



**US Army Corps
of Engineers**
Galveston District

**FREEPORT HARBOR DEEPENING AND WIDENING CHANNEL
IMPROVEMENT PROJECT, BRAZORIA COUNTY, TEXAS**

ODMDS SITE MANAGEMENT AND MONITORING PLAN

AS REQUIRED BY

SECTION 102 OF THE

MARINE PROTECTION, RESEARCH, AND SANCTUARIES ACT

SITE MANAGEMENT AND MONITORING PLAN
FREEMPORT HARBOR CHANNEL
IMPROVEMENT PROJECT, BRAZORIA COUNTY, TEXAS
OCEAN DREDGED MATERIAL DISPOSAL SITE

I. General

The Marine Protection, Research, and Sanctuaries Act (MPRSA) of 1972 (33 U.S.C. Section 1401, *et seq.*) is the legislative authority regulating the disposal of dredged material into ocean waters, including the territorial sea. The transportation of dredged material for the purpose of placement into ocean waters is permitted by the U.S. Army Corps of Engineers (USACE) or, in the case of Federal projects, authorized for disposal under MPRSA Section 103(e), applying environmental criteria established by the Environmental Protection Agency (EPA) in the Ocean Dumping Regulations (40 CFR Parts 220–229).

Section 102(c) of the MPRSA and 40 CFR 228.4(e)(1) authorize the EPA to designate Ocean Dredged Material Disposal Sites (ODMDSs) in accordance with requirements at 40 CFR 228.5 and 228.6. Section 103(b) of MPRSA requires that the USACE use dredged material sites designated by EPA to the maximum extent feasible. Where use of an EPA-designated site is not feasible, the USACE may, with concurrence of EPA, select an alternative site in accordance with MPRSA 103(b).

Section 228.3 of the Ocean Dumping Regulations established disposal site management responsibilities; however, the Water Resources Development Act of 1992 (WRDA 92; Public Law 102-580) included a number of amendments to the MPRSA specific to ODMDS management. Section 102(c) of MPRSA as amended by Section 506 of WRDA 92 provides that:

1. Site management and monitoring plans (SMMPs) shall be developed for each ODMDS designated pursuant to Section 102(c) of MPRSA.
2. After January 1, 1995, no ODMDS shall receive a final designation unless a SMMP has been developed.
3. For ODMDSs that received a final designation prior to January 1, 1995, SMMPs shall be developed as expeditiously as practicable, but no later than January 1, 1997, giving priority to sites with the greatest potential impact on the environment.
4. Beginning on January 1, 1997, no permit or authorization for dumping shall be issued for a site unless it has received a final designation pursuant to Section 102(c) MPRSA or it is an alternate site selected by the USACE under Section 103(b) of MPRSA.

This SMMP for the Freeport Harbor Channel Improvement Project (FHCIP), Brazoria County, Texas, Ocean Dredged Material Disposal Sites was developed jointly by EPA, Region 6 and USACE, Galveston District (USACE-SWG). In accordance with Section 102(c)(3) of the MPRSA, as amended by WRDA 92, the plan includes the following:

1. A baseline assessment of conditions at the site;
2. A program for monitoring the site;

3. Special management conditions or practices to be implemented at the site that are necessary for protection of the environment;
4. Consideration of the quantity of dredged material to be discharged at the site, and the presence, nature, and bioavailability of the contaminants in the material;
5. Consideration of the anticipated use of the site over the long term, including the anticipated closure date for the site, if applicable, and any need for management of the site after the closure; and
6. A schedule for review and revision of the plan.

II. Site Management Objectives

The purpose of ODMDS management is to ensure that placement activities do not unreasonably degrade the marine environment or interfere with other beneficial uses (e.g., navigation) of the ocean. The specific objectives of management of the FHCIP ODMDSs are as follows:

1. Ocean discharge of only that dredged material that satisfies the criteria set forth in 40 CFR Part 227 Subparts B, C, D, E, and G and Part 228.4(e) and is suitable for unrestricted placement at the ODMDS.
2. Avoidance of excessive mounding either within the site boundaries or in areas adjacent to the site, as a direct result of placement operations.

These objectives will be achieved through the following measures:

1. Regulation and administration of ocean dumping permits;
2. Development and maintenance of a site monitoring program;
3. Evaluation of permit compliance and monitoring results.

III. Roles and Responsibilities

In accordance with Section 102(c) of the MPRSA and with the Regional Memorandum of Understanding between USACE-SWG and EPA, Region 6 on Management of ODMDSs signed August 13, 1993, EPA is responsible for designation of ODMDSs. Where use of an EPA-designated site is not feasible, the USACE-SWG may, with concurrence with EPA, Region 6 select an alternative site in accordance with Section 103(b) of the MPRSA as amended by Section 506 of WRDA 92.

Development of SMMPs for ODMDSs within USACE-SWG is the joint responsibility of EPA, Region 6 and the USACE-SWG. Both agencies are responsible for assuring that all components of the SMMPs are implementable, practical, and applicable to site management decision-making.

IV. Funding

Physical, chemical, and biological effects-based testing of dredged material prior to placement at the ODMDS will be undertaken and funded by the permittee if the project is permitted or USACE-SWG for Federal projects. The permittee or USACE-SWG, as appropriate, shall also be responsible for costs associated with placement site hydrographic monitoring. Should monitoring indicate that additional studies and/or tests are needed at the ODMDSs, the cost for such work would be shared by the permittee or USACE-SWG and EPA, Region 6.

