

APPENDIX H

SECTION 404 (b) (1) EVALUATION

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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' (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 been 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, 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 present in the project area, especially during the spring and summer months. Plankton in the immediate vicinity of the dredging site may be 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 be 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)(1) 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)(1) 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)(1) guidelines.