of 12 years to construct; therefore, the need to begin the expansion to accommodate the port expansion drives the schedule and is immediate.

Comment: Section 6.0 page II-45. Does the recommended plan only extend the life of CIDDMA by three years after it reaches capacity in 2025? If so, it appears that this is primarily a port project and that the primary purpose is to build a port facility.

Response: The Recommended Plan only extends the life by 3 years. As directed by Congress, the study identified ways to both extend the life of the Craney Island Dredged

Material Management Area and provide for future port development. It should be important to note that an alternative considered but screened out early on was to place the port on the existing CIDMMA; however, this would obviously decrease the life of CIDMMA and is not what the U.S. Congress desired from the study – as evidenced in the authorizing language.

Comment: Section 7.0 Please provide additional information on rapid fill. Will the cell be filled in the course of planned dredging operations or will areas be dredged expressly to fill the cell?

Response: The initial one-third will be filled in approximately 1 year. The remaining two-thirds will be spread for filling among the existing three cells and will fill in approximately 2017. This will be done in the course of normal dredging operations.

Comment: Section 7.0 Page II-47. Access to the proposed terminal. There appears to be additional studies planned for the rail connections that may be dependant on the third crossing project. Please elaborate on the additional NEPA documents required. Is this considered a tiered EIS with additional EISs developed to address the unknown impacts?

Response: The Third Crossing has an approved EIS. The Route 164 Connector, which is part of the Third Crossing, provides road and rail access to Craney Island. If the schedule for construction of the Third Crossing does not coincide with the construction of the port, then a supplemental EIS will be provided for the construction of the road and rail access.

Affected Environment

Comment: Section 1.1.8 Page III-7. The referenced Figure III-1 seems to need additional data on the maps. The figure doesn't present the data described in this section.

Response: This will be corrected in the final version.

Comment: Section 1.2 There is no discussion of hazardous air pollutants. The existing condition of this area with respect to hazardous air pollutants would be a meaningful comparison in respect to the consequences section.

Response: See response to E4.2.2/E4.2.1 above regarding hazardous air pollutant emissions.

Comment: Section 1.3.2 Page III-15. The discussion of the sea turtle provides no conclusion. Are there any impacts expected?

Response: This section has been revised to further discuss potential impacts to sea turtles. Please see Page IV-27, Section 1.3.1.1. No more than minimal impacts to sea turtles are anticipated.

Comment: Section 1.4.5 Page III-23. Table III-5 and the discussion uses data from 1985 – 20 years old. Is there more current data available for this discussion?

Response: Yes. Table III-5 presents historical information on hard clam, oyster, and blue crab data from 1985 for reference. Page III-30-31, Table III-7 presents the 2002 hard clam assessment in James River and vicinity. Additionally, Seitz and Lipcius (2002) conducted an inventory of abundance, biomass, and diversity of benthic species in 2002. This information is presented on pages III-27-28, and their full report is presented in EIS Appendix E.

Comment: Section 1.4.7 Page III-29. In the oyster discussion please also consider identifying other factors that have caused oyster population declines such as pollution and over harvesting.

Response: To parasites added: "and by overharvest, loss of habitat, and poor water quality." (Page III-27)

Comment: Section 1.4.7 Page III-31. The figure referenced should be Figure III – 10 vs Figure II – 10. The figure does not provide the information mentioned in the discussion. The oyster grounds are not depicted on the maps.

Response: Changed II-10 and II-11 to III-10 and III-11. Figures were mis-referenced.

Comment: Section 1.7.4 Page III-36. Which port is being referred to in this section? Are these all the port facilities in this area?

Response: The Port of Virginia.

Comment: Section 1.7.6 Public and Private Terminals referred to in this section are acronyms. Please provide the full names of the ports if not already described in the document. An acronym table would be helpful in this respect.

Response: A list of acronyms has been developed and will be included with the final EIS.

Comment: Section 1.7.7 In the description of vessel traffic it is stated that the number of vessels has decreased but the container numbers have increased. Is this due to larger vessels? If so it might be good to add this clarification to the discussion.

Response: The clarification will be added.

Comment: Section 1.8.2 Page III-42. There is no conclusion in this section as to the capacity of the waste water facilities to be able to handle the increase of waste water.

Response: As stated in the DEIS (Pg IV-48) the Hampton Roads Sanitation District (HRSD) is the utility that provides wastewater treatment services in the region and HRSD

has stated in writing (April 2002) that their sanitary sewer interceptors serving the area where the port would be located have ample capacity to collect the projected flow and that the Nansemond Wastewater Treatment Plant has more than sufficient capacity to treat the project flow.

Comment: Section 1.11.2 Page III-52. Some lead agencies also look at a 5 db change in noise from existing conditions to ascertain noticeable changes due to the impact of the project on the surrounding community. Can this be reflected in the noise analysis?

Response: Yes. The noise impact section of the DEIS has been modified to include a comparison of pre and post build-out noise levels. The results are presented in Section IV-1.11 and state that noticeable (ie > 5dB) changes in noise levels due to the project extend outward approximately ¼ - ½ mile from the perimeter of the proposed facility. This noise contour falls almost entirely within the existing Craney Island Dredged Material Management Area. Modeling results predict an imperceptible increase in noise levels beyond approximately ¾ - 1 mile of the proposed port. The closest sensitive receptors are well beyond this distance.

Environmental Consequences

Comment: Page IV-1 In the first paragraph, please provide more detail on how the additional information needed for port development would be used and how it will meet the NEPA requirements.

Response: As required by Section 102(2)(C) of the National Environmental Policy Act (1969), Environmental Impact Statements have to be prepared for major Federal actions. Every effort is made in the document to discuss and disclose all major points of view on the environmental impacts of the alternatives, using the best available scientific information in the analysis of potential impacts. Per the Council on Environmental Quality's regulations (40 CFR Part 1502.9(c) and the Department of the Army's Final Rule on Environmental Analysis of Army Actions (32 CFR Part 651.5(g)), supplemental NEPA documentation is required when there are significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts. The Corps and the VPA recognize that the level of detail regarding engineering design and construction/operation of the new cell and terminal will increase during PED preparation and therefore have committed to the preparation of a Supplemental EIS (SEIS) which will incorporate the new information. Per 32 CFR Part 651.24, the SEIS will be processed in the same way as the original EIS.

Comment: Section 1.1.2.1 Page 1.1.2.2. Please provide a description of the CWA Section 404 process requirements for this project. The 404 process requirements should also be clearly stated in the introduction to the EIS.

Response: A description of the CWA Section 404 process requirements for this project will be included in this section. The 404 process requirements will be clearly stated in the

introduction to the EIS.

Comment: Section 1.1.2.2 Page IV-7. Third Paragraph. Could the VPA provide a buffer in another area as an offset?

Response: Section has been revised to state that "Mitigation/offset of pollutant loading would involve the construction of stormwater treatment devices on the proposed terminal, but could also involve buffers or BMPs elsewhere in the Elizabeth River Basin."

Comment: Section 1.2 There is no discussion of the project in relation to PM2.5. Please follow the Best Practices for port emissions dated June 23, 2005, enclosed for your reference. The best practices should be used to estimate all emission sources for the port, including harbor craft.

Response: In recognition that the project location is within an ozone nonattainment area, emissions estimates for ozone precursor pollutants, NOx and VOCs, were completed and documented in the Draft EIS. Estimates for particulate matter (PM) emissions were not included since the area is in attainment with the PM10 and PM2.5 ambient air quality standards. Below is a summary of estimated PM2.5 emissions for each phase of the project. In recognition that published emission factors, with the exception of the onroad mobile source model, are only available for total PM emissions, the PM2.5 estimates conservatively assume 100 percent of the PM emissions is PM2.5.

| **PM2.5 EMISSIONS ESTIMATES<br>Craney Island Eastward Expansion** | |
|---|---|
| **Project Phase** | **Estimated PM2.5 Emissions (tons/yr)** |
| Dredging and Dike Construction (2008-2013) | 62.1 |
| Phase I Port Condition (2017) | 37.3 |
| Phase II Port Condition (2050) | 89.3 |
| Note: estimated PM emissions from dredging and dike construction reflect the highest annual emission value for the construction period (Year 2, 2009). | |

All emission sources expected to be associated with the port facility are included in the emissions estimates. Similar to the methodology described in the Best Practices for port emissions June 23, 2005 draft document, a detailed approach was followed to quantify emissions from both marine and land-based sources. The methodology used in developing the emission estimates for the project is comparable to the methodology outlined in the best practice document; however, there are differences in certain emission factors used in recognition that the estimates were prepared before the date of the recent draft document. Future emissions estimates are expected to be completed as part of a supplemental EIS to be prepared in conjunction with the development of preliminary engineering and design data. These supplemental emissions estimates will be completed using the most up-to-date emission factors and mobile source models, latest USEPA guidance documents for estimating emissions from port related activities, and most current design information available on the proposed port facility.

Emissions from the operation of additional marine vessels/harbor craft (tugboats, dredges, fuel barges, etc.) are included in the estimates for the dredging and dike construction phase of the project. Since the use of these harbor vessels is uncertain for the Phase I and Phase II port operation conditions, emissions associated with these vessels are not included in the Phase I and Phase II port emissions projections. However, future emissions estimates for the project will incorporate emissions from these vessels as appropriate.

Comment: Section 1.2.2 This project does not meet the SIP for VOC and NOX. The section states further that air quality permits may be required and goes on to discuss potential mitigation. Will mitigation be part of the permit? And how will these impacts be quantified and communicated for public review?

Response: As discussed above in response to comment E.4.2.1, the proposed project is required to comply with the general conformity provisions and thereby conform to the pending SIP and any necessary measures established in accordance with the SIP to reduce emissions of NOx and VOCs in the Hampton Roads ozone nonattainment area. Since representatives from VPA are in the initial stages of coordinating with the VDEQ on a new SIP for the Hampton Roads area, specific details relative to SIP emission budgets and project mitigation have not yet been defined. Mitigation measures and impacts on air quality will be communicated for public review in accordance with applicable federal and state regulations to be implemented during the SIP approval process. The public participation provisions applicable to general conformity determinations as prescribed in the Virginia Regulations for the Control and Abatement of Air Pollution under 9 VAC 5-160-140 will also be followed. The requirements of the public participation provisions are to make available for review the draft conformity determination (including supporting materials describing the analytical methods and conclusions relied upon for making the draft conformity determination); place a public notice via a prominent newspaper advertisement and provide 30 days for written public comment prior to taking formal action on the draft determination; document and make available upon request responses to the comments received on the draft conformity determination; and place a notice via a prominent newspaper advertisement the final conformity determination within 30 days of the final conformity determination.

Comment: Section 1.2.3 This section states that the construction related emissions were not quantified. It is hard to conclude that these are not significant without some type of quantification.

Response: Construction emissions have been estimated for dredging and dike construction activities for the eastward expansion of Craney Island. These estimates are provided in Section 1.2.1 of the Draft EIS. Construction related emissions relative to subsequent development of the container terminal facility on the expanded Craney Island will be temporary and are expected to be substantially lower than the documented emissions estimates for dredging and dike construction. Information relative to construction equipment, operating schedules, and engine sizes for the construction of the

container terminal will not be defined until preliminary engineering and design data is available. As appropriate, emissions estimates will be developed for the terminal construction in a supplemental emissions estimate.

Comment: Section 1.4.1.3 Page IV-32. The first paragraph in this section describes that the rip rap will provide an extremely diverse and productive community. Has this been the case for the existing dikes? Please provide the history and experience learned from the existing dike berms.

Response: Though not currently cited in the EIS, a growing amount of evidence is accumulating suggesting that rip-rap structures are indeed a viable habitat not only for attachment of epifaunal species, but also for infaunal species subtidal to the rip-rap (Seitz et al, in review) and fish species (Seitz et al, in review, Carroll et al. 2003). Seitz et al. found that infaunal benthic abundance and diversity were significantly higher in subtidal habitats adjacent to rip-rap than those adjacent to bulkhead shorelines and furthermore epibenthic fish density (as sampled by trawling) and diversity tended to be higher adjacent to rip-rap than bulkhead shorelines. Some of the fish species that frequented habitats adjacent to rip-rap in the York and Lafayette Rivers included spot, croaker, silver perch and anchovies (Seitz et al., in review).

In addition, recent data show that alternative substrates (i.e., besides oyster shell) have suggested that both rip-rap (granite) and concrete structures promote the establishment of oyster populations. For example, recent findings from a concrete three-dimensional reef in the Rappahannock River showed oyster densities that were higher than any restored reef (including the gold standard – 600 oysters/$m^2$ at Fishermen's Island on the Eastern Shore). This reef offers significantly greater vertical complexity, reef stability and substrate surface area than many restored reefs and, thus, may be a more realistic mimic of natural oyster reefs. The modular reef was neither seeded artificially nor harvested. The reef was colonized heavily by native oyster and mussel larvae that recruited successfully and survived in a thriving oyster reef community for the 4.5 years since reef deployment in 2000. Oyster and mussel biomass and density values were among the highest recorded for natural and restored oyster reefs.

Furthermore, new data from a project in Lynnhaven Bay (Lipcius and Burke, in progress) suggest that settlement of oyster spat is greater on rip-rap than other hard substrates including natural oyster shell. In combination, these studies suggest that Rip-Rap structures on the Craney Island Expansion would indeed provide a viable "reef" for not only epibenthic invertebrate species but also for mobile species.

There is an abundance of work in progress that supports the contentions of the report that: "*...riprap is likely to provide an extremely diverse and productive community, and serve as a nursery and feeding area for many fishes and invertebrates...*", however, there are few references following this statement in the report. The findings of the current research mentioned above will to be added to the document to give it more credibility.

References:

Carroll R (2003) Nekton utilization of intertidal fringing salt marsh and revetment hardened shorelines. Masters Thesis, The College of William and Mary, Virginia Institute of Marine Science, Gloucester Point

Seitz, R.D., R.N. Lipcius, N.H. Olmstead, M.S. Seebo, and D.M. Lambert. *In review 2005.* Influence of shallow-water habitats and shoreline development upon abundance, biomass, and diversity of Chesapeake Bay Benthos and their predators. Marine Ecology Progress Series.

The constructed east expansion cell would result in approximately 50 sq. ft. of rip-rap per foot of wharf below the water line. With this number that makes it about 840,000 sq. ft. or over 18 acres of net gain. About half of this habitat would be above 20 feet MLW, the remainder below 20 ft MLW. The riprap which will cover the dike slope is a three dimensional structure that will provide valuable hard attachment substrate for epifaunal invertebrates, and nooks and crannies attractive to small motile organisms including crabs and fish. It is well documented that the impact area was once a hard bottom substrate (oyster shell/reef structure) and part of an extensive public oyster ground (Baylor ground) in the Elizabeth and lower James River. With the demise of the oyster in the bay, primarily due to disease and overfishing, the oyster reef structure was removed and/or covered with soft substrate (sediment). Hard structure (such as oyster reefs) is a grossly depleted habitat in the Chesapeake Bay that provides a wealth of ecosystem functions, including habitat provision for blue crabs, benthic populations, and fish stocks that are now depleted. On the other hand, soft-bottom habitat is the dominant bottom type of the entire Bay and, in fact, is the habitat type that is already enhanced through the extensive loss of oyster reef and shell bottom habitat. This perspective argues for hard substrates in preference to adding more (even clean and functional) soft-sediment area as part of a Bay-wide strategy for restoring historical ecological baselines and functions.

In addition to the West Harbor, Ohio study, the EIS references:

Van Dolah, R.F., et al. 1987. "Ecological Effects of Rubble Weir Jetty Construction at Murrells Inlet, South Carolina; Volume III: Community Structure and Habitat Utilization of Fishes and Decapods Associated with the Jetties," Technical Report EL-84-4, prepared by South Carolina Wildlife and Marine Resources Department, Charleston, S.C., for U.S. Army Engineer Waterways Experiment Station, Vicksburg, Mississippi.

This study from Murrells Inlet, South Carolina found that the quarrystone jetties attracted species that are normally associated with reef structures, species that are commonly found around estuarine inlets, and species that seasonally migrate along the coast. The jetties served as nursery habitat for a variety of fish species. Food habits analyses demonstrated that numerous fishes derived trophic support directly from the biota associated with the structures or indirectly by preying upon smaller forage fishes which congregated around the jetties. It also noted increased recreational fishing around the inlet jetties in which anglers sought red drum, flounder, spot, bluefish, king mackerel, black sea bass, and

smooth dogfish, all of which are similar species found in the study area.

Comment: Section 1.5.2.1 The environmental consequences and the impacts to wetlands from the rail spur and road access corridors was not clear. What are the wetlands impacted, quantity in acres, and how will these impacts be mitigated? Will these issues be the subject of another NEPA document tiered off of this document?

Response: Road and rail corridor impacts were discussed in detail in the Hampton Roads Crossing Study FEIS (2000) and were summarized in the Craney Island Eastward Expansion DEIS (Section IV, paragraph 1.5). At this stage of the project, design has not progressed to the point of being able to quantify wetland impacts related to the road and rail expansions. Portions of the road and rail corridors could be realigned from current designs during PED to minimize wetland impacts. Complete wetland impacts, including compensatory mitigation where appropriate, will be presented in a Supplemental EIS.

Comment: Section 1.5.2.3. Is the statement provided in this section accurate? If the port is not developed would there still be an eastward expansion? Or does this section mean that the channel would be dredged regardless of the port and therefore part of the No Action Alternative?

Response: If an East CDF was constructed the amount of dredging required to construct the east CDF would be substantially smaller than that required to accommodate the port. The pre-dredging would not be required to construct a "structural" dike on the east side. An access channel would not be deepened to 50-ft because it would not be needed. HOWEVER, it was determined early on that if an alternative, or combination of alternatives, included expansion to the east, then the VPA would want to build a port on the expansion. It is therefore, more accurate to say that if an eastward expansion is constructed for dredge material, then the port would construct a marine terminal. The access channel is required for navigation purposes. The pre-dredging is required to accommodate the "structural" dike on the east side that would be adjacent to the 50-ft deep access channel.

There has been some confusion regarding the need to dredge the access channel – regardless. This stems from the statements from VIMS that the access channel dredging helps to open up the cross section of the river and improve the tidal flushing – thereby minimizing impacts to the river. Since the VPA intends to build a marine terminal, provided the expansion is there, no additional modeling was conducted to determine to what extent some dredging would be required if only an east CDF was constructed. An east CDF alternative is not a viable option.

This dredging is certainly not part of the "No Action Alternative". The no action alternative would not include an east CDF, or an east CDF with port.

The text in the EIS should probably be edited to state that "...predredging would be required to construct a structural dike to accommodate the adjacent navigation access

channel…"

Comment: Section 1.7 It should be noted that the LOS on most of the roads is already E or F defined as extremely unstable or break down. Also provide more detail on how the trip distribution was estimated.

Response: Concur that major highways in Hampton Roads already have a LOS of E or F.

Truck trips were determined by converting the forecast TEU volumes to actual containers (2 Twenty Foot Equivalent Units = 1 Forty Foot Equivalent Unit.) The number of containers is approximately the number of TEU divided by 1.7 to 1.75. A percentage of containers were distributed to rail, based on historical averages and expected forecast. A percentage of containers were distributed to barges, again based on historical averages. The remaining containers were assumed to travel by truck, approximately 60% on average. The containers were then converted to truck trips by distributing them to dual moves and single moves (accounting for bobtails). The splits were based on historical averages at the existing marine terminals.

Comment: Section 1.11 Noise. Noise contour maps would be helpful to describe the noise effects of the two projects. Also please provide a discussion on the change on noise levels from the no action and the build out. For example, what would be the db change to the nearest affected community?

Response: Contour maps of pre and post build out noise levels have been prepared and will be included in the Final EIS. These maps show that the noise levels in the closest communities to the proposed project are predicted to experience no perceptible increase in noise.

Comment: Section 1.14.1 Economics. Why are there reduced dredging costs for users of the eastward expansion? Also, in the fifth paragraph of this section please provide more clarification, who are the users of the eastward expansion?

Response: The eastward expansion is closer to the centroid of dredging in the harbor for the users of the CIDMMA. This allows for the use of less pipe in dredging operations thus lowering the costs, however little that is. Additionally, the long term avoidance of ocean disposal, a higher cost alternative, provides savings to the users of Craney Island. The users of the CIDMMA are Federal, state and municpal entities as well as commercial industry or private homeowners. The CIDMMA is open to all on an equal basis as long as the material is navigation related.

Comment: Section 1.14.4 This section describes the economic impact of the CIDMMA in terms of costs and benefits. The section provides good detail on the estimated benefits. However the costs of the project are explained in one overall cost. Are there any indirect costs not accounted for, such as the cost of additional pollution.

Response: Indirect costs, such as those for pollution, are not included.

Comment: Section 1.19 Coastal Zone Resources and Permits. This section would benefit from a description and the requirements of the Coastal Zone Management Act. Also it states in this section that a 404 permit will be required. Appendix H is a 404(b) (1) evaluation?

Response: This section will be revised to include a description and the requirements of the Coastal Zone Management Act. A Section 404 permit will not be required. This will be revised. Appendix H is a 404(b) (1) evaluation.

Comment: Section 1.21.2 Cumulative Effects Assessment. Page IV-72. In step 11 of the cumulative effects assessment a reference is made to adaptive management strategies and monitoring the effects of this project along with the cumulative effects. EPA strongly encourages the use of monitoring whether it be in conjunction with an EMS or adaptive management strategies under this EIS. EPA requests a commitment to monitor the success of the mitigation package to assure that it is functionally equivalent to the environmental impacts of this project

Response: Both monitoring and adaptive management are discussed in the mitigation appendix (EIS, Appendix B). Adaptive management will be included in the mitigation plan for mitigation options that have established practical and feasible adaptive management options. While monitoring will be a follow-up component to all mitigation, adaptive management is not proposed for sediment clean-up as there are no practical and feasible ways to implement adaptive management with this option. Monitoring to establish that mitigation is achieving the required results is normally a condition of permit issuance. The project proponents are anticipating that monitoring will be required, and they will comply with the permit conditions.

Environmental Justice

Comment: 1. This document has taken a great deal of time and effort in its researching and assessment of the potential impacts on the ecosystem of the Elizabeth River, but spends very little time on the assessment of the human population from an Environmental Justice standpoint.

Response: A more in-depth social analysis of the communities surrounding the project area was performed and the discussion that follows is included in the Final Environmental Impact Statement (FEIS). This analysis was performed to better evaluate the potential for environmental justice impacts resulting from the proposed port facility. The project area was defined as those communities in the city of Portsmouth adjacent to the Craney Island Dredged Materials Management Area (CIDMMA) or those north of the Western Branch of the Elizabeth River that were within 4 miles of the area of the proposed expansion. These communities were defined by either census tract or block group boundary and included Census Tracts 2130.01, 2130.02, and 2131.04, as well as

Block Groups 1 and 2 of Census Tract 2131.03. A figure showing the location of these communities with respect to CIDMMA and the potential expansion area is included in the FEIS.

To analyze the economic and social effects of the proposed action a demographic profile was developed for each community using information from both the 1990 and 2000 U. S. Census. Included in these profiles were their demographic and employment characteristics, specifically, race, poverty level, median household income, and unemployment rate. To further analyze the impact of the expansion on these communities, their demographic profiles were compared to the entire city of Portsmouth, the Norfolk-VA Beach-Newport News MSA, and the State of Virginia. The Norfolk-Virginia Beach-Newport News MSA constitutes the service area of the proposed port and consists of the counties of Gloucester, Isle of Wight, James City, Mathews, Surry, and York, along with the cities of Chesapeake, Hampton, Newport News, Norfolk, Portsmouth, Poquoson, Suffolk, Virginia Beach, and Williamsburg.

Of the five communities closest to the project site, four have a percentage of non-white population less than the level for the city of Portsmouth (Census Tracts 2130.01, 2130.02, and Block Groups 1 and 2 of Census Tract 2131.03), and all but one (Census Tract 2131.04) have a non-white percentage below 50 percent of the total population. The races included in the non-white population are black or African-American, American Indian and Alaska Native, Asian, other Pacific Islander, some other race alone, two races, and more than two races. The non-white population in four of the five census tracts exceeds the level for the State of Virginia; however, two others are within 10 percent of the state level.

Of the five communities analyzed, all have poverty levels below 8 percent, and all have percentages of individuals in poverty that are below the city of Portsmouth, MSA, and state levels. Only one community (Census Tract 2130.02) has a median age above that of the state, and each community except one (Block Group 1 of Census Tract 2131.03) has a median income above that of the city of Portsmouth and the State of Virginia.

Based on this analysis, the activities associated with the proposed alternative would not have significant or disproportionate adverse impacts on low-income, minority, or age-sensitive communities. Although some minor and short-term impacts to environmental resources might occur, there are anticipated long-term benefits to these communities due to potential employment and increased demand for local services.

Comment: 2. There has been no clear identification of the communities that could potentially be impacted by the project. Very general information is provided about the Cities of Portsmouth and Newport News, but no attempt is made to look at specific communities that could potentially be impacted by these two major projects. Characterization of those communities, summary of potential impacts upon those communities, or any indication that an in depth examination of the potential for impacts, issues or concerns related to Environmental Justice should have been assessed. There is

considerable information and assessment related to blue crabs, hard clams, and other forms of aquatic life, but the key information related to Environmental Justice is missing.
Response: See Response to Comment above.

Comment: 3. Figures, diagrams, and other graphic representations fail to clearly show where population is located with respect to the proposed site of the project.

Response: Figures have been included in the FEIS that show where communities are located with respect to the project site.

Comment: 4. The study area around the project needs to be defined. It does not seem reasonable to characterize the entire Cites of Portsmouth and the Norfolk, Virginia Beach, Newport News MSA as though they are the study area. There must be some neighborhoods that are in close proximity to the study area. If so, they should be evaluated for environmental justice concerns.

Response: See Response to Comment above.

Comment: 5. The assessment of non-white population presented in the document seems flawed. It is not reasonable to assume that there are no potential Environmental Justice concerns because the non-white in the study area does not exceed the non-white population of either the City of Portsmouth or the Norfolk, Virginia Beach, Newport News MSA. Please note that the non-white percentages noted in the Tract Data exceeds the state average.

Response: The text in the FEIS has been revised to address this comment.

Comment: 6. Please provide information on the low-income population in the area of impact. Information is provided for the City of Portsmouth, the Norfolk, Virginia Beach, Newport News MSA, and the State of Virginia. What about the area of concern? It seems that there should be concern due to the large numbers of persons living in poverty in the areas mentioned above. It seems reasonable that there will be significant numbers of persons living below the poverty level in the area near the project.

Response: The discussion in the FEIS has incorporated information to address this comment.

Comment: 7. What are the plans for conducting meaningful outreach and community involvement for this project? How will you assure the meaningful participation of the at-risk population? Remember environmental justice also entails meaningful community involvement and access to information. What is being done to address these issues?

Response: Within the Draft Feasibility Report for the Craney Island Eastward Expansion prepared by the U.S. Army Corps of Engineers is a coordination section (Page 129) that discusses the manner in which stakeholders were involved in the development of the

CIDMMA Eastward Expansion Study. Study coordination meetings were held with fifty-three stakeholders from Federal, state, regional, and local government agencies; large and small businesses; professional groups; environmental organizations; civic groups; and local universities.

Eight stakeholder meetings were held during the study, and the dates of the meetings were:

- 12 August 1999
- 12 April 2000
- 23 May 2001
- 15 January 2002
- 9 December 2004
- 14 December 2004
- 25 April 2005
- 6 September 2005

The purpose of these meetings was to obtain public input regarding the study and to provide a forum for the study's assumptions, progress, data, results, and conclusions to be communicated with the stakeholders. All stakeholders were periodically advised of the study's progress, and most were active participants in the meetings. The following localities provided information during the process:

- City of Chesapeake
- City of Hampton
- City of Newport News
- City of Norfolk
- City of Portsmouth
- City of Suffolk
- City of Virginia Beach

Federal agencies that were involved with the process included:

- Federal Highway Administration
- National Oceanic and Atmospheric Administration
- U.S. Environmental Protection Agency (USEPA)
- U.S. Fish and Wildlife Service (USFWS)

During the study process six meetings of a NEPA Technical Committee were held. These meetings were undertaken as part of the scoping process consistent with NEPA regulations. Some of the participants included the USACE, USFWS, USEPA, Virginia Department of Conservation and Recreation, and Virginia Department of Environmental Quality. Finally, two meetings were held with the USEPA, Virginia Port Authority, and USACE to discuss the Craney Island Expansion Feasibility Study. The first meeting was

held on 1 July 2004 and the other on 24 March 2005.

Comment: 8. What strategies will be employed to assure the mitigation of potential cumulative or multiple impacts upon the at-risk community?

Response: It is the opinion expressed in the DEIS, and further discussed above, that there will be no need for mitigation measures for environmental justice issues since no significant or disproportionate adverse impacts in low-income, minority, or age-sensitive communities are expected. Although some minor and short-term impacts to environmental resources might occur, there are anticipated long-term benefits to these communities due to potential employment and increased demand for local services.

Comment: 9. It seems difficult to conduct a proper Environmental Justice assessment when the potential communities of concern have not been clearly defined. For this reason, the Environmental Justice assessment appears to be inadequate.

Response: The potential communities of concern have been identified. See Response to Comment above.

General Comments

Comment: The following two voluntary programs have been successful in reducing pollution and its impacts for stormwater and diesel engine idling. Please consider implementing these initiatives for this project.

Response: The port utilizes best management practices for treating stormwater (The VPA has been recognized with two awards in 1994 and 1995 for innovative stormwater treatment practices.) Best management practices will be incorporated in the development of the Craney Island Marine Terminal.

Low Impact Development

Comment: Please consider using Best Management Practices related to stormwater controls throughout the development of this project as described below.

Response: As stated in the DEIS (p. IV-12), "...stormwater quality is a significant regulatory issue that will require comprehensive planning during all phases of the proposed development...[R]egulatory requirements will be met...by a comprehensive stormwater management plan that provides appropriate BMP technology and is designed to achieve a high level of treatment for the facility."

Comment: A Presidential Memorandum (dated April 26, 1994) and Guidance (dated August 10, 1995) applicable to Federal facilities and federally funded projects pertinent to environmentally and economically beneficial landscape practices is to be incorporated into all NEPA-related documents. As outlined in Executive Order 13148 dated April 26,

2000 (Federal Register Vol. 65, No. 81) on Greening the Government, it has been directed that all agencies incorporate the above Guidance into landscape programs, policies and practices. The Guidance calls for agencies that fund any landscape to provide recipients with information of beneficial landscaping as well as to work to support and encourage application of the principles. The EPA, GSA, and USDA are tasked with providing technical information on beneficial landscaping to other federal agencies and their facilities. This effort, also recognized as low impact development, has the potential to reduce impacts on watershed hydrology and aquatic resources as described below.

Response: Concur.

SmartWay Transport - diesel engine idling BMPs

Comment: Please consider incorporating any SmartWay initiatives that can be integrated into this project or general facility operating procedures, especially some of the idling best management practices. This effort has the potential to reduce pollution emissions as noted in the brief smart way description provided below.

SmartWay Transport is a voluntary partnership between various freight industry sectors and EPA that establishes incentives for fuel efficiency improvements and greenhouse gas emissions reductions. By 2012, this initiative aims to reduce between 33-66 million metric tons of carbon dioxide (CO2) emissions and up to 200,000 tons of nitrogen oxide (Nox) emissions per year. At the same time, the initiative will result in fuel savings of up to 150 million barrels of oil annually. There are three primary components of the project: creating partnerships, reducing all unnecessary engine idling, and increasing the efficiency and use of rail and intermodal operations.

One component of the SmartWay Transport Partnership is to eliminate unnecessary truck and rail idling by developing a nationwide network of idle-reduction options along major transportation corridors - truck stops, travel centers, distribution hubs, rail switch yards, borders, ports, and even along the side of the road. The Environmental Protection Agency is working with the trucking industry, manufacturers of idle control technologies, various states, and other partners to help save fuel and reduce air pollution from idling trucks. EPA is conducting emissions testing on idling trucks under various conditions, surveying trucking fleets to learn more about idling times, implementing demonstration projects to test idle control technologies, and holding workshops to educate affected communities. The vast majority of fuel consumed during long-duration idling can be saved and air emissions reduced by installing one of several idle control technologies that provide heat, air conditioning, and electrical power. These technologies include auxiliary units and truck stop electrification. The technologies to address engine idling are evolving, and EPA plans to test new technologies as they come to the market. You can find a list of the currently available idle technologies at http://www.epa.gov/otaq/retrofit/idlingtech.htm.

Response: To minimize air pollutant emissions from port operations, VIT, the operator of VPA's existing marine terminals, has a current policy requiring the purchase of all new cargo handling and non-road equipment with the lowest emission rating. In addition, VPA and VIT evaluate best management practices for port operations aimed at improving operational efficiencies and implement these practices as appropriate. For example, a program has been implemented at a VIT facility to reduce engine idling times for the various equipment owned and operated by the facility. Also, VIT has implemented a chassis pool system to improve the efficiency of truck operations and reduce the duration of time trucks spend at the port facility for loading and unloading cargo. VPA and VIT will continue to evaluate best management practices and will consider future participation in the SmartWay initiatives and other programs to reduce emissions from idling and port operations.

Comment: It would be useful to include a list of acronyms. There were several areas were acronyms were used and not defined.

Response: This has been developed and will be included with the final EIS.

**United States Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service (7 October 2005)**

Comment: Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*) are distributed along the entire East Coast of the United States and have been designated a Species of Concern by NMFS. Many populations, including those found in the Chesapeake Bay, have undergone drastic declines in abundance since the late 1800s. Consequently, NMFS has initiated a status review for this species to determine if listing as threatened or endangered under the ESA is warranted. If it is determined that listing is warranted, a final rule listing the species could be published with in a year from the date of publication of the listing determination or proposed rule.