Physical, chemical, and biological effects-based testing at the ODMDS, or in the site environs after discharge that is not required as a result of hydrographic monitoring, shall be funded by EPA, Region 6. Federal funding of all aspects of the SMMP is contingent on availability of appropriated funds.

V. **Baseline Assessment**

A. Site Characterization (Existing Maintenance ODMDS). The Freeport Harbor Maintenance ODMDS is located approximately 3 miles offshore, and about 1,000 feet southwest of the centerline of the Outer Bar Channel. The site is rectangular in shape with corner coordinates located at:

28°54'00"N, 95°15'49"W; 28°53'28"N, 95°15'16"W;
28°52'00"N, 95°16'59"W; 28°52'32"N, 95°17'32"W.

This site occupies an area of approximately 1.53 square nautical miles (2.02 square statute miles), with depths ranging from 31 to 38 feet. The sediment reference area is located northeast of the channel with vertices at the following coordinates:

28°54'28"N, 95°13'40"W; 28°54'35"N, 95°13'28"W;
28°55'07"N, 95°14'01"W; 28°54'60"N, 95°14'13"W.

B. Site Characterization (Existing New Work ODMDS). The Freeport Harbor New Work ODMDS is located approximately 6 miles offshore, with its area bounded by the following coordinates:

28°50'51"N, 95°13'54"W; 28°51'44"N, 95°14'49"W;
28°50'15"N, 95°16'40"W; 28°49'22"N, 95°15'45"W

The site occupies an area of approximately 2.64 nautical square miles (3.49 square statute miles), with depths ranging from 54 to 63 feet.

Baseline conditions at the Freeport Harbor Maintenance and New Work ODMDSs were assessed during the site designation process. Details of baseline conditions, including descriptions of the marine environment in the site vicinity and the physical, chemical, and biological characteristics of the sediments and the water column at the site, are contained in the Final Environmental Impact Statement (EIS), Freeport Harbor 45-Foot Project (45-foot Project), Ocean Dredged Material Disposal Site Designation prepared by EPA, Region 6, in January 1990.

C. Historical Use of Site

1. Maintenance ODMDS. The Freeport Harbor Maintenance ODMDS received final designation on March 27, 1990 (55 FR 59). Historical use of the site is depicted in Table 1.

**Table 1
Dredging History**

Start	Finish	Dredge Work Type	Total Yards
Aug-92	Nov-92	Maintenance	2,884,532
Jul-93	Sep-93	Maintenance	1,415,742
Aug-94	Nov-94	Maintenance	2,599,267
Sep-95	Jan-96	Maintenance	2,674,026
Jul-96	Aug-96	Maintenance	579,500
Jan-97	Apr-97	Maintenance	2,489,108
Nov-97	Dec-97	Maintenance	1,053,157
Oct-98	Dec-98	Maintenance	2,334,436
Sep-99	Jan-00	Maintenance	1,555,615
Jul-00	Nov-00	Maintenance	1,859,847
Oct-00	Jan-01	Maintenance	2,202,288
Jun-01	Sep-01	Maintenance	2,479,249
May-02	Aug-02	Maintenance	1,996,354
Aug-03	Oct-03	Maintenance	1,726,186
Sep-04	Nov-04	Maintenance	1,908,831
Dec-05	Feb-06	Maintenance	1,911,091
May-06	May-06	Maintenance	200,511
Oct-06	Feb-07	Maintenance	2,516,000
Oct-07	Dec-07	Maintenance	1,415,421
Oct-08	Dec-08	Maintenance	1,577,096
Oct-09	Nov-09	Maintenance	2,420,755 ^a

^a 7,500 cy dredged in January 2010.

SINCE 1992

No. years	18	years/cycle	0.86	Total cy	39,799,012
No. dredgings	21	months/cycle	10.3	cy/cycle	1,895,191
				cy/year	2,211,056

2. New Work ODMDS. The New Work ODMDS was designated (EPA, 1990) originally for the 45-foot Project for placement of 5.1 million cubic yards (mcy) of new work material. This site has been inactive since completion of the 45-foot Project, but has been designated for period of use for an indefinite period of time.

VI. Quantity of Material and Level of Contamination

A. Summary of information used to determine size of the site. Historically, since 1992, the dredging frequency for this navigation project is slightly less than 1 year or approximately 10.3 months, with an average of approximately 1.90 mcy of material excavated per dredging cycle placed at the Maintenance ODMDS. The excavated channel sediments can be characterized as clayey-sandy-silts. The channel sediment may contain a slightly higher percentage of sand than the placement area, and slightly less than the reference area; however, the percentage of silt is similar for all three locations. Average particle-size distribution is described in Table 2.

Table 2
Average Particle-size Distribution

Location	% Sand	% Silt	% Clay
Channel	19.6	52.0	28.4
ODMDS	5.4	66.4	28.2
Reference Area	26.9	56.6	16.5

As described in the site designation EIS, the sizes of the Maintenance ODMDS and New Work ODMDS were determined by simulations run on a computer model. These simulations assumed an average of 3.74 mcy of future maintenance dredged material to be placed during each maintenance cycle and 10.65 mcy of new work dredged material to be placed as part of the improvement project. The 10.65 mcy of new work material is greater than the 5.1 mcy of new work material originally simulated during the designation process for the historic New Work ODMDS (EPA, 1990). Both sites can be described as dispersive; therefore, the dredged material deposited there is expected to erode, especially due to the high percentage of fine-grained components.

