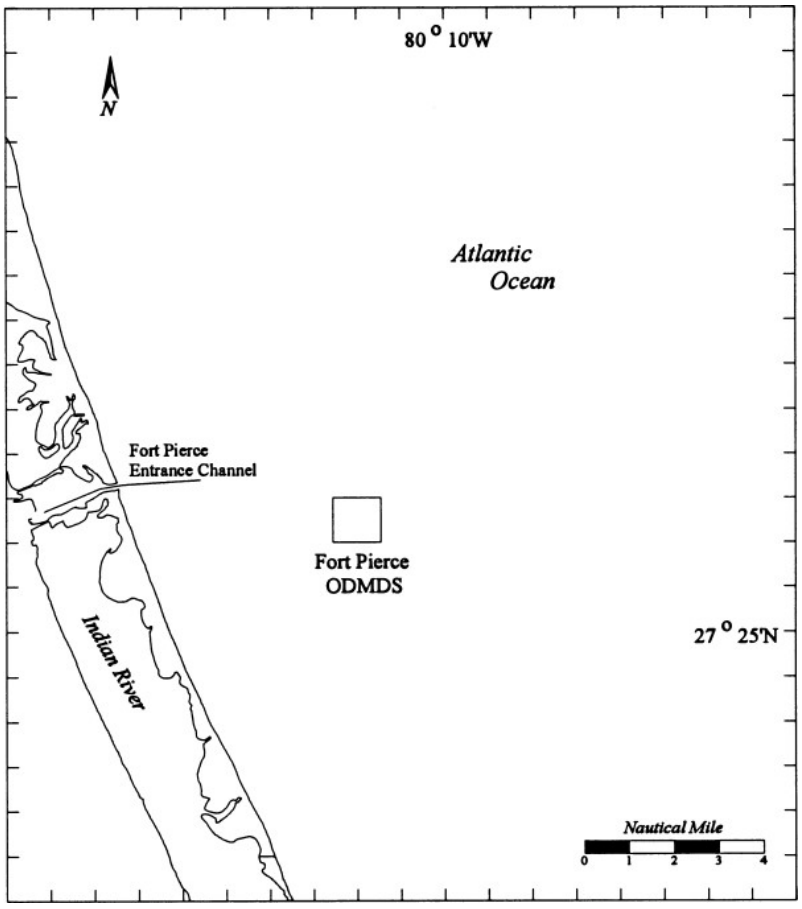
FORT PIERCE OCEAN DREDGED MATERIAL DISPOSAL SITE

SITE MANAGEMENT AND MONITORING PLAN

November 2025

US Army Corps of Engineers



The following Site Management and Monitoring Plan (SMMP) for the Fort Pierce Ocean Dredged Material Disposal Site (ODMDS) has been revised to comply with Section 102(c)(3) of the Marine Protection, Research, and Sanctuaries Act (MPRSA) of 1972, as amended (33 U.S.C. Section 1412(c)) and has been approved by the following officials of the U.S. Environmental Protection Agency (EPA) Region 4 and the U.S. Army Corps of Engineers (USACE), Jacksonville District. This SMMP supersedes all prior Fort Pierce ODMDS SMMP's.

Kevin J. McOmber

Digitally signed by Kevin J. McOmber
Date: 2025.12.29 10:02:15 -05'00'

Kevin J. McOmber, P.E.
Regional Administrator
U.S. Environmental Protection Agency
Region 4
Atlanta, Georgia

Digitally signed by BOWMAN.BRANDON.L.1033516602
Date: 2025.12.16 08:05:25 -05'00'

Brandon L. Bowman
Colonel, U.S. Army
District Commander
Jacksonville District
U.S. Army Corps of Engineers

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

Table of Contents

Appendices

Figures

Tables

1 INTRODUCTION

The Marine Protection, Research, and Sanctuaries Act (MPRSA), also referred to as the Ocean Dumping Act, regulates the transportation and the dumping of any material into ocean waters. The MPRSA applies to all ocean waters that are seaward of the baseline from which the territorial sea is measured. Under the MPRSA, no permit or authorization may be issued for ocean dumping where such dumping will unreasonably degrade or endanger human health or the marine environment. Most material dumped in the ocean today is dredged material (i.e., sediments) removed from the bottom of water bodies to maintain navigation.

In the case of dredged material, the U.S. Army Corps of Engineers (USACE) is responsible for issuing ocean dumping permits and authorizing or conducting federal projects involving ocean dumping of dredged material (33 U.S.C. Section 1413, MPRSA Section 103). The USACE applies the U.S. Environmental Protection Agency (EPA) marine protection criteria established pursuant to Section 102 of the MPRSA when evaluating permit or authorization requests for (and implementing federal projects involving) the transportation of dredged material for the purpose of dumping into ocean waters. MPRSA permits and federal projects involving the ocean dumping of dredged material are subject to the EPA review and written concurrence. The EPA may concur with or without conditions or decline to concur (i.e., non-concur) on the permit or federal project. If the EPA concurs with conditions, the final permit or the terms of the federal project authorization must include those conditions. If the EPA declines to concur on an ocean dumping permit or federal project, USACE cannot issue the permit or authorize or conduct the transportation to and dumping of dredged material in the ocean associated with the federal project. According to USACE regulations at 33 C.F.R. Section 325.6,
MPRSA permits for and federal projects involving the transportation of dredged material for the purpose of dumping into ocean waters may not exceed three years.

Under MPRSA Section 102, the EPA is responsible for the designation of all Ocean Dredged Material Disposal Sites (ODMDS) and dumping sites for all other materials, and the
management of such designated sites. The EPA's ocean dumping regulations at 40 C.F.R. Part 228 establish procedures for the designation and management of ocean sites. Site management consists of regulating times, rates, and methods of dumping; regulating quantities and types of materials disposed; developing and maintaining effective ambient monitoring programs for the site; conducting site evaluation studies; and recommending modifications in site use and/or designation (40 C.F.R. Section 228.3(a)).

The EPA shares the responsibilities of conducting management and monitoring activities at the EPA-designated ODMDSs with USACE. Under MPRSA Section 102(c), the EPA, in conjunction with USACE, is responsible for developing a site management and monitoring plan (SMMP) for each designated ODMDS. The objective of each SMMP is to ensure that dredged material ocean dumping activities will not unreasonably degrade the marine environment or endanger human

health or economic potentialities or other uses of the ocean. The SMMP provisions are an integral part of managing all dumping activities at an ODMDS. Preparation of this SMMP has been informed by the Guidance Document for Development of Site Management Plans for Ocean Dredged Material Disposal Sites (EPA and USACE, 1996).

This SMMP may be modified during its term if the EPA in conjunction with the USACE determines that such changes are warranted, including as a result of information obtained from monitoring or other factors. This SMMP will be reviewed and revised as needed, or at least every 10 years, whichever is sooner. The MPRSA provides that the SMMP shall include, but is not 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 of the material to be disposed of at the site and the presence, nature, and bioavailability of contaminants in the material;
- Consideration of the anticipated long-term use of the site including the anticipated closure of the site, if applicable, and any need for continued management after closure of the site; and
- A schedule for review and revision of the plan (which shall be reviewed and revised at least every 10 years).

