The following Site Management and Monitoring Plan for the Norfolk Ocean Dredged Material Disposal Site (ODMDS) has been developed and agreed to pursuant to the *Water Resources Development Act Amendments of 1992 (WRDA)* to the Marine Protection, Research, and Sanctuaries Act of 1972 (MPRSA) for the management and monitoring of ocean disposal activities, as resources allow, by the U.S. Environmental Protection Agency (EPA) and the U.S. Army Corps of Engineers (USACE).

_____ _____

Cosmo Servidio
Regional Administrator
U.S. EPA Region III

Date

_____ _____

Patrick V. Kinsman, PE
Colonel, U.S. Army
Commanding

Date

_____ _____

John T. Litz, PMP
Colonel, U.S. Army
Commander and District Engineer

Date

This plan is effective from date of signature for a period not to exceed ten (10) years. The plan shall be reviewed and revised more frequently if site use and conditions at the site indicate a need for revision.

SITE MANAGEMENT AND MONITORING PLAN FOR THE NORFOLK OCEAN DISPOSAL SITE (NODS)

SITE MANAGEMENT AND MONITORING PLAN FOR THE NORFOLK OCEAN DREDGED MATERIAL DISPOSAL SITE (ODMDS)

TABLE OF CONTENTS

INTRODUCTION

Section 102(c) of the Marine Pollution, Research, and Sanctuaries Act of 1972 (MPRSA) details the responsibility of the U.S. Environmental Protection Agency (EPA) and the U.S. Army Corps of Engineers (USACE) to monitor and manage Ocean Dredged Material Disposal Sites (ODMDS) to ensure that ocean dredged material disposal activities will not unreasonably degrade the marine environment or endanger human health or economic potentialities. MPRSA, as amended by section 506{a) of the Water Resources Development Act (WRDA) of 1992, and a Memorandum of Agreement Between EPA and USACE require the development of a site management and monitoring plan (SMMP) to specifically address the disposal of dredged material at the Norfolk ODMDS. Following an opportunity for public review and comment, the SMMP shall be required for all disposal activities at the site. All section 103 (MPRSA) ocean disposal permits or evaluations shall be conditioned as necessary to assure consistency with this SMMP.

This SMMP has been prepared in accordance with the *Guidance Document for Development of Site Management Plans for Ocean Dredged Material Disposal Sites* (February 1996), which was prepared by the EPA and the USACE and provides a framework for the development of site monitoring and management plans required by MPRSA and WRDA. The SMMP may be modified if it is determined that such changes are warranted as a result of information obtained during the monitoring process. The SMMP shall be reviewed and revised at least every 10 years.

SCOPE OF THE SMMP

ODMDS management involves a broad range of activities including regulating times, the quantity, and the physical/chemical characteristics of dredged materials dumped at the site. ODMDS management involves establishing disposal controls, conditions, and requirements to avoid and minimize potential impacts to the marine environment. Finally, ODMDS management involves monitoring the site environs to verify that unanticipated or significant adverse effects are not occurring from past or continued use of the site and that permit conditions are met.

MPRSA, as amended by WRDA 1992, provides that the SMMP shall include but not be limited to:

- A baseline assessment of conditions at the site;
- A program for monitoring the site;
- Special management conditions or practices to be implemented at each site that are necessary for the protection of the environment;
- Consideration of the quantity and physical/chemical/biological characteristics of dredged materials to be disposed of at the site;
- Consideration of the anticipated use of the site over the long term;
- A schedule for review and revision of the SMMP.

OBJECTIVES OF SITE MANAGEMENT

There are three primary objectives in the management of the Norfolk ODMDS which provide guidelines in making management decisions necessary to fulfill mandated responsibilities to protect the marine environment as discussed previously:

- Protection of the marine environment, living resources, and human health and welfare;
- Documentation of disposal activities at the ODMDS and provision of information which is useful in managing the dredged material disposal activities
- Provision for beneficial use of dredged material whenever practical

NORFOLK OCEAN DREDGED MATERIAL DISPOSAL SITE (ODMDS)

The Norfolk ODMDS (Figure 1) was designated by EPA pursuant to Section 102(c) of MPRSA as suitable for the ocean disposal of dredged material. The final rule was promulgated by EPA on July 2, 1993 (FR. Vol. 58 No. 126), effective July 2, 1993. The Norfolk ODMDS is circular with a radius of 4 nautical miles. The center of the site is located at 36°59' north latitude and 75°39' west longitude.