The best available scientific information indicates that a reproducing Atlantic sturgeon population persists in the James River, into which the Elizabeth River flows. This population is likely to be very small and as such, it may be particularly vulnerable to natural and/or anthropogenic disturbances. The James River population may be the only remaining reproducing population in the Chesapeake Bay and is, therefore, critical to the recovery of this species in the Bay. While Atlantic sturgeon currently receives no substantive or procedural protection under the ESA, NMFS recommends that the ACOE consider implementing conservation actions to limit the potential for adverse effects on Atlantic sturgeon from this project.

Response: The ACOE will consider implementing conservation actions to limit the potential for adverse effects on Atlantic sturgeon.

Comment: Section 7(a)(2) of the Endangered Species Act (ESA) of 1973, as amended, states that each Federal agency shall, in consultation with the Secretary, insure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of a listed species or result in the destruction or adverse modification of designated critical habitat. Any discretionary federal action that may affect a listed species must undergo Section 7 consultation. As noted above, sea turtles may occur in the Elizabeth River where the CIDMMA expansion will occur. As such, the ACOE must consider the effects of the expansion on sea turtles, particularly how the expansion may affect sea turtle foraging habitat. The draft EIS notes that at full build out shipping traffic in the Hampton Roads Harbor Sytem is expect to increase by about 20 percent or 19 vessel calls per week. The draft EIS states that this increase will increase the potential number of vessel encounters with marine mammals. Large whales, particularly the endangered Northern Right Whale, are vulnerable to ship strikes. As the increased potential for ship strikes is an indirect effect of the CIDMMA expansion, the ACOE must consider these effects. As listed species may be effected by the proposed project, the ACOE should initiate section 7 consultation on the effects of this project.

Response: (EFH concerns have been addressed in previous responses.) The Corps has determined that endangered species data acquired subsequent to publishing the DEIS is sufficient to make a "not likely to affect" determination and to permit NMFS to make an informed analysis of ESA compliance. This data will be provided to NMFS and will be

included in FEIS. Given that the frequency of whale sightings in the shipping channel is negligible (two sighted in 28 years), the potential for increased vessel strikes related to the proposed project is believed to be minimal. A graphic depicting the spatial distribution of these sightings since 1974 will be included in the FEIS. Also, due to the sparseness of mollusks and crustaceans (typically loggerhead food) within the expansion footprint, and total absence of SAV's where Kemp's ridleys frequently forage in Chesapeake Bay (Musick and Limpus, 1997), and where green turtles typically feed on sea grasses and benthic algae (Bjorndal 1997), the expansion footprint is not seen as a significant foraging area for sea turtles. Therefore, the Corps has concluded that the proposed action is not likely to affect listed species. The outcome of Section 7 consultation will not affect the selection of Eastward Expansion as the Recommended Plan. The Corps will seek concurrence from NMFS to conclude Section 7 consultation.

Sand borrow within the Federal channels (Thimble Shoals and Atlantic Ocean Channels) is covered by an existing NMFS Biological Opinion dated 25 April 2002. No further Section 7 consultation is required for this activity.

Bjorndal, K.A. 1997. Foraging ecology and nutrition of sea turtles. Pages 199-233 in: Lutz, P.L. and J.A. Musick, eds. The Biology of Sea Turtles. CRC Press, New York. 432 pp.

Musick, J.A. and C.J. Limpus. 1997. Habitat utilization and migration in juvenile sea turtles. P. 137-164 in: Lutz, P.L. and J.A. Musick, eds. The Biology of Sea Turtles. CRC Press, New York. 432 pp.

Comment: The ACOE is responsible for determining whether the proposed action is likely to affect any listed species. The ACOE should submit their determination along with justification for the determination and a request for concurrence, to the attention of the Endangered Species Coordinator, NMFS, Northeast Regional Office, Protected Resources Division, One Blackburn Drive, Gloucester, MA 01930. After reviewing this information, NMFS would be able to conduct a consultation under section 7 of the ESA. Should you have any questions about these comments or about the section 7 consultation projects in general, please contact Julie Crocker at (978)281-9328 ext. 6530. To discuss ship strike issues specifically, please contact Kristen Koyama, NMFS Northeast Region ship strike coordinator at 978-281-9300 x6531. NMFS Habitat Conservation Division (HCD) has the responsibility of overseeing programs for designated Essential Fish Habitat (EFH). As such, you may receive comments from NFMS HCD under separate cover. Thank you for the opportunity to comment on the draft EIS.

Response: The ACOE is preparing correspondence to provide to NMFS determining whether the proposed action is likely to affect any listed species. As described above, a "not likely to affect" determination has been made. The ACOE will seek concurrence with NMFS on this determination.

**United States Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service (4 November 2005)**

## GENERAL COMMENTS:

Comment: It does not appear that all of the direct, indirect, individual and cumulative impacts of the proposed project have been addressed adequately in the DEIS. The project purpose and need appear to be overly restrictive and to limit artificially the range of alternatives that would meet all of the project purposes required by the ACOE and VPA. Documentation to demonstrate the national economic benefits of the project should be expanded and less environmentally damaging alternatives that would allow for dredged material management and reasonable port capacity expansion have not been investigated fully.

Response: Expanded documentation of the national economic benefits can be found in Appendix B of the main report.

Comment: The EFH assessment included in the DEIS is incomplete because it does not include several species for which EFH has been designated in the project area and it does not address all of the impacts to EFH that may result from the project, including those that will occur at the expansion area, the ocean disposal sites and the sand borrow areas.

Response: This comment is addressed below.

Comment: In addition, the DEIS does not address how the ACOE and the VPA would provide compensatory mitigation for the impacts to EFH, particularly the impacts to the habitat area of particular concern (HAPC) for sandbar shark (*Carcharinus plumbeus*).

Response: This comment is addressed below.

## ESSENTIAL FISH HABITAT

Comment: Section 305(b)(2) of the Magnuson Stevens Fishery Conservation and Management Act (MSA) requires all federal agencies to consult with NOAA Fisheries (NMFS) on any action authorized, funded, or undertaken by that agency that may adversely affect EFH. Included in this consultation process is the preparation of a complete and appropriate EFH assessment to provide necessary information on which to consult. Our EFH regulation at 50 CFR 600.905 mandates the preparation of EFH assessments and generally outlines each agency's obligations in this consultation procedure. The consultation process for civil works projects is further described in our January 18, 2000 EFH Finding letter to the ACOE's North Atlantic Division. This finding specifies that the EFH consultation for civil works projects will be completed through the National Environmental Policy Act (NEPA) process. The information contained within the DEIS is not sufficient to constitute a complete EFH assessment as defined in the MSA.

Response: Per the regulation that you cite, EFH assessments can be contained within the body of a NEPA document. The Draft EIS contains an EFH assessment. As explained below, the information contained within the FEIS will be expanded to constitute a complete EFH assessment as defined in the MSA.

Comment: In order to comply with the requirements of the MSA, the EFH assessment must address all of the direct (e.g., contamination or physical disruption), indirect (e.g., loss of prey, reduction in species' fecundity), site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions of the entire project. This must include both the immediate and long-term impacts of the 580-acre fill, the dredging for the construction of the dikes and the access channel, the disposal of the dredged material from the construction of the project at the existing CIDMMA and ocean disposal sites, the dredging of sand from the borrow sites for the facility's construction, as well as the impacts of the operations of the port facilities to be constructed on the site, including the need for future maintenance dredging at the facility. The EFH assessment included within the DEIS does not address fully all of the potential impacts of the project on EFH, and is incomplete in this respect. In addition, several federally managed species of fish for which EFH has been designated in the project area are not included in the assessment, including juvenile windowpane (*Scopthalmus aquosus*), clearnose skate (*Raja eglanteria*), little skate (*Raja erinacea*) and winter skate (*Raja ocellata*).

Response: The EFH assessment will be expanded to address all of the direct, indirect, site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions of the entire project.

Comment: The DEIS states that the Atlantic Ocean Channel, Thimble Shoal Channel and Cape Henry Channel, proposed as sources of material and the Dam Neck and Norfolk Ocean Disposal Sites, proposed as disposal sites for the dredged material from the project, have been subjected to the NEPA and ESA process and have received all of their federal and state permits, approvals, and authorizations. However, the NEPA process for the use of these sites was completed prior to the passage of the MSA. As a result, EFH consultations were not completed for the use of these sites. In accordance with 50 CFR 660.920 (a), an EFH consultation is not required for actions that were completed prior to the approval of the EFH designations by the Secretary of the Department of Commerce (e.g., permits issued). However, consultation is required for renewals, reviews, or substantial revisions of the action if the renewal, review, or revision may adversely affect EFH. The use of the Atlantic Ocean Channel, the Thimble Shoal Channel and the Cape Henry Channel as borrow sites and the Dam Neck and Norfolk Ocean Disposal sites as dredged material disposal sites for the expansion of the CIDMMA was not within the scope of the original analyses for the use of these sites. As a result, the impacts of 19.5 million cubic yards of sand mining over a five year period and the disposal of 19.1 million cubic yards of material at the open water disposal sites substantial amount of material to be removed from the borrow areas and disposed of at the disposal site over the same time frame were not contemplated in the original NEPA review. Because of the substantial revisions to the scope of these projects, we consider their use for this purpose to be a federal action requiring consultation.

Response: Part IV – 1.4.1.1 The Atlantic Ocean Channel, Thimble Shoals Channel, and Cape Henry Channel are proposed as sources of material for fill of the CIDMMA expansion. The Atlantic Ocean Channel and the Thimble Shoals Channels have been authorized to be dredged to depths of 60 and 55 feet respectively. The deepening of these channels has been conducted in increments since the initial NEPA review was approved in 1982 The NEPA review for dredging of these channels was conducted prior to enactment of the MSA, therefore, EFH consultations were not completed. According to NMFS (2005), "in accordance with 50 CFR 660.920 (a) an EFH consultation is not required for actions that were completed prior to the approval of the EFH designations by the Secretary of the Department of Commerce. However, consultation is required for renewals, reviews, or substantial revisions of the action if the renewal, review, or revision may adversely affect EFH." The dredging of material from the Thimble Shoals and Atlantic Channels for construction of the CIDMMA expansion cell is not inconsistent with the current authorization for activities in these channels, as dredging will not be conducted below the depth authorized for each specific channel. In addition, these channels would be dredged to maximum authorized depth regardless of CIDMMA expansion and/or port development. This does not constitute a renewal, review or substantial revision of the current authorized scope. Therefore, EFH consultation would not be required for dredging of the Atlantic and Thimble Shoals Channels to 60 and 55 feet respectively. In addition, a Limited Re-evaluation Report (LRR) dated October 2002 was submitted to NMFS to notify of the intent to continue with incremental dredging from 45 to 50 feet in the Thimble Shoals and Atlantic Channels. The COE determined that no subaqueous habitat would be lost, that the project would not have an adverse effect on EFH, and therefore, expanded EFH consultation would not be required. NMFS (Mr. John Nichols) provided a verbal response via telephone to the COE (Ms. Michele Cleland, September 19, 2001) indicating that the project did not have such significant impacts that conservation would be required. The current proposed channel dredging is not expected to have any impacts inconsistent with those associated with the previous incremental deepening.

The Norfolk Disposal Site (NDS) was designated by EPA in July, 1993. It is designated to receive dredged material from the lower Chesapeake Bay. The estimated capacity at that time (as stated in the May 12, 1993 Federal Register) was 250 MCY placed "...over the next 50 years." The site has received little use, only by the Navy, and, at most, several MCY. There is still enormous capacity at the site, and the proposed 19.1 MCY from the new access channel and expansion footprint would easily be accommodated within the existing authorization. Therefore, EFH consultation would not be required for disposal of dredge material at the NDS.

Also:
In Part IV on page IV-3 indicated that 10% of material from new channel would go to Craney Island and remainder to Norfolk Placement site.

**The Dam Neck Site is not referenced in the DEIS.

**Need for an Expanded Consultation**

Comment: Because of the scope of the proposed project and the adverse effects the filling of 580 acres of aquatic habitat, the dredging of 250 acres (154 for the dikes and 96 for the access channel) of EFH, the disposal of 19.1 million cubic yards of dredged material from the expansion area and the dredging of additional 19.5 million cubic yards sand from the proposed borrow sites would have on EFH, including a HAPC for sandbar sharks, it is apparent that an expanded EFH consultation as described 50 CFR 600.920 (f) is needed. The expanded consultation process allows the maximum opportunity for NMFS and the federal action agency to work together to review the action's impacts on EFH, and to develop EFH consultation recommendations. Expanded consultations must be used for federal actions that would result in substantial adverse effects on EFH. The complete loss of 580 acres of EFH, as well as adverse impact to several hundred more acres due to dredging and disposal activities associated with the construction and operation of the new CIDMMA expansion and container terminal, will result in a substantial adverse effect on EFH.

The EFH final rule published in the Federal Register on January 17, 2002 defines an adverse effect as: "any impact which reduces the quality and/or quantity of EFH." The rule further states that:

> An adverse effect may include direct or indirect physical, chemical, or biological alterations of the waters or substrate and loss of, or injury to, benthic organisms, prey species and their habitat and other ecosystems components, if such modifications reduce the quality and/or quantity of EFH. Adverse effects to EFH may result from action occurring within EFH or outside EFH and may include site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions.

Under the expanded consultation procedures, the ACOE must submit its EFH assessment to NMFS as soon as practicable, but at least 90 days prior to a final decision on an action. NMFS must respond within 60 days of the submittal of a **complete** EFH assessment unless consultation is extended by agreement between NOAA Fisheries and the ACOE. If the ACOE fails to comply with the consultation requirements of the MSA, NMFS will provide the ACOE with EFH conservation recommendations based upon the information that is available to us.

In the absence of a complete, expanded EFH consultation, we must conclude that the proposed project would have significant adverse affects on EFH and we must recommend that it not be constructed pursuant to Section 305(b)(4)(A) of the MSA.

Response: In consultation with NMFS, an expanded EFH consultation as described 50 CFR 600.920 (f) is being conducted as part of NEPA..

Comment: **PART 1 - Purpose and Need**: According to the DEIS (page I-2), there are three areas of potential Federal interest in the eastward expansion of the CIDMMA that

were identified in the Reconnaissance Phase for further study. These include increased dredged material disposal capacity, National Economic Development (NED) benefits in terms of transportation savings by providing for the development of an East Coast megaport, thus keeping the U.S. competitive in the growing container market, and national defense as the expanded CIDMMA could serve as a defense logistical and tactical area supporting the deployment of national defense forces.

NMFS Northeast Region has been involved in the review of several port improvement plans proposed along the New England and Mid-Atlantic coasts of the United States and as a result, we cannot agree that any one port facility should be given regulatory preference as the "East Coast megaport" in this region. Article 1, Section 9 of the U.S. Constitution states "No Preference shall be given by any Regulation of Commerce or Revenue to the Ports of one State over those of another." We must evaluate each plan in light of its impacts to aquatic resources and with the same criteria used throughout the Northeast Region. Other ports within the region such as Baltimore, Philadelphia or New York may be able to handle increased cargo without the need to fill aquatic habitat to construct additional port facilities.

Response: Concur with the statement that Feds cannot show preference for one region or state over another.

Suggest removing reference to "megaport" – as the creation of Craney Island Marine Terminal is not going to justify the term "megaport." LA/Long Beach will still move at least twice the amount of containers as VPA. With Craney Island operational, VPA would not be in the top 20 ports in the world.

The references to other ports being able to handle the capacity is incorrect. The detailed analysis of alternative ports to handle cargo illustrates that most of the alternative ports are going to run into capacity problems in the next 20 years. Of those ports that can potential handle the cargo (Savannah and LA/Long Beach) the added transportation cost is overwhelming. In addition to the added cost, the additional transportation would result in additional air emissions, and presumably environmental impacts as those ports continue to expand their facilities to handle the additional cargo that could not be handled in Norfolk. This information can be found in the Feasibility Report, pages 33-40 and Appendix B.

Comment: Based upon the information in the DEIS, it appears that the primary purpose of the CIDMMA eastward expansion is to create fast land for the construction of the VPA's new container terminal, not to increase the capacity of the CIDMMA, particularly since this expansion adds only three additional years to the life of the CIDDMA (page II-45).

The stated purpose of the proposed container terminal at the CIDMMA is to provide the Commonwealth of Virginia with sufficient capacity to meet the containerized forecast for Hampton Roads and the continuing long-term growth anticipated during the 2050 planning horizon. The DEIS does not provide documentation to support the VPA's

assertion that an additional 1,800 acres of land are needed (page I-9) to accommodate the projected increases of containerized cargo. Also lacking is the documentation to demonstrate the need for the level of growth predicted by the VPA and why the costs of filling of 580 acres of productive aquatic habitat are outweighed by the project's benefits.

The DEIS states that portions of the VPA's facilities are functionally obsolete and that the VPA has developed a capital improvement program to improve and to maximize the capacity at its existing facilities cargo terminals. Although the DEIS states that the VPA has developed a master plan for its facilities, little information has been provided to demonstrate that these capacity improvements are insufficient to provide reasonable growth in the port or that there would be significant economic consequences to the Nation if cargo moved through other nearby East Coast ports such as Baltimore, Philadelphia or New York.

Response: See material in the Feasibility Report pages 33-40 and Appendix B – Economic Benefits, which discusses in great detail the capacity constraints, containerized forecast, and the economic impacts of diverting cargo to other "nearby" ports.

Comment: PART II - Evaluation of Alternatives : The project purpose put forth by the ACOE and the VPA includes three required elements: extending the life of the existing CIDMMA, providing for future port development and supporting national defense needs. Linking the need for dredge material placement options with the development of a port facility eliminates from consideration any alternative that does not create developable land. Because these two functions have independent utility, they should be considered as separate projects.

Response: The Norfolk District was directed by the U.S. House of Representatives, Committee on Transportation and Infrastructure, dated September 24, 1997 to conduct a study of the feasibility of creating an eastward expansion of CIDMMA to be rapidly filled with dredge material that could accommodate future port expansion. The two objectives are clearly linked.

The Norfolk District, in compliance with NEPA, evaluated ALL alternatives that could satisfy the intent of the U.S. Congress. During the study period it was determined that any combination of alternatives for dredge material placement and port expansion that could satisfy the intent of the directive language would be evaluated. This included off-site dredge material placements that could be combined with off-site port expansion alternatives.

In addition, an extensive analysis was conducted that evaluated the capacity of other east coast ports, such as New York, Baltimore, Charleston, Savannah, and others to determine if the forecast container cargo could be handled in other port locations. Through these analayses and screening, it was determined that other ports have limited capacity to handle diverted cargo, and if they do it would cost the nation over $6 billion in added transportation costs.

Comment: The existing CIDMMA is currently authorized to handle all types of navigational dredged material, including materials both suitable and unsuitable for open ocean disposal. There are several existing open water disposal sites including the Norfolk Ocean Disposal Site and the Dam Neck Disposal Site that are available to receive dredged material suitable for open water placement. Clearly, limiting the use of the CIDMMA to material that is unsuitable for ocean disposal and placing the suitable material at the open water sites would extend the useful life of the facility. On this alternative, the DEIS states that the placement of dredged material at the CIDMMA cannot be limited to only unsuitable material without additional Congressional Authorization. However, the DEIS does not include information on the amount of material that currently goes into the CIDMMA that could be placed at open disposal sites or how much this would extend the life of the facility. It does not appear that any attempt was made to seek authorization for this change in the management of the CIDMMA and it seems to have been dismissed as an option without consideration. Other East Coast ports, notably the Port of NY and NJ, have segregated the disposal of suitable and unsuitable dredged material in order to protect the aquatic environment, preserve upland disposal capacity and manage dredged material for beneficial uses. There does not appear to be a reason why this cannot be accomplished in the Port of Hampton Roads.

Response: By law, the existing facility cannot be limited to unsuitable material without congressional approval. Additionally, when examining the inherent nature of such an alternative, it could not be the least costly alternative when compared to the without project condition or the west dike strengthening. Any alternative that would increase the amount of material that utilizes ocean disposal and increases the life-span of Craney Island would be more expensive to the nation when compared to the without project condition or the west dike strengthening.. The Corps must also dispose of material in the least costly manner available. Disposal of all suitable material in the ocean and reserving the CIDMMA for unsuitable material is counter to this policy.

Comment: The DEIS states that the existing CIDMMA is used regularly for military training exercises. It does not state that this function will not be able to continue as the CIDMMA reaches its capacity. Also, as mentioned above, no documentation has been provided to demonstrate a need for additional military uses of the site for the transport of troops, supplies, etc, or that this type of function is lacking in the area or cannot be accommodated if needed at the existing port facilities in the area.

Response: It is not know whether or not the military training that occurs at the CIDMMA will be able to continue when it reaches capacity. Currently, the training consists of small scale landing on the east side in the area of the rehandling basin. Whether or not the military will be able to do this in twenty-three years is unknown.

Additionally, it not know when the next major war will occur, how big it will be or where it will be. A large amount of military cargo passed through the port of Hampton Roads during the first Gulf War. Thusly, these are qualified benefits. That the terminal could support military logistics is enough to qualify it as meeting the criteria.

Comment: Page II-4 states that a general assumption for the initial alternatives screening was that any proposed confined disposal facility (CDF) expansion cell would be added into the cell rotation to continue optimal drying of material disposal in the facility. The next sentence states that it is assumed the expansion cells will be rapidly filled for port development, which consists of having dredged material placed into the cell as rapidly as possible without the expansion cell participating in the DMMP cell rotation for optimal drying. These two statements contradict each other. The ACOE should clarify how any expansion of the CDIMMA will fit into the DMMP for the site and how it will meet the criteria for extending the useful life of the CIDMMA.

Response: A confined disposal facility and an expansion cell built for port development are considered to be two different types of alternatives. A confined disposal facility will not support port development, nor is it designed to. Therefore, it would not be rapidly filled. While an expansion cell for port development would be rapidly filled.

Comment: It does not appear that the disposal of dredged material is a significant problem in the project area. Even under the no action alternative, ocean disposal of dredge material would still be permitted for suitable material. Since the ACOE has not provided any information on the percentage of material unsuitable for ocean disposal, it is not possible to assess the impacts of the loss of the CIDMMA as a disposal site for unsuitable material. In any case, the DEIS lists several practicable alternatives for dredged material placement that would extend the life of the existing CIDMMA without filling 580 acres of aquatic habitat. These alternatives include the placement of material on upland confined disposal sites, ocean placement, filling in deep holes and some beneficial use projects.

Response: The beneficial use of dredged material is considered on every Corps of Engineers dredging project. If or when the opportunity arises to do so, beneficial use will be utilized. However, until these opportunities are known, they cannot be considered as viable or measurable alternatives. They can only be considered as part of a strategy. Additionally, the Corps of Engineers is required to dispose of material from dredging projects in the least costly manner. Ocean placement, upland disposal sites and filling in deep holes do not meet the measure of least costly manner.

Comment: The use of dredged material, particularly material unsuitable for ocean disposal does not appear to have been considered for the remediation of brownfields, landfill closures, redevelopment of industrial sites that may exist in and around the Port of Hampton Roads. This is a common practice in other states, such as New Jersey where several projects are underway to cap and to close landfills for redevelopment and open space and to remediate and to construct warehousing facilities on brownfields for use by port related industries. The ACOE did not appear to consider these options as part of this DEIS and focused primarily on those options that would create new land in the port area. This omission is a serious deficiency in the DEIS. We recommend that the ACOE undertake a comprehensive approach in creating a new Dredged Material Management Plan for the region that incorporates the latest options for beneficially using dredged material. The Port Authority of New York and New Jersey, the New York District

ACOE and the State of New Jersey can provide both examples of economically viable and environmentally beneficial placement options and guidance on developing a plan for environmentally sound dredged material management.

Response: The beneficial use of dredged material is considered on every Corps of Engineers dredging project. If or when the opportunity arises to do so, beneficial use will be utilized. However, until these opportunities are known, they cannot be considered as viable or measurable alternatives. They can only be considered as part of a strategy

Comment: According to the DEIS, various sites throughout the Hampton Roads area were evaluated for the construction of a marine terminal. Based upon Table II-4 on page II-37, it appears that sites of less than 400 acres were not considered and that only undeveloped sites were evaluated as part of the DEIS. No rationale has been given for the size limitation. This should be clarified. Also, it does not appear that any redevelopment or brownfield sites were considered as part of the alternatives analysis. The ACOE and VPA should provide justification for restricting the alternatives analysis in this manner.

Response: This can be clarified in the report. As discussed in the report, 850 acres of land is needed to meet the cargo need during the planning horizon. Small sites were not necessarily eliminated out of hand, the initial screening criteria was to provide:

Large tracts of land
Access to the 50-ft channel
Access to road
Access to rail

The above criteria quickly eliminated most areas from further consideration. For instance there are brownfield sites in the Southern Branch of the Elizabeth River; however, these sites are far from the 50-ft channel and the size of vessels that carry containerized cargo would not be able to transit this portion of the river due to the narrow winding river and the length of the large container ships (900 – 1200 ft in length). Sites such as these were not listed in the table because they were eliminated from further consideration early in the screening process.

Comment: The No Action alternative was eliminated from consideration in the DEIS. Page II-38 states that the most notable national effect of the No Action alternative would be the economic consequences felt by the entire East Coast and Midwest markets. The DEIS does not explain fully what these economic consequences would be and why this is a reason that the No Action alternative should be eliminated from further consideration. According to CEQ NEPA regulations, Federal agencies must analyze the No Action alternative in each EIS. The complete analysis of the No Action alternative provides a baseline for analysis of the action alternatives, allowing decisionmakers to compare the environmental effects of the various alternatives. This DEIS eliminates the No Action alternative from analysis, restricting the ability to make a proper comparison among alternatives.

Response: More detailed information describing the economic effects and consequences of the No Action alternative will be included.

Comment: The Economic Evaluation of Alternative Plans section of the DEIS does not include an analysis of the economic consequences of the loss of aquatic habitat such as the lost commercial and recreational fishing opportunities and the effects on businesses associated with these types of activities such as marinas, fishing gear suppliers boatyards and even fuel suppliers. A complete evaluation of the plans should include both the economic benefits and costs of the project to all economic contributors in the region.

Response: The site of the eastward expansion has no direct impact on commercial or recreational fisherman. It is not used with any measurable regularity for either activity, nor does it offer a unique opportunity for commercial or recreational fishing.

Comment: PART III – Affected Environment: The DEIS does not include any information about the affected environment at the open water disposal sites or at the sand borrow areas that would be used for the construction of the CIDMMA expansion and port facility. In order to evaluate fully all of the direct, indirect, individual and cumulative effects of the proposed project and its alternatives, the effects on all of the areas that will be impacted by the project's construction must be considered. Although NEPA documents may have been completed for the use of the Atlantic Ocean Channel, the Thimble Shoal Channel, the Cape Henry Channel, the Dam Neck Ocean Disposal Site and the Norfolk Ocean Disposal Site, this project was outside the scope of the analysis completed for these sites. As a result, the impacts and the existing environment at these sites should be included in this DEIS.

Response: NEPA documents were completed for dredging in the Atlantic Ocean Channel, the Thimble Shoal Channel, the Cape Henry Channel, and for use of the Norfolk Ocean Disposal Site for dredged material placement. Dam Neck Ocean Site is not being proposed for use during this proposed project. The proposed project is not outside the scope of the analysis completed for these sites. The Norfolk Ocean site was designated by EPA to receive suitable dredged material from projects exactly like the east expansion dredging which is being proposed. The comprehensive Cumulative Effects Assessment (EIS, Appendix C) addresses 17 past, present, and reasonably foreseeable future actions contributing to cumulative effects. Dredging within the aforementioned channels is included as one of these 17 actions.

Comment: **1.4 Aquatic Biota**
**1.4.2 Essential Fish Habitat**
As discussed above, several federally managed species for which EFH has been designated were not included in the DEIS including juvenile windowpane, clearnose skate, little skate and winter skate.

Response: These will be included in the expanded EFH discussion.

Comment: **1.8 Utilities**

**1.8.1 Water Supply**

We note that page III-41 of the DEIS states that the City of Portsmouth has stated that the existing water distribution system is "unlikely" to meet fire flow and pressure requirements. If the City of Portsmouth is required to seek additional water supplies or distribution capacity as a result of this project, the environmental impacts associated with this action should be included in the DEIS.

Response: The statement in the DEIS regarding the unlikelihood that the City of Portsmouth could meet fire flow and pressure requirements of the proposed port facility is misleading and will be changed in the Final EIS. Coordination with the City regarding the estimated water requirements of the port have shown that adequate capacity exists within the City's water supply to serve the port. However, the current infrastructure (ie pipe size and water pressure) in the area adjacent to the proposed port is not adequate and would have to be upgraded. Portsmouth's Department of Public Utilities/Public Works has indicated that hydraulic modeling will need to be performed to make a determination of the proper size and pressure once VPA's preliminary engineering design of the proposed port has identified the specific requirements for fire flow and pressure.

Comment: PART IV – Environmental Consequences , Section 1.1.2 Water Quality, 1.1.2.1 Dredging for Access Channel and Cell Construction - While the cubic yardage of dredging needed for the access channel and cell construction is included in the DEIS, the acres of bottom that would be impacted is not provided. We were able to calculate approximately how many acres of bottom would be dredged for the dike construction (154) and for the access channel (96) from the information in the DEIS, but we could not determine the acreage that would be impacted at the borrow areas or the ocean disposal sites. The DEIS should state the areal extent of the impact.

Response: 122 acres in cell footprint for construction of fill; 127 acres outside of footprint for navigation access channel.

Comment: We note that Page II-5 states that a channel and berth area will be dredged to allow ship access to the port facility. Yet on page IV-5 in which the environmental consequences of the project are discussed it states that dredging is planned as part of the proposed CIDMMA eastward expansion and would be completed regardless of port development. These statements appear to contradict each other because one says the purpose of the dredging is for port facility access and the other says its purpose is to access the disposal area. No information is provided to explain why a new berthing area would need to be dredged for the CIDMMA expansion only. The site currently has access at the rehandling basin and that access does not appear to change with the proposed expansion. The remaining areas around the existing site do not have deep water access. The DEIS should explain why the expansion area would need this access if a port facility was not constructed and it should resolve these inconsistent statements.

Response: This need for the access channel will be clarified in the appreciate section of the EIS.

Comment: The effects of the suspended sediment on benthic communities and aquatic resources have not been addressed fully. Since CIDMMA expansion and Phase I of the container terminal construction are expected to take five years to construct, it is misleading to say that the impacts will be short-term. For five years, elevated levels of suspended sediment will occur within the vicinity of the project area. Such suspended sediment levels can reduce dissolved oxygen, can mask pheromones used by migratory fishes, and can smother immobile benthic organisms and demersal newly-settle juvenile fish (Auld and Schubel 1978; Breitburg 1988; Newcombe and MacDonald 1991; Burton 1993; Nelson and Wheeler 1997). According to the DEIS, a portion of the plume from the dredging containing very fine sediment particles is expected to move south of the site on flood tides. The figures in the DEIS indicate that there are two oyster reefs south of the site, one on each side of the Elizabeth River. While a thin layer of sediments may not be fatal to adult oysters, it may affect reproduction (Wilber *et al.* 2005). Because larval oysters require hard substrate for settlement, the presence of even a few millimeters of sediment covering an oyster reef may inhibit larval recruitment (Galtsoff 1964; McKinney *et al.* 1976 in Wilber *et al.* 2005).

Response: The primary adverse effect on water quality would be the increase in turbidity and total suspended solids from the re-suspension of sediments during dredging, cell construction, and wharf construction. This condition would persist for the duration of construction for the cell, access channel and wharf. Since construction has a finite length and dredging would not be occurring continuously over the construction period, the condition is considered to be temporary. The potential impacts on water quality from constructing these facilities are discussed in Section IV, 1.1.2. As stated on Page IV-4, some reduction in DO levels, due to releases of organic materials to the water column, are anticipated. However, the anticipated increase in suspended sediment and the reduction in dissolved oxygen are expected to fall within the range experienced by the Elizabeth River under natural climatic events and hydrodynamic conditions.

Comment: **1.1.2.6 Ballast Water**
This section does not address the impacts of ballast water exchange at the port facility. Entrainment of aquatic organisms occurs as ships take on ballast water. Depending upon the size of the vessel, millions of gallons of water and its associated aquatic life, particularly eggs and larvae of managed species and their prey can be transferred from the surrounding aquatic system into the ballast tanks of a ship at a rate of tens of thousands of gallons per minute. As stated on page III-18, the Elizabeth River is an important nursery for many commercial and recreational species including spot (*Leiostomus xanthurus*), Atlantic croaker (*Micropogonias undulatus*), Atlantic menhaden (*Brevoortia tyrannus*), weakfish (*Cynoscion regalis*), striped bass (*Morone saxatilis*), black sea bass (*Centopristis striata*) and summer flounder (*Paralichthys dentatus*) and that the project area is spawning grounds for important forage species such as bay anchovy (*Anchoa mitichilli*) and Atlantic silversides (*Menidia menidia*). The DEIS should address the impacts of the entrainment these species as a result of port operations and ballast water intake.

Response: Potential impacts from ballast water exchange are discussed on pgs. IV-14 and IV-15 of Section 1.1.2.6. As stated therein, ballast water exchange is not conducted at Virginia Port Authority container terminals, and under current state and federal regulations, it would not be conducted at the proposed terminal.

At this time vessels with ballast water tanks operating in Virginia's waters are advised to follow 4 VAC 20-398-30 Voluntary Ballast Water Management Guidelines. These precautions outline measures to reduce the entrainment of sensitive aquatic organisms in ballast water and include, but are not limited to, the following:

- Ships are advised to avoid the uptake of ballast water from areas with marine sanctuaries and preserves.
- Ships are also asked to clean ballast tanks regularly to remove sediments and to avoid exchanging ballast waters in areas where propellers may stir up the bottom sediment.