Subsequent to the New Work ODMDS MDFATE modeling effort, the future new work material volume for offshore placement was reforecasted from 10.65 to 7.75 mcy. Given the reforecasted new work volume is less than the modeled volume, it is anticipated the disposal mound height will not exceed 15 ft, the Tier C1 threshold established in the SMMP.

Subsequent to the Maintenance ODMDS MDFATE modeling effort, the future maintenance material volume for offshore placement was reforecasted from 3.74 mcy/yr to 4.05 mcy/yr. However, it is anticipated that the additional 310,000 cy/yr of maintenance-dredged material will not translate in a disposal mound height exceeding 10 ft, the Tier M1 threshold established in this SMP.

B. Summary of testing requirements per Regional Implementation Agreement (RIA) and summary of past dredged material evaluations. On September 24, 1992, a RIA was executed between EPA Region 6 and SWG. The RIA was revised and updated, and a new RIA (EPA/USACE, 2003) issued November 3, 2003. This RIA described protocols for evaluating the quality of the dredged material and implementation of the "GREEN BOOK." These protocols describe chemical parameters to be analyzed, as well as required detection limits. It also specifies how toxicity testing and bioaccumulation assessments are to be conducted, as well as organisms to be utilized. Since that time, all sediment evaluations have been conducted in accordance with the RIA. Since the mid-1970s, before development of the RIA, dredged material from the Freeport Harbor Project had been evaluated numerous times to determine suitability for offshore

placement. This testing was performed to determine levels of metals and organic constituents, as well as toxicity and bioaccumulation assessments. Testing performed for this project is summarized in Table 3.

Table 3
Testing of Dredged Material, 1975–2006

Date	Type of Testing
September 17, 1975	Predredging Bulk Analyses
October 6, 1975	During-dredging Bulk Analyses
December 2, 1975	After-dredging Bulk Analyses
April 1978	Toxicity and Bioaccumulation Assessment*
October 1978	Toxicity and Bioaccumulation Assessment*
July 1980	Toxicity and Bioaccumulation Assessment*
January 14, 1982	Predredging Bulk Analyses
February 22, 1983	Predredging Bulk Analyses
July 3, 1984	Predredging Bulk Analyses
February 1985	Toxicity and Bioaccumulation Assessment*
May 15, 1985	Predredging Bulk Analyses
March 28, 1986	Predredging Bulk Analyses
March 18, 1987	Predredging Bulk Analyses
March 15, 1988	Predredging Bulk Analyses
April 7, 1989	Predredging Bulk Analyses
July 20, 1993	Predredging Bulk Analyses
September 1994	Toxicity and Bioaccumulation Assessment*
February 2, 1995	Predredging Bulk Analyses
January 25, 1997	Predredging Bulk Analyses
March 3, 1998	Predredging Bulk Analyses
July 8, 1998	Predredging Bulk Analyses
April 29, 1999	Toxicity and Bioaccumulation Assessment*
May 23, 2000	Predredging Bulk Analyses
April 29, 2004	Toxicity and Bioaccumulation Assessment*
June 29, 2005	Toxicity and Bioaccumulation Assessment*
August 22, 2006	Predredging Bulk Analyses

*Also includes predredging bulk analyses.

The results of the above testing indicated that the material was suitable for offshore placement without special management conditions.

VII. Anticipated Site Use

The maintenance dredging frequency for the deepening and widening project is estimated to generate an average of approximately 3.19 mcy of maintenance dredge material to be placed at the existing Maintenance ODMDS. Presently, the Maintenance ODMDS receives on the average of 1.90 mcy of maintenance-dredged material at a frequency of once every 10.3 months.

The new work construction project will generate approximately 12.7 mcy of new work material from the Entrance Channel to be placed within the existing New Work ODMDS previously designated by EPA for indefinite placement of construction (new work) dredged material for the 45-foot Project.

Currently, no beneficial use of material dredged from Freeport Harbor is practiced. It is the policy of the Galveston District to require implementation of beneficial uses of dredged material, wherever practicable. Therefore, resource agencies were consulted during coordination to identify a beneficial uses plan for the FHCIP. However, it was determined that the likely beneficial use of the dredged material to create marsh or nourish adjacent shorelines would either be economically prohibitive or geotechnically incompatible. Therefore, a beneficial use plan is not proposed for the FHCIP.

VIII. Special Management Conditions or Practices

Currently, no special management conditions or practices related to placement of dredged material into the designated ODMDS have been required. As previously discussed, evaluations of sediment quality have indicated that the material from the channel is suitable for offshore placement without such requirements. However, all operations shall be conducted such that the dredged material remains within the bounds of the ODMDS immediately following descent to the ocean floor.