The provisions in this SMMP apply for all dredged material dumping activities at the Fort Pierce ODMDS, including monitoring and management activities by the federal agencies. This SMMP also includes water quality modeling input parameters for dumping (Appendix A). References in this SMMP to conditions that "should be required" refer to implementation in a subsequent proceeding to authorize dumping of dredged material, whether in a permit, in a contract or other federal project specification for the transportation and dumping of dredged material, or by USACE directly. Other than the regulatory text copied below, this SMMP does not itself impose binding requirements or obligations, though terms and conditions from the SMMP will be incorporated into other documents (e.g., permits and federal project documents that authorize transportation and dumping of dredged material at the ODMDS) that will then impose binding rights and obligations on persons responsible for the authorized transportation and dumping.

1.1 Definitions

For the purposes of this document, the following definitions apply:
"*Authorization document"* means any permit issued pursuant to the MPRSA and/or authorizations from the Corps for the transportation and/or ocean dumping of dredged material, including but not limited to transportation-related or dumping-related conditions in contract documents and/or specifications.

"Site user" means a person utilizing a permit issued by the Corps of Engineers under Section 103 of the MPRSA and any person carrying out any Federal dredging and ocean dumping projects reviewed under Section 103(e) of the MPRSA or under a Dredged Material Permit as defined in 40 C.F.R. Section 220.2(h).

"Disposal vessel" is any barge, scow, or self-propelled vessel (such as a hopper dredge) that carries dredged material during transit and from which the dredged material is discharged, typically by opening doors in the bottom of the hull or by splitting the hull.

"Disposal Release Zone" is the area identified within the ODMDS in which dumping of dredged material must occur in order for it to stay within the boundaries of the site, within which the disposal vessel must discharge all of the dredged material.

"Towing vessel" is any self-propelled tug or other marine vessel used to transport (tow or push) the "disposal vessel" for any portion of the transit to the ODMDS.

1.2 Roles and Responsibilities

An interagency SMMP team was established to assist the EPA and USACE in developing Fort Pierce ODMDS SMMPs in 1993 and 2000. The team consisted of the following agencies and their respective representatives:

- USACE Jacksonville District
- State of Florida (Coastal Management Program)
- EPA Region 4
- Port of Fort Pierce
- National Marine Fisheries Service (NMFS)
- U.S. Coast Guard

The EPA and USACE will continue to consult with these Florida and federal agencies, as appropriate, to assess the need for future revisions to the Fort Pierce ODMDS SMMP. The other agencies have, in the past, assisted the EPA and USACE with deciding appropriate dumping practices, monitoring techniques, the level of monitoring, the significance of results, and potential management options.

The EPA and USACE work together to implement the site monitoring program for the Fort Pierce ODMDS. Specific responsibilities of the EPA and USACE are as follows:

EPA: The EPA is responsible for designating, modifying, and de-designating/cancelling ODMDSs under MPRSA Section 102, managing these sites by regulating site use, developing and implementing site monitoring programs (including compliance monitoring), evaluating environmental effects of dumping of dredged material at the sites, reviewing for concurrence on dredged material suitability determinations, and reviewing for compliance with the MPRSA criteria, conditions, and restrictions for MPRSA section 103 permits or Federal projects authorizing the ocean dumping of dredged material.

Under MPRSA Sections 1411 and 1415(a) , the EPA has broad authority to assess civil penalties and seek injunctive remedies for unauthorized transport of material for the purpose of dumping it into ocean waters, including deviations from transportation-related and dumping-related conditions required by a regulation establishing the ODMDS or deviations from transportation-related and dumping-related conduct required or authorized by USACE in a Dredged Material Permit (as defined in 40 C.F.R. Section 220.2(h)) or construction contract.

USACE: The USACE is responsible for evaluating dredged material suitability and compliance with the MPRSA marine protection criteria, conditions, and restrictions, issuing MPRSA Section 103 permits and project authorizations, and, in conjunction with the EPA, regulating site use and developing and implementing site monitoring programs (including compliance monitoring) through development and use of the SMMP. The USACE also has a contract remedy process to enforce conditions related to ocean dumping with a contractor for a federal project. USACE contract remedies are separate and distinct from statutory remedies under the MPRSA.

The SMMP provisions apply to all dredged material transportation to and dumping at the site, including monitoring and management activities by the federal agencies. In addition to the SMMP provisions, USACE includes provisions in subsequently issued permits or in contracts that include the transportation and dumping requirements for a federal project. The EPA can ensure implementation of the provisions as necessary through their inclusion as conditions in the EPA's Section 103 concurrence actions. The agencies may adjust the provisions to individual projects, as necessary. All MPRSA Section 103 permits or contract specifications for ocean dumping of dredged material shall ensure compliance with the conditions of this SMMP.

2 SITE DESCRIPTION

The following sections 2.1 through 2.5 are a summary of site-specific information used in the development of this SMMP.

2.1 SITE HISTORY AND DESIGNATION

The Fort Pierce ODMDS and vicinity has been used for the ocean dumping of dredged material since 1949. Prior to 1993, material was disposed in an area 0.5 nautical miles north of the current Fort Pierce ODMDS. At the time of final site designation in 1993, the site was shifted south to avoid hard/live bottom habitat in the previous dumping location (Figure 1).