In addition to the measures outlined above the operator, or a ship agent on behalf of the operator, of a commercial vessel that enters into Virginia's territorial waters is required to file a Ballast Water Control Report form with the Virginia Marine Resources Commission within seventy-two hours of the discharge of ballast water into Virginia waters, or prior to the commercial vessel's departure from Virginia waters if the commercial vessel does not discharge ballast water into Virginia waters.

The U.S. Coast Guard has recently published a final rule entitled "Mandatory Ballast Water Management Program for U.S. Waters." This final rule became effective on September 27, 2004. This rule was published after the Coast Guard determined that the voluntary Ballast Water Management (BWM) program was inadequate.

In May 2005 the U.S. District Court ruled that EPA must regulate all ballast water discharges in U.S. ocean ports and the Great Lakes. EPA's decision whether to appeal the ruling is pending. If it is determined that EPA will be required to issue new regulations regarding ballast water, the impact of those regulations on Virginia waters will be addressed in a Supplemental EIS to be prepared when preliminary engineering design information becomes available.

Comment: **1.3 PROTECTED RESOURCES AND CRITICAL HABITAT -** NMFS Northeast Region's Protected Resources Division has provided comments on this DEIS in a separate letter dated October 7, 2005. Threatened and endangered species under the jurisdiction of NMFS may be found in the project area, including the offshore borrow areas and the ocean disposal areas. Further consultation with NMFS will be necessary. For additional information and coordination on threatened and endangered species or the Section 7 consultation process, please contact Julie Crocker at 978-281-9300, ext 6530.

Response: Responses to the NMFS October 7, 2005 letter are provided separately in this comment/response section.

Comment: **1.4 AQUATIC BIOTA - 1.4.1 CIDMMA Expansion - 1.4.1.1 Essential Fish Habitat -** As discussed above, the DEIS does not contain a complete EFH assessment. In order to comply with Section 305(b) (2) of the MSA, the ACOE must prepare an assessment of the project's direct, indirect, individual and cumulative effects on EFH. The DEIS fails to address all of the projects impacts or the effects on each federally managed species. This includes the EFH designated at the Atlantic Ocean Channel, the Thimble Shoal Channel, Cape Henry Channel and the Dam Neck and Norfolk ocean placement sites.

Response: An expanded EFH assessment is being developed and will be included in the FEIS. Also, see response(s) above.

Comment: Of particular concern are the impacts of the CIDMMA to sandbar shark. The project area has been designated as a Habitat Area of Particular Concern (HAPC) for these species. It is important to note that impacts to EFH cannot be dismissed as minimal because they are a small percentage of the total EFH for a particular federally managed as species. These areas have been designated as EFH because they are "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity" (16 U.S.C. 1802(10)." HAPC are subsets of EFH identified based on one or more of the following considerations: 1) the importance of the ecological function, 2) extent to which the habitat is sensitive to human-induced degradation, 3) whether and to what extent, development activities are stressing the habitat type, or 4) rarity of habitat type (50 CFR 600.815(a)(8)).

Response: Impacts of the CIDMMA to sandbar shark will be addressed in the expanded EFH assessment.

Comment: The sandbar shark is one of the most important commercial species in the shark fisheries of the southeastern United States (NMFS 1999). Hampton Roads, Virginia ranked fourth in the nation in the value for highly migratory fish landings, including sharks in 2003 (NMFS 2004 in NMFS 2005). Estuarine shallows in the lower Chesapeake Bay provide important nursery and pupping grounds for the sandbar shark (NMFS 1999). Musick *et al.* (1993 in NMFS 1999) have documented a severe decline in the catch per unit effort (CPUE) of the sandbar shark in the Chesapeake Bay area. The proposed project would destroy 580 acres of HAPC for sandbar sharks due to the filling of shallow estuarine habitat used by the species as a pupping and nursery area. An additional 96 acres of HAPC will be lost as a result of the construction of the access channel. In addition, direct mortality of the species may occur if dredging is conducted during the pupping and nursery season of May to October.

Response: Impacts of the CIDMMA to sandbar shark will be addressed in the expanded EFH assessment.

Comment: The Highly Migratory Species (HMS) Fishery Management Plan developed by NMFS includes EFH conservation recommendations to reduce impacts to this important species. The recommendations include the following (NMFS 1999):

• Permanent dredge material disposal sites should be located in upland areas. Where long-term maintenance is anticipated, upland disposal sites should be acquired and maintained for the entire life of the project.

• Destruction of wetlands and shallow coastal water habitats should not be permitted in areas adjacent to HMS EFH. Mitigating or compensating measures should be employed where destruction is unavoidable. Project proponents should demonstrate that project implementation will not negatively affect HMS, their habitat or their food sources.

• Best engineering and management practices (e.g. seasonal restrictions, modified dredge methods, and/or disposal options) should be employed for all dredging and in-water construction projects. Such projects should be permitted only for water dependent purposes when no feasible alternatives are available. Mitigating or compensating measures should be employed where significant adverse impacts are unavoidable. Project proponents should demonstrate that project implementation will not negatively affect HMS, their habitat or their food sources.

• Project guidelines should make allowances to cease operations to take additional precautions for avoid adversely affecting HMS EFH during seasons when sensitive life stages might be the most susceptible to disruption (e.g., seasons when spawning is occurring.)

Response: These EFH conservation recommendations to reduce impacts to this important species will be discussed with NMFS during the expanded EFH consultation process.

Comment: Another serious concern is the impacts of the proposed project on summer flounder. In Virginia, the shoal water flat areas of higher salinity, greater than 18 parts per thousand, in the lower Chesapeake Bay are one of the most important nursery areas for summer flounder (Packer *et al.* 1999). The CIDMMA expansion area has been designated as EFH for larvae, juveniles and adults of this species. From October to May, larvae and post larvae summer flounder migrate inshore, entering coastal and estuarine nursery areas to complete transformation (Merriam and Sclar 1952, Olney 1983; Olney and Boehlert 1988; Able *et al.* 1990; Szedlmayer *et al.* 1992). They leave the water column and settle into the bottom where they bury into the sediments and complete development to the juvenile stage (Packer *et al.* 1999). During metamorphosis, it is unlikely that summer flounder will be able to escape impingement or entrainment in a dredge or burial during the filling of the site.

Response: Impacts of the proposed project on summer flounder will be addressed in the expanded EFH assessment.

Comment: This project would also result in the removal of 580 acres of benthic habitat that supplies a food source for both federally managed species and species managed by the Atlantic States Fisheries Commission such as striped bass and weakfish. According to the information in the DEIS and the USFWS Planning Aid Report included as

Appendix A of the DEIS, the benthic community at the CIDMMA expansion area includes benthic invertebrates such as *Neries succinea*, *Sabellaira vulgarus* and *Ampelisca abdita*. Steimle *et al.* (2000), report that *Ampelisca abdita* is particularly important to the diets of winter flounder (*Pseudopluronectes americanus*), windowpane, juvenile scup (*Stenotomus chrysops*), juvenile weakfish, striped searobins (*Prionotus evolans*), juvenile black sea bass and juvenile silver hake (*Merluccius bilinearis*), all of which have been documented to occur around the CIDMMA. *Paraprionospio pinnata,* the second most abundant benthic invertebrate species collected adjacent to Craney Island by Dauer and Ewing (1986 in FWS 2002) and *Neries succinea*, the seventh most abundant species, were found to be prey species of spot in the Chesapeake Bay by Homer and Boynton (1978).

Response: Impacts of the proposed project on all of the listed species will be addressed in the expanded EFH assessment.

Comment: Fisheries sampling in the vicinity of the project area is reported in the DEIS. In addition to the species mentioned above, a wide variety of species have been caught in the waters around Craney Island, including red hake (*Urophycis chuss*), butterfish (*Peprilus tricanthus*), cobia (*Rachycentron canadum*), Spanish mackerel (*Scomberomorus maculatus*), bluefish (*Pomatomus saltatrix*), tautog (*Tautog onitis),* alewife (*Alosa pseudoharenus*), blueback herring (*Alosa aestivalis*) and American shad (*Alosa sapidissima*) (USFWS 2002). This information also indicates that the Elizabeth River is an important nursery area for many commercial and recreational species including spot, Atlantic croaker, Atlantic menhaden, weakfish, striped bass, black sea bass, and summer flounder. The most intensive use for spawning is by forage fish, including bay anchovy and Atlantic silversides (Priest 1981 in ACOE 2005). Bay anchovy has been shown as a prey species for windowpane (Kimmel 1973; Carlson 1991 in Packer *et al.* 1999)) for striped bass (Homer and Boynton 1978; Hollis 1952) and weakfish (Chao and Musick 1977; Hartman and Brandt 1995). Both species are also important to the diets of summer flounder (Homer and Boynton 1978; Smith and Daiber 1977). Juvenile spot and Atlantic menhaden are also components of the diets of weakfish and bluefish (Hartman and Brandt 1995), summer flounder and spotted hake (*Urophycis regia*) (Homer and Boynton 1978). Clearly, the loss of 580 acres of aquatic habitat for the expansion of the CIDMMA and the subsequent port facility development will have an adverse effect on a wide variety of aquatic resources due to the loss of nursery areas and habitat for forage species as well as managed species and should be discussed in the DEIS.

Response: The loss of 580 acres of aquatic habitat related to the expansion of the CIDMMA and the subsequent port facility development and its effects on a wide variety of aquatic resources is discussed at length in the DEIS, the CEA, and the Mitigation Appendix in the DEIS. The mitigation plan which includes wetlands restoration, sediment clean-up, and oyster restoration was developed over 3 years with multiple stakeholders. The mitigation plan was developed to provide compensatory mitigation for these impacts and losses. The mitigation plan components provide restored and improved nursery areas and habitat for forage species as well as managed species.

Comment: In addition to the direct, physical removal of EFH and the removal of the forage base, sustained water column turbulence can reduce the feeding success of sight-feeding fish such as winter flounder, tautog, and summer flounder. According to Olla *et al.* (1974 and 1975 in Collette and Klein-MacPhee 2002), tautog are opportunistic sight feeders. Winter flounder are also sight feeders and are diurnally active in both inshore and offshore waters (Pearcy 1962 in Collette and Klein-MacPhee 2002).

Response: Water quality would be affected by localized increases in turbidity and total suspended solids during dredging, cell construction, and wharf construction. Because dredging has a finite length and would not be occurring continuously over the construction period, the condition is considered to be temporary. The potential impacts on water quality from constructing these facilities are discussed in Section IV, 1.1.2. The anticipated increase in suspended sediment is expected to fall within the range experienced by the Elizabeth River under natural climatic events and hydrodynamic conditions. Because of the localized and temporary nature of water column turbulence, and the adaptation of resident fish species to naturally elevated levels of suspended sediments, feeding success of sight-feeding fish is not expected to be impacted to any appreciable extent.

Comment: According to the DEIS, riprap placed on the dikes will attract species that are normally associated with reef structures, species that are commonly found around estuarine inlets and species that seasonally migrate along the coast; and a study from West Harbor, Ohio is cited as evidence that this will occur. No information is presented to demonstrate how the estuarine waters of the Chesapeake Bay are comparable to West Harbor, Ohio. There is no discussion of what species would use this habitat. Further, since the CIDMMA would be used as a port facility, it is unclear how much of the new dike area would be exposed riprap since the berthing areas of wharf facilities are usually not faced with exposed riprap. This is additional evidence of the need for an expanded consultation.

Response: It is well documented that the impact area was once a hard bottom substrate (oyster shell/reef structure) and part of an extensive public oyster ground (Baylor ground) in the Elizabeth and lower James River. With the demise of the oyster in the bay, primarily due to disease and overfishing, the oyster reef structure was removed and/or covered with soft substrate (sediment). Hard structure (such as oyster reefs) is a grossly depleted habitat in the Chesapeake Bay that provides a wealth of ecosystem services, including habitat provision for blue crabs, benthic populations, and fish stocks that are now depleted. On the other hand, soft-bottom habitat is the dominant bottom type of the entire bay and, in fact, is the habitat type that is already enhanced through the extensive loss of oyster reef and shell bottom habitat. This perspective argues for use of oyster reef restoration in preference to adding more (even clean and functional) soft-sediment area as part of a bay-wide strategy for restoring historical ecological baselines and services.

In addition to the West Harbor, Ohio study, the EIS references:

Van Dolah, R.F., et al. 1987. "Ecological Effects of Rubble Weir Jetty Construction atMurrells Inlet, South Carolina; Volume III: Community Structure and Habitat Utilization of Fishes and Decapods Associated with the Jetties," Technical Report EL-84-4, prepared by South Carolina Wildlife and Marine Resources Department, Charleston, S.C., for U.S. Army Engineer Waterways Experiment Station, Vicksburg, Mississippi.

This study from Murrells Inlet, South Carolina found that the quarrystone jetties attracted species that are normally associated with reef structures, species that are commonly found around estuarine inlets, and species that seasonally migrate along the coast. The jetties served as nursery habitat for a variety of fish species. Food habits analyses demonstrated that numerous fishes derived trophic support directly from the biota associated with the structures or indirectly by preying upon smaller forage fishes which congregated around the jetties. It also noted increased recreational fishing around the inlet jetties in which anglers sought red drum, flounder, spot, bluefish, king mackerel, black sea bass, and smooth dogfish, all of which are similar species found in the study area.

Comment: **1.4.1.3.3 Benthos and 1.5.2.3 Subaqueous Bottom** - The benthic community present at the site provides a forage base for a number of commercial and recreational fish species including striped bass, summer flounder, winter flounder, windowpane, spot, weakfish, striped bass and winter flounder. The permanent loss of 580 acres of this habitat must be considered a long-term impact from both the CIMMDA expansion and the port terminal development. This section of the DEIS states that all dredging activities needed for the port expansion will be completed as part of the proposed CIDMMA expansion and other proposed harbor improvements, not as a result of the proposed container terminal development. As previously noted, page II-5 of the DEIS states that a channel and berth area would be dredged to allow ship access to the port facility. No information is provided to explain why this new dredging to create a berthing area would need to be dredged for the expansion only.

Response: This will be clarified in the report. A separate paragraph has been prepared to better explain the dredging requirements.

Comment: **1.13 RECREATIONAL AND COMMERCIAL USE OF WATERS**
**1.13.2.2 Commercial Fishing**
The DEIS states that the loss of benthic habitat due to the project construction would have a negligible effect on commercial fisheries in Chesapeake Bay and vicinity because benthic species of commercial importance such as hard clams (*Mercenaria mercenaria*) were not abundant in recent surveys of the CIDMMA expansion area. However, as discussed above, the benthic community of the project site provides forage habitat and nursery habitat for a variety of commercially important species including summer flounder, winter flounder, Atlantic menhaden and Atlantic croaker. In addition, the area is a HAPC for sandbar shark, one of the most important commercial species in the shark fisheries of the southeastern United States (NMFS 1999). The impacts to these species, their forage base and the fisherman and related industries that depend upon these species

were not considered in the DEIS. In 2004 commercial fish landings in the Hampton Roads, VA area totaled 34 million pounds worth 100.6 million dollars (NMFS 2005).

Response: Impacts to these species, their forage base and the fisherman and related industries that depend upon these species will be addressed in the FEIS.

Comment: **1.13.1.3 Recreational Boating and Fishing**
In 2001, Virginia waters attracted over 724,000 recreational anglers making more that 3.1 million fishing trips (ASA 2002). The American Sportfishing Association (ASA 2002) also reported that in 2001, recreational fishing in Virginia generated 248.6 million dollars in retail sales and 4,251 jobs. The primary target species were striped bass, flounder, weakfish, drum and bluefish. EFH for flounder (winter, summer and windowpane), bluefish and red drum have been designated in the project area. In addition, the Chesapeake Research Consortium (1991) has listed the project area as a known spawning river for striped bass. The DEIS does not include an evaluation of the projects impacts to the recreational fishing and boating industries based upon the impacts to their habitat or food sources. As discussed above, the project would likely substantial impacts to these recreationally important fish species.

Response: The FEIS will include an evaluation of the project's impacts to the recreational fishing and boating industries based upon the impacts to their habitat or food sources.

Comment: **1.14 ECONOMICS**
The economic value of the aquatic resources in the project area should be considered in the DEIS. A great deal of information is presented on the economic contributions of the VPA, but no data is provided on the value of commercial and recreational fishing in the area. As stated above, in 2004 commercial fish landings in the Hampton Roads, VA area totaled 34 million pounds, worth 100.6 million dollars (NMFS 2005); and recreational fishing in Virginia generated 248.6 million dollars in retail sales and 4,251 jobs in 2001 alone (ASA 2002). In order to have a balanced evaluation of the project's impacts, all of the contributors to the region's economy should be included, not just VPA.

Response: The text in the Final EIS will incorporate the following information: According to the Virginia Marine Resources Commission the area to the east of Craney Island is not heavily used for recreational fishing or pleasure boating (VMRC, personal communication, 2005). A review of the VA Saltwater Fishing Comparison Report (2003-2004) shows that no catches were made near Craney Island for those years. VMRC also indicated that based on their observations, the Craney Island area is not an especially popular destination for sport fisherman. This may be due to it's proximity to active commercial and military shipping lanes.

According to the 2001 Boater Registration Registry maintained by the Virginia Department of Game and Inland Fisheries, approximately 14,000 boats were registered to residents of Chesapeake, Portsmouth, and Norfolk. An indeterminate number of these boat owners likely use the Elizabeth River near Craney Island to travel into and out of

Hampton Roads and the Chesapeake Bay. Construction of a port facility would not preclude their continued passage through this area. Boaters who choose to recreate directly in the area east of Craney Island (ie within the footprint of the new cell) would be impacted by construction and would no longer be able to use that area.

VMRC's commercial harvest records from 2004 indicate that the value of finfish landings in the Elizabeth River for several important species were small in comparison to the value statewide. These species included menhaden, flounder, croaker, and striped bass.

| Species | Value of Elizabeth River Landings | Value of VA Landings |
|---|---|---|
| Menhaden | $24 | $288,250 |
| Flounder | $955 (small only) | $3,785,089 (all flounder) |
| Croaker | $68 | $2,822,769 |
| Striped Bass | $198 | $3,419,016 |
| **Total** | $1,245 | $10,315,124 |

While impacts to these fisheries would be expected as a result of the eastward expansion of Craney Island, these impacts are expected to be a portion of the dollar value represented above since the entire river would not be impacted by construction.

According to VMRC the area to the east of Craney Island is used by crab fisherman, but data on how many crab pots would be displaced by the proposed project is not known. It is reasonable to expect that the expansion would reduce the number of pots fished in this area.

Comment: **1.20 SAND BORROW FOR DIKE CONSTRUCTION**
The impacts to EFH, fishery resources and federally protected species from the use of the Atlantic Ocean Channel, Thimble Shoal and Cape Henry Channels are not addressed in the DEIS. The proposed project will remove more than 19 million cubic yards of sand from these areas. As discussed above, an EFH assessment must be prepared to address the removal of sand from these areas. In addition, this project is outside of the scope of the Endangered Species Act Section 7 consultations prepared for these channels which were based only upon maintenance dredging activities, not sand mining for the expansion of the CIDMMA. As a result, additional consultation pursuant to Section 7 of the ESA is required.

Response: (See response below)

Comment: **1.22 MITIGATION and Appendix B Mitigation Analysis**
The Mitigation Analysis only considers the 580-acre fill as an action requiring mitigation. As discussed above, NEPA guidelines require that the ACOE consider all of the direct, indirect, individual and cumulative impacts of the project. These impacts include 96 acres of new work dredging for the berthing area that will result in the conversion of subtidal shallow water habitat to deepwater habitat, the placement of 19.1 million cubic yards of dredged material at the Dam Neck or Norfolk Ocean Disposal Sites, the removal

of 19.5 million cubic yards of sand from the Atlantic Ocean, Thimble Shoal or Cape Henry channels for the dike construction and the impacts of the operation of the proposed port facility including impacts from future maintenance dredging and disposal actions and ballast water intake. Without a full and complete evaluation of the projects impacts, it is not possible to determine the compensatory mitigation that would be needed to offset those impacts.

Response: During the preparation and scoping of the EIS, the ACOE did consider all of the direct, indirect, individual and cumulative impacts of the project. A comprehensive cumulative impacts assessment (EIS, Appendix C) was prepared which identified and evaluated 17 past, present, and reasonably foreseeable future actions in the Hampton Roads area. Previously prepared NEPA documents for EPA's final designation of Norfolk Ocean Disposal Site (July 1982), and Dam Neck Ocean Disposal Site (May 1985), cover impacts related to deposition of dredged material at these locations. The Final Environmental Impact Statement (FEIS) and Addendum, Norfolk Harbor and Channels, Deepening and Disposal, was filed with EPA on April 3, 1981. Impacts associated with deepening Thimble Shoals and the Atlantic Ocean channels and placing dredged material in the previous mentioned designated ocean disposal site(s) is covered in this document. Final Supplement I to the Norfolk Harbor and Channels, Deepening and Disposal, EIS was filed in May 1985. The ocean disposal sites evaluated in the Addendum and Supplemental EIS were Norfolk Disposal Site (NDS) and Dam Neck Ocean Disposal Site (DNODS). These documents identified no compensatory mitigation requirements.

Sand borrow within the Federal channels (Thimble Shoals and Atlantic Ocean Channels) is covered by an existing NMFS Biological Opinion dated 25 April 2002. No further Section 7 consultation is required for this activity.

Bjorndal, K.A. 1997. Foraging ecology and nutrition of sea turtles. Pages 199-233 in: Lutz, P.L. and J.A. Musick, eds. The Biology of Sea Turtles. CRC Press, New York. 432 pp.

Musick, J.A. and C.J. Limpus. 1997. Habitat utilization and migration in juvenile sea turtles. P. 137-164 in: Lutz, P.L. and J.A. Musick, eds. The Biology of Sea Turtles. CRC Press, New York. 432 pp.

Comment: As discussed above, the project would result in the permanent loss of 580 acres of EFH for fourteen federally managed species including a HAPC for sandbar shark. The mitigation analysis does not address the specific impacts to these species or their EFH. Because the project site has been designated as EFH, compensatory mitigation needs to be provided that would offset the permanent loss of habitat as well as any habitat degradation that would occur due to the dredging, sand mining, dredged material disposal and port facilities operations. The mitigation analysis uses the Habitat Equivalency Analysis (HEA) methodology "to quantify the loss in habitat productivity from the proposed CIDMMA expansion and to provide a scale for a mitigation project that would compensate for the estimated loss in ecosystem services and production at the

appropriate trophic levels." This approach is used often by Natural Resource Trustees, including NOAA, to determine compensation for natural resource injuries resulting from vessel groundings, oil spill and hazardous waste sites. However, the implicit assumption of the HEA is that the public is willing to accept a one-to-one trade-off between a unit of services and a unit of restoration project services (i.e. the public equally values a unit of services at the injury site and the restoration site (NOAA 2000). Habitat equivalency analysis is applicable as long as the services provided are comparable. However, the DEIS does not justify how the services provided at the CIMMDA, including the value for the site as a spawning and nursery area for federally managed species and their forage base and the HAPC for sandbar sharks, are comparable to the services that will be provided by the mitigation proposed.

Response: As discussed extensively in the mitigation appendix (Appendix B of the EIS), the HEA approach was developed and applied to this project with the input of multiple stakeholders over three years. The "public," in this case represented by this diverse group, endorsed this approach and determined that services lost at the injury site are comparable to services provided at the mitigation site(s).

As stated by the Virginia Marine Resources Commission (letter dated November 21, 2005):

*"...we note that NOAA's Habitat Equivalency Analysis (HEA) was utilized as a tool to examine function, in terms of productivity, of the lost acreage and the scale of mitigation that would be necessary to replace of the productivity lost by the proposed project. We further note that additional factors, such as habitat diversity, were considered in addition to HEA results. Given that it is not feasible to create 580 acres of open water elsewhere within the impacted watershed, staff believes the use of a functional analysis for determining a mitigation plan is an acceptable alternative."*

In scaling the mitigation plan, the USFWS noted how differences in habitat types would be accounted for by stating that:

*"...the value of one acre of habitat in the expansion area would not be ecologically equivalent to one acre of a particular mitigation option. The differences in the habitat values were taken into account through the Habitat Equivalency Analysis which developed acreage equivalency ratios..."* (letter dated November 3, 2005).

The Corps believes that the collaboratively developed HEA analysis and the ecological services evaluations (Appendix B) conducted to arrive at the recommended mitigation plan adequately justify, both quantitatively and qualitatively, how the services provided at the existing CIMMDA expansion site are comparable to the services that will be provided by the mitigation plan proposed. The mitigation plan was developed to consider fisheries impacts, including the value of the impacted site as a spawning and nursery area for federally managed species and their forage base and the HAPC for sandbar sharks. The mitigation plan provides improved feeding areas for fish (bottom sediment clean-up, oyster reefs, and wetlands), spawning and nursery areas for fish (wetlands), and toxics

reductions, improved health to fish (sediment clean-up) in the mitigation plan. Removing contaminated sediments will enhance fisheries habitat by reducing physiological stress and by increasing numbers of benthic organisms, many of which are food sources for fish found in the area, such as spot, summer flounder, and windowpane flounder. Restoring the wetland sites should also provide positive benefits to EFH by enhancing water quality and providing additional food, and spawning and nursery areas to fish in the area.

Comment: Although sediment remediation, wetlands restoration from uplands and oyster reef restoration can provide a variety of ecological benefits to NOAA trust resources including EFH, it is premature to conclude that these actions will compensate for the substantial impacts to aquatic resources of national importance that would result from the construction of the CIDMMA Eastward Expansion and VPA container terminal. Without a full and complete analysis of all of the direct, indirect, individual and cumulative impacts of the proposed project, a complete analysis of alternatives including the No Action alternative,

Response: As mentioned previously, a full and complete analysis of all of the direct, indirect, individual and cumulative impacts, and a complete analysis of alternatives, including the No Action alternative, has been completed and is presented in the comprehensive CEA and EIS. The compensatory mitigation plan presented in the EIS (Appendix B) was developed with input from a Mitigation Subcommittee consisting of representatives from 12 Federal and State agencies and 3 local interest groups. The committee convened on 15 occasions between June 2002 and May 2005. After much deliberation, sediment clean-up, oyster restoration, and wetlands restoration were identified as the closest in-kind compensatory mitigation to replace the lost ecological function of 580 acres of benthic habitat and the overlying water column and associated environmental impacts. During the initial phases of mitigation plan development, more than 100 different locations were evaluated in the initial screening of alternatives that ranged from oyster restoration, riparian buffers, artificial fish reefs, clam sanctuaries, fish passage, sediment clean-up, and submerged aquatic vegetation restoration. The Corps and VPA did not "select" the recommended mitigation plan, the mitigation plan was developed collaboratively with the input of multiple stakeholders to fully compensate for the impacts of the project. The NMFS was consistently invited to participate in these discussions, but chose not attend.

Comment: Documentation that the propose mitigation will offset the impacts to EFH, federally managed species and their food sources, it is premature for the DEIS to conclude that the "Best Buy" plan selected by the ACOE and the VPA will compensate fully for environmental impacts of the project.

Response: The mitigation plan was not developed by the Corps. The plan was developed over 3 years by a Mitigation Subcommittee comprised of Federal and state agencies, academia, and local interest groups. This committee concluding that the consensus mitigation plan is the best plan to compensate for the impacts of the project. NMFS was invited to participate on this committee but declined.

## CONCLUSIONS

Comment: Section 2 (a) (9) of the MSA states "One of the greatest long-term threats to the viability of commercial and recreational fisheries is the continuing loss of marine estuarine and other aquatic habitat." The expansion of the CIDMMA would result in the permanent loss of 580 acres of estuarine habitat, as well the conversion of 96 acres shallow estuarine habitat to deep water channels. The proposed expansion results only in an additional three years use of site.

Response: The purpose of this study is not limited to additional capacity. The dual purpose of this project is to provide for future port development while extending the life of the existing facility. The plan that is presented does this.

The 96 acres is not shallow water habitat. The area to be dredged for the access channel is deep water already.

Comment: Alternate dredged material disposal options appear available. The alternatives analysis for port facility expansion evaluated only undeveloped sites greater than 400 acres without providing justification for limiting the alternatives in this manner. Options for port facility expansion, such as the redevelopment of brownfields, do not appear to have been considered.

Response: All reasonable sites were considered. The VPA requires 850 acres of land to meet cargo demands in the planning horizon. In addition, the land must be on the 50-ft channel, or reasonably close to permit access; and road and rail connections must be available. With these limitations it was determined that only one or two sites might be available with enough land to accommodate the port needs. A single 400 acre site would accommodate the port needs through half of the planning horizon.

Brownfields were considered; however, none are currently available that could meet the criteria. The majority of the available brown field sites are on the Southern Branch of the Elizabeth River and are not on the 50-ft channel.

Comment: Also, the DEIS does not address adequately the impacts to aquatic resources that would result from the construction of the CIDMMA expansion and port facility. Impacts to EFH, federally managed species, the HAPC for sandbar sharks, forage species and nursery and spawning habitat are not considered fully; and adequate mitigation for these impacts has not been proposed. As discussed above, an expanded EFH consultation is needed as is further consultation pursuant to Section 7 of the ESA.

Response: the DEIS has been revised to more thoroughly address impacts to aquatic resources including EFH, federally managed species, the HAPC for sandbar sharks, forage species and nursery and spawning habitat. The consensus mitigation plan provides adequate compensatory mitigation for these impacts. An expanded EFH consultation will be pursued with NMFS. Informal consultation pursuant to Section 7 of the ESA will also be completed.

Comment: These consultations must include an evaluation of the entire project on EFH and ESA species, including the impacts of the fill at the CIDMMA, the access channel dredging, the Atlantic Ocean Channel, Thimble Shoal Channel and Cape Henry Channel sand borrow areas and the Dam Neck and Norfolk Ocean disposal areas. If you would like to discuss this matter further, please contact Mr. Stan Gorski or Ms. Karen Greene of NOAA's NMFS Northeast Region's Sandy Hook field office at 732-872-3037 or 732 872-3023.

Response: Mr. Gorski and Ms. Greene have been contacted subsequent to receiving these comments. Discussions will continue as the EFH and NEPA process continues.

**United States Department of the Interior, U.S. Fish and Wildlife Service (4 November 2005)**

Comment: Part III. The document often describes the expansion area conditions by presenting information on the Elizabeth River as a whole. It fails to point out that the conditions at the expansion site are believed to be better than the river in general. This is particularly true for water quality, contamination issues, and biological conditions. This problem even occurs where site specific information is available. For example, page III-26 presents considerable information concerning benthic community indices for the Elizabeth River and its tributaries which portrays a picture of substantial degradation, but it does not mention the data presented in Table III-6 showing less degraded values at the project site. Where the document presents information for the Elizabeth River as a whole, it should distinguish the situations where the conditions in the project area are better than in the river generally.

Response: The status of the project area relative to other parts of the Elizabeth River varies depending upon the constituent or indicator. The Southern Branch and the area near the confluence of the Southern and Eastern Branches are the most impacted by several measures, including copper, dissolved oxygen concentrations, TBT, and benthic IBI scores. Relative status is noted in individual sections related to water quality, sediment contamination, and biological condition. Virginia DEQ and the Elizabeth River Project's State of the River Report (2003) provides information on the river's conditions (sediment contamination, bottom community health, cancer in fish, dissolved oxygen, dissolved metals, and TBT) in the major branches of the river. These tables will be included in the FEIS.

Comment: Pg IV-3, Sect. 1.1.2.1. The section on the water quality effects resulting from dredging and cell construction lacks clarity and is incomplete. This section indicates that approximately 19 million cubic yards (mcy) would be removed for navigational access. In fact, 15.4 mcy of this dredging is to remove poor foundation material. To assess the effect on water quality, the document should indicate the character of the material in terms of its grain size and potential contaminant burden. The impacts associated with disposal of dredged material at the Norfolk Ocean Site should be acknowledged. Also, the effects associated with the dredging of 19.5 mcy to obtain dike material, and the discharge of this material into open water to create the cell dikes, should be described. The prediction that the suspended sediment plume will be restricted to the navigation channel is not convincing as it seems to assume that most of the material would be generated from the dredging of the navigational access area. On the contrary, most of the sediment plume would be generated from dredging and filling activities conducted in shallower water apart from the channel. The prediction that the plume of suspended sediment that moves into Hampton Roads (the lower James River) during the ebb tide would return to the dredged area on the flood tide seems unlikely.

Response: Section 1.1.2.1 of Part IV of the DEIS has been revised to discuss dredging volumes, composition of the sediment to be dredged (clay with sand lenses), effects on

water quality (primarily turbidity related from dredging and disposal activities), and sediment plume movement.

Comment: Pg IV-5, Para. 1. The description of the findings from the study of Boon and Byrne (1975) regarding the sediment plume from dredging of Hampton Bar is vague and misleading. The plume description in the text fails to identify the type of dredge operation. In actuality, this plume resulted from the use of a hydraulic dredge to excavate sandy material and deposit it into scows with overflow. Most of this large surface sediment plume was due to the scow overflow. The document text should be revised to indicate these important details, or perhaps consideration should be given to deleting the information because of lack of relevance to the proposed dredging. Another problem with this paragraph is that it only presents information on hydraulic cutterhead dredges despite the fact that the project will also be using bucket (clamshell) dredges. This may create a biased perspective because while cutterhead dredges produce relatively small plumes that are predominately near the bottom, clamshell dredges create larger plumes that occur throughout the water column. The document should add information clarifying the type of plume that would occur with a clamshell dredge. In the last sentence the meaning of "impounded sediments" is uncertain and should be clarified.