A seasonal restriction has been recommended by the National Marine Fisheries Service (NMFS), during formal consultation undertaken pursuant to the Endangered Species Act (NMFS, 2007) for maintenance dredging activities. This restriction was based on potential impacts of hopper dredging operations on several species of threatened and endangered sea turtles. The recommendation is to restrict hopper dredging to the period from December 1 through March 31, during which turtle abundance is at a minimum. This recommendation pertains, however, only to actual dredging operations, and not placement of the material into the ODMDSs. While it may not be practical to observe this restriction for all dredging cycles, it will be practiced when feasible. It is anticipated that a Biological Opinion addressing the proposed new work dredging will be issued by NMFS to define restrictions to avoid or minimize impacts to threatened and endangered species that may result from hopper dredging operations.

IX. Monitoring Program

The primary purpose of the Site Monitoring Program is to evaluate the impact of the placement of dredged material on the marine environment.

The evaluations will be used for making decisions, preventing unacceptable adverse effects beyond the site boundary, and ensure regulatory compliance over the life of the ODMDSs. Emphasis will be placed on determining physical impacts, since, to date, dredged material from the FHCIP and from the future maintenance of the navigation channels have been determined to be acceptable for ocean placement, without special conditions; however, consideration of contaminants will also be included.

Testing of dredged material is conducted based on "GREEN BOOK" and RIA procedures; however, it is necessary to verify the decisions made regarding suitability of the dredged material are correct and that the material is not having an adverse impact to the environment. In the event that the material persists in the ODMDSs, there may be potential for long-term contaminant effects on benthos.

The size and location of the Freeport Harbor New Work and Maintenance ODMDSs were determined pursuant to the General Criteria as listed in 40 CFR 228.5, and the Specific Criteria at 40 CFR 228.6(a). There are no significant environmental resources delineated within or immediately outside of the designated ODMDSs. Since these sites are dispersive in nature, the primary concern of the use of the sites is the potential short-term build up of dredged material, such that a hazard to navigation is presented. Another concern is whether there is significant short-term transport of the dredged material beyond the ODMDSs boundaries; specifically, the benthic community can be impacted if significant rapid movement of material off the site occurs, resulting in burial of benthic populations outside the sites. Studies have shown that benthic organisms can burrow through 6–9 inches of dredged material without significant impacts on the community (EPA/USACE, 1996).

The Site Monitoring Program is designed as a tiered program. If initial tier results fail predetermined limits, then a more complex set of tests is invoked at the next tier to determine the extent of impact. The tiers are used to facilitate rapid, accurate, and economical collection of information for use by the EPA, Region 6 and the USACE-SWG. The tiered hypothesis testing for these factors is described below.

CONSTRUCTION MATERIAL

While the literature on maintenance material disposal on the Gulf Coast indicates only minor short-term and negligible long-term mounding from placement activities, little information is available for new work material ODMDSs. Mounding from the construction material, while acceptable, is higher and of firmer material than is true for the maintenance material. Additionally, construction placement is expected to last for only a period of 2 years or less and more-frequent monitoring would be expected than would be necessary for the periodic, but short-term placement that occurs with maintenance dredging. The following monitoring and surveillance program is proposed for the FHCIP ODMDSs during construction. The monitoring is discussed in detail below.

A major consideration in the acceptability of the size of the ODMDSs was the location of the dredge when each discharge occurs. To prevent excessive mounding, it is necessary that a method be utilized to record the location of each discharge to ensure that the dredge distributes material uniformly over the ODMDS while it avoids approaching the edges of the ODMDS too closely. The following is the scheme used in the modeling to avoid excessive mounding and dispersal of material outside the ODMDS: two discharges at all exterior placement points (one should a larger dredge be used), followed by one discharge at each of the interior placement points in a given sequence until each has been utilized. Continue repeating the sequence with one discharge at each interior placement point until construction is complete.

TIER C1

Bathymetric Surveys

Routine bathymetric scans shall be conducted for the ODMDS to determine that there is no excessive mounding; e.g., to heights greater than 15 feet (threshold) above the existing bottom elevation (unless an alternate height is determined in agreement between the EPA and USACE on a case-by-case basis), and that there is no short-term transport of material beyond the limits of the ODMDS. Therefore, an accumulation of 1 foot of sedimentation along the ODMDS

boundary will be considered the threshold level for movement of material outside of the designated ODMDS. These determinations will be based on a comparison of the results with predisposal surveys.

Bathymetric surveys shall be obtained before the start of disposal operations, and monthly thereafter until operations are complete. Additional surveys shall then be performed after 6 months and 1 year.

Hydrographic surveys shall be conducted along transects within the ODMDS. These transects shall be oriented perpendicular to the channel in the direction of sediment transport (i.e., southwest). Transect intervals shall be every 1,000 feet extending 1,000 feet outside each boundary. In addition, a depth profile shall be obtained along the boundary.

Surveys shall be obtained using a USACE, or contract, survey vessel equipped with electronic surveying capabilities. The vessel must be equipped with positioning equipment with a horizontal precision of 1 foot. The fathometer, which shall display real-time depth on real-time location, must have a precision of 0.5 foot. All data shall be collected using methodology described in Engineer Manual 1110-2-1003, dated January 1, 2002.