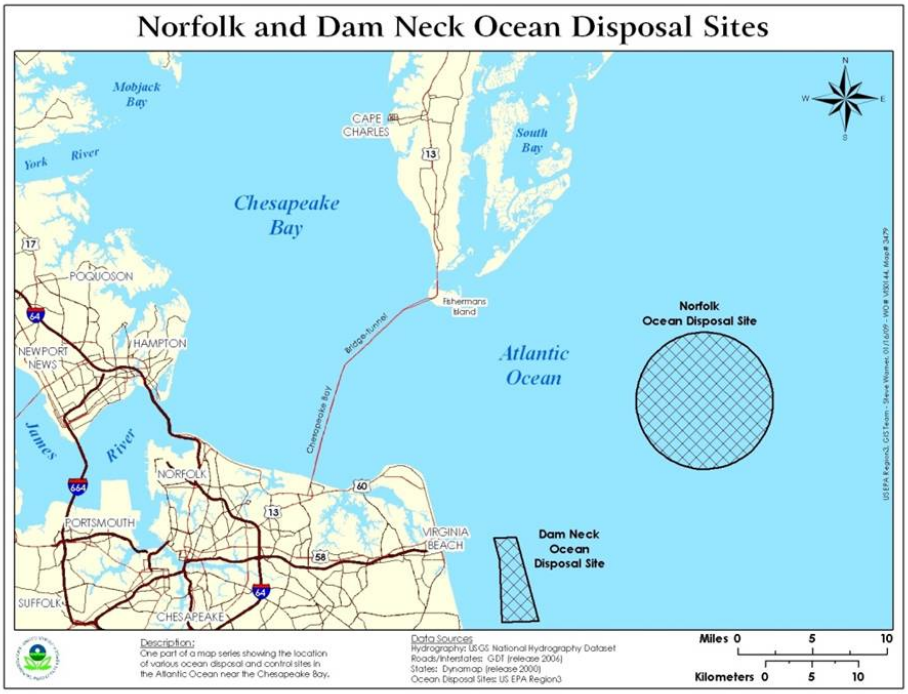

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Figure 1. Map of Norfolk ODMDS.

The Norfolk ODMDS has an area of about 50-square nautical miles with water depth ranging from about 43 to 85 feet. The bathymetry is gently sloping (less than 1 foot per 1,000 feet) from west to east. Current use of the site indicates that 100-500K cubic yards (cy) of material from

the Naval Facilities at Yorktown, Virginia will be placed in the site every three years. If in the future the Craney Island Dredged Material Management Area (DMMA) is no longer available, suitable material currently placed in the Craney Island DMMA could be placed in the ODMDS. Approximately 3.5 million cy is placed in the Craney Island DMMA per year.

DISPOSAL HISTORY

The only prior use of the NODS includes the following projects: U. S. Navy, VDOT-Midtown Tunnel (1,121,642cy), JBLE-Skiffes Creek Channel (128,266cy), and JBLE-Langley Fuel Pier Replacement Project (71,914cy). Material maintenance dredged from Naval Supply Center, Cheatham Annex (51,000 cy) and Naval Weapons Station, Yorktown (475,000cy) was placed in the NODS in August 1993. These sediments were primarily silt and clay. All materials were evaluated for dredged material compliance with the U. S. Ocean Dumping Regulations (Title 40 of the Code of Federal Regulations, Parts 220-228) using the Evaluation of Dredged Material Proposed for Ocean Disposal (EPA-503/8-91/001), commonly referred to as the "Green Book." Disposal of dredged material at the Norfolk ODMDS has occurred using a hopper dredge. However, this does not preclude the use of other disposal methods.

MANAGEMENT CONCERNS AND ISSUES

Mounding. Due to limited usage of the ODMDS, bathymetric surveys have not been performed since the site's final designation in 1993. When the volume of material and/or the regular usage of the site increases, a bathymetric survey program will be instituted adequate to monitor the site.

OCEAN DREDGED MATERIAL SITE MANAGEMENT

All ocean disposal at the Norfolk ODMDS must be conducted in accordance with the Ocean Regulations and Criteria (40 CFR Parts 220-229), whether conducted as permit activity or as a Federal activity. The following are Norfolk ODMDS management requirements and all permits or evaluation concurrences shall be conditioned to include these requirements.

Evaluation of Dredged Materials to be Disposed. Only dredged materials which have been evaluated in accordance with EPA's Ocean Dumping Regulations and Criteria and found suitable will be accepted for disposal in the Norfolk ODMDS.