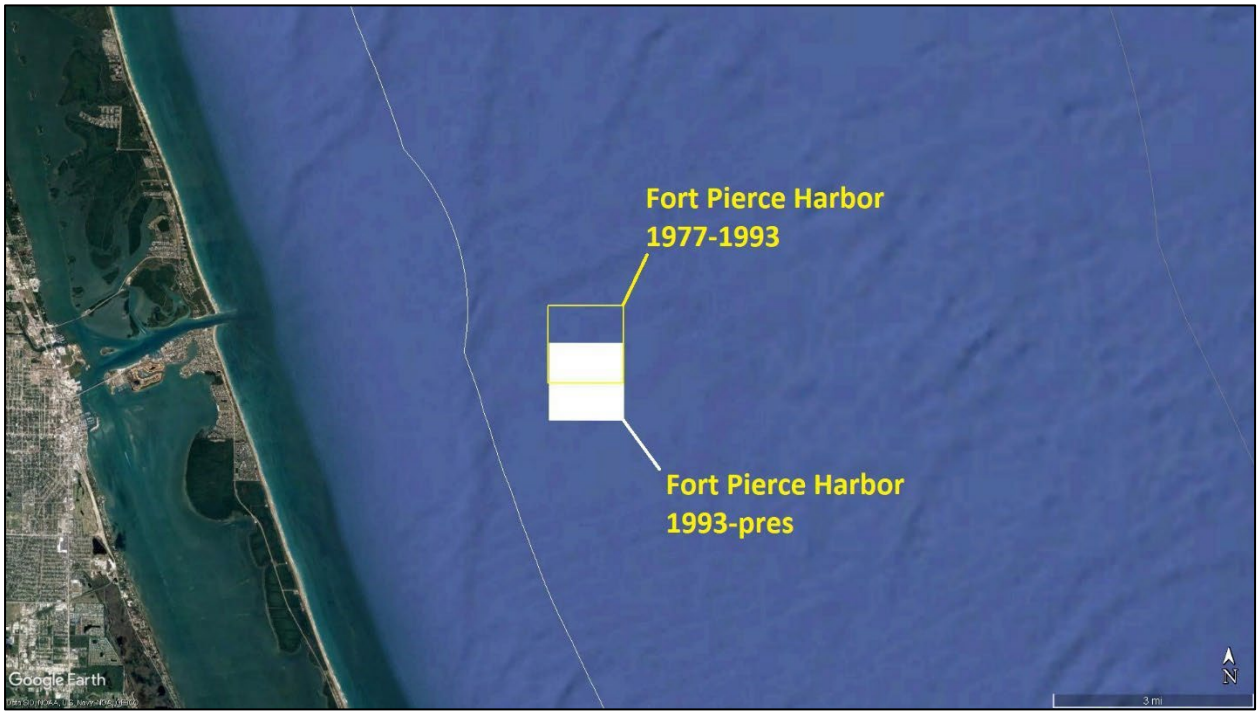


Figure 1. Shifting of the Fort Pierce ODMDS to avoid hard/live bottom habitat.

A SMMP was first developed for the Fort Pierce ODMDS as part of the final site designation (EPA, 1983). The SMMP was revised in 2000 (EPA and USACE, 2000) and replaced by the *Southeastern United States Inactive ODMDS SMMP* in 2013 (EPA and USACE, 2013) as the Fort Pierce ODMDS had not been used since 2002. The Fort Pierce ODMDS became active in October of 2014 with the dumping of 246,930 cubic yards of maintenance dredged material from Fort Pierce Harbor; the updated Fort Pierce ODMDS SMMP was finalized in 2015. This plan serves as a revision to and supersedes previous SMMPs for the Fort Pierce ODMDS.

The official Fort Pierce ODMDS designation is published at 40 C.F.R. Section 228.15(h)(11):

Fort Pierce Harbor, FL, Fort Pierce, FL, Ocean Dredged material Disposal Site.

(i) ***Location:*** 27°28’00” N, 80°12’33” W; 27°28’00” N, 80°11’27” W; 27°27’00” N, 80°11’27” W; and 27°27’00” N, 80°12’33” W (NAD27).

(ii) ***Size:*** 1 square nautical mile.

(iii) ***Depth:*** Average range 40 to 54 feet.

(iv) ***Primary Use:*** Dredged material.

(v) ***Period of Use:*** Continuing use.

(vi) ***Restrictions:*** Disposal shall be limited to suitable dredged material from the greater Fort Pierce Harbor vicinity. All dredged material consisting of greater than 10% fine grained material (grain size of less than 0.047mm) by weight shall be limited to that part of the site east of 80°12’00” W and south of 27°27’20” N (NAD27).

2.2 SITE LOCATION

The site is located 4.5 nautical miles (nmi) offshore and measures 1 nm by 1 nm (Figure 2). The site is centered at 27° 27.50'N latitude and 80° 12.00'W longitude (1,136,619 northing; 915,603 easting; NAD83). The site coordinates are listed in Table 1.

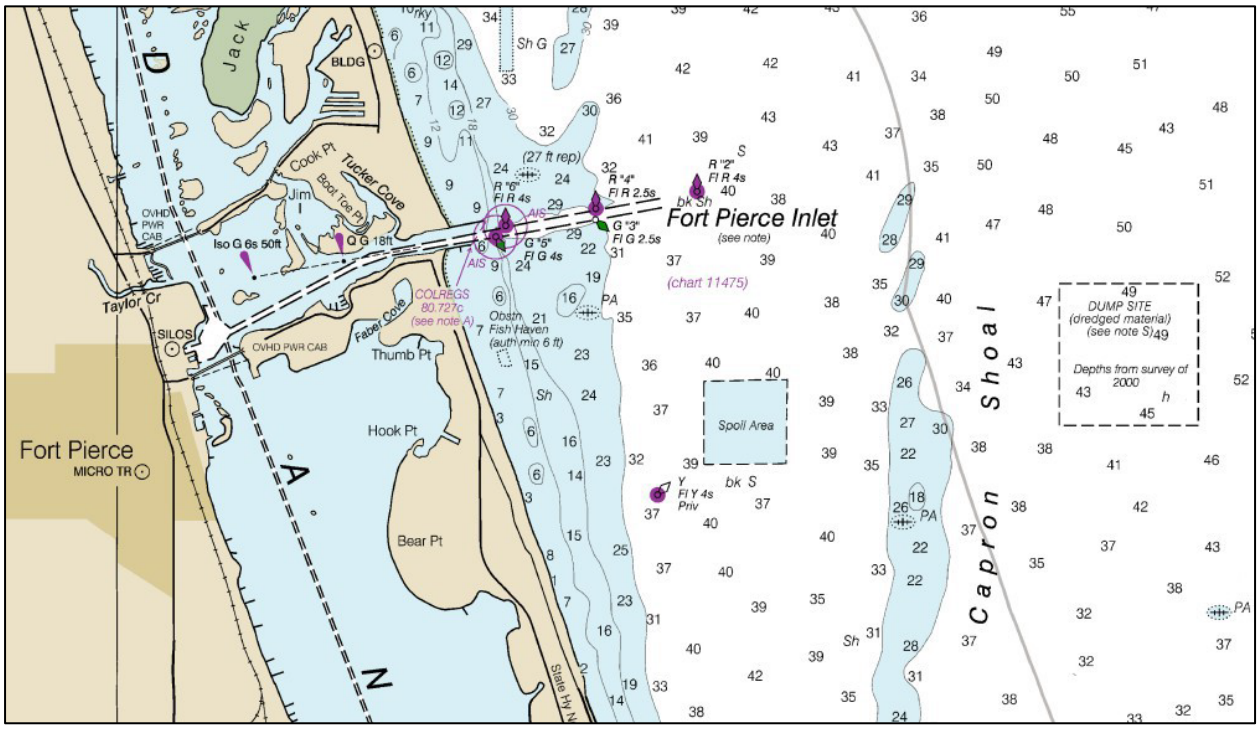


Figure 2. Fort Pierce ODMDS ("DUMP SITE") Location Map (NOAA Chart 11474).

Table 1. Fort Pierce ODMDS Location

Vertices[1]	Geographic[2] (NAD83)		State Plane[3] (FL East 0901 Ft NAD83)	
NW Corner	27°28.00'N	80°12.55'W	1,139,745 N	912,685 E
Upper NE Corner	27°28.00'N	80°11.45'W	1,139,784 N	918,630 E
SE Corner	27°27.00'N	80°11.45'W	1,133,725 N	918,670 E
SW Corner	27°27.00'N	80°12.55'W	1,133,686 N	912,724 E

[1]Figure 2

[2]Degrees, Decimal Minutes

[3]State Plane Florida East (feet)

2.3 Site Use

The Fort Pierce ODMDS and vicinity has been used for disposal of dredged material since 1949. Since that time about 2.2 million cubic yards of material has been disposed at the site, or an average of about 28,041 per year. Appendix B outlines the history of disposal dredged material at the Fort Pierce ODMDS.