Data Analysis

- If the surveys indicate deposited dredged material is not mounding to heights greater than the threshold elevation above the existing bottom elevation, and there is no short-term movement of material beyond the limits of the ODMDS, then the management objectives are being met. Further monitoring shall be conducted as scheduled.
- If the monthly surveys indicate movement of material outside of the designated limits, then the disposal operation will be reviewed to determine if the disposal sequence is being properly followed. The disposal sequence shall be adjusted as necessary to compensate for the movement.
- If the after-disposal surveys indicate mounding to heights greater than the threshold elevation, and/or movement of material out of the ODMDS has occurred, then the monitoring program shall proceed to Tier C2.

Sediment Chemistry

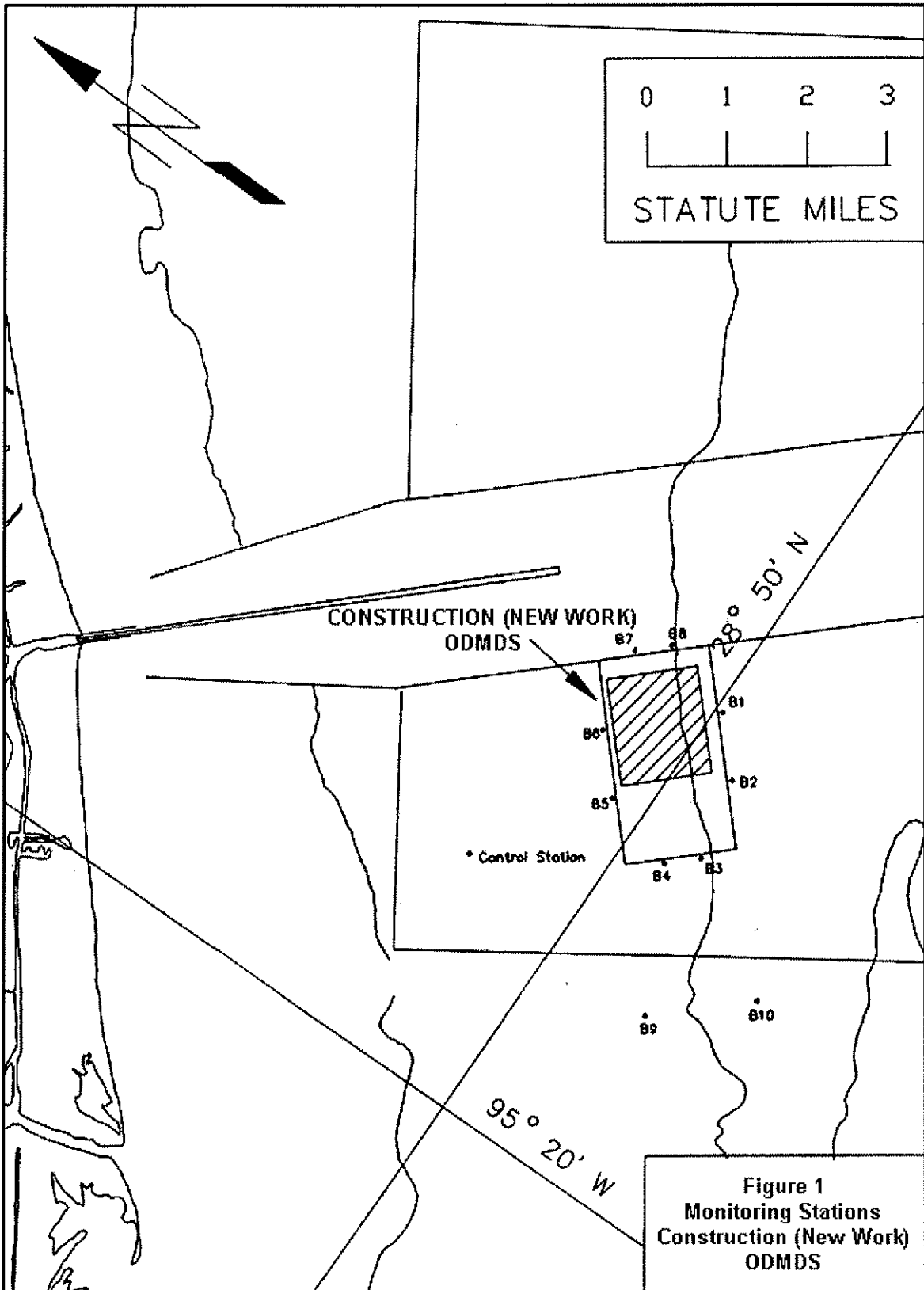
The New Work ODMDS is expected to receive most of the construction material and is selected as worst case for the monitoring described below. Monitoring stations, which consist of a control station, stations located immediately outside the ODMDS, and stations located some distance downcurrent from the site should be sampled for the items noted in the following paragraph to determine if impacts are occurring outside of the ODMDS. EPA (1989) describes two stations on each side of the ODMDS, roughly 300 feet from the ODMDS edges (stations B1 through B8), a control site located upcurrent of the ODMDS, and two stations located 10,000 feet downcurrent (southwest) of the downcurrent edge of the ODMDSs (Figure 1).

These stations shall be sampled before and at the completion of disposal operations. Postdisposal sampling shall occur 6 months and 1 year after the cessation of discharge of new work material at the site.