Response: A variety of dredge types may be used to construct the proposed project. These include hopper dredges, mechanical dredges, and hydraulic dredges. Boon and Byrne (1975) evaluated use of a hydraulic dredge on Hampton Bar, Virginia. Section 1.1.2.1 will be revised to clarify the reference to the 1975 Boone and Byrne study. Text will also be revised to omit reference to "impounded sediments".

Added TSS numbers to the following sentence in Part IV, Section 1.1.2.1. Numbers obtained from Maersk EA.

A study of pipeline dredging operations reported total suspended solids (TSS) concentrations of 12 - 871 mg/L depending on the dredging equipment used (43-70 mg/L for a pipeline, 12-282 mg.L for a clamshell, and 74-871 mg/L for a hopper dredge).

Comment: Pg IV-29. The document should clarify that EFH only pertains to Federally managed species. The discussion on the project's effect on fish is improperly restricted to EFH. Potential impacts to the much broader range of indigenous species should be considered.

Response: The FEIS will clarify that EFH only pertains to Federally managed species. Potential impacts to a broader range of indigenous fish species will be addressed in the FEIS.

Comment: Pg IV-29, Para. 4. The document, here and on page IV-31, overstates the expected habitat value of the riprap placed on the exterior of the dike. It notes that the riprap is likely to "provide an extremely diverse and productive community, and serve as a nursery and feeding area for many fishes and invertebrates" and infers that it would attract fish species that are normally found associated with reef structures and coastal

estuarine inlets. While it is true that riprap provides a hard attachment substrate for epifaunal invertebrates, and nooks and crannies attractive to small motile organisms and some fish, in this situation these values will come at the expense of the infaunal habitat on the slope. The riprap would not be providing a genuine three dimensional reef habitat, but would simply cover the slope. The existing shoreline is already lined with riprap which would be eliminated by the project. The document did not indicate that the existing riprap shoreline is providing noteworthy habitat value. The value of the new riprap will not be much different, apart from the increased shoreline coverage. Additionally, information on page II-46 indicates that the riprap would only extend down the exterior slope to a depth of -3 feet. This appears to be an error since the riprap would probably be placed all the way down the slope.

Response: Though not currently cited in the EIS, a growing amount of evidence is accumulating suggesting that rip-rap structures are indeed a viable habitat not only for attachment of epifaunal species, but also for infaunal species subtidal to the rip-rap (Seitz et al, in review) and fish species (Seitz et al, in review, Carroll et al. 2003). Seitz et al. found that infaunal benthic abundance and diversity were significantly higher in subtidal habitats adjacent to rip-rap than those adjacent to bulkhead shorelines and furthermore epibenthic fish density (as sampled by trawling) and diversity tended to be higher adjacent to rip-rap than bulkhead shorelines. Some of the fish species that frequented habitats adjacent to rip-rap in the York and Lafayette Rivers included spot, croaker, silver perch and anchovies (Seitz et al., in review).

In addition, recent data show that alternative substrates (i.e., besides oyster shell) have suggested that both rip-rap (granite) and concrete structures promote the establishment of oyster populations. For example, recent findings from a concrete three-dimensional reef in the Rappahannock River showed oyster densities that were higher than any restored reef (including the gold standard – 600 oysters/$m^2$ at Fishermen's Island on the Eastern Shore). This reef offers significantly greater vertical complexity, reef stability and substrate surface area than many restored reefs and, thus, may be a more realistic mimic of natural oyster reefs. The modular reef was neither seeded artificially nor harvested. The reef was colonized heavily by native oyster and mussel larvae that recruited successfully and survived in a thriving oyster reef community for the 4.5 years since reef deployment in 2000. Oyster and mussel biomass and density values were among the highest recorded for natural and restored oyster reefs.

Furthermore, new data from a project in Lynnhaven Bay (Lipcius and Burke, in progress) suggest that settlement of oyster spat is greater on rip-rap than other hard substrates including natural oyster shell. In combination, these studies suggest that Rip-Rap structures on the Craney Island Expansion would indeed provide a viable "reef" for not only epibenthic invertebrate species but also for mobile species.

There is an abundance of work in progress that supports the contentions of the report that: "*...riprap is likely to provide an extremely diverse and productive community, and serve as a nursery and feeding area for many fishes and invertebrates...*", however, there are

few references following this statement in the report. The findings of the current research mentioned above will to be added to the document to give it more credibility.

References:

Carroll R (2003) Nekton utilization of intertidal fringing salt marsh and revetment hardened shorelines. Masters Thesis, The College of William and Mary, Virginia Institute of Marine Science, Gloucester Point

Seitz, R.D., R.N. Lipcius, N.H. Olmstead, M.S. Seebo, and D.M. Lambert. *In review 2005.* Influence of shallow-water habitats and shoreline development upon abundance, biomass, and diversity of Chesapeake Bay Benthos and their predators. Marine Ecology Progress Series.

The constructed east expansion cell would result in approximately 50 sq. ft. of rip-rap per foot of wharf below the water line. With this number that makes it about 840,000 sq. ft. or over 18 acres of net gain. About half of this habitat would be above 20 feet MLW, the remainer below 20 ft MLW. The riprap which will cover the dike slope is a three dimensional structure that will provide valuable hard attachment substrate for epifaunal invertebrates, and nooks and crannies attractive to small motile organisms including crabs and fish. It is well documented that the impact area was once a hard bottom substrate (oyster shell/reef structure) and part of an extensive public oyster ground (Baylor ground) in the Elizabeth and lower James River. With the demise of the oyster in the bay, primarily due to disease and overfishing, the oyster reef structure was removed and/or covered with soft substrate (sediment). Hard structure (such as oyster reefs) is a grossly depleted habitat in the Chesapeake Bay that provides a wealth of ecosystem functions, including habitat provision for blue crabs, benthic populations, and fish stocks that are now depleted. On the other hand, soft-bottom habitat is the dominant bottom type of the entire Bay and, in fact, is the habitat type that is already enhanced through the extensive loss of oyster reef and shell bottom habitat. This perspective argues for hard substrates in preference to adding more (even clean and functional) soft-sediment area as part of a Bay-wide strategy for restoring historical ecological baselines and functions.

In addition to the West Harbor, Ohio study, the EIS references:

Van Dolah, R.F., et al. 1987. "Ecological Effects of Rubble Weir Jetty Construction at Murrells Inlet, South Carolina; Volume III: Community Structure and Habitat Utilization of Fishes and Decapods Associated with the Jetties," Technical Report EL-84-4, prepared by South Carolina Wildlife and Marine Resources Department, Charleston, S.C., for U.S. Army Engineer Waterways Experiment Station, Vicksburg, Mississippi.

This study from Murrells Inlet, South Carolina found that the quarrystone jetties attracted species that are normally associated with reef structures, species that are commonly found around estuarine inlets, and species that seasonally migrate along the coast. The jetties served as nursery habitat for a variety of fish species. Food habits analyses demonstrated that numerous fishes derived trophic support directly from the biota associated with the structures or indirectly by preying upon smaller forage fishes which congregated around the jetties. It also noted increased recreational fishing around the

inlet jetties in which anglers sought red drum, flounder, spot, bluefish, king mackerel, black sea bass, and smooth dogfish, all of which are similar species found in the study area.

Comment: Pg IV-30, Sec 1.4.1.3. The document notes that "public oyster grounds (Baylor grounds) are located within the vicinity of CIDMMA" but fails to describe the effect of the project on them. It should note that approximately 200 acres of legally designated Baylor grounds would be covered by the expansion cell, but the actual impact on oysters would be negligible because these grounds have not been productive for many years.

Response: Added the following sentence to Part IV – Section 1.4.1.3 Benthos: Approximately 200 acres of designated Baylor Grounds would be covered by the expansion cell, however, the impact on oysters would be negligible because these oyster grounds have not been productive for many years. (Page IV-31)

Comment: Pg IV-31, Para. 2. The document notes that a study by Seitz and Lipcius (2002) concluded that "the area of the Craney Island expansion had significantly lower bivalve density, diversity, and abundance than the adjacent deep-water habitats or shallow-water habitats in the Craney Island-Lafayette River system." While it is true that this conclusion was made in the study report, the conclusion is not completely supported by the report's data analysis. The report's statistical tests showed that the bivalve density and biomass were not significantly different between the Craney Island expansion area and the deep-water area. Therefore, it would be appropriate to delete the word "significant" from the conclusion or to qualify the statement is some other way. We would also suggest dropping the word "adjacent" from the conclusion statement because the deep-water and shallow-water stations were not predominately adjacent to the Craney Island expansion area.

Response: We (VIMS provided this response) strongly disagree with all but one of the comments on the VIMS Benthic Studies Report, and which do not alter the key conclusions of the report. We therefore stand by all of our conclusions, but for one minor change noted in 1b. The individual comments and our responses are as follows:

1 a. Comment: *"The document notes that a study by Seitz and Lipcius (2002) concluded that "the area of the Craney Island expansion had significantly lower bivalve density, diversity, and abundance than the adjacent deep-water habitats or shallow-water habitats in the Craney Island-Lafayette River system." While it is true that this conclusion was made in the study report, the conclusion is not completely supported by the report's data analysis. The report's statistical tests showed that the bivalve density and biomass were not significantly different between the Craney Island expansion area and the deep-water area. Therefore, it would be appropriate to delete the word "significant" from the conclusion or to qualify the statement is some other way."*

1b. Response: In the Discussion, the first sentence, which is one of the major conclusions of the report, emphasizes the lower bivalve density, diversity, abundance and biomass in

the Craney Island expansion than in the adjacent deep-water habitats or shallow-water habitats. The adjective "significantly" was inadvertently left in the first sentence of the report's Discussion, and does not detract from the overall conclusion. The sentence should read "The area of the proposed Craney Island expansion had lower bivalve density, diversity, and abundance than the adjacent deep-water habitats or shallow-water habitats in the Craney Island-Lafayette River (CI-LR) system." In fact, **ALL** eight major response variables measured in our study were lower in the Craney Island Expansion than in the Deep or Shallow-Water habitats. The response variables included (1-4) Total Bivalve Density, Abundance, Biomass and Mean Size, (5) Bivalve Species Richness, (6-7) Density of the two Biomass Dominants (Baltic clam *Macoma balthica* and stout razor clam *Tagelus plebius*), and (8) Mean Size of *Tagelus plebius*. In particular, one of the critical indicators of a healthy benthic community, Species Richness (Diversity), was *significantly* lower in the Craney Island expansion than in both the adjacent Deep and Shallow-Water habitats. Furthermore, abundance and biomass in the Craney Island *and* Deep habitats both were significantly lower than that in the *shallow* habitats. Despite the inadvertent inclusion of "significant" our conclusions are not altered in the least. Moreover, the remainder of the Discussion clarified the general conclusions of the first sentence.

2a. Comment: *"We would also suggest dropping the word "adjacent" from the conclusion statement because the deep-water and shallow-water stations were not predominately adjacent to the Craney Island expansion area."*

2b. Response: We disagree with the suggestion of dropping the word "adjacent" from the conclusion statement for the following reasons. First, most of the Deep-Water stations were, in fact, immediately adjacent to the Craney Island expansion area (see Figures 1 and 2 in the Seitz and Lipcius 2002 report), and as such this comment is wholly unwarranted. Second, if we were to have chosen deep sites adjacent to the Craney Island expansion on the James River side, and eliminated some from the Elizabeth River system, we expect that the differences between the Craney Island expansion and Deep-Water habitats would have been accentuated in favor of the Deep-Water habitats because benthic communities in the James River are, in general, healthier than those in the Elizabeth River.

3a. Comment: *"We also question another conclusion which is cited from this report stating that the low bivalve biomass indicates that the expansion area is not likely to be a significant feeding ground for demersal fish. The report notes that bivalves were selected for sampling in part because they are "dominant and representative members of the benthic community." However, other studies cited in the Corps document (Dauer and Ewing, 1986, Dauer, 2000, 2002) show that bivalves are not dominant representatives of the larger benthic community in the expansion area. Bivalves comprise less than 10 percent of the infaunal community biomass (0.085 grams ash free dry weight/$m^2$ compared with 0.940 gAFDW/$m^2$). The community at this site is actually dominated by small polychaete worms. While this level of community biomass is mediocre, it would nonetheless provide a suitable prey base for a variety of common bottom feeding fishes including spot, croaker, silver perch, gizzard shad, mullet, killifishes, blennies, gobies,*

*skilletfish, hogchoker, blackcheek tonguefish, and winter flounder. The area is also likely to have other potential prey organisms, such as mysids, shrimps, small crabs, and other motile epifaunal crustaceans that are not effectively sampled in routine benthic surveys. Since the conclusion in the Seitz and Lipcius report regarding the potential value of the area as a feeding ground for demersal fish is based solely on sampling bivalves, which do not represent a dominant component of the benthic community at this site, the document should include some clarifying language."*

3b. Response: This comment has three parts, which will be discussed individually.

First, one element of the comment challenges our statement that bivalves are dominant and representative members of the benthic community. In general for all *healthy* Chesapeake Bay regions, long-lived, large, often deep-dwelling species should be present. We don't dispute the findings of Dauer and colleagues for the Elizabeth River system, but these are not the standards for a healthy Chesapeake Bay benthic community. In fact, the studies by Dauer and colleagues are sound and convincingly point out the generally degraded nature of benthic communities in the Elizabeth River. The valid standard for comparisons of benthic communities is not one from a highly degraded system, but rather one from least impacted, relatively pristine portions of the ecosystem. Our statement refers to the undisputed fact that bivalves are dominant and representative members of healthy Chesapeake Bay benthic communities, as we stated in the report: "The benthic communities [in Chesapeake Bay] are dominated in biomass by bivalves (i.e., clams, oysters, mussels) and in numbers by polychaetes (Boesch 1977, Virnstein 1977, Hines et al. 1990). Infaunal bivalve assemblages include key species such as the hard clam, *Mercenaria mercenaria*, the Baltic clam, *Macoma balthica*, and the stout razor clam *Tagelus plebeius,* which are common [in many places] throughout Chesapeake Bay (Holland 1985, Boesch 1977)." In addition, in a thorough examination of Chesapeake Bay biomass, Hagy (2002) states that bivalves in Chesapeake Bay are a key component of the benthos, sometimes comprising up to 90 % of the benthic prey biomass. The reviewer referenced studies by Dauer and colleagues conducted in the Elizabeth River system, in which polychaetes are numerical dominants. Since Dauer's studies and other previous studies in the Craney Island expansion footprint did not sample deep-dwelling infauna that are indicative of a healthy ecosystem and are typical food sources for blue crabs, that was the motivation for our study of the deeper dwelling and larger infauna. In addition, although the blue crab shares various prey preferences with demersal fish, the emphasis in our study was on the blue crab because spot, croaker and hogchoker are not in a state of major decline, in contrast to the blue crab and native oyster in Chesapeake Bay.

Second, the reviewer states *"Bivalves comprise less than 10 percent of the infaunal community biomass (0.085 grams ash free dry weight/m$^2$ compared with 0.940 g AFDW/m$^2$). The community at this site is actually dominated by small polychaete worms."* Considering the points made in the paragraph above, the small percentage of bivalves present in the Craney Island expansion area is further evidence that this benthic system is degraded. In fact, biomass in the Craney Island expansion area was only 0.085 g AFDW/m$^2$, one order of magnitude lower than that in the Deep-Water habitats (0.952 g

AFDW/$m^2$) and nearly two orders of magnitude lower than biomass in the Shallow-Water habitats (6.800 g AFDW/$m^2$).

Third, the reviewer states *"While this level of community biomass is mediocre, it would nonetheless provide a suitable prey base for a variety of common bottom feeding fishes including spot, croaker, silver perch, gizzard shad, mullet, killifishes, blennies, gobies, skilletfish, hogchoker, blackcheek tonguefish, and winter flounder."* Past feeding studies have demonstrated that preferred prey of demersal fishes including croaker, spot and hogchoker are the larger benthic infauna such as nereid polychaetes, the Baltic clam and amphipods (Hines et al. 1990 from the report), which are absent from the Craney Island expansion habitats. While it is possible that some of the fishes mentioned by the reviewer feed on some of the small benthic invertebrates present in the Craney Island expansion, the biomass is so low that it is debatable whether this prey base is "suitable." Though caging studies by Virnstein (1977) in the York river showed increases in polychaetes and bivalves inside of predator-exlcusion cages, recent information on croaker feeding (Powers et al. 2005) provides other evidence that bivalves are part of a healthy diet for demersal fish. In the Neuse River estuary, croaker modified their diets from large amounts of bivalves during normoxic conditions in June to dominance by polychaetes and plant material during the physically stressful, anoxic period in September. Croaker are opportunistic feeders that modify their diet depending on prey availability (Currin et al. 1984, Hines et al. 1990), and the switch from bivalve prey in June to polychaetes and plant matter in September reflected the summertime decline of *Macoma* spp. due to anoxia, and was consistent with the loss of an important and preferred prey type Powers et al. 2005). Moreover, results of two collaborative studies (Baird et al. 2004, Eby et al. 2005) indicated that the summertime declines in availability of benthic invertebrate prey have serious population consequences for demersal fishes as well as impacts on ecosystem processes. Eby et al. (2005) demonstrated that the physiological condition, individual growth rate and population growth of croaker and spot in the Neuse River Estuary were lower in the year of severe hypoxia (1997) than in two years of less intense summertime oxygen depletion in 1998 and 1999. Combining these results with those of Powers et al. implies that switching from bivalves to alternative prey resources including plant matter does not suffice to sustain high production of demersal fishes throughout the Neuse River Estuary. This conclusion is also supported by the results of trophic mass-balance modeling demonstrating that production of the benthic infauna in the Neuse River Estuary was sufficient to support energy demands by demersal fishes and blue crabs before but not after the large-scale hypoxic event in July 1997 (Baird et al. 2004). Thus, we feel that we are not out on a limb in stating that the expansion footprint is not likely to be a significant feeding ground for the blue crab or demersal fish and the wording is to the point.

Consequently, we stand by our conclusions that the Craney Island expansion has lower bivalve density, diversity, biomass and abundance than the adjacent deep-water habitats or shallow-water habitats in the Craney Island-Lafayette River (CI-LR) system, and that it is not likely to be an important feeding ground for the blue crab and demersal fishes.

References:
Baird D, Christian RR, Peterson CH, Johnson GA (2004) Consequences of hypoxia on estuarine food web and ecosystem function: energy diversion from consumers to microbes. Ecol Appl 14:805–822
Currin BM, Reed JP, Miller JM (1984) Growth, production, food consumption, and mortality of juvenile spot and croaker: a comparison of tidal and nontidal nursery areas. Estuaries 7:451–459
Eby LA, Crowder LB, McClellan CB, Powers MJ, Peterson CH (2005) Habitat degradation from intermittent hypoxia: impacts on juvenile fishes. Mar Ecol Prog Ser 291:249–262
Hagy JD (2002) Eutrophication, hypoxia, and trophic tranfer efficiency in Chesapeake Bay. PhD dissertation, University of Maryland, Center for Environmental Science, Solomons, MD
Hines AH, Haddon AM, Wiechert LA (1990) Guild structure and foraging impact of blue crabs and epibenthic fish in a subestuary of Chesapeake Bay. Mar Ecol Prog Ser 67: 105–126
Powers, SP, Peterson CH, Christian RR, Sullivan E, Powers MJ, Bishop MJ, Buzzelli CP (2005) Effects of eutrophication on bottom habitat and prey resources of demersal fish. Mar Ecol Prog Ser 302: 233-243
Virnstein, R. W. 1977. The importance of predation by blue crabs and fishes on benthic infauna in Chesapeake Bay. Ecology 58: 1199-1217.

Comment: Pg IV-31, Para. 5. The document notes that "Based on the Benthic Index of Biotic Integrity, the impact area is generally poor quality and exhibits degraded conditions." We believe that this description gives an overly negative impression of the area. The data in Table III-6 shows that only 50 % of the samples taken in 1999 and 2001 from the expansion area fail to meet the benthic restoration goal (i.e., show a degraded condition). This is comparable to values from the Elizabeth main stem, but lower than any of the tributary segments which range between 64 and 92 % (see page III-26 for the figures). The average for all Virginia tidal waters was 30% in 1999, and 38% for the three-year period from 1997-1999. Therefore, the document should further qualify the description of the benthic community condition to reflect its condition relative to Virginia tidal waters generally and to other Elizabeth River areas in particular.

Response: In general for all *healthy* Chesapeake Bay regions, long-lived, large, often deep-dwelling species should be present. We don't dispute the findings of Dauer and colleagues for the Elizabeth River system, but these are not the standards for a healthy Chesapeake Bay benthic community. In fact, the studies by Dauer and colleagues are sound and convincingly point out the generally degraded nature of benthic communities in the Elizabeth River. The valid standard for comparisons of benthic communities is not one from a highly degraded system, but rather one from least impacted, relatively pristine portions of the ecosystem. Our statement refers to the undisputed fact that bivalves are dominant and representative members of healthy Chesapeake Bay benthic communities, as we stated in the report: "The benthic communities [in Chesapeake Bay] are dominated in biomass by bivalves (i.e., clams, oysters, mussels) and in numbers by polychaetes (Boesch 1977, Virnstein 1977, Hines et al. 1990). Infaunal bivalve assemblages include

key species such as the hard clam, *Mercenaria mercenaria*, the Baltic clam, *Macoma balthica*, and the stout razor clam *Tagelus plebeius,* which are common [in many places] throughout Chesapeake Bay (Holland 1985, Boesch 1977)." In addition, in a thorough examination of Chesapeake Bay biomass, Hagy (2002) states that bivalves in Chesapeake Bay are a key component of the benthos, sometimes comprising up to 90 % of the benthic prey biomass. The reviewer referenced studies by Dauer and colleagues conducted in the Elizabeth River system, in which polychaetes are numerical dominants. Since Dauer's studies and other previous studies in the Craney Island expansion footprint did not sample deep-dwelling infauna that are indicative of a healthy ecosystem and are typical food sources for blue crabs, that was the motivation for our study of the deeper dwelling and larger infauna. In addition, although the blue crab shares various prey preferences with demersal fish, the emphasis in our study was on the blue crab because spot, croaker and hogchoker are not in a state of major decline, in contrast to the blue crab and native oyster in Chesapeake Bay.

Comment: This paragraph of the document also states that the widening of the navigation channel for ship access and berthing will provide an equivalent cross sectional area of open water to what would be lost by construction of the expansion cell. The statement is apparently derived from the 2001 report of the hydrodynamic modeling study. However, the volume of water column that would be enlarged due to the ship access dredging (3.7 mcy) is much less than the volume that would be lost due to construction of the expansion cell (580 acres X 3.5 yd deep X 4840 sq yd/acre = 9.8252 mcy). This indicates that the increase in the cross sectional area of open water resulting from the ship access dredging is substantially less than the area that would be lost due to construction of the expansion cell. Since this discrepancy raises a concern about the assumptions used in the hydrodynamic modeling study, it must be resolved.

Response: The sentence on Pg IV-31, Para 5. "Mitigation of the loss of about 580 acres of open water will partially occur via the widening and deepening of adjacent berthing areas for the Terminal which will provide an equivalent cross sectional area of open water" will be modified to read "Mitigation of the loss of about 580 acres of open water will partially occur via the widening and deepening of adjacent berthing areas for the Terminal."

It was never the intent or the purpose of the channel widening and deepening of the adjacent berthing areas to offset the loss of open water associated with the CIEE. It was observed, however, during the hydrodynamic modeling that redirection of the weakened flow from the wide shallow margins near the mouth of the Elizabeth River to the widened and deepened berthing area adjacent to the main channel provided an increased conveyance during flood and ebb. The hydrodynamic modeling response captured this phenomena and predicted that flushing (residence time) of the Elizabeth River system would actually be improved with the CIEE since the increase in residual transport would more than offset the loss in tidal prism.

Comment: Pg IV-67, Sec 1.20. The document notes that the USACE has a long-standing policy to use dredged material from navigation projects for beach replenishment or similar purposes that would benefit local, state, and Federal interests. It then notes that "significant quantities of material suitable for dike construction are expected to be available in these channels" (referring to the Atlantic Ocean Channel, Thimble Shoal and Cape Henry channels). This implies that normal maintenance dredging of these channels would be sufficient to produce the 19.5 mcy needed for dike construction. Because this seems unlikely, the document should clarify whether the dike material would be obtained from normal maintenance activities or whether the channels would be used as borrow areas that would be deepened beyond the normal depths. Does use of channel material for dike construction mean locals would receive less sand for beach replenishment?

Response: The FEIS document will clarify that dike material would be obtained from these channels to authorized depths. Using channel material for dike construction does not mean locals would receive less sand for beach replenishment. Dike construction can be accomplished using "sandy dredged material" that may not be suitable for beach nourishment. In addition, projects such as Virginia Beach hurricane protection and Sandbridge beach nourishment projects have sand borrow sites other than these channels.

Comment: Page IV-75, Para. 5. The document states, here and elsewhere, that the mitigation plan includes 411 acres of bottom sediment remediation. This figure is misleading because information in the Mitigation Analysis appendix shows that only 68 acres of bottom would be directly remediated. The 411-acre figure is a conjecture of the potential benefit to benthic communities from remediating 68 acres, based on an assumption that there would be a 25 percent increase in the benthic biomass throughout the Southern Branch. Because this larger benefit is highly speculative, the document should primarily refer to the 68 acres that would be directly remediated, with a supplementary explanation provided, if necessary, for the potential of additional improvement to neighboring areas.

Response: The location of PAH contamination in the Southern Branch Elizabeth River and the effects of this contamination on the aquatic organisms and water quality in the estuary is well documented. Nine sites, adjacent to former creosote plants and other industrial sites exist within a 411-acre section of the Southern Branch between the Jordan Bridge and Money Point. Remediation efforts at two of the sites are underway. Remediation of the remaining seven sites is proposed in the mitigation plan.

Just as the toxic levels of PAH's from these sites have contributed to documented water quality degradation and the deformity and toxics burdens in commercial and recreational finfish species, crustaceans, and benthic organisms, remediation of the documented contaminated sediment "hot spots" within this 411-acre area will serve to improve not only the benthic environment but the health of the estuarine food web and the aquatic species population. Upon completion, remediation of all known toxic "hot spots" will have occurred. To accommodate the remediation efforts, the mitigation plan proposes the construction of oyster reefs and salt marshes along the shoreline and in the waters

adjacent to these areas to provide habitat for the anticipated growth in the aquatic species population.

References:

Interim Final Feasibility Study and Environmental Assessment, Elizabeth River Basin. USACE, Norfolk District. June 2001

Elizabeth River Restoration and Conservation: A Watershed Action Plan Watershed Action Plan. Revised 2nd Edition. Elizabeth River Project. 2002.

Sediment clean-up in these recognized "hot spots" will provide restoration benefits beyond the exact footprint of the clean-up. This has been documented in many other sediment clean-up projects in the United States and the world. If this were not true, there would be no need to target and select these areas in preference to other sites in the river.

Comment: Pg IV-76, Para. 1. We question the validity of the statement that "this mitigation plan amounts to a slightly greater amount of production than is estimated to be lost from project construction." It is true that the mitigation ratios developed for the oyster reef and marsh creation options were based on their relative amounts of secondary production (benthic invertebrates and zooplankton) as determined from actual site specific measurements in the expansion area and from data from the literature. However, the sediment remediation portion of the plan, which is the dominant component, was not determined on the basis of expected production increases. As noted in our previous comment, the Corps estimate that the sediment remediation of 68 acres would result in improved production equivalent to 411 acres is highly speculative. Since the justification for this estimate is so weak, we recommend that the aforementioned statement be deleted.

Response: As discussed in the previous response, by targeting all known "hot spots" in this stretch of the river for clean-up, it is reasonable to assume that benthic habitat improvements would be realized within the larger area.

Comment: Pg IV-76, Parag 2. The document states that a number of state and federal organizations, including the Service support the mitigation plan. While a Service representative participated on the committee that developed the mitigation plan, the Corps was informed by the representative that he was not empowered to give official agency approval of the plan, but only to provide technical assistance. Verbal comments and opinions expressed during committee meetings certainly did not constitute the official position of the Service which would only be conveyed by the Field Office Supervisor or higher level agency official, usually in written format.

Response: The USFWS representative participated in developing the mitigation plan over a period of three years. All of the recommendations of the USFWS were carefully considered and many, if not all, were incorporated into the mitigation plan presented in the EIS. The word "support" will be replaced by the word "developed."

Comment: Page IV-89, Table IV-22. This table is confusing and fails to adequately describe the mitigation plan. Under the heading "Mitigation Type" there should be four basic entries: sediment remediation, wetland restoration, oyster reef (add clam as necessary), and bird management. We suggest adding an additional column for "Site Name", which would be distinct from the location. For example, Lambert Point would be the site name and Main- stem Elizabeth River would be the location. As noted previously, the 411-acre figure for sediment remediation is speculative and misleading. Each individual sediment remediation site should be listed, along with its actual acreage figure. It is not meaningful to give a sum of the total mitigation project acreages because the environmental values of the different types of projects are different, i.e., one acre of oyster reef is not equivalent to one acre of sediment remediation. Also, the value of one acre of habitat in the expansion area would not be ecologically equivalent to one acre of a particular mitigation option. The differences in the habitat values were taken into account through the Habitat Equivalency Analysis which developed acreage equivalency ratios. In the Executive Summary of the document, the total mitigation acreage is given in an attempt to help summarize the plan. We recommend that this be avoided because it falsely implies acre-for-acre equivalency. Presenting the acreages of the different mitigation types would be appropriate (i.e., 68 acres sediment remediation, 56 acres wetland/riparian habitat establishment, and 20 acres of oyster reef/clam restoration).

Response: The column entitled "Mitigation Type" has been revised as suggested. A column entitled "Site Name" has been added to the table. Each sediment site has been added, along with actual acreage. The total acreages of the different individual mitigation types have been added to the table.

Comment: Appendix B, Pg 7, Para. 1. The document is imprecise in stating that: "Overall, and compared to other areas in the lower Chesapeake Bay and the Elizabeth River, the area is of relatively low overall productivity and low ecological value." It is true that the expansion area has somewhat lower productivity and ecological value than other typical areas in the lower Chesapeake Bay and James River. However, the ecological condition of the expansion area (as indicated by benthos and zooplankton surveys) is much better than most of the other areas within the Elizabeth River, where the habitat has been substantially degraded by sediment contamination and poor water quality.

Response: (extracted from Rom Lipcius) – We don't dispute the findings of Dauer and colleagues for the Elizabeth River system, but these are not the standards for a healthy Chesapeake Bay benthic community. In fact, the studies by Dauer and colleagues are sound and convincingly point out the generally degraded nature of benthic communities in the Elizabeth River. The valid standard for comparisons of benthic communities is not one from a highly degraded system, but rather one from relatively pristine portions of the ecosystem. Moreover, the Dauer 2000 and 2002 studies of the Elizabeth used a "Young Grab," which only samples regularly to 7 cm sediment depth. This depth is only suitable for the capture of shallow-dwelling polychaetes or recruits of bivalves and would clearly miss the larger, deeper-dwelling bivalves that add substantially to the biomass. Since Dauer's studies and other previous studies in the Craney Island expansion footprint did

not sample deep-dwelling infauna that are typical food sources for blue crabs, that was the motivation for our study of the deeper dwelling and larger infauna. In addition, although the blue crab shares various prey preferences with demersal fish, the emphasis in our study was on the blue crab because spot, croaker and hogchoker are not in a state of major decline, in contrast to the blue crab and native oyster in Chesapeake Bay.

Comment: Appendix B, Pg 21, Parag 2. It is misleading to state that the "Buchman's results were used by the Subcommittee to develop the sediment remediation portion of the mitigation plan." These results were simply a demonstration of the capability of the HEA approach to determine the potential value of sediment remediation as mitigation for habitat lost in the expansion area. The actual process that was used to determine the sediment remediation component of the mitigation plan is described on pages 23 and 24 of this appendix.

Response: The narrative has been revised to clarify that "...these results were simply a demonstration of the capability of the HEA approach to determine the potential value of sediment remediation as mitigation for habitat lost in the expansion area."

Comment: Appendix B, Pg 27, Parag 3. The definition of zooplankton as pertaining to its use in the Habitat Equivalency Analysis contains some inaccuracies and could be otherwise improved. The spelling of "protests" should be corrected to protists. We recommend deleting the reference to foraminiferans (which are primarily benthic) and radiolarians (which are strictly marine) and substituting tintinids and non-loricate ciliates as examples of the most common planktonic protists in the project area. We also suggest deleting the reference to "larval stages of many fish species" since they only comprise an incidental component in the routine zooplankton collections used in the HEA. In place of the reference to Nybakken (1988), which provides a general description of marine zooplankton, the following citations would provide more appropriate site specific information.

> Sharp, W.C. 1995. Zooplankton community dynamics in the Elizabeth River, Virginia. M.S. Thesis, Old Dominion University, Norfolk, VA.
>
> Park, G. and H. Marshall. 1993. Microzooplankton in the lower Chesapeake Bay and the tidal Elizabeth, James, and York rivers. Virginia Journal of Science, 44(4): 329-340.

Response: Suggested revisions have been noted and changes to the text have been made as suggested.

**Commonwealth of Virginia Department of Environmental Quality**
**(17 November 2005)**

Environmental Impacts and Mitigation

Comment: *1. Natural Heritage Resources.* The Department of Conservation and Recreation has searched its Biotics Data System for occurrences of natural heritage resources in the project area. "Natural heritage resources" are defined as the habitat of rare, threatened, or endangered species of plants and animals, unique or exemplary natural communities, and significant geologic resources. The Department of Conservation and Recreation ("DCR") reports that there are natural heritage resources in the vicinity of the project. However, due to the project location and the distance to the resources, DCR does not anticipate that the project will adversely affect natural heritage resources.

Response: (No response required.)