Guidance for evaluation of dredged materials under the MPRSA Section 103 program is provided in the Evaluation of Dredged Material Proposed for Ocean Disposal Testing Manual (EPA, 1991) and the Southeast Regional Implementation Manual (SERIM, EPA, 2008), as updated. The Mid Atlantic Regional Implementation Manual also provides guidance and can be referred to, as updated. The determination of dredged material suitability for ocean disposal must be documented in a MPRSA Section 103 evaluation and receive written concurrence from EPA Region III prior to disposal. Dredged materials will be reevaluated for suitability for ocean disposal in accordance with current USACE/EPA guidance at an interval of at least every three years. Re-evaluation and testing procedures should be coordinated with the USACE and the EPA prior to any sampling or testing.

Dredged Material Suitable for Beneficial Uses. Beneficial uses refers to the concept that

dredged material can be disposed in a manner that is economically and environmentally acceptable and accrues natural resource benefits to society. Beach-compatible dredged materials (sands) should be placed on nearby beaches or within the active littoral system when it is economically feasible and environmentally acceptable to do so. Other beneficial uses of dredged materials, such as their use to enhance or develop fisheries resource features (reefs or berms) are also encouraged with appropriate environmental review. Site capacity and mounding problems are favorably affected by not placing beach compatible sand in the ODMDS.

Methods of Disposal. No specific disposal method is required for this site. Disposal may be by hopper dredge, dump scow, or by pipe line discharge. Dredged materials must be discharged within the ODMDS boundaries. The placement of dredged materials outside the ODMDS boundaries is not authorized. An approved ocean disposal verification plan, such as the USACE Dredge Quality Management system or an approved equivalent, must be implemented by all dredged material placement operations at the designated site. Placement methods which prevent mounding of dredged materials from becoming unacceptable navigation hazard will be used. Placement methods which minimize interference to fishing in adjacent areas will be used. Specific procedures, which accomplish these goals, are discussed under the Specific Requirements section.

Disposal Quantities. Quantities of dredged materials placed within the ODMDS will be limited to those amounts that do not produce unacceptable adverse effects to human health and welfare, the marine environment, or human uses of the environment (as defined in EPA's Ocean Dumping Regulations and Criteria). The disposal quantity management objective for the Norfolk ODMDS is to regulate disposal quantities such that the total quantity of material placed in the site not exceed 1.3 billion cubic yards for the life of the site.

Timing of Disposal. There are no seasonal restrictions to the placement of dredged material within the Norfolk ODMDS. However, seasonal restrictions or seasonal special requirements may be associated with a particular dredging activity at a particular location.

Disposal Buoy. As the ODMDS is outside normal shipping lanes and 17 nautical miles from the nearest land, no buoys will be placed to mark the site. Differential global positioning system is required for all disposal vessels.

SPECIFIC REQUIREMENTS

Ocean Disposal Compliance Reporting. Vessels used for dredged material disposal will be required to operate under an approved disposal plan. The location and quantity of each disposal load placed within the Norfolk ODMDS will be maintained in a computerized database by the Corps. All disposals reported outside of the ODMDS boundaries or where no location is reported will be documented and the disposal operator questioned to determine what occurred and the reason for the misdump. The disposal plan will include requirements for an automated system that will record the horizontal location and draft condition of the disposal vessel from the time it passes the Chesapeake Bay Bridge-Tunnel outbound until the vessel passes the bridge-tunnel inbound. Vessel positioning shall be by differential global positioning system.

Minimum reporting requirements for each load are as follows:

- Dredge or vessel name
- Sequential load number
- Date
- Time in one-minute intervals for the specified disposal cycle
- Vessel positioning in latitude/longitude (World Geodetic System 1984) or horizontal datum based on Virginia State Plane Coordinate System (South Zone) North American Datum 1983 (NAD 83) in U.S. Survey feet
- Draft of vessel in feet
- Depth of water in feet referred to National Ocean Service (NOS) mean lower low water (MLLW), National Tidal Datum Epoch (NTDE) 1983-2001
- Begin and end dump event times and positions
- Source of dredged material (i.e. reach name)
- Volume of dredged material disposed, in cubic yards

This data shall be available on a daily basis and submitted electronically to USACE and EPA Region III on a weekly basis. No vessel shall leave for the disposal site without the ability to collect and record the ocean disposal compliance monitoring data specified. The disposal positions reported shall be those of the disposal vessel itself (i.e., the scow not the tug).