Samples shall be collected for (1) grain-size analysis, and (2) chemical characterization of sediments. The analytes and protocols described in the RIA shall apply to this testing. Sediment chemistry results shall be compared to the before-disposal results of samples from the sites and control sample. Data from previously collected sediments in the vicinity can also be considered. Significantly elevated sediment concentrations are defined as concentrations above the range of contaminant levels in dredged sediments that the Regional Administrator and the District Engineer found to be suitable for disposal at the ODMDS.

Data Analysis

- If contaminant concentrations are not significantly different from before-disposal data, then the management objectives are being met. Further monitoring shall be conducted as scheduled.
- If significant increases in levels of contaminants are observed, but bathymetric monitoring indicates that there is no short-term transport of material beyond the limits of the ODMDS, as determined in Bathymetric Surveys Tier C1, then this is an indication that the increase is not a result of dredged material placement. Further monitoring shall be conducted as scheduled.
- If significant increases in levels of contaminants are observed, and bathymetric monitoring indicates that there is short-term transport of material beyond the limits of the ODMDS, as determined in Bathymetric Surveys Tier C1, then bioassay/bioaccumulation testing shall be conducted to determine effects to the benthic communities. This testing is described in Tier C2.



Benthos

Monitoring stations, which consist of a control station, stations located immediately outside the ODMDS, and stations located some distance downcurrent from the site should be sampled for the items noted in the following paragraph to determine if impacts are occurring outside of the ODMDS. EPA (1989) describes two stations on each side of the ODMDS, roughly 300 feet from the ODMDS edges (stations B1 through B8), a control site located upcurrent of the ODMDS, and two stations located 10,000 feet down current (southwest) of the downcurrent edge of the ODMDS (stations B9 and B10). These should be the same stations used for sediment chemistry (see Figure 1). Substrate elevation should also be determined at each sampling station during each sampling event.

These stations shall be sampled before and at the completion of disposal operations. Postdisposal sampling shall occur 6 months and 1 year after the cessation of discharge of new work material at the site. Samples shall be collected for macrobenthic invertebrates (in triplicate). Macrobenthic community structure during each sampling event shall be compared to the control sample to eliminate effects of potential seasonal variation. Significant changes are defined as statistically significant differences in community structure or population density.

Data Analysis

- If macrobenthic community structure is not significantly different than the control, then the management objectives are being met. Further monitoring shall be conducted as scheduled.
- If significant changes are observed, then further analysis shall be conducted under Tier C2.

TIER C2

Bathymetric Surveys

If deposited dredged material mounds to heights above the threshold value, then monitoring shall continue as scheduled, and could possibly be extended. A Notice to Mariners shall be posted as appropriate.

If transport of material from the site is occurring, hydrographic surveys shall be expanded to include the impacted areas to determine the changes in dispersion of the material. An accumulation of more than 1 foot of sedimentation along the ODMDS boundary will be considered the threshold level for significant movement of material outside of the designated ODMDS.

Data Analysis

- During Dredging – If deposited dredged material is mounding to heights above the threshold value, but less than 20 feet above the existing bottom elevation, and there is no significant short-term transport of material beyond the limits of the ODMDS, then monitoring shall continue as scheduled. A Notice to Mariners shall be issued as appropriate.

- During Dredging – If deposited dredged material is mounding to heights greater than 20 feet above the existing bottom elevation, and there is no significant short-term transport of material beyond the limits of the ODMDS, then bathymetric monitoring shall continue as scheduled. A Notice to Mariners shall be posted as appropriate. If mounding is considered to be excessive, alterations to the placement operations may be warranted.
- During Dredging – If significant movement of material out of the ODMDS is occurring, bathymetric monitoring shall be expanded to include the impacted areas to determine the changes in dispersion of the material. Following completion of disposal operations, surveys shall continue on a quarterly basis for 1 year, or until agreement is reached between the EPA and USACE-SWG to discontinue monitoring. Findings shall be documented for future reference.
- After Dredging – If deposited dredged material has mounded to heights above the threshold value, but less than 20 feet above the existing bottom elevation, and there is no significant short-term transport of material beyond the limits of the ODMDS, then bathymetric monitoring shall continue at predetermined 6-month intervals for 1 year, or until agreement is reached between the EPA and USACE-SWG to discontinue monitoring. Findings shall be documented for future reference, and a Notice to Mariners shall be issued as appropriate.
- After Dredging – If deposited dredged material is mounding to heights greater than 20 feet above the existing bottom elevation, and there is no significant short-term transport of material beyond the limits of the ODMDS, then bathymetric monitoring shall continue at predetermined 6-month intervals for 1 year, or until agreement is reached between the EPA and USACE-SWG to discontinue monitoring. Findings shall be documented for future reference, and a Notice to Mariners shall be issued as appropriate.
- After Dredging – If significant movement of material out of the ODMDS has occurred, bathymetric monitoring shall be expanded to include the impacted areas to determine the changes in dispersion of the material, and shall continue on a quarterly basis for a 1-year period, or until agreement is reached between the EPA and USACE-SWG to discontinue monitoring. Findings shall be documented for future reference.

Sediment Chemistry

If the results of the Tier C1 sediment chemistry evaluation indicate the need for additional testing, then solid-phase bioassay and bioaccumulation testing shall be conducted in accordance with the procedures described in the RIA. Funding for work under this Tier shall be provided by EPA, Region 6 as described in Section IV, Funding.