Comment: *(a) Agency Responsibilities.* The Department of Game and Inland Fisheries, as the Commonwealth's wildlife and freshwater fish management agency, exercises enforcement and regulatory jurisdiction over wildlife and freshwater fish, including state or federally listed endangered or threatened species, but excluding listed insects. The Department (hereinafter "DGIF") is a consulting agency under the U.S. Fish and Wildlife Coordination Act (16 U.S.C. sections 661 et seq.), and provides environmental analysis of projects or permit applications coordinated through the Department of Environmental Quality and several other state and federal agencies. DGIF determines likely impacts upon fish and wildlife resources and habitat, and recommends appropriate measures to avoid, reduce, or compensate for those impacts.

*(b) Findings.* In general, the Department of Game and Inland Fisheries ("DGIF") supports the overall mitigation plan (see item 2(c), below). However, DGIF states concerns and provides recommendations concerning protection of bird and mammal species (items 2(e) and 2(f)) and of Elizabeth River fisheries (item 2(d)). DGIF recommends strict erosion and sediment controls throughout the project.

Response: Erosion and sediment controls will be employed throughout project construction.

Comment: The Department of Game and Inland Fisheries supports the overall mitigation plan, but recommends strict monitoring of all mitigation sites. To assess the functional value of the mitigation, DGIF recommends developing measurable success criteria, including biological components (vegetation, benthics, fishery, and wildlife). Similarly, the Department of Conservation and Recreation, which participated in the development of the mitigation plan, finds that it adequately addresses environmental concerns related to the protection of the Chesapeake Bay and the Elizabeth River.

Response: The mitigation appendix (EIS, Appendix B) addresses monitoring and adaptive management to a feasibility level of detail. As part of the final design of the proposed mitigation projects during the PED phase, a companion and more detailed monitoring plan will also be developed. The monitoring plan will contain measurable success criteria, and, where applicable, adaptive management recommendations.

VDGIF Comment: *(d) Elizabeth River and Fisheries.* The Elizabeth River has been designated as a Confirmed Anadromous Fish Use Area, according to DGIF. The proposed dredging of a 50-foot deep access channel for the project has the potential to result in increased sedimentation in the River. To minimize potential adverse impacts from this sedimentation, DGIF recommends that no dredging occur during the migratory and spawning season for anadromous fish, defined as February 15 through June 30.

Response: The Elizabeth River has been designated as a Confirmed Anadromous Fish Use Area (CAFUA), according to VDGIF. Anadromous fish are those that spend most of their life in salt water but migrate into freshwater tributaries to spawn. Designated anadromous fish spawning and nursery grounds are 15-20 miles up the James River (see figure below - will be included in FEIS) from the project site. Salinities in the Elizabeth River in the area of the proposed expansion range from 16-22 ppt. Salinities of the tidal-fresh water areas of the lowest reaches of the CAFUA range from 0-0.5 ppt. Therefore, use of the proposed project area by anadromous fishes would only be as part of a migration corridor.

Only a small area of the Lower James and Elizabeth River mouth at the location of the proposed access channel may experience temporary increased turbidity during dredging activities. Due to the size of the Elizabeth River and James River mouths, this small area of minimal impact is not anticipated to hinder migration of anadromous fishes. In addition, VMRC has not required temporal dredging limitations due to CAFUA for similar dredging projects within the lower James River.

For these reasons, and because minimal impacts to anadromous fishes from year-round dredging activities are anticipated, dredging will not be restricted during the period February 15 through June 30.

Comment: *(e) Bird Management.* The Department of Game and Inland Fisheries encourages the Corps to develop a Craney Island Bird Management Plan, one of the mitigation options mentioned above (see item 2(c)). This development should be coordinated with DGIF (see "Regulatory and Coordination Needs," item 1(b), below). The Plan should include the following elements.

*(i) Nesting Areas.* The Corps should make every effort to protect and maintain appropriate nesting areas for shorebirds and early successional nesters, such as:

- Wilson's plover (state-listed as endangered);
- Piping plover (listed by state and federal governments as threatened); and

- Least tern (state species of concern).

Protection of nesting areas is particularly important along the western side of the proposed facility.

*(ii) Secondary On-site Breeding Area.* According to DGIF, the Corps should protect and maintain a secondary on-site breeding area from April 1 through September 1. The substrate in these protected areas should consist of sand with some shell mixed in, and have sufficient elevation to avoid flooding or pooling of water. Because the species in question require bare sand with little or no vegetation, potential nesting areas should be disced and graded prior to the onset of each breeding season. The areas should also be roped off and/or posted with "closed area" signs during the breeding season, to keep construction equipment and human traffic out of the areas.

*(iii) Protecting Nesting Areas.* To avoid potential direct adverse impacts upon listed bird species, it is important that all construction activities and material inflows avoid any areas on Craney Island where bird nests (with eggs) are found. DGIF recommends that the Corps work around nesting areas from the date nesting activity is first documented until the date when all young have fledged or when all breeding adults have abandoned the site, as determined by a DGIF biologist or a biological consultant approved by DGIF (see "Regulatory and Coordination Needs," item 1(b), below).

If the project appears likely to result in disturbance of shorebirds or early successional nesters, such as the piping plover (listed by state and federal governments as a threatened species), the Department of Game and Inland Fisheries recommends that islands be created and maintained as alternative nesting sites.

*(iv) Training of Personnel.* During each breeding season, all Corps and Port Authority employees and contractors engaged in construction activities should be informed of the location of all protected nesting areas. They should receive instruction on how to identify early successional nesting birds, and on the sensitive nature of these breeding species.

*(v) Mammalian Predator Removal.* DGIF also recommends that an annual mammalian predator removal program be established by the Corps. DGIF offers guidance on development and implementation of such a program (see "Regulatory and Coordination Needs," item 1(c), below).

Response: The Craney Island Bird Management Plan (CIBMP) will be funded as part of the overall mitigation plan presented in the EIS (Appendix B). The CIBMP would be developed during the advanced engineering and design phase of the project, by a team of individuals representing the avian scientific community, the USACE, state agencies (including VDGIF), and permitting state/Federal agencies. During this phase, the recommendations which you have provided will be considered to be incorporated in the CIBMP.

Comment: *(f) Marine Mammal Protection.* The Department of Game and Inland Fisheries is concerned that increased container ship traffic in coastal waters, attributable to the establishment of an additional ship terminal on the expanded

Craney Island, may adversely affect marine mammals. In recent years, marine mammal vessel strikes have increased in Virginia's coastal waters. The toll has included mortal injuries to two northern right whales (listed by federal and state governments as endangered species), which collided with vessels near the mouth of the Chesapeake Bay. Marine mammals are known to occur in Virginia's ocean and in-shore shipping channels, although their densities and temporal and spatial distribution remain largely unknown. For these reasons, DGIF disagrees with the assertion in the Draft EIS that the increased opportunity for collision and injury to marine mammals presented by the new terminal is expected to be "minimal."

DGIF recommends that the Port Authority address the issue of potential marine mammal mortality by assessing the spatial and temporal distribution and abundance of marine mammals in Virginia's nearshore and in-shore shipping channels. In addition, the Port Authority should examine measures intended to minimize the potential for vessel strikes of marine mammals.

Response: The nearshore and inshore shipping channels into the Chesapeake Bay are accessed by military, commercial, and recreational vessels entering the Port of Hampton Roads and the Port of Baltimore. The U.S. Navy is required to report whale sightings in these areas and commercial vessels participate in voluntary reporting when traveling in this region. Sightings data is maintained by The National Oceanic and Atmospheric Administration and reported to mariners by the U.S. Coast Guard.

The NOAA Fisheries Service Mid-Atlantic Sightings Archive: Right Whales Sightings for the Mid–Atlantic Region from 1974 through 2002 reported between 13-15 right whales within 30 nautical miles of the entrance to the Chesapeake Bay. Only two whales were reported within the nearshore shipping channels. No whales were reported in the inshore shipping channels. Given that the frequency of whale sightings in the shipping channel is negligible (two sighted in 28 years), the potential for vessels strikes as a result of the construction of the eastward expansion and the future operation of a marine terminal at this location is believed to be minimal. A graphic depicting the spatial distribution of these sightings will be included in the FEIS.

In addition, the Virginia Port Authority is presently a member of the Northeast Implementation Team (NEIT) for the Recovery of the North Atlantic Right Whale. The NEIT focuses exclusively on North Atlantic right whale ship strike reduction and support of the NOAA Ship Strike Reduction Strategy Working Group. The NEIT is currently developing strategies to educate mariners on the presence of right whales and further reduce the potential for ship strikes in the Mid-Atlantic region.

Comment: *(g) Additional Information.* The Department of Game and Inland Fisheries maintains a data base of wildlife locations, including threatened and endangered species,

trout streams, and anadromous fish waters. This data base may contain information not available from the DCR Biotics Data System (see item 1, above). The data base is at the following web site:

- http://www.dgif/virginia.gov/wildlife/info_map/index.html.

Response: The referenced database was accessed to provide threatened and endangered species information contained in the EIS.

Comment: *3. Chesapeake Bay Preservation Areas.* According to the Department of Conservation and Recreation's Division of Chesapeake Bay Local Assistance (DCR-DCBLA), the eastward expansion of Craney Island takes place on open water that is not under the jurisdiction of the Chesapeake Bay Preservation Act (*Virginia Code* sections 10.1-2100 et seq.) or the Chesapeake Bay Preservation Area Designation and Management Regulations (9 VAC 10-20-10 et seq.) which implement the Act. However, subsequent development of the 580-acre expansion will be required to comply with the Act and the Regulations. Specifically, development of the marine terminal facility will have to comply with stormwater management criteria that meet the water quality protection provisions of the Virginia Stormwater Management Regulations (4 VAC 3-20 et seq.; see 4 VAC 3-20-71). In addition, for land disturbance of 2,500 square feet or more, the development of the terminal must comply with the Virginia Erosion and Sediment Control Regulations and the *Erosion and Sediment Control Handbook* (third edition, 1992).

Response: This section has been revised to more clearly indicate that the regulatory requirements apply to the development of the expansion as opposed to the expansion itself. The basic need to offset the increased pollutant loads from the development would not change.

Comment: *4. Air Quality.* According to DEQ's Division of Air Program Coordination, Craney Island is in an ozone non-attainment area. For this reason, emissions of volatile organic compounds (VOCs) and oxides of nitrogen ($NO_x$) to project construction and operation should be kept to a minimum. VOCs and $NO_x$ are precursors to atmospheric ozone ($O_3$), which is harmful to lungs and to vegetation.

Response: In recognition that the project location is within an ozone nonattainment area, minimizing emissions of ozone precursor pollutants, VOCs and NOx is of particular importance. Project representatives will coordinate with the VDEQ in the development of a new SIP for the Hampton Roads area which will define pollutant emissions budgets and determine measures necessary for achieving attainment with the ozone standard. The project is subject to the general conformity provisions which mandate that the project conforms to the pending SIP and does not inhibit efforts to achieve compliance with the ozone standard.

As indicated in the Draft EIS, it is anticipated that emission reduction programs currently being implemented at VPA terminals will be incorporated for construction and operation

of the proposed Craney Island terminal facility. An example of a current emission program being implemented by VIT, operator of VPA's existing marine terminals, is to purchase new and replacement cargo handling and nonroad equipment with the lowest available emission rating. Also, a chassis pool system that improves the efficiency of on-terminal transport and thereby reduces the amount of time trucks spend at the terminal is in place. These programs have been effective in reducing emissions of VOCs and NOx on a cargo handling unit basis and suggest that impacts to regional air quality have been minimized even during significant increases in cargo volumes handled at the facilities. Additionally, VPA is planning to use electric cranes at the Craney Island terminal and will consider the use of other electrified container handling equipment and low emissions technologies for the proposed terminal to minimize air pollutant emissions.

Comment: *(a) Open Burning.* If project activities include the burning of construction or demolition material, this activity must meet the requirements of the Regulations for open burning (9 VAC 5-40-5600 et seq.), and it may require a permit (see "Regulatory and Coordination Needs, item 2). The Regulations provide for, but do not require, the local adoption of a model ordinance concerning open burning. The Corps and the Port Authority should contact appropriate local officials to determine what local requirements, if any, exist. The model ordinance includes, but is not limited to, the following provisions:

- All reasonable effort shall be made to minimize the amount of material burned, with the number and size of the debris piles;
- The material to be burned shall consist of brush, stumps and similar debris waste and clean burning demolition material;
- The burning shall be at least 500 feet from any occupied building unless the occupants have given prior permission, other than a building located on the property on which the burning is conducted;
- The burning shall be conducted at the greatest distance practicable from highways and air fields;
- The burning shall be attended at all times and conducted to ensure the best possible combustion with a minimum of smoke being produced;
- The burning shall not be allowed to smolder beyond the minimum period of time necessary for the destruction of the materials; and
- The burning shall be conducted only when the prevailing winds are away from any city, town or built-up area.

Response: No open burning activities are currently planned for the project. However, if open burning will be conducted the open burning activities will be conducted in accordance with applicable Virginia regulations and local requirements and the appropriate open burning permit(s) will be secured as required.

Comment: *(b) Fugitive Dust Control.* During construction fugitive dust must be kept to a minimum by using control methods outlined in 9 VAC 5-50-60 et seq. of the Regulations for the Control and Abatement of Air Pollution. These precautions include, but are not limited to, the following:

- Use, where possible, of water or chemicals for dust control;
- Installation and use of hoods, fans, and fabric filters to enclose and vent the handling of dusty materials;
- Covering of open equipment for conveying materials; and
- Prompt removal of spilled or tracked dirt or other materials from paved streets and removal of dried sediments resulting from soil erosion.

Response: Activities that may result in the generation of fugitive dust emissions during construction of the port facility will be minimized in accordance with the control methods under 9 VAC 5-50-60 of the Virginia regulations.

Comment: *(c) Fuel-burning Machinery.* Fuel-burning machinery used in the expansion of Craney Island, the resulting construction of a shipping terminal, and the operation and maintenance of the terminal may require air pollution control permits from DEQ. See "Regulatory and Coordination Needs," item 2, below.

Response: If applicable, air pollution control permits will be secured for the project in accordance with Virginia's stationary source air permitting requirements under 9 VAC 5 Chapter 80 of the Regulations for the Control and Abatement of Air Pollution. Since the emission sources expected to be used in the construction and operational phases of the project consist of land and marine based mobile equipment, the stationary source permitting programs implemented by the VDEQ are not expected to be applicable. However, if non-exempt equipment such as stationary fuel-burning equipment will be used during construction or installed for port facility operations, the appropriate permit(s) will be secured in accordance with VDEQ permitting procedures.

Comment: *(a) Water Quality Impacts and Virginia Water Protection Permit.* The proposed project will involve significant impacts to surface waters, including wetlands, according to DEQ's Tidewater Regional Office. Accordingly, the project proponents will need to submit a Joint Federal-State Permit Application ("JPA") which documents that the impacts have been avoided and minimized to the maximum extent practicable, and that remaining unavoidable impacts have been properly compensated (see "Regulatory and Coordination Needs," item 5, below).

Response: Section 1.5 has been revised to note the need for a JPA.

Comment: While the mitigation plan presented in the Draft EIS represents a consensus of a diverse group of stakeholders (see item 2(c), above), it is not sufficiently detailed for regulatory purposes. See "Regulatory and Coordination Needs," item 5, below.

Response: A Joint Federal-State Permit Application ("JPA") will be submitted during the PED phase of the project which will contain sufficient detail for regulatory purposes.

Comment: The Draft EIS makes a number of references to "Proposed Water Quality Standards," according to DEQ's Tidewater Regional Office. The term "proposed" should

be changed to "existing." In addition, the preparers of the Draft EIS should ensure that the most recent DEQ monitoring data are used in the Final EIS.

Response: The DEIS has been revised to reflect Virginia's recent adoption of the water quality standards that were previously called "proposed" or "draft." Discussion of water quality standards attainment based on the 1998 303(d) list has been updated to reflect the 2004 303(d) list.

Comment: *(b) Characterization of Impacts.* According to DEQ's Tidewater Regional Office and the Virginia Institute of Marine Science, the Draft EIS appears to understate the extent of water quality impacts. We have several examples.

*(i) Water Quality Criteria for Rating of Impacts of Alternatives.* Table II-2 in the Draft EIS (page II-27) indicates that a water quality/ hydrodynamics rating of "Negligible" means that the "Impact [is] not detectable, no discernable effect on water quality/hydrodynamics." DEQ's Tidewater Regional Office questions the use of this rating in Table II-3 for the East Expansion, CDF cell (page II-29), in view of the results of the Chen Model which shows modeled impacts to sedimentation, current velocity, salinity, etc. Based on model results, the rating of these impacts should be "minor" or "moderate" but not "negligible" for the recommended plan. The model indicates that discernable and detectable impacts are clearly predictable. While hydrodynamic models are voluminous documents, they are nonetheless a major component of environmental evaluation, and should be included in an appendix of the Final EIS.

Response: The water quality/hydrodynamics impacts rating for the East Expansion, CDF cell in Table II-3 has been revised to "minor." Due to the large size of the hydrodynamic study, the authors have chosen to provide a web address for the full document rather than including it in the EIS.

Comment: *(ii) Project Duration and "Temporary" Impacts.* The Virginia Institute of Marine Science ("VIMS") noted that the Draft EIS made reference to an "aggressive" schedule for rapid fill, ground preparation, and port construction (Phase I) that will continue for at least 12 years (5 years for cell construction, 1 year for fill and wharf construction, the rest for the remaining development). VIMS asks whether perpetual, year-round construction is contemplated for at least 5 years and possibly 12. If so, VIMS asks whether this time frame was considered in determining that water quality impacts from re-suspension of sediments would be "temporary" in nature.

Response: The primary adverse effect on water quality would be the increase in turbidity and total suspended solids from the incidental release of sediments during dredging, cell construction, and wharf construction. This would be expected during the 5-year cell construction period and the 1-year wharf construction period, and therefore would be temporary, as opposed to permanent impacts from long-term port operation. Erosion and sediment control and best management practices would be implemented to prevent impacts from port development activities, in accordance with state regulations.

Comment: *(iii) Sediment Suspension.* VIMS points out that the Draft EIS predicts minor, short-term, and localized increases in suspended sediments and turbidity. VIMS requests specific data to support this assumption.

Response: The primary adverse effect on water quality would be the increase in turbidity and total suspended solids from the re-suspension of sediments during dredging, cell construction, and wharf construction. This condition would persist for the duration of construction for the cell, access channel and wharf. Since construction has a finite length and dredging would not be occurring continuously over the construction period, the condition is considered to be temporary. The potential impacts on water quality from constructing these facilities are discussed in Section IV, 1.1.2. Some reduction in DO levels due to releases of organic materials to the water column, are anticipated. However, the anticipated increase in suspended sediment and the reduction in dissolved oxygen are expected to fall within the range experienced by the Elizabeth River under natural climatic events and hydrodynamic conditions.

Comment: Little data was presented to identify a baseline condition supporting the prediction that total suspended solids would remain within the natural range of the Elizabeth River. In addition, VIMS seeks more specific analysis of the prolonged duration and potential cumulative impacts from concurrent projects. If multiple types of dredges are to be used, the EIS should disclose their efficiencies, and how much dredged material can be expected to remain in suspension, and the duration of the suspension.

Response: A typical dredging related sediment plume may extend a few hundred meters (approximately one quarter mile) downstream from active dredging areas (Priest, 1981). The low ambient current velocities and tidal effects in the vicinity of the site may reduce the plume migration to less than the typical distance (APM Marine Terminal EA, 2003). The type of dredge equipment used will have a great impact on the suspended sediment concentrations. A study of pipeline dredging operations reported total suspended solids (TSS) concentrations of 12 - 871 mg/L depending on the dredging equipment used (i.e., 43-70 mg/L for hydraulic dredge, 12-282 mg/L for clamshell mechanical dredge, and 74-871 mg/L for a hydraulic hopper dredge)(Priest, 1981). Long-term, depth-averaged background suspended sediment concentration in the Elizabeth River near the dredge area is approximately 20 mg/l, and the short-term, storm-induced suspended sediment concentrations can be as high as 76 mg/l on a depth-averaged basis and 127 mg/l near the bottom (APM Marine Terminal EA, 2003). Therefore, with proper precautions taken, the increase in suspended sediments associated with the dredging activities is likely to be on the order of the background concentration in the Elizabeth River, and within the natural short-term variability in the background concentrations associated with advective pumping into the Elizabeth River from the James River and a result of prop wash from the passing of large ships.

The construction of the eastward expansion dikes is anticipated to produce a much smaller sediment plume than the dredging portion of development as the fill will be composed of much coarser grained material which is less likely to be suspended and/or remain in suspension. The contaminant load of the sediments is anticipated to be

negligible as this material has been used in the past without concern for a variety of applications including beach nourishment projects.

A dredge plan will be developed during the PED Phase to minimize the potential effects of a suspended sediment plume during the construction of the foundation, access channel, and cell dikes. The dredging will be accomplished using equipment that minimizes turbidity plumes to the greatest extent practical. The Elizabeth River system adjacent to the project site recovers rapidly and dredge-induced suspended sediment concentrations are expected to decrease rapidly following the termination of dredging operations.

Comment: It should be noted, according to VIMS, that impacts from suspended sediments will also include the sand borrow area (15.4 million cubic yards, or MCY) and should be addressed. Similarly, impacts to water quality and the benthic community from proposed open ocean disposal of 17.1 MCY from dike foundation and channel dredging are not discussed. While the Dredge Management Plan is expected to address these and other concerns associated with the anticipated turbidity plume or plumes, VIMS states that these impacts should be quantified and analyzed at this time, to allow an accurate assessment of impacts.

Response: The Atlantic Ocean Channel will be used as the primary source of material for dike construction, while Thimble Shoal and Cape Henry Channels will be used as the secondary and tertiary material sources, respectively. The Atlantic Ocean, Thimble Shoal, and Cape Henry Channels have been authorized by Congress to be dredged to depths of 60, 55, and 50 feet respectively. The dredging of material from the Thimble Shoals and Atlantic Channels for construction of the CIDMMA expansion cell is not inconsistent with the current authorization and existing NEPA documentation for activities in these channels, as dredging will not be conducted below the depth authorized for each specific channel. In addition, these channels would be dredged to maximum authorized depth regardless of CIDMMA expansion and/or port development. This does not constitute a renewal, review, or substantial revision of the current authorized scope of these channels. Therefore, no additional impacts will occur at the fill source material sites.

The Norfolk Ocean disposal site, an open ocean disposal site designated by the EPA in July 1993, is designated to receive dredged material from the lower Chesapeake Bay. The open ocean disposal site is sufficiently removed from amenities such as beaches, fish havens, environmentally sensitive areas, and shipping lanes so as to minimize impacts (Federal Register, July 1993). To ensure that undue adverse water quality impacts from the placement of dredged materials at the Norfolk Ocean site do not occur, materials will be evaluated in compliance with the site's management and monitoring plan and with the EPA's Ocean Dumping Regulations and Criteria. If required, an alternate location for unsuitable material, most likely CIDMMA, will be determined.

Comment: *(iv) Sediment Contamination.* Contamination of sediments is another issue meriting attention. Given the variation in contaminant levels in the Elizabeth River, VIMS questions the assumption in the Draft EIS that 90% of the material removed for

cell construction will be suitable for ocean disposal. Supporting data is needed to justify this assumption.

Response: Sediment samples taken in the proposed dredging areas consist predominantly of clayey material with some sandy lenses. Sediment and water quality analyses of the proposed dredge areas have not been performed to date; however, such analyses will be performed during the PED phase since the proposed design/construction methods and materials may change. The predominantly clayey material to be dredged is likely undisturbed with contaminant transport through layers unlikely. However, it is thought that by placing the upper few feet of material in CIDMMA, all remaining material will be suitable for ocean placement. Although, it is unknown what percent of material going into CIDMMA will be suitable for ocean placement, it is anticipated that 10% is a conservative upper limit. As such, approximately 10% of the dredged material (1.5 MCY) will be placed at CIDMMA, while the remaining 90% (13.8 MCY) will be removed to the Norfolk Ocean placement site. Additional testing of the material will be conducted during the next phase of the project to determine the precise amount of material that will meet the regulatory criteria for ocean disposal.

Comment: *(c) Benthic Impacts.* The Draft EIS depicts oyster restoration reefs south and east of the project area (Figure III-11). Given the close proximity of these five reefs to the project area, VIMS believes that potential impacts to the reefs should be discussed in part III, section 1.4.5 (Draft EIS, pages III-22 through III-28) and part IV, section 1.4.1.3 (Draft EIS, pages IV-30 and IV-31).

Response: See DEIS, Part III, Section 1.4.7 Oysters - The closest oyster reef restoration site lies approximately 1.5 miles east of the proposed expansion. Four other oyster restoration sites are also located within 4 miles of the proposed expansion.

Part IV, Section 1.4.1.3 Benthos - A typical dredging related sediment plume may extend a few hundred meters (approximately one quarter mile) downstream from *active* dredging areas (Priest, 1981). The low ambient current velocities and tidal effects in the vicinity of the site may reduce the plume migration to less than the typical distance (APM Marine Terminal EA, 2003). The type of dredge equipment used will have a great impact on the suspended sediment concentrations. As described in Section 1.1.2.1, with proper precautions taken, the increase in suspended sediments associated with the dredging activities is likely to be on the order of the background concentration in the Elizabeth River. Dredging practices appropriate for reducing sediment suspension and subsequent deposition on existing Elizabeth River oyster restoration sites will be utilized to prevent impacts to these established oyster reefs. These practices are discussed in Part IV, Sections 1.1.2.1 and 1.1.2.2. No impacts are anticipated.

Comment: Benthic re-colonization of the dredged channel is projected to occur in 1 to 5 years, although depths will increase from 3 meters to 16 meters, and ship traffic and associated propeller wash will occur on a continuing basis in the berthing area within 6 to 9 months. While the benthic community may re-establish over time, VIMS indicates that the potential exists for a significant shift in community structure.

Response: Data in the Elizabeth River Benthic Index of Biotic Integrity (BIBI) study (Dauer 2001) indicates that deep-water sites (10 meters or greater) also achieve high BIBI scores. Fifty percent of the shallow water samples resulted in a BIBI value of 3.0 or greater. Comparatively, 43% of the deeper sites had a BIBI value greater than 3.0. Thus, the individual proportions of the shallow and deep sites satisfying BIBI standards appear similar (APM Terminal EA, 2003). The dredging of this area may even improve BIBI scores in the area. If sediment contamination does exist in the surface layers, dredging of the sediments during construction will remove these polluted sediments from the Elizabeth River bottom thereby exposing healthier sediment which organisms can re-colonize. As discussed in the DEIS, the benthic community will re-establish over time. The potential exists for a shift in community structure, but this is not necessarily seen as an adverse impact. This will be addressed further in the FEIS.

Comment: Similarly, the Draft EIS assumes habitat suitability for affected fish and other marine organisms along the riprap dikes after cell construction. Given the significant change from shallow water, soft bottom habitat to rock structures at increased depths, the potential for a shift in community composition exists and should be discussed.

Response: It is well documented that the impact area was once a hard bottom substrate (oyster shell/reef structure) and part of an extensive public oyster ground (Baylor ground) in the Elizabeth and lower James River. With the demise of the oyster in the bay, primarily due to disease and overfishing, the oyster reef structure was removed and/or covered with soft substrate (sediment). Hard structure (such as oyster reefs) is a grossly depleted habitat in the Chesapeake Bay that provides a wealth of ecosystem services, including habitat provision for blue crabs, benthic populations, and fish stocks that are now depleted. On the other hand, soft-bottom habitat is the dominant bottom type of the entire bay and, in fact, is the habitat type that is already enhanced through the extensive loss of oyster reef and shell bottom habitat. This potential for a shift in community composition in the project area exists and will be discussed further in the EIS.

Comment: *6. Solid and Hazardous Waste Management.* According to DEQ's Waste Division, the Draft EIS addressed solid waste issues and sites and hazardous waste issues and sites. However, it did not include a search of Virginia's waste-related data bases.

*(a) Finding.* The Waste Division performed a cursory review of its data files and determined that the Craney Island Dredged Material Management Area is listed by EPA as a small-quantity generator of hazardous wastes (SQG) under identification number VAR000006569. (The Draft EIS states that the area is a conditionally-exempt small-quantity generator of hazardous wastes; see page III-44). The following web site may be helpful in locating additional information for this identification number:

- http://www.epa.gov/echo/search_by_permit.html.

Response: The facility information and ID number will be referenced in the document. Part III, Section1.9.4 CIDMMA outlines the results of an EDR search of regulated facilities within 2 miles of the proposed expansion.

Comment: *Guidance.* Any sediment suspected of contamination, or hazardous or solid wastes that are generated, transported, disposed, stored, or treated in Virginia must be tested and handled in accordance with applicable federal, state, and local laws and regulations. Dredge spoils, when managed in accordance with requirements of the State Water Control Board or other Virginia agencies with similar authority, are conditionally exempt from the Virginia Solid Waste Management Regulations (9 VAC 20-80-60.E.), and are excluded from the waste barging regulations (9 VAC 20-170-10).

Response: This comment will be incorporated into Part III, Section 1.9.4 CIDMMA.

Comment: In addition, any storage, treatment, or disposal of hazardous wastes must be conducted in accordance with applicable state laws and regulations. These include, but are not limited to, the following:

- Virginia Waste Management Act (*Virginia Code* sections 10-1400 et seq.);
- Virginia Hazardous Waste Management Regulations (9 VAC 20-60);
- Virginia solid Waste Management Regulations (9 VAC 20-80); and
- Virginia Regulations for the Transportation of Hazardous Materials (9 VAC 20-110).

Applicable federal laws include, but are not limited to:

- Resource Conservation and Recovery Act (RCRA) (42 U.S.C. 6901 et seq.);
- U.S. Department of Transportation's Rules for Transportation of Hazardous Materials, 49 Code of Federal Regulations, Part 107.

*(c) Pollution Prevention.* DEQ encourages the Corps to implement pollution prevention principles, including the reduction of solid wastes at the source, re-use of materials, and recycling of waste materials.

Response: The text will be revised to include the list of applicable state laws and regulations concerning storage, treatment, or disposal of hazardous wastes.
The Virginia Port Authority through its operating affiliate expects to implement programs similar to those currently in place at its existing facilities which reduce or recycle the following waste products. Examples of these include:

1. Used waste oil from equipment oil changes is used to power portable heaters in vehicle and facilities maintenance garages and workshops. Excess waste oil is recycled by an outside consultant.

2. Used cleaning solvents are removed from the terminal facility by a licensed contractor that recycles the products for use in manufacturing concrete.

3. All other parts cleaning solvents used at the facility are biodegradable.

4. Used tires are removed by a licensed contractor, shredded, and recycled for use in manufacturing asphalt.

5. Ballast replacement program: All PCB light ballast are removed and replaced as light fixtures fail in all terminal facilities.

In November 2004, the VPA developed a Litter Management Master Plan to address the need to reduce litter at Norfolk International Terminals. The plan addresses on-going placement of additional receptacles in high foot traffic and vehicle parking locations, relocation of unused receptacles, frequency of emptying receptacles, and designation of labor crews to remove litter from problem areas. The plan is reviewed annually and revised as necessary to reflect changes in use / new construction at the terminal. A similar plan will be developed for the proposed Craney Island Terminal.

Comment: *7. Historic Structures and Archaeological Resources.* According to the Draft EIS, the project will not affect historic resources, because no known historic resources are located within the project area (Draft EIS, page IV-64, section 1.17.1). As the Department of Historic Resources notes, the proposed expansion of Craney Island would cover area that is currently a shipping channel. The pre-history and the maritime history of the Norfolk area make it likely that submerged archaeological resources exist along the proposed expansion area.

Response: The Corps contracted with Pan-American Consultants, Inc. in 2000 for a literature search and remote sensing survey of the area east of Craney Island under consideration for expansion. Although numerous anomalies were found during this survey, none were considered potentially significant or deserving of additional investigations. While it is certainly possible that there could be prehistoric resources buried beneath the sediments in this area, the existing water depths of 10-17 feet make it impractical to investigate this possibility. Since the remote sensing survey did not reveal any targets that had a reasonable potential of being associated with historic resources, no further investigations in the expansion area were determined to be necessary.

Comment: In addition, there are multiple known historic structures and resources in Norfolk and its surroundings that may be visually affected by the proposed Craney Island expansion and terminal construction.

Response: See section 1.12.1 in part VI for an explanation of the visual effect of the proposed project on historic resources in Norfolk. Additional information on potential historical resources within the viewshed of the proposed project has been added to section 1.17 in part III.

Comment: *Section 106 Review Process Requirements.* Section 106 of the National Historic Preservation Act requires that the federal agency, in this case the Corps, identify resources that may be affected by the proposed undertaking, in consultation with the State

Historic Preservation Office (the Department of Historic Resources) and other interested parties.

Response: (No response required.)

Comment: *Historic Resources Review to Date.* The Draft EIS indicates (page III-67) that a remote sensing survey of the expansion area was conducted in 2000, during which over 400 magnetic anomalies were discovered. (None of these was considered to be historic.) The Department of Historic Resources ("DHR"), in an archives search, did not find any report detailing the results of this survey, or copies of any DHR response to the consultant's recommendations. Similarly, the Draft EIS (pages III-67 and III-68, section 1.17) indicates that consultation with DHR on effects of the proposed project on historic resources took place in 2002 and that a copy of the Department's response was included in the document. The archives search did not locate any correspondence on this matter, and the copy of the response did not appear in the Draft EIS.

DHR requests copies of the correspondence and report identified above, and continued consultation on effects of the project to historic properties. See "Regulatory and Coordination Needs," item 3, below.