The Jacksonville District has projected disposal of approximately 250,000 cubic yards every 5 years for the maintenance of the Fort Pierce Harbor channel and turning basin. The capacity of the Fort Pierce ODMDS has been estimated at greater than 10 million cubic yards providing capacity well beyond the foreseeable future (EPA, 1999). If use projections increase significantly, a more detailed analysis of the site capacity should be investigated.

2.4 Past Monitoring Activities

Surveys provide an important record of changes or impacts that have occurred during the use of the site, including possible changes in bathymetric, sedimentological, chemical, and biological aspects of the ODMDS and surrounding area as a result of the disposal of dredged material at the site. Table 2 summarizes the monitoring surveys conducted prior to site's designation in 1993, which established baseline data for assessing impacts associated with the use of the Fort Pierce ODMDS.

Monitoring activities completed after site designation are outlined in Table 3. Note that bathymetric surveys are typically required to be conducted before and after each disposal event. Appendix C lists all bathymetric surveys. Data collected during these surveys are used to inform future monitoring activities and site disposal activity.

In 1995, the Fort Pierce Harbor Navigation Improvement Project required the disposal of approximately 724,000 cubic yards of dredged material at the ODMDS. Post disposal surveys indicated that this activity resulted in the formation of a 1-meter-high sediment mound at the site. Following the disposal, concerns were raised by the public and local scientists regarding the potential transport of fine-grained material from the ODMDS to nearby mid-shelf reefs. Several studies were conducted in the late 1990s and early 2000s to examine the potential for transport of fine sediment offsite. The EPA concluded that the fine-grained material on the reefs was dissimilar to disposed dredged material and that a measurable amount of offsite transport of fine-grained dredged material was not occurring (Ferry and McArthur, 2002).

Following the 2002 disposal event, monitoring indicated that a majority of the disposed fine-grained material remained within the unrestricted zone with some transport to the northeast within the ODMDS boundaries (CAIS, 2003).

Table 2. Fort Pierce ODMDS surveys and studies prior to site designation.

Date	Survey Title	Conducted by	Purpose	Conclusion
1985	*Environmental Survey in the Vicinity of an ODMDS Fort Pierce Harbor, Florida*	Conservation Consultants, Inc. for USACE	Characterization Survey (water and sediment quality, bathymetry, benthic macroinvertebrate, meiofauna and macroepifauna analysis and tissue analysis)	
1989	*Evaluation of the Dispersion Characteristics of the Miami and Fort Pierce ODMDSs*	USACE WES	Determine if disposal at site poses threat to sensitive nearshore reef areas due to short term or long-term transport.	Most material settles to the bottom within hours of disposal; sediment will be transported from the site during both ambient and storm conditions, but the rate of movement should not affect the reef system.
1992	*Short-Term Modeling Worst Case Sediment Scenario Fort Pierce ODMDS*	EPA Region 4	Model short term dispersion of 90% silt and clay dredged material.	Under worst case conditions, the disposal plume could reach live bottom communities at concentrations below 10mg/l for short durations.
1991	*Fort Pierce, Florida ODMDS Video Mapping Survey*	EPA Region 4	Insure absence of live bottom habitat within site boundaries.	Live bottom habitat identified in northern portion of site. Site was moved ½ mile south to avoid disposal on this habitat.
1992	*Mapping of Sediment Chemistry at the Proposed Fort Pierce, Florida ODMDS*	CAIS for EPA Region 4	Provide baseline sediment lithology within and immediately surrounding the ODMDS.	Sediment lithology is very uniform in gamma activity, elemental, and physical content.
1993	*Ft. Pierce Harbor, FL ODMDS Benthic Communities*	Barry Vittor & Assoc. for EPA Region 4	Provide baseline of benthic communities at the ODMDS.	Species abundance, diversity, evenness, and richness was high at all stations. Annelids, echinoderms, and arthropods accounted for the greatest proportion of individuals.

Table 3. Fort Pierce ODMDS surveys and studies since site designation.

Date	Survey Title	Conducted by	Purpose	Conclusion
1994	*Bathymetry Survey of the Fort Pierce Interim Site*	USACE	Post disposal bathymetry survey following channel maintenance.	
1994	Fort Pierce, FL Dredge Material Discharge Study	NOAA for USACE	Measure transport and dilution of disposal plume.	Dredged material descended quickly in a cohesive mass and formed a residual plume that decayed to 37% of its initial value within 4 minutes.
1994	*Areal Mapping of Sediment Chemistry at the Fort Pierce, FL ODMDS.*	CAIS for EPA Region 4	Post disposal survey following channel maintenance.	Minimal change at the site since the 1992 survey. Increase in the coarse particle size fraction. Inconclusive evidence of disposed dredged material at the site.
1996	*Preliminary Survey of Mud Deposits on the Mid-Shelf Reefs off Fort Pierce, St. Lucie County, Florida*	John Reed	Investigate the reported occurrence of thick layers of mud on the reefs off the St. Lucie County and Ft. Pierce region of eastern Florida.	1) Unusually thick layers of mud present on mid-shelf reefs. 2) Mud has characteristics similar to Fort Pierce Harbor and Indian River Lagoon. 3) Possible correlation with dredging and disposal activities in 1995.
1997	*Post Disposal Areal Mapping of Sediment Chemistry at the Fort Pierce, FL ODMDS.*	CAIS for EPA Region 4	Post disposal survey following Harbor Improvement Project.	Gamma activity indicated a dredged material mound covering most of the western half of the ODMDS. An increase in the amount of fines at the bottom surface was detected throughout the site.
1997	*Preliminary Evaluation of Trace Metals and Radionuclides in Harbor and Shelf Sediments off Fort Pierce, Florida*	EPA Region 4 for USACE	Examine deposits on nearby reefs and compare to harbor and disposal site sediments to try and identify source of reef deposits.	Reef deposits were dissimilar to harbor sediments and sediments found at the ODMDS suggesting that the reef sediment deposits are not comprised of disposed dredged material.

Date	Survey Title	Conducted by	Purpose	Conclusion
1998	*Post Disposal Areal Mapping of Sediment Chemistry at the Fort Pierce, FL ODMDS.*	CAIS for EPA Region 4	Document changes and movement of disposed dredged material.	Disposed dredged material persists within the ODMDS and does not appear to be moving significantly. A decrease in the amount of fines at the bottom surface was detected throughout the site indicating a loss of fines at the site.
1999	*Ft. Pierce Harbor, FL ODMDS Sidescan Sonar Survey*	EPA Region 4	Examine southern portion of site for presence of hard bottom habitats and detect location of fine-grained sediments within and near the ODMDS.	No significant hard bottom resources were detected in the southern portions of the ODMDS. Dredged material identified in patches in area of disposal and north and south of this area.
1999	*Ft. Pierce Harbor, FL ODMDS Benthic Communities Post Disposal Survey*	EPA Region 4	Post disposal benthic effects survey.	Little change observed from the 1992 baseline. The macroinvertebrate communities remain diverse and well distributed. A decrease in the abundance of brittlestars was observed. Except for arsenic, all sediment chemistry concentrations remain low. Arsenic concentrations are naturally high in Florida coastal waters.