Data Analysis

- If significant toxicity is not found, testing shall continue as described in Tier C1. However, subsequent sampling shall continue on a quarterly basis for the 1-year period following completion of disposal operations, or until agreement is reached between the EPA and USACE-SWG to discontinue monitoring. Findings shall be documented for future reference.
- If significant toxicity is found, the USACE-SWG together with EPA Region 6 will consider various management options to rectify the situation. Because the ODMDS is a

dispersive site, potential sources of toxicity other than dredged material must also be considered. A decision must also be made whether to allow continued use of this site. Findings shall be documented for future reference.

Benthos

A significant change in community structure or population density may be an indication that the substrate has changed. This could be a result of natural redistribution of sediments or the dredged material may be moving beyond the ODMDS at a faster rate than anticipated. A change in community structure could also indicate that toxicity has occurred. Monitoring the macrobenthic community shall continue on a quarterly basis until 1 year following completion of discharge operations has elapsed, or until agreement is reached between the EPA, Region 6 and USACE-SWG to discontinue monitoring.

Data Analysis

- If significant changes are observed, but bathymetric monitoring indicates that there is no short-term transport of material beyond the limits of the ODMDS, as determined in Bathymetric Surveys Tier C1, then this is an indication that the changes are not a result of dredged material placement. Further monitoring shall be conducted as scheduled.
- If significant changes are observed, and bathymetric monitoring indicates that there is short-term transport of material beyond the limits of the ODMDS, as determined in Bathymetric Surveys Tier C1, then this is an indication that the changes may be a result of dredged material placement. Further monitoring shall be conducted as scheduled.
 - If significant changes are observed 1 year following completion of disposal operations, then the monitoring shall continue on a quarterly basis for 1 additional year. If significant changes are observed after the second year, further monitoring plans will be developed based on the degree of impact.
- If significant changes are observed, and there is an indication that the sediments are toxic, as determined in Sediment Chemistry Tier C2, then this is an indication that the changes may be a result of dredged material placement. Further monitoring shall be conducted as scheduled.
 - If significant changes are observed 1 year following completion of disposal operations, then the monitoring shall continue on a quarterly basis for 1 additional year. If significant changes are observed after the second year, further monitoring plans will be developed based on the degree of impact.

MAINTENANCE MATERIAL

TIER M1

Physical and chemical evaluations of the ODMDS material shall be conducted to characterize possible effects from the placement of dredged material occurring at the site. Physical analyses of the sediment can assist in assessing the impact of disposal practices on the benthic environment at the disposal site and determine if dredged material is migrating offsite. Chemical analyses of the sediment shall be conducted to establish whether contaminants of concern are suspected to be affecting the benthic environment at the disposal site.

Bathymetric Surveys

The ODMDS is located outside of the safety fairway for large vessel traffic; therefore, the mounding will be considered in regard to shallow-draft vessels only. Considering the grain-size characteristics of typical maintenance dredged material from this channel, significant mounding is not expected subsequent to discharge operations. The threshold elevation for mounding of dredged material within the ODMDS will be 10 feet, or other mutually agreed-upon height, above the existing bottom elevation.

Since the sites are dispersive, movement of material from the sites is expected to occur after disposal operations cease. In order to detect if short-term movement of the material out of the designated ODMDS is occurring at a significant rate, hydrographic surveys of the ODMDS shall be obtained before the start of disposal operations, and soon after completion of disposal operations. An accumulation of 1 foot of sedimentation along the ODMDS boundary will be considered the threshold level for movement of material outside of the designated ODMDS. This determination shall be based on a comparison of the results of these before and after surveys.

Hydrographic surveys shall be conducted along transects within the ODMDS. These transects shall be oriented perpendicular to the channel in the direction of sediment transport (i.e., southwest). Transect intervals shall be every 1,000 feet extending 1,000 feet outside each boundary. In addition, a depth profile shall be obtained along the boundary.

Surveys shall be obtained using a USACE or contract survey vessel equipped with electronic surveying capabilities. The vessel must be equipped with positioning equipment with a horizontal precision of 1 foot. The fathometer, which shall display real-time depth on real-time location, must have a precision of 0.5 foot. All data shall be collected using methodology described in Engineer Manual 1110-2-1003, dated January 1, 2002.

Data Analysis

- If deposited dredged material is not mounding to heights greater than the threshold height above the existing bottom elevation, and there is no short-term movement of material beyond the limits of the ODMDS, then the management objectives are met. No further postdisposal monitoring will be required.
- If mounding to heights greater than the threshold height, and/or movement of material out of the ODMDS has occurred, as determined by the postdredging survey, then the monitoring program shall proceed to Tier M2.

Sediment Chemistry

Sediment chemistry analyses shall be conducted in conjunction with the dredged material evaluations from samples collected in the navigation channel. Collecting samples from both the navigation channel and ODMDS during the same sampling event has been determined to be the most efficient use of resources. Because most ODMDSs lie directly adjacent to the navigation channels, there are relatively short distances between the two areas. As described in the RIA, sediment testing in the navigation channels generally occurs on a 5-year cycle. Sediment chemistry results from the ODMDSs should be compared to the results collected from the navigation channel. Significantly elevated sediment concentrations are defined as concentrations above the range of contaminant levels in dredged sediments that the Regional Administrator and the District Engineer found to be suitable for disposal at the ODMDS.