Summary Report. In addition, a summary report of operations shall be provided to the USACE, Norfolk or Baltimore District, and EPA Region III within 60 days of either the government's acceptance of the work (in the case of federal dredging projects) or the applicant's completion of the ocean disposal activity (in the case of a Section 103 permitted project). Minimum required data to be included in the summary report are as follows:

- Project Name
- Permit/Federal Project Number
- Location of which material was dredged (waterway/channel/reach)
- Public notice or permit data
- Disposal Site Used
- Project Type (Federal or permitted)
- Type of work (New or maintenance work)
- Method of Dredging and Disposal
- Disposal Dates (Range of disposal dates from start to finish)
- Quantity of dredge materials disposed (in cubic yards)
- Point of Contact for Disposal Activity

Disposa1 "Zones" Within the ODMDS. In order to manage site use (maximize site capacity, reduce multiple user conflicts, facilitate monitoring and management, and reduce potential adverse impacts to the marine environment) the USACE, in consultation with EPA, will designate zones within the ODMDS for dredged material placement from each specific ocean dumping activity. Site monitoring data will be used to adjust these zones relative to current site conditions.

Control of Mounding. Dredged material disposal shall be conducted in a manner to maximize

ODMDS capacity and minimize mounding of material, the dumps shall be scattered throughout designated disposal zones and not placed repeatedly at one location. Disposal zones will be divided into several disposal cells or quadrants which will be sequentially used to ensure dispersal or spreading of the dredged material. Depths at the time of disposal will be monitored to determine if adjustment of disposal methods is needed to prevent unacceptable mounding.

Emergency Dumps and Misdumps. If a Norfolk ODMDS user experiences an emergency situation which causes a dumping of material outside of the ODMDS, the site user must notify the USACE, Norfolk or Baltimore District, the U.S. Coast Guard, Sector Hampton Roads, and EPA Region III in writing within 10 days of the emergency dump, the reason for the emergency, and the location of the dump (40 CFR 224). If, in the opinion of EPA Region III and the USACE District, the misplaced dredged materials are a hazard to the marine environment and its uses, or if the material creates a hazard to navigation, the site user shall remove such material and deposit it where directed. A misdumped load may be considered a violation of the MPRSA and subject to penalties and should be reported in the same manner as emergency dumps.

BASELINE ASSESSMENT OF CONDITIONS AT THE NORFOLK ODMDS

Site Designation EIS Baseline. Baseline conditions at the Norfolk ODMDS are principally reported in the site designation final environmental impact statement, *The Designation of an Ocean Dredged Material Disposal Site located offshore Norfolk, Virginia (November 2, 1992).* These baseline data include information reference from scientific literature as well as information compiled from field surveys at the Norfolk ODMDS. These field survey data included: water and sediment chemistry; benthic macroinfauna and epifauna population characteristics; and concentrations of trace metals and chlorinated hydrocarbons in benthic macroinfauna tissues.

SITE MONITORING

Goals of Site monitoring. Site monitoring is conducted to ensure the environmental integrity of an ocean dredged material disposal site and to verify compliance with site designation criteria, any special site management conditions, and with permit conditions or federal authorization requirements. Monitoring should provide useful and pertinent information to support site management decisions. The main purpose of a disposal site monitoring program is to determine whether site management practices, including disposal operations, need to be changed to avoid unacceptable impacts. Site monitoring is not a stand-alone activity. It is based on the site designation process, the characteristics of the dredged materials, and compliance with authorized activities.

To use site monitoring as an effective tool, site managers will define in quantitative terms if there are unacceptable impacts that dredged material is having on the resources of concern. Where applicable, action levels can be set well below the defined unacceptable effect level and corrective measures can be taken before unacceptable effects occur. Continuous monitoring of all physical, chemical, and biological parameters and resources in and around the ocean dredged material disposal site is not necessary. A monitoring program should be structured to address specific questions (hypotheses) and measure key indicators and

endpoint, particularly those defined during site designation or specific project issues that arise. A tiered strategy for a monitoring program is desirable. With a tiered approach, an unacceptable result may trigger further and often more complex monitoring. The technical framework for evaluating environmental impacts of dredged material placement can be found in EPA-842-B- 92-008.

Norfolk ODMDS Monitoring Objectives. The objectives of the site monitoring plan for the Norfolk ODMDS are to provide information to:

- Determine if the disposal activities are occurring in compliance with site restrictions and permit conditions;
- Indicate the short and long-term fate of dredged material placed at the site;
- Determine the effect of the dredged material disposal on uses of the marine environment outside the ODMDS.
- Determine whether unreasonable degradation to the marine environment is occurring

Monitoring Methods and Rationale. The EPA and USACE will coordinate on the strategies proposed below for the Norfolk ODMDS to monitor the physical, ecological, and chemical conditions to address the monitoring objectives above. These methods have provided information to address specific and current management issues at the site including: mounding (and site capacity), dumps occurring outside the disposal area, movement or fate of material, and ecological and chemical impacts within the site and surrounding area. Information obtained during any future monitoring may indicate the need for additional monitoring at a higher, more complex, level. If more intensive monitoring is required, this monitoring plan must be revised or an additional threshold for action established.