Date	Survey Title	Conducted by	Purpose	Conclusion

2001	*Ft. Pierce Harbor, FL ODMDS Sidescan Sonar Survey*	EPA Region 4	1) Identify any hard bottom communities to the east of the ODMDS. 2) Determine if pockets of fine- grained material identified in the 1999 sidescan sonar survey extend to the north and south of the ODMDS.	1) Numerous ridge-like features and sonar returns indicative of hard bottom were detected east of the ODMDS (0.5 to 3 nm). 2) Pockets of fine-grained material extend well north of the ODMDS (5.5 nm and beyond). These features parallel the coast for an undetermined distance north. 3) Confirmed location of previously identified ledge north of the ODMDS.

2002	Fort Pierce ODMDS Current Measurements	NOAA for USACE	Determine current direction and magnitude.	1) The principal axis of the current direction is north-south at the surface, shifting to NNW/SSE at the bottom. 2) Currents are often small, sometimes zero. 3) Mean surface current magnitudes are 1.3 cm/sec.
2003	*Post Disposal Areal Mapping of Sediment Chemistry at the Fort Pierce, FL ODMDS.*	CAIS for EPA Region 4	Document changes and movement of disposed dredged material following maintenance event.	The most recently disposed dredged material was clearly shown in the southeastern corner of the ODMDS. Some of the silty dredged material may have migrated to the northeastern corner of the ODMDS but remained within the site boundaries.
2011	Fort Pierce ODMDS Status and Trends	EPA Region 4	Periodically characterize the chemical, physical and biological characteristics within and surrounding the ODMDS.	Physical and chemical characteristics of the benthos and water column remain similar to previous studies. The density and abundance of macroinvertebrates decreased significantly. This may be due to a change in the sampling methodology.

2024 Dec.	Trend Assessment Survey of the Fort Pierce ODMDS	EPA Region 4	Monitor for any adverse effects. (Includes assessment of the macroinfaunal communities within and outside of the ODMDS, sediment grain size, sediment chemistry and water quality). Test the sediment profile imaging instrument.	Similar results for macroinvertebrate populations were observed within / outside of the ODMDS. Low levels of SVOAs and most metals were observed; only arsenic exceeded threshold, but this is not thought to be anthropogenic.

2.5 Site Characterization

The EPA conducted Trend Assessment Surveys in 2011 and 2024 to monitor changes within the ODMDS compared with the surrounding area (Table 3).

2.5.1 Physical Characterization

Materials historically placed in the Fort Pierce ODMDS have consisted of silts, sands, and mixtures of shell and sand. Future disposals at the site are expected to primarily consist of unconsolidated silty sand. The ODMDS has a measured depth range of 40 – 54 feet. Bathymetric trends indicate that the ODMDS site is only partially dispersive, and a significant amount of disposed material remains on site. Due to previously observed dispersal of fines, a disposal zone in the southeast corner of the ODMDS has been delineated, specifically for fine grained material, defined as material consisting of greater than 10% fines (grain size of less than 0.047mm) (see Section 3.3.2 and Figure 3). Post disposal bathymetry has indicated mounding occurred following disposal, with 0.5-meter mounds observed in the north portions of the ODMDS and a mound 1-meter high observed in the southeast disposal zone (see Appendix C). There has been limited site use since mounding was last observed in 2014.

2.5.2 Chemical Characterization

Sediment chemistry analyses from the last EPA Trend Assessment Surveys (2011 and 2014) included testing for PCBs, pesticides, semi-volatile organics (SVOAs), metals, total organic carbon (TOC), total solids, and grain size distribution (PSD). No PCBs or pesticides were detected at any of the stations. Low levels of SVOAs and most metals were observed; only arsenic exceeded the Threshold Effects Level (TEL) listed in the NOAA Screening Quick Reference Tables (SQUIRT; Buchman, 2008), but this is not thought to be due to disposal and is consistent with both the 2011 and 2014 study and characteristic of samples both within and outside of the ODMDS. The TEL value is the concentration threshold at which toxicity effects begin to show up or where toxicity effects are possible.

2.5.3 Biological Characterization

The macroinfaunal assemblages found at EPA survey stations both inside and outside the Fort Pierce ODMDS are adapted to a fluctuating environment and are typical of those found in nearshore, shallow-water benthic habitats. When comparing between stations located within the ODMDS and those outside the ODMDS, no significant differences were found. Generally, there was a degree of variability with regards to sediment composition and macroinvertebrate assemblages both inside and outside the ODMDS, consistent across studies.

2.5.4 Discussion of critical amenities

In 1991, a video mapping survey conducted on board the OSV Peter W. Anderson by the EPA discovered hard or live bottom on the northern end of the interim site. As a result of this discovery, as discussed in Section 2.1, the Fort Pierce ODMDS was shifted 0.5 nautical miles south from the original site. As outlined in the site designation text in Section 2.1.1, fine grain material is required to be disposed of in the southeast corner of the site, given the dispersive nature of the site and as a measure to protect hard bottom in the area. Monitoring will continue to the degree commensurate with the dumping of dredged material at the ODMDS.

3 SITE MANAGEMENT

Appropriate management of an ODMDS assures that disposal activities do not unreasonably degrade or endanger human health, welfare, the marine environment, or economic potentialities as directed under MPRSA Sections 102 and 103(a). The primary objectives for management of an ODMDS include, but are not limited to:

- Protecting the marine environment, such that:
  - No unacceptable physical, chemical, or biological impacts occur inside or outside the disposal site; and
  - Adequate site monitoring is conducted to detect environmental impacts.
- Ensuring that disposed material (1) meets the suitability requirements of the ocean dumping regulations (40 C.F.R. Parts 220 through 228) and (2) is consistent with national and regional guidance for the evaluation of dredged material proposed for ocean dumping.
  - Under MPRSA Section 103, evaluation of any proposed dumping of dredged material into ocean waters must apply the EPA marine protection criteria established pursuant to Section 102 of the MPRSA. To apply the criteria, the Ocean Testing Manual, sometimes referred to as the Green Book (EPA and USACE, 1991), and the Southeast Regional Implementation Manual (SERIM; EPA and USACE, 2008) provide guidance for sampling, testing, and analysis of water, sediment, and biological tissue to evaluate the environmental acceptability of dredged material proposed for ocean disposal. The regulations prohibit the ocean dumping of uncharacterized materials (40 C.F.R. Section 227.5(c)).
- Identifying management conditions to be implemented by the EPA and USACE, as well as conditions that should be required in permits and documents establishing the terms of a Federal project applicable to transportation and dumping in ocean waters.