Response: Our records indicate both the draft and final remote sensing reports were sent to DHR for their review although no response was ever received. An additional copy of the final report was sent on November 28, 2005, along with copies of the previous transmittal letters. A copy of the March 14, 2002 letter from DHR was sent to DHR on December 16, 2006. The Norfolk District will continue to consult with DHR on potential effects to historical resources as this project moves into the design phase, particularly with regard to the mitigation sites.

Comment: *8. Road Transportation.* According to the Department of Transportation, the proposed project will not affect the local road and highway network. However, planned road projects such as the "Third Crossing" with its connection through the Craney Island Expansion to Route 164 (Western Highway) may affect the project.

Response: The proposed "Third Crossing" was addressed in a separate EIS which was completed by VDOT in December, 2000. This EIS considered the possible development of a port facility at Craney Island. In addition, the Craney Island Expansion Draft EIS addresses how planned road projects such as the "Third Crossing" would have a positive effect on the Craney Island terminal by providing supporting and interconnected road infrastructure. In the "Environmental Consequences" section of the DEIS, Table IV-16 illustrates the projected traffic volumes and the corresponding volume-over-capacity (V/C) ratios with and without the proposed Third Crossing project. The Third Crossing project would be built near CIDMMA, and although neither project is dependent on the other, the roadways included in the TISA are the same since they are used by trucks transporting freight into and out of the region. Figure II-9 shows the proximity of the Third Crossing, the proposed Craney Island terminal, and other planned VDOT projects.

Comment: *9. Beneficial Uses of Dredged Material.* The Draft EIS indicates that dredged material brought to the Craney Island Dredged Material Management Area will continue to be used beneficially when possible, but the Virginia Institute of Marine Science ("VIMS") cites the document as stating that "based on the experience of recent years, it is assumed littler of the material placed into the existing site will be suitable for beneficial use." VIMS asks whether there is data to demonstrate that most of the inflow material is not suitable for beneficial use. If it is not, then the material may not be suitable as a foundation for a major port facility. In addition, VIMS questions whether sand mined offshore for dike construction would otherwise be considered suitable for beneficial use elsewhere, such as the nourishment of public beaches or other public interest projects. The Draft EIS did not present an economic analysis of using sand in this manner.

Response: Dredged material brought to the Craney Island Dredged Material Management Area (CIDMMA) will continue to be used beneficially when possible. Suitable sandy dredged material is used on a continuing basis to raise, maintain, and improve the dikes at the dredged material containment facility. This same material may not be suitable for other beneficial use applications such as beach nourishment, for example.

There is currently no competition among different projects for a "limited" sand resource. Sand mined offshore for dike construction could be considered suitable for other beneficial uses, however, beach nourishment projects such as Virginia Beach, Sandbridge, and Ocean View have designated offshore borrow areas specifically dedicated to sand acquisition for beach nourishment projects.

Federal Consistency under the Coastal Zone Management Act

Comment: Pursuant to the Coastal Zone Management Act of 1972, as amended, federal activities located inside or outside of Virginia's designated coastal management area that can have reasonably foreseeable effects on coastal resources or coastal uses must, to the maximum extent practicable, be implemented in a manner consistent with the Virginia Coastal Resources Management Program (VCP). The VCP consists of a network of programs administered by several agencies. DEQ coordinates the review of federal consistency determinations with agencies administering the Enforceable and Advisory Policies of the VCP.

The Draft EIS includes a general commitment on the part of the Corps to obtain and comply with all approvals from agencies administering the Enforceable Policies of the VCP (page IV-67). However, there are several information gaps. In consequence, there is insufficient information to enable the Commonwealth to concur that the proposed project is consistent with the enforceable policies of the VCP at this time. Accordingly, we invite the Corps to submit a revised federal consistency determination at a later date, during or after consideration of the Joint Federal-State Permit Application ("JPA") for the project by regulatory agencies and following the improved analysis we expect in the Final EIS for the project. The consistency determination must fully address all the enforceable policies of the VCP that apply, or may apply, to the proposed project. The

discussion which follows indicates tentative conclusions, or provides preliminary guidance, on the issues of significance in the federal consistency determination review.

*1. Fisheries Management.* The issues relative to fisheries management described in the discussion of fisheries and wildlife resources ("Environmental Impacts and Mitigation," item 2, above) should be resolved, and the resolution described, to address this component of the Enforceable Policies.

*2. Subaqueous Lands Management.* Unless there is a legal or regulatory exemption, the project will require a permit from the Marine Resources Commission, and compliance with that permit will be necessary for consistency of the project with this component of the Enforceable Policies.

*3. Wetlands Management.* Provided that a Virginia Water Protection Permit is issued, that the applicants comply with it, and that all required compensatory mitigation is provided, the project should be consistent with the Wetlands Management component of the Virginia Coastal Resources Management Program, according to DEQ's Tidewater Regional Office. However, as indicated above, final determination must await a later submission of a full consistency determination.

*4. Dunes Management.* This program, administered by the Marine Resources Commission, does not apply to the project.

*5. Non-point Source Pollution Control.* This enforceable policy will apply to the marine terminal project constructed on top of the eastward expansion through the Erosion and Sediment Control Plan requirement, administered by the Department of Conservation and Recreation.

*6. Point Source Pollution Control.* The water quality certification under section 401 of the federal Clean Water Act is an enforceable policy of the VCP. This certification will be addressed by DEQ's Tidewater Regional Office as part of its Virginia Water Protection Permit process.

*7. Shellfish Sanitation.* The Department of Health had no comments on the Draft EIS. However, the project raises shellfish issues, as identified in the discussion of Virginia Institute of Marine Science comments (see "Environmental Impacts and Mitigation," item 5, above).

*8. Air Pollution Control.* Aspects of this enforceable policy will apply to the development of a marine terminal on the 580-acre area created by the eastward expansion of Craney Island (see "Environmental Impacts and Mitigation," item 4, above).

*9. Coastal Lands Management.* See "Environmental Impacts and Mitigation," item 3, above.

Response: As suggested, the Corps will submit a revised federal consistency determination at a later date, during or after submittal of the JPA. The consistency determination will fully address all the enforceable policies of the VCP that apply, or may apply, to the proposed project.

Comment: *1. Purpose and Need.* The Draft EIS quotes the study authority as listing national defense, increased dredged material disposal capacity, and growth in commodity transport as three areas of potential federal interest in the proposed project (page 1-2), but it does not explain the national defense objective fully, according to DEQ's Tidewater Regional Office. The factor is not mentioned at all in the Executive Summary.

Response: National defense needs are served by allowing continued use of Craney Island as a training facility. It is sometimes used to practice small scale landings on the east side in the area of the Rehandling Basin. Additionally, the port terminal could potentially be used for shipping military cargo in the event of war. This will be included in the executive summary.

Comment: *Evaluation of Alternatives.* As in the "purpose and need" discussion, the national defense objective needs further explanation. The table of the screening results states that any alternative involving port development gets a "yes" under "supports national defense needs" (see Draft EIS, pages II-9 through II-16), but is not otherwise explained.

Response: National defense needs are served by allowing continued use of Craney Island as a training facility. It is sometimes used to practice small scale landings on the east side in the area of the Rehandling Basin. Additionally, the port terminal could potentially be used for shipping military cargo in the event of war. This will be explained further in the document.

Comment: As the Virginia Institute of Marine Science ("VIMS") points out, the eastward expansion of the Craney Island Dredged Material Management Area, with western dike strengthening, is the alternative with the greatest net National Economic Development ("NED") benefits, yet it was not selected as the preferred alternative (eastward expansion without western dike strengthening). Under the alternative with western dike strengthening, the cost would be $1.37 million more than the preferred alternative, but the life expectancy of the CIDMMA would be extended 17 years, and the disposal capacity expanded by 67 million cubic yards. The preferred alternative supported by the Port Authority would extend the service life by 3 years. (See Draft EIS, page II-44.) The rationale needs further explanation, although VIMS recognizes that future consideration of western dike strengthening is possible under the preferred alternative.

Response: Any alternative that is not scheduled to be built until 2028 would be subject to a General Re-Evaluation Report (GRR). A GRR is a feasibility level study. It is unlikely that such a plan would be authorized so far in advance. Corps regulations allow the selection of the Locally Preferred Plan (LPP), if such a plan is of less scope and costs

than the plan with the most NED benefits. In this case, with the previous factors, the LPP was selected.

Comment: *Ragged Island Wildlife Management Area.* Any activities proposed for this area, including wetland and oyster reef restoration efforts (see "Environmental Impacts and Mitigation," item 2(x), above) should be coordinated with the Department of Game and Inland Fisheries (Glen Askins, Wildlife Division, telephone (757) 253-4180).

Response: The preliminary design of the proposed mitigation project at Ragged Island has been coordinated with the Department of Game and Inland Fisheries (Glen Askins, Wildlife Division). All future development and detailed design of this mitigation option during PED will be coordinated with VDGIF.

Comment: *Bird Management and Protection.* Questions relating to bird management and protection, such as developing a bird management plan and protecting nesting areas, should be addressed to the Department of Game and Inland Fisheries (Ruth Boettcher, telephone (757) 442-2429).

*(a) Bird Predator Removal Plan.* For assistance in developing a removal plan for mammalian predators of shorebirds, the Corps and the Port Authority should consult the Department of Game and Inland Fisheries (Ruth Boettcher, as above).

Response: Ms. Ruth Boettcher with VDGIF will be contacted for all questions/issues related to avian populations.

Comment: *Air Quality Regulation.* As indicated above ("Environmental Impacts and Mitigation," item 3), any open burning contemplated in connection with the project may require an open burning permit from DEQ. Similarly, fuel-burning equipment may require air pollution control permits from DEQ. Questions on both types of permitting requirements should be directed to DEQ's Tidewater Regional Office (Jane Workman, Air Permits Manager, telephone (757) 518-2112).

Response: As indicated above in response to Environmental Impacts and Mitigation comment 2(c), the types of fuel-burning emissions sources associated with the project are mobile sources and therefore are not expected to be subject to Virginia's air permitting requirements for stationary sources. However, if non-exempt equipment is to be used, the appropriate air quality permits will be secured for this equipment in accordance with 9 VAC 5, Chapter 80 of the Regulations for the Control and Abatement of Air Pollution. Project representatives will coordinate with the VDEQ's Tidewater Regional Office to ensure that the appropriate air permits are secured prior to installation and operation of all equipment subject to air permitting requirements.

Comment: *Historic Resources.* As indicated above (see "Environmental Impacts and Mitigation," item 7(a)), the National Historic Preservation Act (section 106) requires consultation with the Department of Historic Resources concerning the effects to historic

resources resulting from the proposed project. The Corps should contact the Department (Joanna Wilson, telephone (804) 367-2323, extension 140) to carry out this consultation.

Response: The Corps will continue to coordinate all NHPA section 106 activities related to this project with Ms. Joanna Wilson at Virginia DHR.

Comment: *Road Transportation.* Any land use requirements, lane closures, traffic control, or work safety zone issues arising from the proposed project should be coordinated with affected localities and with VDOT's Norfolk Residency (telephone (757) 494-2451).

Response: As suggested, all land use requirements, lane closures, traffic control, or work safety zone issues arising from the proposed project will be coordinated with affected localities and with VDOT's Norfolk Residency.

Comment: *Water Quality Regulation.* As indicated above ("Environmental Impacts and Mitigation," item 5), this project will require a Virginia Water Protection Permit from DEQ. Significantly more detail will be required for each component of the mitigation plan as part of the permitting process. Depending on the nature of the details presented, adjustments to the plan may be required. In addition, if specific compensatory mitigation projects are undertaken by the Corps or the Port Authority, the mitigation must be completed successfully, irrespective of the associated costs. Questions on this permitting process may be directed to DEQ's Tidewater Regional Office (Harold Winer, Deputy Regional Director, telephone (757) 518-2153).

Response: A Virginia Water Protection Permit will be obtained from DEQ during the PED phase of the project. At that time, more detail will be provided for each component of the mitigation plan as part of the permitting process, and mitigation success will be clearly defined.

**Commonwealth of Virginia Marine Resources Commission (21 November 2005)**

Comment: The proposed mitigation plan consists of 487 acres of "large scale ecosystem restoration" to offset the loss of 580 acres of subtidal riverine habitat. While this does not represent a 1:1 replacement of the resource lost, we note that NOAA's Habitat Equivalency Analysis (HEA) was utilized as a tool to examine function, in terms of productivity, of the lost acreage and the scale of mitigation that would be necessary to replace of the productivity lost by the proposed project. We further note that additional factors, such as habitat diversity, were considered in addition to HEA results. Given that it is not feasible to create 580 acres of open water elsewhere within the impacted watershed, staff believes the use of a functional analysis for determining a mitigation plan is an acceptable alternative.

Response: Concur. No response required.

Comment: Specific to the mitigation options, staff believes the success of existing artificial reefs within the Elizabeth River system should be carefully examined before construction of additional reefs is heavily relied upon as a viable mitigation option. In addition, staff recommends that mitigation for clam resources, at a ratio of 1.33:1, be considered as an addition to the mitigation plan. While the density of clams within the footprint of the proposed expansion may be low, the overall scale of the proposed fill may result in a significant loss of clam resources. Virginia Marine Resources Commission Fisheries Management Division can perform an evaluation of clam density within the footprint of the proposed fill area. Also, a time of year restriction for the protection of anadromous fish will be further evaluated during the application-processing phase. Lastly, staff strongly discourages the filling of additional subtidal lands for the purpose of creating wetlands as part of any mitigation strategy for the expansion of Craney Island. The filling of subtidal habitat to mitigate for the filling of subtidal habitat seems to run counter to the purpose of mitigation to begin with. We strongly encourage the grading of existing uplands for the purposes of creating wetlands for mitigation.

Response: The success of existing artificial oyster reefs within the Elizabeth River system will be carefully examined before construction of additional reefs for mitigation. In consultation with VMRC, mitigation for clam resources will be evaluated during the permitting phase. Time of year restrictions for the protection of anadromous fish will also be further evaluated during the permit application-processing phase. The filling of additional subtidal lands for the purpose of creating wetlands as part of any mitigation strategy for the expansion of Craney Island will also be avoided to the greatest extent practicable.

**The Elizabeth River Project (7 November 2005)**

Comment: 1) Most importantly, we are encouraged to see a significant amount of funds earmarked for sediment restoration, which we believe is the most appropriate way to offset the impacts. The plan proposes cleanup of all known toxic hot-spots in the sediments of the Southern Branch of the Elizabeth River, with the potential for significant ecological improvement to offset the losses in the impact area.

Response: (Concur. No response required.)

Comment: To elaborate on two significant factors in support of our long-standing recommendation for a reliance on sediment cleanup in the mitigation plan:

a) The river sediments in the Mainstem, near or directly at this site, have shown some the highest scores in the Elizabeth River on the Benthic Index of Biological Integrity (B-IBI), which gauges benthic, or bottom-dwelling, community health (Daniel M. Dauer, Old Dominion University, 1999-2004). These scores indicate a higher species diversity and abundance, and a higher ecological value to the Elizabeth River system, than would be indicated by the (Lipicus and Seitz, 2002) bi-valve study which you reference (B. Mitigation Analysis, Project-Related Adverse Impacts, pages 6 & 7). In fact, the B-IBI studies would indicate the bottom-dwelling community in the impact area is some of the most valuable to the ecology of the Elizabeth River.

Response: (Same as response to FWS on this subject) In general for all *healthy* Chesapeake Bay regions, long-lived, large, often deep-dwelling species should be present. We don't dispute the findings of Dauer and colleagues for the Elizabeth River system, but these are not the standards for a healthy Chesapeake Bay benthic community. In fact, the studies by Dauer and colleagues are sound and convincingly point out the generally degraded nature of benthic communities in the Elizabeth River. The valid standard for comparisons of benthic communities is not one from a highly degraded system, but rather one from least impacted, relatively pristine portions of the ecosystem. Our statement refers to the undisputed fact that bivalves are dominant and representative members of healthy Chesapeake Bay benthic communities, as we stated in the report: "The benthic communities [in Chesapeake Bay] are dominated in biomass by bivalves (i.e., clams, oysters, mussels) and in numbers by polychaetes (Boesch 1977, Virnstein 1977, Hines et al. 1990). Infaunal bivalve assemblages include key species such as the hard clam, *Mercenaria mercenaria*, the Baltic clam, *Macoma balthica*, and the stout razor clam *Tagelus plebeius,* which are common [in many places] throughout Chesapeake Bay (Holland 1985, Boesch 1977)." In addition, in a thorough examination of Chesapeake Bay biomass, Hagy (2002) states that bivalves in Chesapeake Bay are a key component of the benthos, sometimes comprising up to 90 % of the benthic prey biomass. The reviewer referenced studies by Dauer and colleagues conducted in the Elizabeth River system, in which polychaetes are numerical dominants. Since Dauer's studies and other previous studies in the Craney Island expansion footprint did not sample deep-dwelling infauna that are indicative of a healthy ecosystem and are typical food sources for blue crabs, that was the motivation for our study of the deeper dwelling

and larger infauna. In addition, although the blue crab shares various prey preferences with demersal fish, the emphasis in our study was on the blue crab because spot, croaker and hogchoker are not in a state of major decline, in contrast to the blue crab and native oyster in Chesapeake Bay.

Comment: b) Sediment clean-up was recognized by the mitigation sub-committee as offering the "nearest in-kind relatedness" of all the mitigation options under consideration (table 3, Mitigation Option Weighting Factor Evaluation, p. 15 of your study). The in-kind relatedness of this mitigation option, while not thoroughly discussed in your study, is the primary reason that The Elizabeth River Project recommends sediment clean-up as the most appropriate form of mitigation. We agree it is not practical to create 580 acres of new river bottom elsewhere on the system. Returning contaminated river bottom to ecological function through remediation efforts is the nearest in-kind replacement for what will be lost.

Response: The Corps concurs with this position. The in-kind-relatedness of sediment clean-up is discussed thoroughly in EIS, Appendix B (pages 11, 25, Table 3).

Comment: In addition, it may be possible to improve the cost-effectiveness of this mitigation measure by exploring whether any design options are feasible for construction of the cells which could also serve as remediation of some contaminated sediments, such as placing some contaminated sediment in the cells for permanent isolation from the system. Study would need to be conducted to ensure no re-contamination of the Mainstem.

Response: The Corps policy is that contaminated sediments derived from remediation projects are not placed in CIDMMA. Because of this policy, the Corps and VPA have ruled out placing contaminated dredged material within the east expansion cell.

Comment: 2) The Elizabeth River Project is also encouraged that the plan takes a landscape approach to achieve ecosystem benefits through placing sediment cleanup projects in near proximity to wetland and oyster reef projects, maximizing the potential cumulative habitat functions. The draft plan includes some large, promising wetland mitigation sites on the Southern Branch, which, coupled with the nearby sediment cleanups, strengthen the potential to off-set losses to the ecosystem at the site of impact.

Response: (Concur. No response required.)

Comment: 3) The percent of the mitigation plan intended for oyster reefs strikes an appropriate balance between this still experimental, while promising, mitigation measure and other mitigation approaches.

**At the same time, given the importance of this mitigation plan for the future of the Elizabeth River, we also wish to reiterate several issues, discussed previously during the planning process, which remain significant for achieving an appropriate mitigation plan.**

Response: (Concur. No response required.)

Comment: 1) As discussed, The Elizabeth River Project believes it remains practical and appropriate to seek 1:1 mitigation, in acreage, of the 580 acres of river to be lost. As mentioned in previous discussions; assuming that your landscape approach does, in fact, provide ecological improvement for a total of 487 acres, as presented in your draft plan, a minimal cost of $10,000 per acre could achieve an additional 93 acres of mitigation in vegetated buffer adjacent to wetland restoration areas (total estimated cost, $930,000). Replacement habitat for threatened/endangered bird species should be considered in these buffer areas, as the project area includes habitat of the federally threatened Piping Plover.

Response: As stated by the USFWS (letter dated November 3, 2005): *"... it is not meaningful to give a sum of the total mitigation project acreages because the environmental values of the different types of projects are different, i.e., one acre of oyster reef is not equivalent to one acre of sediment remediation. Also, the value of one acre of habitat in the expansion area would not be ecologically equivalent to one acre of a particular mitigation option. The differences in the habitat values were taken into account through the Habitat Equivalency Analysis which developed acreage equivalency ratios. ...We recommend that this be avoided because it falsely implies acre-for-acre equivalency."* The Mitigation Subcommittee in their three year deliberative process did not set out to provide an equivalent acreage but rather an equivalent value and function. The subcommittee agreed on this approach throughout and, for the reasons stated, the additional 93 acres of mitigation in buffer adjacent to wetland restoration areas (to arrive at 580 acres) was not a recommendation that came out of the committee.

Comment: 2) As we also discussed during the planning process, there remains a need to complete the investigation of the feasibility of some key sites. One way to address this might be to maintain an on-going list of alternative sites to address uncertainties in site availability/feasibility.

a) The status of potential wetland sites is a moving target, with some sites still on the market for economic development and others, such as the St. Julien site, under remediation for other purposes which may or may not be compatible with wetland restoration. A list of alternative sites should be considered, particularly for wetland mitigation, to achieve the 51.6 acres prescribed for the Elizabeth River.

b) Some sediment sites (Scuffletown Creek, Money Point) also have alternate sources of potential funding which may remove them from the list of sites available for mitigation of this project, as also discussed previously. Alternative sites which could be mentioned include the Copper Slag and Scotts Creek sites which Elizabeth River Project has identified previously (not in the Southern Branch), and a Norfolk Steel site in the Southern Branch.

Response: During the development of the mitigation plan numerous alternative wetland, sediment, and oyster mitigation sites were considered. You have mentioned some of these sites. These alternative sites, and others which surface between now and the time

the mitigation plan is constructed, will be maintained on an on-going list of feasible alternatives. In the event that certain sites must be replaced in the mitigation plan, further feasibility investigations of these alternative sites will be conducted during the advanced design phase of project development.

Comment: c) Regarding the feasibility of the Wycoff and Republic cleanup sites, The Elizabeth River Project this past summer contracted with Virginia Institute of Marine Science for additional sampling data (attached). In addition, US EPA has secured additional data for Wycoff that should be used to calculate the acreage of this site (25 samples, visual interpretation attached).

Response: Field sampling data and other additional pieces of information regarding the proposed sediment clean-up sites will be obtained or may become available between now and the time final design is completed. During the final design phase, this new information will be used to more precisely calculate the acreage of all the proposed sediment clean-up sites.

Comment: d) Figure IV-8, Mitigation Site, Southern Branch, Elizabeth River, shows the Republic sediment cleanup site inaccurately (S2). Should be moved to the north.

Response: Figure IV-8 will be revised.

Comment: **Finally, there are several issues that were not addressed during the mitigation subcommittee deliberations which have bearing on the assessment of environmental impacts and the viability of the mitigation plan.**

1) We do not recall any discussion with the subcommittee regarding mitigation for the impacts of dredging 3.7 million cubic yards of Elizabeth River bottom to create an access channel to the port facility. This dredging will result in the loss of a healthy river bottom community from the initial dredging and maintenance dredging over time. As a result, the mitigation plan should address these losses, which we understand to equate to more than 120 acres not currently mitigated.

Response: The Mitigation Subcommittee and NEPA Committee meeting minutes from as early as October 24, 2001 document discussions of the access channel. Dredging for the access channel and the cell construction is discussed extensively in Section IV of the EIS (Environmental Consequences) under every major resource category. These impacts are not permanent and dredged bottom areas will recover fairly rapidly once the dredging is completed. While some changes in benthic community populations may occur, this is not necessarily seen as an adverse impact. For this reason, dredging alone does not have its own compensatory mitigation plan. The recommended mitigation plan does, however, provide bottom habitat, water quality, and fisheries habitat benefits in the form of cleaned sediments, restored wetlands, and restored oyster reefs. An analysis of the impacts of dredging on essential fish habitat was included in the Draft EIS and will be expanded on in the Final EIS.

Comment: 2) Regarding impacts during construction and impacts from on-going port operations, our recommendations include:
a) State-of-the-art controls to limit impacts related to suspended sediments and dissolved oxygen during the construction of the cells, and monitoring of the same, as this activity will suspend a large amount of sediments.

Response: The Corps and VPA will work with VDEQ during development and acquisition of the Virginia Water Protection Permit to determine practical and feasible methods of reducing water quality effects related to dredging.

Comment: b) The Environmental Impact Statement was insufficient in assessing specific impacts to air and water quality after construction, during long-term operation of a port with its anticipated increases in shipping and trucking. (It is our understanding that an additional Environmental Impact Statement is planned by the port authority when design issues are more developed). Maximum, state-of-the-art storm water and air emission controls, and maximum pollution prevention practices to reduce emissions and discharges, should be incorporated into design of the port facility to reduce impacts for the Mainstem, one of the more ecologically healthy areas of the river. The Elizabeth River Project commends the Virginia Port Authority for its progress with implementing innovative storm water and pollution prevention practices at its other facilities as a Model Level River Star and would hope to serve an advisory role to the Port Authority in its achievement of model environmental protection during port operations.

Response: With respect to air quality impacts associated with port operations, emissions estimates were completed and documented in the Draft EIS accounting for anticipated increases in shipping, trucking, and the operation of other port related equipment. Since the port facility will be located in an ozone nonattainment area, emissions of VOC and NOx are of particular importance. Recognizing the long planning horizon associated with this project (Phase I and Phase II port operations are not anticipated until 2017 and 2050, respectively), the estimated air pollutant emissions documented in the draft EIS, which are based on currently available emissions data and models for marine vessels, nonroad engines, on-road vehicles (trucks), and locomotives, should be considered preliminary estimates and are believed to overstate actual facility related emissions that will occur during the operation of the port. Actual long term emissions from the port should be lower than the documented emissions due to future advances in engine efficiency, pollution control technologies, and fuel quality. Future refinement of the emissions estimates for the operational phases of the port are expected to be documented in a supplemental EIS to be prepared in conjunction with the development of preliminary engineering and design data.

Additionally, the project is required to comply with the general conformity regulation since it is a proposed federal action in a nonattainment area. As such, a conformity determination is required to demonstrate that the project will conform to and not interfere with the provisions of a new State Implementation Plan (SIP) to be established by the Virginia Department of Environmental Quality (VDEQ) for the Hampton Roads area. The pending SIP is expected to establish an emissions budget for the regional area and

define pollution reduction measures as necessary to achieve and maintain attainment with the ozone standard. Notwithstanding the above, the VPA expects to continue its current voluntary emission reduction programs and consider new ones aimed at reducing emissions and air quality impacts from its facilities.

Comment: a) As with wetland and sediment sites, it is advisable to identify specific, potential habitat restoration areas in the Elizabeth River for oyster and/or clam restoration. One spot that should be considered is the sand flat immediately south of Amerada Hess and adjacent to the Elizabeth River Terminals wetland restoration site. This site would support a landscape approach. Other sites could include former Baylor grounds.

Response: As mentioned above, in the event that certain mitigation sites must be replaced in the mitigation plan, further feasibility investigations of alternative sites, such as those you have recommended, will be conducted during the advanced design phase of project development.

Comment: b) Your draft plan may have under-estimated costs of 3-D oyster reef construction in the Elizabeth River (costs estimated at $100,000 per acre, p. 64, B. Mitigation Analysis). VA Marine Resources Commission's current estimate for construction costs, using shucking-house oysters, is $191,000 per acre ($1.91 per bushel, with 100,000 bushels needed per acre), plus seeding costs.

Response: The estimated costs for oyster reef restoration ($150,000 acre: $100,000 for reef structure and $50,000 for seeding) are presented in Appendix B, page 64. This cost estimate is based upon USACE oyster restoration projects recently constructed in the Great Wicomico River (2004/2005), Tangier/Pocomoke Sound (2002), and the Rappahannock River (2001/2002). This cost estimate will be refined during the advanced design phase of the project.

Comment: c) Funding should be identified and programmed for long-term adaptive management of the mitigation reefs, as needed.

Response: Both monitoring and adaptive management are identified in Appendix B as part of the project and have been included as part of the project costs.

Comment: 4) The Elizabeth River Project supports the recommendation of the Cumulative Effects Assessment by Larry Canter (April 2004), p. 206, for the Corps to take the lead in "establishing a Hampton Roads Area Environmental Management Committee" to review monitoring information about the 17 referenced projects with related cumulative impacts, for the purposes of adaptive environmental management.

Response: There are a number of agencies, groups, and committees that currently meet on a regular basis, review monitoring information, and adapt management practices that influence cumulative effects in the Hampton Roads area and the Elizabeth River basin. For example, the Hampton Roads Planning District Commission's (HRPDC) Physical

and Environmental Planning Department (PEP) provides a forum for the local governments to exchange information and to develop cooperative initiatives that address regional environmental issues and opportunities, as well as state and federal regulations. The Department's staff undertakes technical and policy studies and provides technical assistance to the member localities and others. With a current emphasis on water resource management, the Department also encompasses general physical planning activities such as comprehensive planning and ordinance development, solid waste, recreation, and open space and linkages to state and federal agencies and programs. The Physical and Environmental Planning Department also coordinates comprehensive environmental education and outreach to the Hampton Roads community. The Corps and VPA will coordinate with HRPDC to determine if a "Hampton Roads Area Environmental Management Committee" should be developed in this, or some other, context.

**Wetlands Watch (7 November 2005)**

Comment: The proposed project is really two separate ones – CIDMMA expansion and Virginia Port Authority (VPA) terminal construction. However, it is difficult to tell from this draft EIS which proposed activity is covered and which is not. The text deals with the CIDMMA and port operation, using the port operation to establish the national economic development threshold leading to a justification for the combined project. Yet, it is clear that the actual port construction will require a subsequent permit for undetermined activities not mentioned in this draft EIS. There needs to be a "bright line" between the proposals in this draft EIS and a subsequent permit application by VPA.

Response: The EIS is intended to cover both purposes, not just one purpose.

Comment: The rationale for the CIDMMA expansion is to provide additional dredge material disposal capacity as well as a platform for a VPA port. However, the Locally Preferred Plan (LPP), the one preferred by the VPA, provides only three years or 12 mcy of additional capacity. While marginally more costly, the Tentatively Proposed plan (TPP) provides 17 years or 67 million cubic years (mcy) of additional capacity. We believe that, if the project goes forward, the Tentatively Proposed Plan should be the one followed.

Response: The Tentatively Proposed Plan would likely not be authorized by Congress due to the fact that it recommends construction twenty-three years into the future. The LPP allows for additional study, that would have more centainty associated with it, as the CIDMMA approaches its capacity. This is why the LPP is recommended.

Comment: If the LPP is chosen, the useful life of the CIDMMA will be exhausted during the operation of the port facility and the future dredging operations in the port of Norfolk would fall within the time line for analysis of this draft EIS. In that case the impacts of the future disposition of dredge spoils after 2028 should be addresses in the EIS.

Response: Our analysis allows for the future disposal of suitable material at the EPA approved Norfolk Ocean Disposal site. Unsuitable material, when encountered would be disposed of in an upland site approved for such use. To attempt to identify today where those sites would be in twenty-three years, would be impossible.

Comment: Finally, because the expansion of the CIDMMA is the primary reason for this EIS, the proposed capacity increases for both the LPP and TPP should be prominently noted with in the Executive Summary and the body of the EIS.

Response: The suggestion will be included in the summary.

Comment: The draft EIS mentions briefly the dredging of an access channel to 52 feet, removing 3.7 mcy. This access channel appears to be outside of the footprint of the expansion. This project is not mentioned as part of the discussion of environmental impact and was not part of the discussion in the Mitigation Subcommittee when the

mitigation plan was discussed. If this access channel has not been accounted for in this draft EIS and its mitigation plan, it needs to be.

Response: The Mitigation Subcommittee and NEPA Committee meeting minutes from as early as October 24, 2001 document discussions of the access channel. Dredging for the access channel and the cell construction is discussed extensively in Section IV of the EIS (Environmental Consequences) under every major resource category. These impacts are not permanent and dredged bottom areas will recover fairly rapidly once the dredging is completed. While some changes in benthic populations will occur, this is not necessarily seen as an adverse impact. For this reason, dredging alone does not have its own compensatory mitigation plan. The recommended mitigation plan does, however, provide bottom habitat, water quality, and fisheries habitat benefits in the form of cleaned sediments, restored wetlands, and restored oyster reefs. An analysis of the impacts of dredging on essential fish habitat was included in the Draft EIS and will be expanded on in the Final EIS.

**Cumulative Effects Assessment**

Comment: We are encouraged to see the inclusion of a comprehensive Cumulative Effects Assessment (CEA) in this draft EIS. The need for a robust CEA was a major objection from Wetlands Watch to the APM Terminal permit environmental assessment in 2003. This CEA is an improvement over that situation, but the CEA has limitations as noted with the lack of data on the other projects being evaluated. This CEA appears to run in parallel to the draft EIS, rather than being a driving force within it. There is no indication that the results of the CEA were included to make adjustments to the level of compensatory mitigation. As the CEA states on page 194,

> **"It is stressed that no specific mitigation plan for cumulative effects has been addressed by the Norfolk District.** Rather, attention has been given to identifying mitigation options for the direct effects of the eastward expansion of the CIDMMA."

Response: The DEIS does not present a mitigation plan to compensate for all past, present, and reasonably foreseeable future actions within the geographic area of interest. As evaluated in Step 10 of the CEA, and presented in Appendix B of the DEIS, the proposed mitigation plan has been developed to compensate for the cumulative impact of the proposed project. The specific components of the mitigation plan were not developed until after the CEA was completed and had been evaluated by the Mitigation Subcommittee. Appendix 'B' of the DEIS discusses in detail the methodology used to determine the level of mitigation needed to compensate for the ecological impacts associated with the fill of 580 acres of subaqueous bottom. In this sense, the mitigation plan reduces contributions to cumulative effects to the greatest extent practicable.