1. **Physical Monitoring**
    a. **Evaluation of Direction and Magnitude of Material Movement.** The extent and probable direction in which local waves and currents erode and transport the dredged material mounds may be important in determining potential effects of site use on adjacent marine resources and in managing use of the site. Sediment dispersion can increase site capacity and make material available for transport outside site boundaries. When applicable, hydrodynamic and sediment transport models such as LTFATE and MDFATE may be used to evaluate dredged material movement at the Norfolk ODMDS. These models are included in the Corps of Engineers' PC based Automated Dredging and Disposal Alternatives Modeling System (ADDAMS).
    b. **Multibeam Echosounder Surveys.** The USACE and/or permit applicant will conduct multibeam echosounder surveys after dumping activities to monitor the bathymetry of the assigned disposal zone within NODS. The multi-beam survey bin size shall be 5’ x 5’ and sounding data reduced to NOS MLLW 1983-2001 NTDE based on NOAA Tidal Zoning dated 2009 from the Chesapeake Bay Bridge Tunnel PORTS gauge. The NODS site is not presently covered by the NOAA Tidal Zoning but tidal zone SA56 will be used for tidal corrections with the values of 1.41 height multiplier

and 30-minute time correction USACE uses for this placement site. Additional multibeam echosounder surveys will be required if site use and/or activity differs from the maintenance dredged material disposal described previously.

2. **Ecological Monitoring**
    a. Monitoring of benthic infauna and/or epifauna will occur at the site every other year, as funding allows. This information will be collected within the disposal site and surrounding areas. Diversity indices will be analyzed and compared to prior monitoring and disposal activity within the site. Information collected from this monitoring may be incorporated into the revised SMMP. If degradation to the marine environment is suspected, more intensive ecological monitoring may be warranted.
3. **Chemical Monitoring**
    a. Monitoring of the sediment chemistry within the disposal site and the surrounding area will occur at the site every other year, as funding allows. Sediment will be analyzed for contaminants of concern that are determined during the Section 103 permit evaluation process. This information may inform the need for more intensive ecological monitoring, and may be incorporated into the revised SMMP.

Other Survey Techniques. Additional survey techniques such as side scan sonar, multi-beam echosounder surveys, video recordings, still photography, bottom grab samples, and vertical sediment profiling may be utilized on a periodic basis to determine the effects of disposal in the Norfolk ODMDS. The USACE and EPA Region III will coordinate the appropriate use of these techniques when circumstances warrant additional monitoring.

Disposal Site Use Records. All dredged material disposal activities at the Norfolk ODMDS will be conducted under an approved verification plan. The USACE will maintain a database of site use. The documented site use information along with other information collected during monitoring will be used to direct future ocean disposal and monitoring activities. The data requirements were discussed previously. All records of use and monitoring results will be made available to the public.

Data Reporting. Data collected will be made available to interested parties.

ANTICIPATED SITE USE

It is anticipated that use of the Norfolk ODMDS will be moderate to light for many years. The primary factor affecting the use of the ODMDS is the availability of Craney Island Dredged Material Management Area.

MODIFICATION OF THE NORFOLK ODMDS SMMP

Should the results of the monitoring surveys or valid reports from other sources indicate that continued use of the ODMDS would lead to unacceptable effects, then the ODMDS SMMP will

be modified to mitigate these adverse effects. The SMMP will be reviewed and updated at least every 10 years. The SMMP will be reviewed and updated as necessary if site use changes significantly. For example, the SMMP will be reviewed if the quantity or type of dredged material placed at site changes significantly or if conditions at the site indicate a need for revisions. The plan should be updated in conjunction with activities authorizing use of the site.

In general, EPA and the USACE shall share responsibility for implementation of the SMMP. Site users may be required to undertake monitoring activities as a condition of their permit. The USACE will be responsible for implementation of the SMMP for Federal operations and maintenance and new work projects. This agreement does not obligate USACE or EPA to expend funds for site monitoring or maintenance of the Norfolk ODMDS. If conditions at the Norfolk ODMDS indicate that testing or monitoring of the site is needed and funds are not available to perform this evaluation, appropriate management action, including closure of the site, will be taken.

REFERENCES

U.S. Environmental Protection Agency (EPA). 1992. Final Environmental Impact statement

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