Data Analysis

- If contaminant concentrations are not significantly different than navigation channel concentrations then no further testing is needed.
- If significant increases in levels of contaminants are observed at the ODMDS, then a bioassay/bioaccumulation study shall be conducted to determine effects to the benthic community. The studies are described below as Biological Testing under Tier M2.

TIER M2

Bathymetric Surveys

If transport of material from the sites is occurring, hydrographic surveys shall be expanded to include the impacted areas and shall be performed on a semiannual basis to determine the changes in dispersion of the material until the impacts are no longer observed. An accumulation of more than 1 foot of sedimentation along the ODMDS boundary will be considered the threshold level for significant movement of material outside of the designated ODMDS.

Data Analysis

- If deposited dredged material is mounding to elevations above the threshold value, but less than 15 feet above the existing bottom elevation, and there is no significant short-term transport of material beyond the limits of the ODMDS, then semiannual postdisposal monitoring shall occur as described.
- If at 6 months after disposal, deposited dredged material remains mounded to elevations greater than half the postdisposal elevations, then bathymetric surveys shall be continued.
- If deposited dredged material is mounding to heights greater than 15 feet and/or significant movement of material out of the ODMDS has occurred, the USACE-SWG together with EPA, Region 6 will consider various management options to rectify the situation. Such options could include, but are not limited to, expansion of the ODMDS or relocation of the ODMDS within the zone of siting feasibility described in the designation EIS.

Biological Testing

If the results of the Tier M1 sediment chemistry evaluation indicate the need for additional testing, then solid-phase bioassay and bioaccumulation testing shall be conducted in accordance with the procedures described in the RIA. Funding for work under this Tier shall be provided by EPA, Region 6 as described in Section IV, Funding.

Data Analysis

- If toxicity is not indicated, then no further testing is needed and disposal activities can continue at the ODMDS.
- If toxicity is indicated at the ODMDS, the USACE-SWG together with EPA, Region 6 will consider various management options to rectify the situation. Because the ODMDS is a dispersive site, potential sources of toxicity other than dredged material must also be considered. If planned use of the ODMDS is imminent, a decision must also be made whether to allow continued use of this site.

X. SMMP Review and Revision

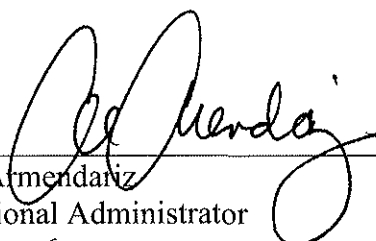
Pursuant to Section 102(c) of the MPRSA, as amended by WRDA 92, the SMMP for the FHCIP ODMDSs will be reviewed and revised, if necessary, not less frequently than 10 years after adoption and every 10 years thereafter.

Modifications or updates to the SMMP may be necessary, based on specific needs identified for specific authorized projects. Modifications or updates to the SMMP may be proposed by either the USACE-SWG or EPA, Region 6. Following a 30-day review period of the changes(s), the modifications may be incorporated into the plan by mutual consent of both agencies.

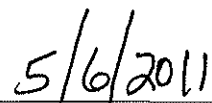
References

- National Marine Fisheries Service (NMFS). 2007. Revision 2 to the November 19, 2003, Biological opinion concerning dredging of Gulf of Mexico navigation channels and sand mining ("borrow") areas using hopper dredges by U.S. Army Corps of Engineers, Galveston, New Orleans, Mobile, and Jacksonville districts (Consultation Number F/SER/2000/01287).
- U.S. Environmental Protection Agency (EPA). 1989. Draft environmental impact statement, Freeport Harbor (45-foot Project), Ocean Dredged Material Disposal Site designation, EPA 906/01-80-003. U.S. EPA Region VI, Dallas, Texas.
- . 1990. Final environmental impact statement, Freeport Harbor (45-Foot Project), Ocean Dredged Material Disposal Site designation, EPA 906/01-90-001. U.S. EPA, Region VI, Dallas, Texas.
- U.S. Environmental Protection Agency/U.S. Army Corps of Engineers (EPA/USACE). 1996. Guidance document for development of SMMPs for Ocean Dredged Material Disposal Sites. Office of Water (4504F), Environmental Protection Agency, Washington, D.C.
- . 2003. Regional implementation agreement for testing and reporting requirements for ocean disposal of dredged material off the Louisiana and Texas coasts under Section 103 of the Marine Protection, Research and Sanctuaries Act, July 2003. U.S. EPA Region VI, Dallas, Texas; U.S. Army Corps of Engineers, Galveston District; and U.S. Army Corps of Engineers, New Orleans District.


This SMMP complies with Section 102(c)(3) of the Marine Protection, Research and Sanctuaries Act of 1972 (33 U.S.C. Sections 1401, *et seq.*) as amended by Section 506 of the Water Resources Development Act of 1992 (WRDA 92; Public Law 102-580), and has been approved by the following officials of Region 6 of the U.S. Environmental Protection Agency, and Galveston District of the U.S. Army Corps of Engineers. This plan goes into effect upon the date of the last signature:



Al Armendariz
Regional Administrator
Region 6
U.S. Environmental Protection Agency



Date



Christopher W. Sallese
Colonel, Corps of Engineers
Galveston District
U.S. Army Corps of Engineers



Date