Comment: Having stated that, the CEA also seems to say that one could consider the direct impact mitigation proposal as also addressing the cumulative impacts:

"However, because cumulative effects can occur on the same resources and ecosystems subject to expansion cell-related direct effects, the potential mitigation options identified to date could be considered by collaborating agencies in a program focused on cumulative effects mitigation."

Response: No one agency or entity bears the responsibility to compensate for the cumulative impacts associated with multiple actions that have occurred or will occur in a given geographic area. All those who have contributed (or will contribute) incrementally to cumulative impacts bear some responsibility for developing appropriate mitigation. Programs, such as the Virginia Coastal Resources Management Program developed under the direction of the Federal Coastal Zone Management Act of 1972 and administered by the Virginia Department of Environmental Quality, provide an avenue for federal, local, and state agencies to collaborate on the review of development projects and the mitigation plans associated with those projects. The Joint Permit Application process and the Environmental Impact Statement review process are vehicles for this collaboration and evaluation of multiple projects within the Chesapeake Bay Watershed.

The Joint Permit Application is used to apply for permits for work in the waters of the United States (including wetlands) within Virginia. Such work may include construction, dredging, filling, or excavation in the waters or in wetlands. These applications are used to apply for permits from the Norfolk District Army Corps of Engineers (Corps), the Virginia Marine Resources Commission (VMRC), the Virginia Department of Environmental Quality (DEQ), and local wetlands boards. Comments on these applications and associated compensatory mitigation are solicited from the U. S. Fish and Wildlife Service, the National Marine Fisheries Service, the EPA, the Virginia Institute of Marine Science and many other state, federal and local agencies. In addition, these agencies publish guidance documents to assist with the development of compensatory wetland mitigation plans. Other programs addressing cumulative impacts include the Elizabeth River Trust Fund, the Elizabeth River Monitoring Committee, and the Elizabeth River Sediment Remediation Partnership.

Comment: We do not agree that the direct impact mitigation proposals are sufficient to deal with cumulative impacts. We see the statement quoted above as speculative, saying that the direct impact options "could be considered…in a program focused on cumulative effects mitigation," and stating that a "program" is needed to deal with cumulative effects, beyond the direct impacts mitigation.

Response: No one agency or entity bears the responsibility to compensate for the cumulative impacts associated with multiple actions that have occurred or will occur in a given geographic area. All those who have contributed (or will contribute) incrementally to cumulative impacts bear some responsibility for developing appropriate mitigation. Programs, such as the Virginia Coastal Resources Management Program developed under the direction of the Federal Coastal Zone Management Act of 1972 and administered by the Virginia Department of Environmental Quality, provide an avenue for federal, local, and state agencies to collaborate on the review of development projects and the mitigation plans associated with those projects. The Joint Permit Application process and

the NEPA review process are vehicles for this collaboration and evaluation of multiple projects within the Chesapeake Bay Watershed.

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Comment: Projects of this magnitude negatively impact a finite and limited environmental resource and just as with any resource, this value increases with scarcity. To address this increased value, we suggest that it is entirely appropriate to levy a "cumulative effects surcharge" in addition to the direct effects mitigation. If more than lip service is to be paid to cumulative effects, future projects of significant magnitude will have to, through mitigation, produce a significant net positive environmental benefit. For example, this might be done by financing essential monitoring plans, or additional landscape-based restoration or preservation, or some percentage of mitigation above that done to offset direct effects.

Response: As addressed above, a "cumulative effects surcharge," if adopted, would have to be borne by multiple parties and stakeholders in the watershed. No such surcharge, or methodology to equitably distribute a surcharge, currently exists. In addition, costs associated with adaptive management and monitoring have been budgeted into the $50.2 million compensatory mitigation plan.

Comment: Indeed, the draft EIS mentions the need for additional steps to be taken beyond mitigation for direct effects. At page IV-74, the draft EIS states,

> **"In the absence of appropriate monitoring and mitigation efforts, potentially significant adverse cumulative effects could occur on water quality, benthic habitat, and protected species and critical habitat."**

Response: As mentioned previously, the CEA was completed prior to finalizing the mitigation plan presented in the EIS. Chapter 8 of the CEA presents a summary of the mitigation options under consideration but does not present the final recommended plan. It is the conclusion of the EIS that "appropriate monitoring and mitigation" has been

collaboratively developed with the input of multiple stakeholders and is proposed to mitigate potentially significant adverse cumulative effects.

Comment: There is no mention of a permanent monitoring effort in this draft EIS to insure that the mitigation efforts are successful. The wetlands mitigation narrative mentions targets for survival of plantings and accounts for the need for monitoring on an occasional basis, but no formal proposal to perform that monitoring is made. For the oyster reef and sediment mitigation proposals, there is likewise no monitoring proposed.

Response: As discussed in the mitigation appendix (EIS, Appendix B), monitoring of all mitigation projects will take place. The details of the monitoring plan component will be developed as part of the Virginia Water Protection Permit from DEQ, and the Marine Resources Commission permit, during the PED phase of the project. Significantly more detail will be required for each component of the mitigation plan as part of the permitting process.

Comment: Without a comprehensive monitoring program, adequately funded above and beyond the direct impact mitigation proposed, the mitigation efforts could fall short. The danger in this is stated clearly in the draft EIS, again at page IV-74,

> **"However, other cumulative effects, such as impacts to aquatic resources, if not successfully mitigated, would be considered in a negative context."**

Response: See responses above.
Comment: If this happens, this project would produce "potentially significant adverse cumulative effects," using the language of the draft EIS. It is our belief that monitoring should be an integral part of the mitigation plan.

Response: See responses above.

Comment: We also feel that the call in the CEA for a 'Hampton Roads Area Environmental Management Committee' is an excellent on and ask that it, and the funds necessary for its operation over the life of this project, be made a part of the final EIS.

Response: As mentioned previously, there are a number of agencies, groups, and committees that currently meet on a regular basis, review monitoring information, and adapt management practices that influence cumulative effects in the Hampton Roads area and the Elizabeth River basin. For example, the Hampton Roads Planning District Commission's Physical and Environmental Planning Department (PEP) provides a forum for the local governments to exchange information and to develop cooperative initiatives that address regional environmental issues and opportunities, as well as state and federal regulations. The Department's staff undertakes technical and policy studies and provides technical assistance to the member localities and others. With a current emphasis on water resource management, the Department also encompasses general physical planning activities such as comprehensive planning and ordinance development, solid waste, recreation, and open space and linkages to state and federal agencies and programs. The

Physical and Environmental Planning Department also coordinates comprehensive environmental education and outreach to the Hampton Roads community.

Comment: We applaud the use of Landscape-based mitigation planning. However, as noted in the mitigation analysis of the EIS:

> "Oyster reef restoration has more risk associated with it than the other selected options. To reduce this risk, a monitoring and adaptive management program will be implemented to maintain the restored oyster reefs over time."

We see no provision in the mitigation cost estimate for this ongoing "adaptive management program." We recognize that adjustments to reef acreage were made based on "risk-weighting," however, project effects are permanent; the mitigation must be no less permanent. Accordingly, the Corps should require a performance bond or other financing tool, to cover the costs of the adaptive management program for the life of the project.

Response: Adaptive management will be part of the oyster reef component of the mitigation plan. This is discussed on pages 36, 50, and 64 of the mitigation appendix (EIS, Appendix B).

**Sediment remediation**

Comment: Contaminated sediment is one of the largest problems within the Elizabeth River and we are glad to see that sediment clean up is a significant component of the mitigation plan. However, two concerns we have are the cost estimate and the number of acres to be mitigated.
The mitigation costs are based on the average of three remediation strategies. This would be appropriate if the target sediments were "average." However, the targeted sediments are the "hotspots" of the Southern Branch, meaning that they are likely to require the more expensive of the remediation options. In addition, there may be significant costs associated with sampling, testing and characterization of the contaminated sediments that don't appear to have been accounted for.

Response: The costs developed for the sediment clean-up are preliminary cost estimates based upon the best available information we have at this time. These costs will be refined during the PED phase. The costs that were used are the average costs for three most common and widely used methodologies for remediating contaminated sediments. The costs are also comparable to a recently developed Feasibility Study and Conceptual Remedial Design for "Money Point," a section of the industrial waterfront on the Southern Branch. The cost associated with the sampling, testing, characterization, and monitoring of these sites have been incorporated into the current plan estimates.

Comment: The mitigation plan for the CIEE specifies the clean up of 68 acres at a cost of $33 million, but claims credit for remediation of 411 acres. Although we understand the logic behind stating that the areas adjacent to the cleanup will also reap benefits, it is misleading to claim that benefit. Remediation is commonly understood as an active process. The simple passage of time has remediation power in some instances, yet one

can't take credit for doing nothing. If we agree that the HEA is a valid approach for determining remediation acreage, there is no need to "pad the numbers." We suggest and support simply footnoting why there is a discrepancy between the acres impacted and the acres remediated.

Response: Bottom sediment contamination has existed in the Elizabeth River for over 100 years and the simple passage of time has had no significant or observable effect on reducing these levels of contamination. Because tidal currents are relatively slow, and freshwater influx is low due to canal locks on the upper river, the physical nature of the Elizabeth is such that little flushing of contaminants occurs. Contaminants are essentially "trapped" in the river system. Appendix B of the EIS (pages 28-30, 34) explains how 68 acres of remediation in the most grossly contaminated areas will contribute to the restoration of a larger portion of the river (411 acres). This is a reasonable assumption given that sediments are resuspended and transported continually throughout the system and that the "hotspots" provide a continual source of contaminated material. Appendix B of the EIS provides a thorough discussion of the correlation between the 67 acres "remediated" and the 411 acres "restored."

Comment: We also feel strongly that the monitoring issue raised in the CEA has applicability here. There is great uncertainly about the nature of the "hot spots" being targeted. Indeed, they may only be fully characterized when mitigation efforts are commenced. There is also a need to ascertain if the assumptions in the multiplier for actual acres treated are borne out in reality. Without monitoring, there will continue to be uncertainty in future CEA's due to a lack of real world data – data that can only be provided by monitoring.

Response: While preliminary investigations indicate the severity of contamination at the proposed sites, they will be more thoroughly evaluated and characterized during PED to look at the specific extent and nature of the contamination. As explained above, no "multiplier" was used to calculate the 411 acre restoration area. The nine most highly contaminated sites in the Southern Branch of the Elizabeth River lie between the Jordan Bridge and Money Point. The acreage of the Southern Branch between these two points is 411 acres. Remediation efforts at two of the sites are underway. Remediation of the remaining seven sites is proposed in the mitigation plan.

Just as the toxic levels of PAH's from these sites have contributed to documented water quality degradation and the deformity and toxics burdens of commercial and recreational finfish species and crustaceans, remediation of the documented toxic sediment within this 411-acre area will serve to improve not only the benthic environment but the health of the entire estuarine food web. Upon completion, remediation of all known toxic "hot spots" will have occurred. To accommodate the remediation efforts, the mitigation plan proposes the construction of oyster reefs and salt marshes along the shoreline and in the waters adjacent to these areas to provide habitat for the anticipated growth in the aquatic species population. Costs associated with monitoring this section of the River have been included in the mitigation plan budget. A comprehensive monitoring plan will be completed in the Preconstruction, Engineering and Design (PED) phase of the project.

# APPENDIX L

# COMMENTS AND RESPONSES FROM THE FINAL ENVIRONMENTAL IMPACT STATEMENT COORDINATION

**United States Environmental Protection Agency (30 June 2006)**

Comment: The FEIS has adequately assessed the affected environment and environmental consequences of this project; however, EPA continues to have concerns regarding environmental impacts anticipated in the construction of the project. Our concerns are based primarily on the success of the mitigation in compensating for the environmental loss. As described in the mitigation plan developed for the FEIS, the mitigation was based on a habitat evaluation approach that assesses the functional productivity lost due to the projects impacts. This approach concluded that approximately 487 acres of mitigation made up of a mix of wetlands restoration and conservation, oyster reef restoration and sediment clean up and restoration would provide a large scale ecosystem benefit for the affected area. EPA was a part of the mitigation committee and agrees that this plan goes a long way in mitigating for the lost environmental resources due to this project. To assure that the mitigation is successful EPA recommended in the comments to the DEIS that an adaptive management approach be implemented to assure the success of the mitigation plan. In the FEIS the Corps has agreed to this approach. We would further recommend that along with the VDEQ and VMRC that any other interested resource agency be invited to participate in the monitoring and adaptive management approach. In addition any approach that would increase the mitigation for this project would be strongly recommended. For example if the cost of sediment remediation could be lowered by allowing the sediment to be placed in the Craney Island expansion cell it should be pursued even though now prohibited by law. Furthermore in light of the enormous economic benefits that will be realized by the port the current mitigation costs are not unreasonable. Additional acres of conservation should be considered.

Response: As mentioned in our previous response(s), and explained in the mitigation appendix (EIS, Appendix B), mitigation plan components will be monitored following implementation, and adaptive management will be implemented to assure the production of ecological benefits. Specific details regarding monitoring and adaptive management will be developed during the PED Phase in consultation with VDEQ, VMRC, and other interested resource agencies, as part of the permitting and continued detailed development of the mitigation portion of the project. In connection with the advanced engineering and design of the mitigation plan components, every effort will be made to both reduce costs and maximize ecological benefits over the landscape, including the incorporation of adjacent conservation/buffer areas where applicable.

**United States Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service (3 July 2006)**

Comment: We do not agree with the ACOE's determination that there is little or no EFH in the project area due to degraded habitat and anthropogenic impacts. Nor can we concur that the adverse effects on EFH species from the loss of 580 acres of aquatic habitat and the subsequent construction of a container terminal will be temporary and minimal. Habitat characteristics of the CIDMMA expansion area, including salinities, depths, sediment types, water quality, and benthic community, indicate that this area is EFH for summer flounder, black sea bass, red drum, bluefish, Atlantic butterfish, and windowpane flounder. The exclusion of windowpane flounder from consideration in the EFH assessment based upon the ACOE's designation of the sediments as muddy clays is not appropriate as the designated EFH for windowpane flounder includes muddy bottoms, and the salinities and depths are consistent with the EFH defined for this species. The benthic organisms and forage species found at CIDMMA expansion site are components of the diet of windowpane. Also, windowpane have been caught in sampling done in the project area.

Response: While acknowledging that the project area contains some habitat that meets the definition of EFH, we refer the reviewer to Sections III.1.1 (Water Quality) and III.1.4 (Aquatic Biota), of the FEIS for a detailed description of water, sediment, and biotic community characteristics within the project area. The information presented therein describes the area as having more than a modest degree of habitat degradation. Reviewing agencies such as VDGIF, VMRC and VDEQ, those most knowledgeable of current local habitat conditions within the project area, have not disagreed with the FEIS' characterization of the project area as being degraded. This characterization is based on data collected by these agencies and other investigators going back over several decades. To consider the project area as being part of a healthy ecosystem that is critical to EFH is not supported by these data.

As part of an evaluation of EFH for the proposed Pinners Point Connector, VDOT contracted with VIMS to conduct sampling of the Elizabeth River approximately 1 mile southwest of Craney Island. The EFH species of concern made up a very small fraction of the total fish caught (<0.01 percent). The investigation showed that the project area is typically inhabited by sciaenids, such as spot (*Leiostomus xanthurus*), Atlantic croaker (*Micropogonias undulates*), and weakfish (*Cynoscion regalis*). Other species that comprised over 1 percent of the total catch included: hogchoker (*Trinectes maculates*), spotted hake (*Urophycis regia*), and Atlantic silverside (*Menidia menidia*). However, the most abundant species at over 50 percent of the total catch were bay anchovies (*Anchoa mitchilli*).

Geer et al. (2000) and Lowery (2000), based on results from trawl surveys from 1978 to 2000, found the top five dominants in the vicinity of CIDMMA included, in order, bay anchovy, spot, Atlantic croaker, hogchoker, and weakfish. These 5 species accounted for approximately 93 percent of catch. Blue crabs accounted for 0.28 percent of the total catch in this area of the Elizabeth River or about 184 crabs caught in 91 trawls (35

present trawls – Year 2000, and 51 historic trawls – Years 1979 to 1985). These results indicate that the project area is not preferred habitat for EFH species.

According to NMFS, the benthic organisms and forage species found at the CIDMMA expansion site are components of the diet of windowpane flounder. The USACE, Norfolk District, funded VIMS to conduct a study of the benthic community within the project area and to determine the impact of the eastward expansion of the CIDMMA (Seitz and Lipcius, 2002). This study is described in Section III.1.4.5 (Benthos) of the FEIS. Sampling was accomplished at 41 deep sites (greater than 4 feet deep) in the CIDMMA area, 40 other deep sites (deep zones) in the general area of the CIDMMA and Lafayette River system, and 40 shallow (less than 4 feet deep) subtidal sites (shallow zone) in the area. Based on these data, the overall abundance and standing stock, respectively, for each of those habitats was generated, and then the potential loss of biomass due to the eastward expansion of the CIDMMA was estimated as a percentage of the abundance and biomass of the entire CIDMMA-Lafayette River system. From the abundance and biomass loss estimates, estimates for mitigation options were developed.

The following conclusions were generated from this VIMS study (Seitz and Lipcius, 2002):

- The area of the CIDMMA eastward expansion had significantly lower bivalve density, diversity, and abundance than the adjacent deep-water habitats or shallow-water habitats in the Craney Island-Lafayette River (CI-LR) system. Bivalve density was significantly lower in the "Craney Island" and "Deep" zones than in the "Shallow" zone. Bivalve density in shallow-water habitats was nearly 10-fold higher than that in the area to the east of the CIDMMA. Diversity in terms of species richness was lowest in the "Craney Island" zone, which was significantly lower than that in "Deep" habitats. Only four species of bivalves were collected in the "Craney Island" zone, whereas seven species were collected in the adjacent deep habitats, and nine species were in the shallow zones.

- The CIDMMA eastward expansion zone also had significantly lower mean bivalve biomass than the shallow-water habitats in the CI-LR system. Biomass in the "Deep" zone was lower than in the shallow-water habitats and higher but not significantly different from that in the "Craney Island" zone. Since bivalve density in shallow-water habitats was nearly 10-fold higher than that in the CIDMMA expansion area, and the mean bivalve size was larger, the resultant biomass was much greater. The clams that comprised the biomass in the shallow zone were typically large individuals of *Macoma balthica* and *Tagelus plebeius*. Although some *Tagelus* and *Mercenaria* were present in the "Craney Island" zone, they were usually smaller individuals (juveniles) with low biomass.

- Within the CI-LR system, it was estimated that there were approximately 445 million bivalves. Of these, only about 5 percent (19 of 445 million) resided

> within the CIDMMA eastward expansion area. Bivalve biomass within the expansion area also constituted a small fraction of the biomass within the general area. Within the CI-LR system, it was estimated that total bivalve biomass was approximately 37,986 kg ash free dry weight. Of the total biomass, only about 0.56 percent (215 of 37,986 kg) was represented in the CIDMMA expansion area. Because of this extremely low bivalve biomass and because the bivalves were very small juveniles, the CIDMMA expansion area is not likely to be a significant feeding ground for the blue crab or demersal fish.

While the USACE acknowledges that there are likely to be some impacts to fisheries in the expansion area, these impacts have been taken into consideration in the mitigation plan by providing bivalve and wetland restoration and impaired sediment remediation in the Elizabeth River. In addition, approximately 18 acres of rip-rap will be placed around the perimeter of the expansion cell, providing additional substrate for benthic species and structure for forage species. The benefits of the proposed rip-rap are discussed in Part IV, Section 1.4.1.3 Benthos, in the FEIS.

Comment: Because the CIDMMA expansion and Phase I of the container construction are expected to take five years to construct, and because the facility and fill will be permanent, we cannot agree that all of the impacts of the proposed project on EFH will be temporary. Elevated levels of suspended sediment will occur within the vicinity of the project area for the expected five years of construction. Such suspended sediment levels can reduce dissolved oxygen, can mask pheromones used by migratory fishes, and can smother immobile benthic organisms and newly settled demersal juvenile fish. Further, the 580 acre fill will be permanent and the facility will need maintenance dredging on a regular basis to maintain the access navigation channel. This will create long-term potential adverse impacts on EFH due to suspended sediment level increases from the increased shipping traffic and the maintenance dredging activities.

Response: As mentioned in our previous response, the USACE acknowledges that the proposed project will result in some permanent impacts. As regards water quality impacts to EFH, the FEIS documents that water quality will be affected by localized increases in turbidity and total suspended solids during dredging, cell construction, and wharf construction. However, we consider this condition to be temporary because the dredging operation will cease at the end of project construction. We have also documented that dredging will be intermittent and will not be occurring continuously over the construction period. Similarly, we agree that maintenance dredging of the access channel will occur at regular, albeit not frequent, intervals, and only within isolated shoal areas that form between maintenance cycles. As explained in the FEIS (Section IV.1.1.2), best management practices and appropriate dredging equipment will be employed. As a result, the anticipated increase in suspended sediment from dredging is expected to fall within the range experienced by the Elizabeth River under natural climatic events and hydrodynamic conditions. Because of the localized and temporary nature of water column turbulence and the tolerance of resident fish species to naturally elevated levels of suspended sediments, feeding success of sight-feeding fish is not expected to be

impacted to any appreciable extent. Maintenance dredging of the access channel will be conducted using a hydraulic dredge and pumped directly into CIDMMA. This type of dredging will produce the least amount of suspended sediment.

The construction of the eastward expansion dikes is expected to produce a much smaller sediment plume than the dredging portion of development as the fill will be composed of much coarser grained material that is less likely to be suspended and/or remain in suspension.

Additional water quality assessments and sediment evaluations will be conducted during the PED Phase to ensure that any effluent discharged meets prescribed water quality standards. In addition, a dredge plan will be developed during the PED Phase to minimize the potential effects of a suspended sediment plume during the construction of the foundation, access channel, and cell dikes. The dredging will be accomplished using equipment that minimizes turbidity plumes to the greatest extent practical.

Comment: The permanent loss of 580 acres of benthic habitat supplies a food source for both federally managed species and species managed by the Atlantic States Fisheries Commission such as striped bass and weakfish. According to the information in the FEIS and USFWS Planning Aid Report, the benthic community at the CIDMMA expansion area includes *Neries succinea*, *Sabellaira vulgaris*, and *Ampelisca abdita*. *Ampelisca abdita* has been reported to be important to the diets of winter flounder, windowpane flounder, juvenile scup, juvenile weakfish, striped searobins, juvenile black sea bass, and juvenile silver hake, all of which have been documented to occur around the CIDMMA. *Paraprionospio pinnata*, the second most abundant benthic invertebrate species collected adjacent to CIDMMA by Dauer and Ewing (1986), and *Neries succinea*, the seventh most abundant species, were found to prey species of spot in the Chesapeake Bay.

Response: While Dauer's various studies on the benthic communities in the Elizabeth River have shown that the CIDMMA expansion area supports an assemblage that includes species that are prey to Federally-managed fish stocks, they have also revealed that the communities are lower in density, diversity, and abundance than those documented from other areas of the lower Chesapeake Bay where anthropogenic impacts are less pronounced. These findings are supported by the results of the Benthic Biological Monitoring Program of the Elizabeth River watershed (Section III.1.4.5 of the FEIS) and the Seitz and Lipsius (2002) study. See discussion of Seitz and Lipcius (2002) above in the response to the first comment. In addition, trawl data have indicated a low percentage (<0.01) of EFH species of concern in the project area. This suggests that this area is poor forage and/or poor physical habitat for these species.

Comment: The Elizabeth River portion of the project is an important nursery area for many commercial and recreational species including spot, Atlantic croaker, Atlantic menhaden, weakfish, striped bass, black sea bass, and summer flounder. The most intensive use for spawning is by forage fish including bay anchovy and Atlantic silversides. Bay anchovy has been shown as a prey species for windowpane flounder, for striped bass, and weakfish. Both species are also important to the diets of summer

flounder. Juvenile spot and Atlantic menhaden are also components of the diets of weakfish and bluefish, summer flounder, and spotted hake. As a result, we cannot consider the loss of this habitat to have been minimized or be a minimal adverse effect on EFH, federally managed species, or other resources of concern to NMFS.

Response: The FEIS acknowledges that the Elizabeth River provides spawning and nursery habitat for some commercial and recreational fish. However, the river's watershed has been highly urbanized, and the waterfront has been heavily industrialized for decades. Water and sediment quality data discussed in the FEIS (Section III.1.1) reflect the influence of intensive watershed development on the river's habitat. While some of the river's upper reaches are less subject to pollutant input and, therefore, more likely to contain spawning and nursery areas of modest quality, the CIDMMA expansion area is not. Data are presented in the FEIS that show the proposed expansion area to have problems with nutrient enriched water, sediment contamination, bottom community health, dissolved oxygen, and TBT levels. Despite these conditions, some fish species may continue to utilize the area for spawning and nursery activities, but the overall poor quality of the habitat would likely result in most commercial and recreational species seeking out areas of higher quality habitat.

The proposed mitigation plan includes restoration of wetlands and oyster/clam beds as well as remediation of contaminated bottom sediments in the upstream reaches of the river where spawning is likely to take place. These measures have been incorporated into the mitigation plan specifically to replace the loss of potential spawning area due to the expansion and to provide higher quality nursery habitat in the Elizabeth River.

Comment: The Elizabeth River has been designated as a Confirmed Anadromous Fish Use Area (CAFUA) by the State of Virginia. Species found in the area include alewife, American shad, blueback herring, hickory shad, striped bass, and white perch. The upstream portions of the Elizabeth River and its tributaries provide spawning and nursery habitat for these species. Disturbance of the sediments caused by dredging could create undesirable turbidity levels and can mask pheromones used by migratory fishes, impeding their migration. Buckel and Conover (1997) in Fahey et al. (1999) report that diet items of juvenile bluefish includes *Alosa* species such as these. These species are also prey items of summer flounder and windowpane flounder. Thus, activities that adversely affect the spawning success and quality for the nursery habitat of these anadromous fish will adversely affect the EFH for juvenile bluefish by reducing the availability of prey items. Therefore, dredging operations should take into account these evaluations and avoid impacts on anadromous fish migration and spawning and the associated impacts on EFH and the prey species of federally managed species.

Response: We agree that dredging operations should take into account spawning in the Elizabeth River by anadromous fish. Spawning habitat for these species is found in the upstream reaches of the river and not in the vicinity of the proposed CIDMMA expansion. As previously discussed above, dredging and construction operations are not expected to cause turbidity levels exceeding the range observed in the Elizabeth River. In addition, no FEIS comments were received from the Virginia Department of Game and

Inland Fisheries (VDGIF), Virginia Marine Resources Commission (VMRC) or the Virginia Institute of Marine Science (VIMS) concerning CAFUA in the project area. The following language was included in Part IV, Section 1.4.1.1 Fish and Essential Fish Habitat:

According to the VDGIF, designated anadromous fish spawning and nursery grounds occur 15-20 miles up the James River from the proposed project area. Salinities in the Elizabeth River in the area of the proposed expansion range from 16-22 ppt. Salinities of the tidal-fresh water areas of the lowest reaches of the CAFUA range from 0-0.5 ppt. Therefore, use of the proposed project area by anadromous fish, including Atlantic sturgeon, would only be as part of a migration corridor. Only a small area of the Lower James and Elizabeth River mouth at the location of the proposed access channel may experience temporary increased turbidity during dredging activities. Due to the size of the Elizabeth River and Lower James River mouths, this small area of minimal impact is not anticipated to hinder migration of anadromous fishes.

The following information was provided by VDGIF. According to this information, no Time of Year Restriction is in place for the Elizabeth River or areas in the James River downstream from the James River Bridge.

Virginia Department of Game and Inland Fisheries
Modifications to Recommended Instream Time-of-year Restriction (TOYR)
to Mitigate Potential Impacts Upon Anadromous Fish
March 3, 2006

- James River (designated reaches and tributaries)
  - below the confluence of Gray's Creek with the James River at Jamestown Island to the James River Bridge (Rt. 17): TOYR = February 15 through June 15 of any year
  - above this point to Bosher's Dam: TOYR = February 15 through June 30 of any year
  - above Bosher's Dam: TOYR = March 15 through June 30 of any year
  - Below the James River Bridge: No TOYR
- Rappahannock River (designated reaches and tributaries)
  - Below Rt. 360: TOYR = February 15 through June 15 of any year
  - Above Rt. 360: TOYR = February 15 through June 30 of any year
- York River (designated reaches and tributaries)
  - Below Rt. 33: TOYR = February 15 through June 15 of any year
  - Above Rt. 33: TOYR = February 15 through June 30 of any year
- Potomac River (designated reaches and tributaries)
  - Entire length: TOYR = February 15 through June 30 of any year (no change)
- Elizabeth River (designated reaches and tributaries)
  - No TOYR needed until further data collected

Comment: We recognize the efforts made to develop the proposed compensatory mitigation plan, but we remain concerned that all of the direct, indirect, individual, and cumulative impacts of the proposed project have not been addressed or adequately compensated. There is lack of detailed analysis and plans in the FEIS for all of the components of the mitigation and baseline data on the proposed mitigation sites. Therefore, it is not possible to assess fully the benefits of the proposed mitigation, its likelihood of success, and the consequence of lost and impaired habitat functions for a robust assemblage of living marine resources under NOAA authority.

Response: The loss of 580 acres of aquatic habitat related to the expansion of the CIDMMA and the subsequent port facility development and its effects on a wide variety of aquatic resources is discussed at length in the FEIS, the CEA, and the Mitigation Appendix in the FEIS. During the preparation and scoping of the EIS, the USACE did consider all of the direct, indirect, individual and cumulative impacts of the project. A comprehensive cumulative impacts assessment (EIS, Appendix C) was prepared identifying and evaluating 17 past, present, and reasonably foreseeable future actions in the Hampton Roads area. The mitigation plan, which includes wetlands restoration, sediment clean-up, and oyster restoration, was developed over 3 years with multiple stakeholders to provide compensatory mitigation for these impacts and losses. The mitigation plan components provide restored and improved nursery areas and habitat for EFH forage species as well as managed species.

The compensatory mitigation plan presented in the FEIS (Appendix B) was developed with input from a Mitigation Subcommittee consisting of representatives from 12 Federal and state agencies and 3 local interest groups. The NMFS was invited to participate in these discussion but did not attend. The committee convened on 15 occasions between June 2002 and May 2005. After much deliberation, sediment clean-up, oyster restoration, and wetlands restoration were identified as the closest in-kind compensatory mitigation to replace the lost ecological function of 580 acres of benthic habitat and the overlying water column and associated environmental impacts. During the initial phases of mitigation plan development, more than 100 different locations were evaluated in the initial screening of alternatives that ranged from oyster restoration, riparian buffers, artificial fish reefs, clam sanctuaries, fish passage, sediment clean-up, and submerged aquatic vegetation restoration. The USACE and VPA did not select the recommended mitigation plan, but, rather, the mitigation plan was developed collaboratively with the input of multiple stakeholders to fully compensate for the impacts of the project.

As discussed extensively in the mitigation appendix (Appendix B of the EIS), the HEA approach was developed and applied to this project with the input of multiple stakeholders over three years. The "public," in this case represented by this diverse group, endorsed this approach and determined that services lost at the injured site are comparable to services provided at the mitigation site(s).

As stated by the Virginia Marine Resources Commission (letter dated 21 November 2005):

*"...we note that NOAA's Habitat Equivalency Analysis (HEA) was utilized as a tool to examine function, in terms of productivity, of the lost acreage and the scale of mitigation that would be necessary to replace of the productivity lost by the proposed project. We further note that additional factors, such as habitat diversity, were considered in addition to HEA results. Given that it is not feasible to create 580 acres of open water elsewhere within the impacted watershed, staff believes the use of a functional analysis for determining a mitigation plan is an acceptable alternative."*

In scaling the mitigation plan, the USFWS noted how differences in habitat types would be accounted for by stating that:

*"...the value of one acre of habitat in the expansion area would not be ecologically equivalent to one acre of a particular mitigation option. The differences in the habitat values were taken into account through the Habitat Equivalency Analysis which developed acreage equivalency ratios..."* (letter dated 3 November 2005).

The USACE believes that the collaboratively developed HEA analysis and the ecological services evaluations (Appendix B) conducted to arrive at the recommended mitigation plan adequately justify, both quantitatively and qualitatively, how the services provided at the existing CIDMMA expansion site are comparable to the services that will be provided by the mitigation plan proposed. The mitigation plan was developed to consider fisheries impacts, including the value of the impacted site as a spawning and nursery area for Federally-managed species and their forage base and the HAPC for sandbar sharks. The mitigation plan provides improved feeding areas for fish (bottom sediment clean-up, oyster reefs, and wetlands), spawning and nursery areas for fish (wetlands), toxics reductions, and improved health to fish (sediment clean-up) in the mitigation plan. Removing contaminated sediments will enhance fisheries habitat by reducing physiological stress and by increasing numbers of benthic organisms, many of which are food sources for fish found in the area, such as spot, summer flounder, and windowpane flounder. Restoring the wetland sites should also provide positive benefits to EFH by enhancing water quality and providing additional food and spawning and nursery areas to fish in the area.

It is noteworthy that two representatives from NOAA did participate in the EIS and the mitigation plan development. These individuals included Mr. Walter Priest (NOAA Restoration Center, Virginia Office), and Mr. Simeon Hahn (Coastal Resources Coordinator, NOAA, Office of Response and Restoration). Mr. Priest was involved throughout the development of the EIS and the consensus mitigation plan, and Mr. Hahn played an important role in helping to develop the Habitat Equivalency Analysis for the mitigation plan.

See response below for discussion of comment "... There is lack of detailed analysis and plans in the FEIS for all of the components of the mitigation and baseline data on the proposed mitigation sites."

Comment: We understand that all of the proposed mitigation will be subject to final review and approval by the ACOE and the federal and state regulatory agencies, and that this review process will help to ensure the success of the planned mitigation. More detailed plans, baseline data, and monitoring and maintenance plans for each site are necessary to avoid impacts and determine if the mitigation will off set the remaining impacts on EFH.