  - For federal projects, the EPA should specify in the MPRSA concurrence letters that the EPA concurrence itself is conditioned on incorporation of the EPA concurrence conditions into any USACE federal contract documents.
- Maintaining a long-term disposal alternative for dredged material, while encouraging beneficial use of dredged material where practicable.
- Identifying a schedule or condition triggering a review or renewal of this SMMP.

SMMP sections 3.1 through 3.4 summarize the disposal operation conditions that will be considered for management of the Fort Pierce ODMDS as described in 40 C.F.R. 228.15(h)(11). Enforceable conditions for dredged material disposal operations at the Fort Pierce ODMDS are drawn from USACE-issued permits and transportation and dumping authorization documents for federal projects. The conditions intended to be enforceable are identified in this SMMP as necessary under MPRSA section 103(a) or 103(e) and should be included as conditions in the EPA's concurrence if the permit or authorization documents do not already require such conditions.

Water quality compliance determinations will be made using a numerical model, such as the Short-Term FATE (STFATE) model, for evaluation of mixing. The general goal of the model is to increase the accuracy, reliability, and cost-effectiveness of dredged-material management activities in a timely manner (EPA and USACE, 1991). The STFATE model input parameters listed in Appendix A are specific to the Fort Pierce ODMDS. This model is used to predict the movement of dredged material disposed in open waters and may result in increasing or lessening operational restrictions or the need for confined release zones to protect the environment and ensure regulatory compliance. Only material determined to be suitable and in compliance with the marine protection criteria established pursuant to Section 102 of the MPRSA (40 C.F.R. Part 227) through the verification process by the USACE and EPA Region 4 is appropriate for transportation and disposal in the ODMDS.

The USACE develops conditions for dredging projects involving disposal of dredged materials that are permitted by USACE (federal and non-federal), as well as requirements for USACE authorized federal dredging projects, regardless of whether government owned and operated dredging equipment or contracted equipment is used. The EPA may also specify or confirm additional project-specific conditions in its concurrence. Conditions and reporting requirements become enforceable when and as included in the disposal site designation regulation, in MPRSA Section 103 permits, and in transportation and disposal-related authorizations for federal projects, including USACE federal contract documents or other federal project specification documents.

Violations of the MPRSA by a permittee or dredging contractor—including violations of conditions established in an MPRSA permit or federal project authorization—are subject to

compliance action including suspension of disposal operations or possible assessment of substantial administrative, civil, or criminal penalties, or other injunctive remedies, as appropriate.

3.1 Criteria Compliance Process

USACE uses the marine protection criteria established pursuant to Section 102 of the MPRSA when evaluating permit requests for applications and when implementing federal projects involving the transportation of dredged material for the purpose of dumping it into ocean waters. Dumping of dredged material in the ocean must comply with the criteria, and the EPA reviews the demonstrations of compliance when reviewing permits and projects for written concurrence, which may include conditions that must be incorporated into the permit or project authorization documents.

In the case of federal navigation projects, USACE implements substantive MPRSA requirements directly in USACE projects involving transportation and ocean disposal of dredged materials, including through USACE contractors. Federal projects, though not required to have a permit, must adhere to the same criteria, factors to be evaluated, procedures, and requirements that apply to permits, including the process for evaluation of the project. Federal projects must receive the EPA's concurrence prior to authorization of transportation and disposal of dredged materials, and authorizing documents must contain any conditions included in the EPA's concurrence. The EPA and USACE will coordinate early in the contracting process so the USACE can incorporate any EPA concurrence conditions into project authorization documents.

Ocean dumping of dredged materials from non-federal projects requires an ocean dumping permit issued by USACE pursuant to MPRSA Section 103. A summary of the permitting process can be found at: https://www.epa.gov/marine-protection-permitting/mprsa-dredged-material-permits.

3.2 Dredged Material Characterization

Prior to the disposal of material for each dredging project at the Fort Pierce ODMDS, the EPA and USACE must evaluate the project applying the marine protection criteria established pursuant to Section 102 of the MPRSA (40 C.F.R. Part 227) and USACE must specifically authorize the disposal under MPRSA Section 103. It is important that the EPA and USACE agree on the sampling and analysis plan for each project *prior* to any sampling of proposed dredged material. This includes how dredging projects will be subdivided into project segments for sampling and analysis.

Guidance for a process to determine the suitability of dredged material proposed for disposal at the Fort Pierce ODMDS is described in the 1991 Ocean Testing Manual, and the Southeast Regional Implementation Manual.

Steps include the following:

1) Case-specific evaluation of proposed material against the exclusion criteria (40 C.F.R. 227.13(b));
2) Determination of the need to test non-excluded material, taking into consideration the time since previous testing and the potential of sediment contamination since last verification;
3) Conducting required testing to determine the suitability of the material for ocean disposal; and
4) Review and evaluation of testing data results by USACE and the EPA to determine suitability.

Additional reviews by stakeholders including the public, states and other federal Agencies would also be conducted through the USACE permitting or authorization processes.

Only material which USACE and the EPA have determined to be suitable and in compliance with the Ocean Dumping Criteria (40 C.F.R. Part 227) may be considered for transportation and disposal in the Fort Pierce ODMDS. Documentation will be in the form of a MPRSA Section 103 Evaluation, as outlined in Appendix C of the SERIM. Water quality compliance determinations will be made using the STFATE (ADDAMS) model and the input parameters provided in Appendix A of this SMMP. No disposal activities may occur at the site until the EPA reviews the testing data results and transmits its written concurrence that the material is acceptable for disposal at the site. The EPA concurrence will be valid for three years from the date of the EPA signature.

Additional information describing the types of material disposed at the site (source location, sediment type, etc.) are discussed in Section 2.5 of this document.

3.3 Dredged Material Transportation and Disposal

3.3.1 Transportation of Dredged Material

No specific disposal route is required for this site.

3.3.2 Disposal Locations

Prior to disposal of each dredging project, an agreement will be reached between the EPA and USACE concerning the placement for each project with permits/contracts. The EPA and USACE may establish release zones within the site to maintain compliance with the marine protection

criteria in 40 C.F.R. 227.28, including to prevent mounding above -25 mean lower low water (MLLW). The release zone will be included as part of the MPRSA 103 Evaluation.

The regulation at 40 C.F.R. 227.28 defines the "release zone" for dredged material into the ODMDS to occur at least 330 feet (100 meters) inside the ODMDS boundaries. For projects disposing greater than 250,000 cubic yards within the unrestricted area, additional analysis will be required to determine the appropriate disposal zone.

Implementation of the buffer zone requirements ensures that the dredged material is deposited within the site boundaries and increases the likelihood that no material will leave the site as it falls to the seabed. Disposal will be completed (i.e., doors closed) prior to leaving the ODMDS boundaries.

The EPA and USACE may establish release zones within the site to maintain compliance with the marine protection criteria established pursuant to Section 102 of the MPRSA (40 C.F.R. Section 227.28).

Fine Grained Material Area. At the Fort Pierce ODMDS, fine grained materials will be placed in the southeastern corner ("restricted area"), in accordance with Figure 3, to afford greater protection of live bottoms to the northwest. Fine grained material is defined as material consisting of greater than 10% fines (grain size of less than 0.047mm) by weight [40 C.F.R. §228.15(h)(11)(vi)].

For disposal within the restricted area, disposal should occur at least 500 feet inside the disposal site boundaries. Modeling efforts have shown that this release zone will contain the initial disposal mound within the site boundaries for projects up to 1 million cubic yards (EPA, 1999). For projects greater than 1,000,000 cubic yards, modeling will be required to determine an appropriate disposal zone to contain the initial disposal mound within the ODMDS boundaries.

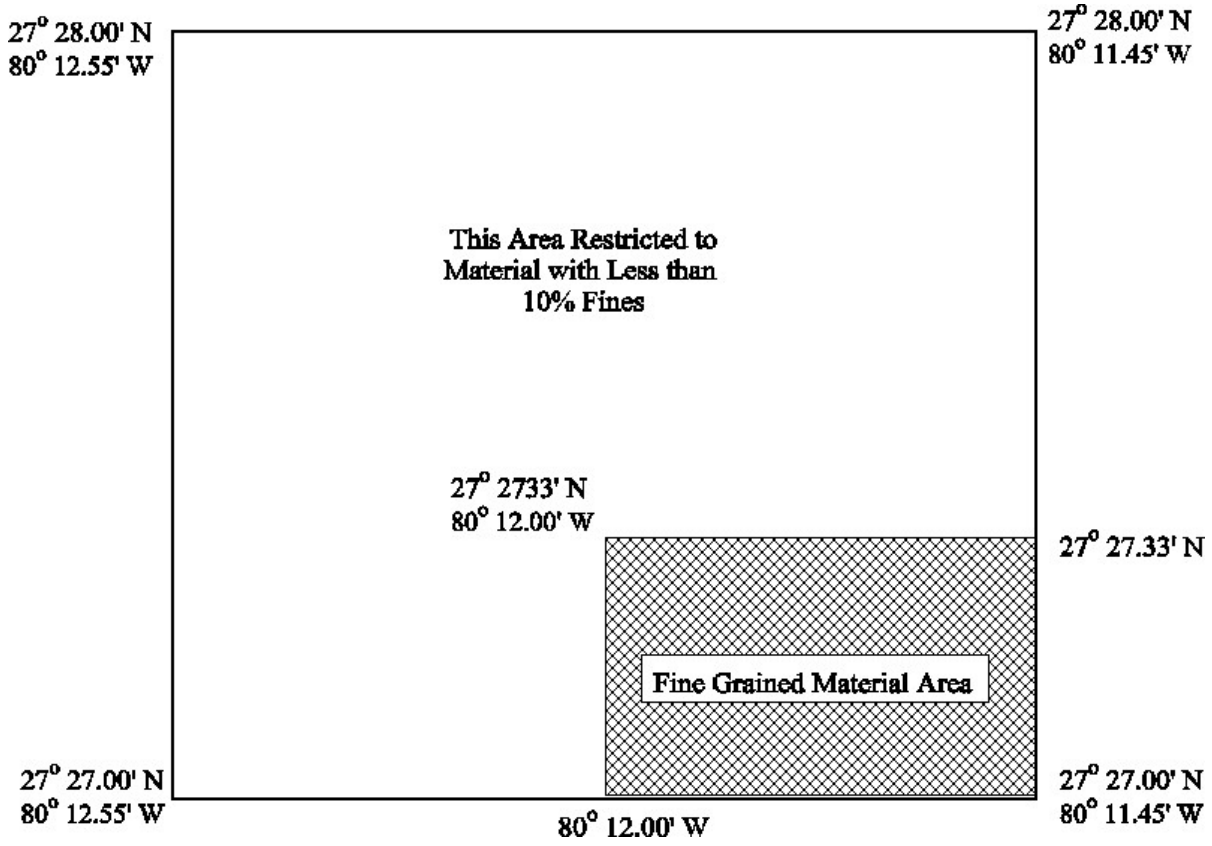


Figure 3. Dredged Material Disposal Zones.

3.3.3 Disposal Methods

For enforcement and compliance assurance purposes, the permit or authorization documents should specify a requirement for "closed doors," requiring both physically closed doors and a properly functioning hull status monitor indicating that the doors are closed. The monitoring plan and disposal authorization documents should specify methods to prevent mounding of dredged materials from becoming an unacceptable navigation hazard.

No specific disposal technique is required for this site. However, to protect North Atlantic right whales, disposal vessel (either hopper dredge or tug and scow) speed and operation will be restricted in accordance with the 2020 South Atlantic Regional Biological Opinion for Dredging and Material Placement Activities in the Southeast United States (2020 SARBO) that was issued by the National Marine Fisheries Service to conclude ESA Section 7 consultation of impacts associated with dredging (to include maintenance dredging); dredged material placement (to include in an ODMDS); and transportation of materials between dredging and material placement locations (or successor SARBO), or another relevant Biological Opinion for specific projects not covered by the SARBO.

In addition, the disposal vessel's captain should be aware of and follow the measures in the North Atlantic right whale Conservation Plan in Appendix F of the 2020 SARBO that includes requirements to observe, avoid and report North Atlantic right whale in the area, with required distances that must be maintained and vessel speed requirements if a North Atlantic right whale has been spotted or reported in the area as defined in Appendix F. In addition, the disposal vessel's captain should be aware of vessel approach restrictions in 50 C.F.R. Section 224.103(c), which prohibit approaching within 500 yards of a right whale by vessel, aircraft, or any other means. Additional requirements in the SARBO must be followed to avoid or minimize adverse effects to ESA-listed species or designated critical habitat (e.g., sea turtles, Atlantic sturgeon, shortnose sturgeon, Nassau grouper, whales, and corals).

Dredged material shall not be leaked or spilled from disposal vessels during any portion of the transit to the ODMDS. Transit to the ODMDS begins as soon as dredged material loading into the disposal vessel is completed and the vessel begins moving to the ODMDS. All appropriate measures to avoid spillage during transit must be taken. Appropriate measures may include but are not limited to the following: up-to-date U.S. Coast Guard and/or American Bureau of Shipping certification of all disposal-related vessels; maintenance (inspection and/or replacement) of gaskets on barge doors, minimization of excess free liquids in barge loads, pre-transit testing of barge door hydraulics, and pre-transport verification of appropriate weather and sea state conditions.

3.3.4 Disposal Times

At present no restrictions have been determined to be necessary for disposal related to seasonal variations in ocean current or biotic activity. Timing of disposal operations will be in accordance with the most recent SARBO..

As monitoring results are compiled, should any such restrictions appear necessary, disposal activities will be scheduled to avoid adverse impacts. During the winter, precautions necessary to protect whales, as described in the next paragraph, are required. Additionally, if new information indicates that endangered or threatened species are being adversely impacted, restrictions may be imposed.