Response: The level of baseline information, description, and design for the mitigation components is adequate for this Feasibility Phase of the project. As noted in the EIS, much of the baseline information was derived from a comprehensive watershed restoration study of the Elizabeth River conducted by the USACE during 1997-2001. Wetland restoration and sediment remediation were two major recommendations of this study approved by the Assistant Secretary of the Army (Civil Works) in November 2001. Detailed analysis and plan development for all of the components of the mitigation plan, including acquisition of appropriate baseline data, will be developed during the next phase of the project (PED Phase). This detailed information will be coordinated with all applicable Federal, state, and local agencies.

Recommendation: We recommend that the project not be constructed, as proposed. Consideration of less environmentally damaging alternatives that may afford maximum practicable habitat protection for NOAA trust resources should be investigated further.

Response: Alternative dredged material placement sites were evaluated in Section II of the FEIS. Locations of these alternative sites (other than the Combined Aquatic Disposal Facilities) can be found on Figure 11-1. A cursory evaluation of EFH at these locations was conducted in response to the FEIS comments using the "Guide to Essential Fish Habitat Designations in the Northeastern United States." This response lists the number of EFH designations within the 10-minute by 10-minute areas in which the alternative sites located. Pertinent alternative evaluation information for these sites is also listed. The FEIS includes a complete discussion of these alternative locations with respect to other EIS criteria, including aquatic biota.

| Type of Site | Alternative Location | # EFH Designations | Comments |
|---|---|---|---|
| On-site | On-site (CIDMMA) | 0 | Does not meet project needs. |
| Expansion | East Expansion | 32 (Six verified in EFH Assessment) | Supports all project needs. |
| Expansion | North Expansion | 38 | Supports project needs. Significant Hydrodynamic impacts. |
| Expansion | West Expansion | 38 | State law prohibits. |
| Upland Placement | Southeastern Public Authority landfill - Suffolk | 0 | Many environmental, real estate, engineering, and institutional concerns. |
| Upland Placement | Portsmouth – between power generation plant and Hwy 164 | 0 | Conflict of land use with Maersk port development. |
| Ocean Placement | Dam Neck Site | 48 | Does not meet port development objective. Site would require major modifications. |
| Beneficial Use of Dredged Material | Ragged Island Site | 0 | Cannot be rapidly filled. Does not meet port development objective given that is a State Wildlife Refuge. |
| Beneficial Use of Dredged Material | Hoffler Creek Site | 0 | Cannot be rapidly filled. Does not meet port development objective given that is a wildlife preserve. |
| Beneficial Use of Dredged Material | Lily Creek Site | 0 | Cannot be rapidly filled. Conflict of use given that site was recently developed with residential housing. |

| Type of Site | Alternative Location | # EFH Designations | Comments |
|---|---|---|---|
| Creation of New Island Facilities | Buckroe Beach/Horseshoe Flats | 40 | This is a borrow site for the Buckroe Beach Federal project. Is a finfish migratory route and crab sanctuary. |
| Creation of New Island Facilities | Willoughby Bay Island | 41 | Heavy military and recreational use. Disruption of Mason Creek drainage. |
| Creation of New Island Facilities | Ocean View offshore | 41 | Heavy recreational use and possible incompatibilities with Norfolk Redevelopment Plan. |
| Creation of New Island Facilities | East of Chesapeake Bay Bridge-Tunnel | 48 | Conflicts with Ches. Bay multi-agency goals. Beyond the scope of this study. |
| Creation of New Island Facilities | Hampton Flats | 38 | Detrimental to shellfish larvae and disruptive to hydrodynamics. |
| Deep Hole Site | James River | 36 | Dredged material nutrient release and scour concerns. Does not meet port development objective. |
| Deep Hole Site | Hampton Roads Bridge-Tunnel | 40 | Dredged material nutrient release and scour concerns. Does not meet port development objective. |
| Deep Hole Site | Southern Chesapeake Bay | 47 | Dredged material nutrient release and scour concerns. Does not meet port development or national defense objectives. |
| Combined Aquatic Disposal Facility | Offshore of River Shore-Portsmouth | 38 | Does not meet port development or national defense objectives. |
| Combined Aquatic Disposal Facility | Offshore of old TCC campus-Suffolk | 38 | High commercial fishery value. Does not meet port development objective. |
| Combined Aquatic Disposal Facility | Mouth of Nansemond River | 38 | Environmental concerns for James and Nansemond. Does not meet port development and national defense objectives. |

| Type of Site | Alternative Location | # EFH Designations | Comments |
|---|---|---|---|
| Combined Aquatic Disposal Facility | James River between Nansemond River and Chuckatuck Creek. | 38 | Disruptive of Nansemond R. and Knotts Cr. Discharge. Does not meet port development and national defense objectives. |
| Combined Aquatic Disposal Facility | Middle Ground site west of Monitor Merrimack Bridge-Tunnel | 38 | High commercial fishery value. Does not meet port development and national defense objectives. |
| Combined Aquatic Disposal Facility | Middle Ground site east of Monitor Merrimack Bridge-Tunnel | 38 | High commercial fishery value. VMRC clam brood stock area. |
| Combined Aquatic Disposal Facility | Hampton Flats west side | 38 | High commercial fishery value. Disruptive to hydrodynamics critical to larval fisheries. Navigation concerns. |
| Combined Aquatic Disposal Facility | Channel to Newport News | 38 | Navigation disruption. |
| Combined Aquatic Disposal Facility | Adjacent to Hampton Creek entrance | 38 | High commercial fishery value. Adjacent to Hampton Flats critical hydrodynamics area. |
| Combined Aquatic Disposal Facility | Adjacent to Willoughby Federal navigation channel | 38 | High commercial fishery value. Concern for proximity to navigation channel. Conflicts with VDOT and/or Navy interests. |
| Combined Aquatic Disposal Facility | North of Norfolk Naval Base carrier docks | 38 | Incompatible with Navy's use of site. |
| Combined Aquatic Disposal Facility | Norfolk Harbor | 38 | Does not meet port development objective. |
| Combined Aquatic Disposal Facility | Adjacent to NIT North/South | 38 | Does not meet port development objective. Conflict with borrow site for oyster restoration programs. Borrow material questionable. |
| Combined Aquatic Disposal Facility | East side of existing CIDMMA | 38 | Does not meet port development objectives. |

As seen in the table above, many of the alternative sites lie within the same 10-minute by 10-minute area as the proposed expansion site. Most other sites outside of this EFH designated area have a larger number of designated EFH. Should the project be implemented at any of these sites, greater impacts to EFH would likely be incurred.

The James River Deep Hole Site has 36 EFH designations, as shown in the table. However, there are concerns about nutrient releases, scour, and meeting port development objectives at this site. Those alternate sites with zero (0) EFH designations failed to meet the identified project need and presented fatal flaws as shown above. All other sites presented various environmental and physical problems in addition to not meeting the project need. Through a thorough alternative analysis, included as Part II in the FEIS, the USACE has determined that the eastward expansion will: (1) result in the least environmental impacts of the alternatives considered, and (2) best meet the project need.

Recommendation: No dredging should be permitted between February 15 and June 30 of any year to protect migrating and spawning anadromous fish that are prey species of federally managed fish such as bluefish and summer flounder.

Response: Information provided by the Virginia Department of Games and Inland Fisheries (VDGIF), the agency responsible for designating CAFUA and establishing TOYR on dredging, indicates that no TOYR is required for the Elizabeth River (see response to your previous comment on CAFUA). VDGIF indicates that the current fisheries data do not substantiate a TOYR in the Elizabeth River. The USACE concurs with the VDGIF finding and, therefore, does not plan to implement the proposed EFH conservation recommendation for the same reason.

Recommendation: Detailed plans for all compensatory mitigation projects be provided to us for review including baseline data on each site (benthic sampling, contaminant sampling, existing hydrology, vegetation elevations, as appropriate, for each site), as well as monitoring and maintenance plans for each site. All success criteria and monitoring and maintenance plans should be developed for each site. These plans should include the site specific goals of the proposed mitigation project, criteria for success, remedial actions that may be taken, and long-term management plans. All mitigation plans must be developed fully and approved by the ACOE. The ACOE should review and approve these plans prior to work on the mitigation sites. These plans should be in place prior to any construction on the CIDMMA expansion or on the mitigation site.

Response: We concur.

Recommendation: Construction of the mitigation projects should be prior to, or concurrent with, the construction of the CIDMMA expansion.

Response: We concur.

Comment: Section 305(b)(4)(B) of the MSA requires the ACOE to provide NMFS with a detailed written response to these EFH conservation recommendations, including a description of measures adopted by the ACOC for avoiding, mitigating, or offsetting the impact of the project on EFH. In the case of a response that is inconsistent with NMFS' recommendations, the ACOE must explain its reasons for not following the recommendations, including the scientific justification for any disagreements with NMFS over the anticipated effects of the proposed action, and the measures needed to avoid, minimize, mitigate, or offset such effects pursuant to 50 CFR 600.920(k).

Response: Detailed written responses to the NMFS EFH conservation recommendations, including descriptions of measures to avoid, mitigate, and offset project impacts to EFH, have been provided above. Where responses have been inconsistent with NMFS recommendations, reasons for not following the recommendations have been provided, including scientific justification for disagreements.

**United States Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service (15 June 2006)**

Comment: Based on the low frequency of whale sightings in the shipping channel and the participation of commercial vessels in voluntary reporting when traveling in the region, the ACOE has made the determination that the potential for vessel strikes as a result of the construction of the expansion and future operations of a marine terminal are negligible. However, as the facility will not begin receiving vessel traffic until 2016, it is difficult for NMFS to reasonably predict what impacts this increase in traffic will have on whale populations. This uncertainty is based on a lack of information on the likely routes that the cargo ships will be taking to and from the terminal and an inability to forecast the condition of the right whale populations at that time as it is outside of the reasonably foreseeable future. NMFS will need to consider the impact of increased shipping traffic over the entire vicinity of the route, and not just within the Norfolk shipping channels and the immediate project vicinity.

Due to the fact that the use of the facility as a cargo terminal will not begin until 2016 and the likely routes that the cargo vessels will be using are not yet known, NMFS is not able to reasonably predict what effect this project will have on listed whales. Therefore, NMFS recommends that the ACOE reinitiate consultation when more details on the vessels that will be using the cargo terminal are available. The details needed will include the size and speed of the vessels, the origin of the vessels, and the routes that these vessels will be taking to and from the facility.

Response: The USACE, Norfolk District, and the VPA will reinitiate consultation in the supplemental EIS that will be prepared prior to construction of the marine terminal facility. As requested, updated vessel information, including the size and speed of the vessels, the origin of the vessels, and the routes that these vessels will be taking to and from the facility, will be provided at that time.

**Commonwealth of Virginia, Department of Environmental Quality**
**Consolidated State Comments (28 June 2006)**

Environmental Impacts and Mitigation

VDCR Comment: *Recommendations.* Because of the legal status of the piping plover, DCR recommends that the Corps of Engineers coordinate with the Fish and Wildlife Service and the Department of Game and Inland Fisheries to ensure compliance with the Endangered Species Act and state protected species legislation.

DCR also recommends that coordination with the Department of Game and Inland Fisheries be undertaken with regard to the Craney Island Bird Long-Term Management Plan contemplated as part of the proposed mitigation plan.

Response: Concur. No response required.

VDGIF Comment. *Effects on Marine Mammals.* The Final EIS indicates that increases in vessel traffic attributable to this project are not likely to affect marine mammals listed by the state or federal governments as endangered or threatened (page IV-34, section IV.1.3.1.4). The Department of Game and Inland Fisheries disagrees with this conclusion. The increase in container ship operations in Virginia's coastal waters may adversely affect marine mammals. In the last several years, marine mammal vessel strikes have increased in these waters. These strikes have included two northern right whales (listed by federal and state governments as endangered) that sustained mortal injuries after colliding with vessels near the mouth of the Chesapeake Bay. Marine mammals are known to occur in Virginia's ocean and in-shore shipping channels, though their densities and temporal/spatial distributions remain largely unknown.

Response: The available NMFS data on northern right whale sightings in Virginia's coastal waters were provided in the FEIS. The forecasted increase in vessel traffic may affect northern right whales migrating through Virginia's coastal waters. However, since the proposed marine terminal will not begin receiving additional vessel traffic until 2016 and the condition of the right whale population cannot be reasonably forecast for 2016, NMFS has recommended that the VPA and USACE reinitiate consultation when more detailed information regarding future vessel size, speed, and traffic are available. Accordingly, the VPA and USACE will reinitiate consultation with the NMFS and the VDGIF as more detailed vessel traffic information becomes available at a time closer to the scheduled completion of the first phase of the Craney Island marine terminal.

VDGIF Comment. *Selected Mitigation Plan.* The Department of Game and Inland Fisheries supports the selected mitigation plan.

Response: Concur. No response required.

VDGIF Comment: *Marine Mammal Protection.* The Department of Game and Inland Fisheries understands that the Port Authority is a member of the Northeast

Implementation Team for the Recovery of the North Atlantic Right Whale (Final EIS, page IV-34). Accordingly, the Port Authority should address the issue of marine mammal mortality by assessing the spatial and temporal distribution and abundance of marine mammals in Virginia's nearshore and in-shore shipping channels. The Port Authority should also examine measures to minimize the potential for vessel strikes.

Response: The Northeast Implementation Team is a group organized by the NMFS that promotes outreach and education programs developed by NMFS for the maritime industry. Spatial and temporal research is conducted by scientists at the NMFS. To minimize the potential for ship strikes, NMFS has proposed regulations limiting vessel speeds in seasonal or dynamic management areas within 30 nm of the entrance to Chesapeake Bay. Vessels entering the Port of Virginia will adhere to any final ship strike reduction measures promulgated by the NMFS.

VDGIF Comment: *Coordination.* The Corps, and/or the Port Authority, should coordinate activities at Ragged Island Wildlife Management Area with the Department of Game and Inland Fisheries. Similarly, the bird management plan should be coordinated.

Response: Concur. No response required.

VDEQ Comment: *Air Quality.* DEQ's Division of Air Program coordination reiterated the guidance it provided in our comments on the Draft EIS. This guidance follows. According to DEQ's Division of Air Program Coordination, Craney Island is in an ozone non-attainment area. For this reason, emissions of volatile organic compounds (VOCs) and oxides of nitrogen ($NO_x$) from project construction and operation should be kept to a minimum. VOCs and $NO_x$ are precursors to atmospheric ozone ($O_3$).

*(a)* *Open Burning.* If project activities include the burning of construction or demolition material, this activity must meet the requirements of the Regulations for open burning (9 VAC 5-40-5600 et seq.), and it may require a permit (see "Regulatory and Coordination Needs, item 3). The Regulations provide for, but do not require, the local adoption of a model ordinance concerning open burning. The Corps and the Port Authority should contact appropriate local officials to determine what local requirements, if any, exist.

*(b) Fugitive Dust Control.* During construction, fugitive dust must be kept to a minimum by using control methods outlined in 9 VAC 5-50-60 et seq. of the Regulations for the Control and Abatement of Air Pollution.

*(c) Fuel-burning Machinery.* Fuel-burning machinery used in the expansion of Craney Island, the resulting construction of a shipping terminal, and the operation and maintenance of the terminal may require air pollution control permits from DEQ. See "Regulatory and Coordination Needs," item 3, below.

Response: No open burning activities are currently planned for the project. However, any open burning will be conducted in accordance with applicable Virginia regulations and local requirements, and the appropriate permit(s) will be secured as required. State regulations for the control of fugitive dust will be followed during construction. The VPA and USACE will coordinate with the Tidewater Regional Office of VDEQ regarding air pollution control permits for fuel-burning equipment that may be used during construction of the eastward expansion and construction and operation of the marine terminal.

VDEQ Comment: *Water Quality and Wetlands. (a) Project Impacts and Documentation.* DEQ's Tidewater Regional Office states that the project will involve significant impacts to surface waters and wetlands. The Joint Federal-State Permit Application ("JPA") should document that these impacts have been avoided and minimized to the maximum extent practicable, and that remaining unavoidable impacts have been properly compensated. The JPA should be completed and submitted prior to the beginning of work on the project.

*(b) Mitigation Plan.* While the mitigation plan in the Final EIS represents the consensus of a diverse group of stakeholders, it is not sufficiently detailed for regulatory purposes. Significantly more detail will be required for each component of the plan, and adjustments to the plan may be required depending on the nature of the details presented. See "Regulatory and Coordination Needs," item 2, below.

Response: A Joint Federal-State Permit Application ("JPA") will be submitted during the PED Phase of the project and will contain sufficient detail for regulatory purposes. The JPA will document that impacts have been avoided and minimized to the maximum extent practicable and that remaining unavoidable impacts have been properly compensated.

VDEQ Comment: *The Document.* In its comments on the Draft EIS, DEQ's Tidewater Regional Office questioned the use of the term "negligible impacts" in Table II-2 (Draft EIS, page II-27). The "Response to Comments" section of the Final EIS (Appendix K, CD version) indicates that table II-3 has been revised to reflect "minor" impacts. However, this change does not appear to be reflected in that table in the Final EIS (Final EIS, Table II-3, pages 2-29 through 2-32). In addition, the footnoted legend has been omitted from the Final EIS. As the only link between Table II-2 (criteria, pages II-27 and II-28) and Table II-3 (impacts), the legend should be an integral part of both tables.

Response: This will be corrected in the FEIS.

VDHR Comment: *Historic Structures and Archaeological Resources.* The Department of Historic Resources expects to continue its direct consultation with the Corps of Engineers, pursuant to section 106 of the National Historic Preservation Act.

Response: Concur. No response required.

Comment: According to the City of Portsmouth, the project will require a permit from the Portsmouth Wetlands Board. The permit may require an on-site mitigation plan.

Response: Any applicable permits and/or on-site mitigation plans will be coordinated with the Portsmouth Wetlands Board.

Federal Consistency under the Coastal Zone Management Act

VDEQ Comment: Based on the information submitted and the comments of reviewing agencies, we concur that the proposed eastward expansion of Craney Island is consistent with the Virginia Coastal Resources Management Program, **provided** that the Corps, the Port Authority, and their contractors obtain all approvals not yet secured that are applicable to the enforceable policies, and adhere to all the conditions of the Virginia Water Protection Permit, the Marine Resources Commission Permit (if that is required), and carry out the subsequent development consistently with the Chesapeake Bay Preservation Act (*Virginia* Code sections 10.1-2100 et seq.). In accordance with the Federal Consistency Regulations at 15 CFR Part 930, section 930.4, this conditional concurrence is based on the Corps, the Port Authority, and their contractors obtaining necessary authorizations prior to any ground disturbance. If the requirements of section 930.4, sub-paragraphs (a) through (a)(3) are not met, this conditional concurrence becomes an objection under 15 CFR Part 930, section 940.43.

Response: Concur. No response required.

VDEQ Comment: *1. Wetlands Management.* According to DEQ's Tidewater Regional Office, the project will be consistent with the wetlands management enforceable policy of the Virginia Coastal Resources Management Program if a Virginia Water Protection Permit is issued and complied with, and if all required compensatory mitigation is provided.

Response: Concur. No response required.

VDEQ Comment: *2. Subaqueous Lands Management.* As stated in our comments on the Draft EIS, the project will require a permit from the Marine Resources Commission unless there is a legal or regulatory exemption, and compliance with that permit will be necessary for consistency of the project with this component of the Enforceable Policies.

Response: Concur. No response required.

VDEQ Comment: *3. Coastal Lands Management.* As indicated in our comments on the Draft EIS, the eastward expansion of Craney Island takes place on open water that is not under the jurisdiction of the Chesapeake Bay Preservation Act (*Virginia Code* sections 10.1-2100 et seq.) or the Chesapeake Bay Preservation Area Designation and Management Regulations (9 VAC 10-20-10 et seq.) which implement the Act. However, subsequent development of the 580-acre expansion must be consistent with the Act and the Regulations. Specifically, development of the marine terminal facility will have to

comply with stormwater management criteria that meet the water quality protection provisions of the Virginia Stormwater Management Regulations (4 VAC 3-20 et seq.; see 4 VAC 3-20-71). In addition, for land disturbance of 2,500 square feet or more, the development of the terminal must comply with the Virginia Erosion and Sediment Control Regulations and the *Erosion and Sediment Control Handbook* (third edition, 1992).

Response: Concur. No response required.

VDEQ Comment: *4. Wildlife Resources Protection.* Any activities at Ragged Island Wildlife Management Area should be coordinated with the Department of Game and Inland Fisheries (Glen Askins, Regional Wildlife Manager, telephone (804) 843-5966). The bird management plan should be coordinated with the Department as well (Ruth Boettcher, Eastern Shore Biologist, telephone (757) 787-5911); the Department of Conservation and Recreation concurs in this recommendation.

Response: Concur. Coordination will take place with appropriate agencies and suggested individuals.

VDEQ Comment: *5. Wildlife Resources Protection* The Corps should also coordinate with the Department of Game and Inland Fisheries (above) and with the U.S. Fish and Wildlife Service (Karen Mayne, Virginia Field Office Supervisor, telephone (804) 698-6694) concerning protection of the piping plover, a threatened species (see "Environmental Impacts and Mitigation," item 1(a)(i), above).

Response: Concur. Coordination will take place with appropriate agencies and suggested individuals.

VDEQ Comment: *Water and Wetland Permitting.* The Corps and the Virginia Port Authority should prepare and submit Joint Permit Applications covering the eastward expansion of Craney Island, as well as for the proposed terminal development thereon. The JPAs should be submitted to the Marine Resources Commission (2600 Washington Avenue, Newport News, Virginia 23607), which will distribute copies of it to appropriate regulatory agencies including DEQ's Tidewater Regional Office, the Portsmouth Wetlands Board, the Corps Regulatory Branch if appropriate, and the Commission itself. As indicated above ("Environmental Impacts and Mitigation," item 5), the JPA should be accompanied by a more detailed mitigation plan.

Response: A Joint Federal-State Permit Application ("JPA") will be submitted during the PED Phase of the project and will contain sufficient detail for regulatory purposes. The JPA will document that impacts have been avoided and minimized to the maximum extent practicable and that remaining unavoidable impacts have been properly compensated.

VDEQ Comment: *Air Quality Regulation.* As indicated above ("Environmental Impacts and Mitigation," item 3(a)), any open burning contemplated in connection with the

project may require an open burning permit from DEQ. Similarly, fuel-burning equipment may require air pollution control permits from DEQ. Questions on both types of permitting requirements should be directed to DEQ's Tidewater Regional Office (Jane Workman, Air Permits Manager, telephone (757) 518-2112).

Response: Concur. Questions regarding open burning and/or fuel-burning equipment that may require air pollution control permits from VDEQ will be directed to suggested VDEQ office and individual.

**The Elizabeth River Project (29 June 2006)**

Comment: Your final report still underestimates the health of the river bottom at the impact site. Seven out of 11 monitoring stations in the impact area meet Chesapeake Bay Program goals for benthic, or bottom-life, health (Daniel M. Dauer, Old Dominion University, 2001-2005). These include some of the few scores within the entire Elizabeth River watershed which meet the bay goals set for the Benthic Index of Biological Integrity (B-IBI), which gauges benthic, or bottom-dwelling, community health (Daniel M. Dauer, Old Dominion University, 2001-2005). The B-IBI is a standardized, agreed upon assessment tool used throughout the Chesapeake Bay for characterizing the overall health of the benthic habitat. These scores indicate a higher species diversity and abundance, and a higher ecological value to the Elizabeth River system, than would be indicated by the (Lipicus and Seitz, 2002) bi-valve study which you reference (B. Mitigation Analysis, Project-Related Adverse Impacts, pages 6 & 7). In fact, the B-IBI studies would indicate the bottom-dwelling community in the impact area is some of the most valuable to the ecology of the Elizabeth River.

Response: In general, for all *healthy* Chesapeake Bay regions, long-lived, large, often deep-dwelling species should be present. We don't dispute the findings of Dauer and colleagues for the Elizabeth River system, but these are not the standards for a healthy Chesapeake Bay benthic community. In fact, the studies by Dauer and colleagues are sound and convincingly point out the generally degraded nature of benthic communities in the Elizabeth River. The valid standard for comparisons of benthic communities is not one from a highly degraded system, but rather one from least impacted, relatively pristine portions of the ecosystem. Our statement refers to the undisputed fact that bivalves are dominant and representative members of healthy Chesapeake Bay benthic communities, as was stated in the VIMS report (Lipcius and Seitz, 2002): "The benthic communities [in Chesapeake Bay] are dominated in biomass by bivalves (i.e., clams, oysters, mussels) and in numbers by polychaetes (Boesch 1977, Virnstein 1977, Hines et al. 1990). Infaunal bivalve assemblages include key species such as the hard clam, *Mercenaria mercenaria*, the Baltic clam, *Macoma balthica*, and the stout razor clam *Tagelus plebeius,* which are common [in many places] throughout Chesapeake Bay (Holland 1985, Boesch 1977)." In addition, in a thorough examination of Chesapeake Bay biomass, Hagy (2002) states that bivalves in Chesapeake Bay are a key component of the benthos, sometimes comprising up to 90 percent of the benthic prey biomass. The reviewer referenced studies by Dauer and colleagues conducted in the Elizabeth River system in which polychaetes are numerical dominants. Since Dauer's studies and other previous studies in the Craney Island expansion footprint did not sample deep-dwelling infauna that are indicative of a healthy ecosystem and are typical food sources for blue crabs, that was the motivation for our study of the deeper dwelling and larger infauna. In addition, although the blue crab shares various prey preferences with demersal fish, the emphasis in the VIMS study was on the blue crab, because spot, croaker, and hogchoker are not in a state of major decline, in contrast to the blue crab and native oyster in Chesapeake Bay.

Comment: At the same time, given the importance of this mitigation plan for the future of the Elizabeth River, it appears that several issues, mentioned also in our review of your draft plan, still have not been addressed and remain significant for achieving an appropriate mitigation plan.

The Elizabeth River Project believes it remains practical and appropriate to seek 1:1 mitigation, in acreage, of the 580 acres of river to be lost. As mentioned in previous discussions; assuming that your landscape approach does, in fact, provide ecological improvement for a total of 487 acres, as presented in your draft plan, a minimal cost of $10,000 per acre could achieve an additional 93 acres of mitigation in vegetated buffer adjacent to wetland restoration areas (total estimated cost, $930,000). Replacement habitat for threatened/endangered bird species should be considered in these buffer areas, as the project area includes habitat of the federally threatened Piping Plover.

Response: As stated by the USFWS (letter dated 3 November 2005): *"... it is not meaningful to give a sum of the total mitigation project acreages because the environmental values of the different types of projects are different, i.e., one acre of oyster reef is not equivalent to one acre of sediment remediation. Also, the value of one acre of habitat in the expansion area would not be ecologically equivalent to one acre of a particular mitigation option. The differences in the habitat values were taken into account through the Habitat Equivalency Analysis which developed acreage equivalency ratios. ...We recommend that this be avoided because it falsely implies acre-for-acre equivalency."* The Mitigation Subcommittee in its three-year deliberative process did not set out to provide an equivalent acreage but, rather, an equivalent value and function. The subcommittee agreed on this approach throughout and, for the reasons stated, the additional 93 acres of mitigation in buffer adjacent to wetland restoration areas (to arrive at 580 acres) was not a recommendation that came out of the committee.

Comment: As recommended in comments on the draft plan, there remains a need to complete the investigation of the feasibility of some key sites and to maintain a list of alternative sites. We have noted in the Corps' response that an on-going list of sites is being maintained and that further feasibility investigations will be conducted as needed.

Response: During the development of the mitigation plan, numerous alternative wetland, sediment, and oyster mitigation sites were considered. You have mentioned (previously) some of these sites. These alternative sites, and others that are identified between now and the time the mitigation plan is constructed, will be maintained on an on-going list of feasible alternatives. In the event that certain sites must be replaced in the mitigation plan, further feasibility investigations of these alternative sites will be conducted during the advanced design phase of project development.

Comment: We reiterate concerns that mitigation does not appear to address the impacts of dredging 3.7 million cubic yards of Elizabeth River bottom to create an access channel to the port facility. While we agree that this does not convert shallow water habitat to deep water habitat, with lesser impacts, with maintenance dredging over time this habitat

is unlikely to recover. As a result, the mitigation plan should address these losses, which we understand to equate to more than 120 acres not currently mitigated.

Response: The Mitigation Subcommittee and NEPA Committee meeting minutes from as early as 24 October 2001 document discussions of the access channel. Dredging for the access channel and the cell construction is discussed extensively in Section IV of the EIS (Environmental Consequences) under every major resource category. These impacts are not permanent and dredged bottom areas will recover fairly rapidly once the dredging is completed. While some changes in benthic community populations may occur, this is not necessarily seen as an adverse impact. For this reason, dredging alone does not have its own compensatory mitigation plan. The recommended mitigation plan does, however, provide bottom habitat, water quality, and fisheries habitat benefits in the form of cleaned sediments, restored wetlands, and restored oyster reefs. An analysis of the impacts of dredging on essential fish habitat was included in the Draft EIS and will be expanded on in the Final EIS.

Comment: Regarding impacts during construction and impacts from on-going port operations, to elaborate on prior comments: We are concerned to see that air emissions from terminal facilities and associated cargo ships are likely to result in long-term violations of air quality guidelines and are termed "potentially significant" in your study. In addition, the emissions from construction are "potentially significant" but short-term. We reiterate our strong recommendation that the Virginia Port Authority continue to pursue the maximum possible reductions in emissions through use of the latest and emerging technologies and equipment and alternative fuels. The Virginia Port Authority has voluntarily reduced emissions by 30 percent in its current port operations and should work stringently to continue to reduce emissions in the future. During construction of the facility, we continue to recommend state-of-the-art controls to limit impacts related to suspended sediments and dissolved oxygen during the construction of the cells, and monitoring of the same, as this activity will suspend a large amount of sediments.

Response: With respect to air quality impacts associated with port operations, emissions estimates were completed and documented in the Final EIS accounting for anticipated increases in shipping, trucking, and the operation of other port related equipment. Since the port facility will be located in an ozone nonattainment area, emissions of VOC and NOx are of particular importance. Recognizing the long planning horizon associated with this project (Phase I and Phase II port operations are not anticipated until 2017 and 2050, respectively), the estimated air pollutant emissions documented in the Draft EIS, which are based on currently available emissions data and models for marine vessels, nonroad engines, on-road vehicles (trucks), and locomotives, should be considered preliminary estimates and are believed to overstate actual facility related emissions that will occur during the operation of the port. Actual long-term emissions from the port should be lower than the documented emissions due to future advances in engine efficiency, pollution control technologies, and fuel quality. Future refinement of the emissions estimates for the operational phases of the port are expected to be documented in a supplemental EIS to be prepared in conjunction with the development of preliminary engineering and design data.

Additionally, the project is required to comply with the general conformity regulation, since it is a proposed Federal action in a nonattainment area. As such, a conformity determination is required to demonstrate that the project will conform to, and not interfere with, the provisions of a new State Implementation Plan (SIP) to be established by the VDEQ for the Hampton Roads area. The pending SIP is expected to establish an emissions budget for the regional area and define pollution reduction measures as necessary to achieve and maintain attainment with the ozone standard. Notwithstanding the above, the VPA expects to continue its current voluntary emission reduction programs and consider new ones aimed at reducing emissions and air quality impacts from its facilities.

Comment: In pursuing the oyster reefs: As with wetland and sediment sites, it remains advisable to identify specific, potential habitat restoration areas in the Elizabeth River for oyster and/or clam restoration. One spot that should be considered is the sand flat immediately south of Amerada Hess and adjacent to the Elizabeth River Terminals wetland restoration site. This site would support a landscape approach. Other sites could include former Baylor grounds. We reiterate that your draft plan may have under-estimated costs of 3-D oyster reef construction in the Elizabeth River (costs estimated at $100,000 per acre, p. 64, B. Mitigation Analysis). VA Marine Resources Commission's current estimate for construction costs, using shucking-house oysters, is $191,000 per acre ($1.91 per bushel, with 100,000 bushels needed per acre), plus seeding costs.

Response: The estimated costs for oyster reef restoration ($150,000 acre: $100,000 for reef structure and $50,000 for seeding) are presented in Appendix B, page 64. This cost estimate is based upon USACE oyster restoration projects recently constructed in the Great Wicomico River (2004/2005), Tangier/Pocomoke Sound (2002), and the Rappahannock River (2001/2002). This cost estimate will be refined during the advanced design phase of the project.

Comment: The Elizabeth River Project reiterates support of the recommendation of the Cumulative Effects Assessment by Larry Canter (April 2004), p. 206, for the Corps to take the lead in "establishing a Hampton Roads Area Environmental Management Committee" to review monitoring information about the 17 referenced projects with related cumulative impacts, for the purposes of adaptive environmental management.

Response: There are a number of agencies, groups, and committees that currently meet on a regular basis, review monitoring information, and adapt management practices that influence cumulative effects in the Hampton Roads area and the Elizabeth River Basin. For example, the Hampton Roads Planning District Commission's (HRPDC) Physical and Environmental Planning Department (PEP) provides a forum for the local governments to exchange information and to develop cooperative initiatives that address regional environmental issues and opportunities, as well as state and Federal regulations. The Department's staff undertakes technical and policy studies and provides technical assistance to the member localities and others. With a current emphasis on water resource management, the Department also encompasses general physical planning activities, such as comprehensive planning and ordinance development, solid waste,

recreation, and open space and linkages to state and Federal agencies and programs. The Physical and Environmental Planning Department also coordinates comprehensive environmental education and outreach to the Hampton Roads community. The USACE and VPA will coordinate with HRPDC to determine if a "Hampton Roads Area Environmental Management Committee" should be developed in this or some other context.