Transportation of dredged material shall only be allowed when weather and sea state conditions, and scow loading level, will not interfere with safe transportation and will not create risk of spillage, leak or other loss of dredged material during transit. No disposal trips shall be initiated when the National Weather Service has issued a gale warning for local waters.

3.3.5 Disposal Vessel Tracking

Disposal Monitoring. For all disposal activities, an electronic tracking system (ETS) must be utilized. The ETS will provide surveillance of the transportation and disposal of dredged material. The ETS will be maintained and operated to continuously track the horizontal location and draft condition (nearest ±0.1 foot) of the disposal vessel (i.e., hopper dredge or disposal scow) from the point of dredging to the disposal site and return to the point of dredging. Data shall be collected at least every 0.25 nautical miles or every 4 minutes during travel to and from the ODMDS and every twelve seconds or every 30 feet of travel, whichever is smaller, while the hull status is open within the ODMDS. In addition to the continuous tracking data, the following trip information shall be electronically recorded for each disposal cycle:

a. Load Number
b. Disposal Vessel Name and Type (e.g., scow)
c. Estimated Volume of Load
d. Description of Material Disposed
e. Source of Dredged Material
f. Date, Time and Location at Initiation and Completion of Disposal Event

It is expected that disposal monitoring will be conducted utilizing the Dredging Quality Management (DQM) system for Civil Works projects [see https://dqm.usace.army.mil], although other systems are acceptable. Disposal monitoring and ETS data will be reported to the EPA Region 4 on a weekly basis utilizing the extensible Markup Language (XML) specification and protocol per Section 3.4 and delivered as an attachment to an email (DisposalData.R4@epa.gov).

The EPA Region 4 and the USACE Jacksonville District shall be notified within 24 hours if disposal occurs outside of the ODMDS or specified disposal zone or if any apparent leaking or spilling of dredged material occurs as indicated by a loss of disposal vessel draft. The draft change threshold for notification will be determined at the time of project authorization under Section 103 of the MPRSA.

3.4 Disposal Permitting & Reporting

3.4.1 Permitting Process

All transportation to and disposal of dredged material in the ocean, except for federal civil works projects, requires an ocean dumping permit issued by the USACE pursuant to Section 103 of the MPRSA. A summary of the permitting process can be found on both the EPA

(https://www.epa.gov/marine-protection-permitting/mprsa-dredged-material-permits) and USACE websites (https://www.sas.usace.army.mil/Missions/Regulatory/Permitting/).

3.4.2 Information Management of Dredged Material Disposal Activities

As discussed in the following sections, a substantial amount of diverse data regarding use of the Fort Pierce ODMDS and effects of disposal is required from many sources. If this information is readily available and in a useable format it can be used to answer many questions typically asked about a disposal site including:

- What is being dredged?
- How much is being dredged?
- Where did the dredged material come from?
- Where was the dredged material placed?
- Was the material dredged correctly? Disposed correctly?
- What will happen to the environment at the disposal site?

To streamline data sharing, the EPA Region 4 and the USACE South Atlantic Division have agreed on an eXtensible Markup Language (XML) standard for sharing of disposal monitoring data (see also section 3.4). Additional standards will continue to be evaluated for sharing of other disposal site related information (e.g., environmental monitoring data, testing data, etc.).

3.4.3 Post Disposal Summary Reports

The USACE shall provide a Post Disposal Summary Report to the EPA within 90 days after project completion.

Necessary report elements include the following: dredging project title; permit number and expiration date (if applicable); contract number; name of contractor(s) conducting the work, name and type of vessel(s) disposing material in the ODMDS; disposal time from each vessel; volume disposed at the ODMDS (as paid *in situ* volume, total paid and un paid *in situ* volume, and gross volume reported by the dredging contractor), number of loads to ODMDS, type of material disposed at the ODMDS; identification by load number of any misplaced material; dates of pre and post disposal bathymetric surveys of the ODMDS and a narrative discussing any violation(s) of the Section 103 concurrence and/or permit (if applicable).

The narrative should include a description of any violation(s), the time the violation(s) occurred and when it was reported to the EPA and the USACE, a discussion of the circumstances surrounding the violation(s), and identification and description of specific measures taken to prevent reoccurrence.

The Post Disposal Summary Report must be accompanied by the bathymetry survey results (that is, plot and X, Y, Z ASCII data file, optionally a GIS shapefile), a summary scatter plot of all disposal start locations, and a summary table of the trip information required by Section 3.3.5 with the exception of the disposal completion data. If all data is provided in the required XML format, scatter plots and summary tables will not be necessary.

3.4.4 Project Initiation and Violation Reporting Requirements

The USACE or other site user should notify the EPA 15 days prior to the beginning of a dredging cycle or project disposal.

The EPA Region 4 and the USACE Jacksonville District require notification by email within 24 hours if disposal occurs outside of the specified disposal release zone, if excessive leakage occurs, if hull open status occurs outside the ODMDS, or another violation of the conditions in the authorization documents and/or Dredged Material Permit occur. Excessive leakage is defined as more than 1.5 feet of draft loss during transit to the ODMDS averaged between forward and aft sensors. Correspondence will be required to explain how the issue was addressed, pertinent dates, and corrective actions to be implemented to prevent reoccurrence in the future.

4 SITE MONITORING

Site monitoring is conducted to ensure the environmental integrity of a disposal site and the areas surrounding the site as well as to verify compliance with the site designation criteria; any special management conditions; and permit, contract, or Federal project authorization document requirements. Monitoring programs should be flexible, cost effective, and based on scientifically sound procedures and methods to meet site-specific monitoring needs. Tiered approaches to monitoring should be used where specific management actions or additional monitoring activities may be triggered when unacceptable environmental conditions are recorded.

Specific goals of the monitoring program are to provide the following:

1) Information indicating whether the disposal activities are occurring in compliance with the permit (or federal project authorization documents) and site restrictions;
2) Information on the short-term and long-term fate of materials disposed of in the marine environment; and,
3) Information concerning the short-term and long-term environmental impacts of disposal activities.

The site monitoring program describes the monitoring actions that should be taken if issues are found during routine trend assessment monitoring or by any other means. A tiered strategy for a monitoring program is used to ensure that more advanced monitoring activities are used only when necessary. With a tiered approach, an unacceptable environmental condition may trigger further and often more complex monitoring and/or changes to the management of the site. Data collected during site monitoring should be used to adjust site management and/or revise the SMMP.

A monitoring program should be structured to address specific questions (i.e., hypotheses) and measure key indicators and endpoints, particularly those defined during site designation or when specific project-related issues that arise. Trend analyses are outlined in the Ocean Dumping Regulations at 40 C.F.R. 228.13; these analyses should be used to determine whether there are consistent changes from previous site conditions or baseline conditions. At a minimum, a Trend Assessment Study should be conducted at least once every ten years and should be used to inform any revisions to this SMMP. Results from these surveys should be used to assess the need for additional targeted or more complex studies.

The monitoring program for the Fort Pierce ODMDS is designed to address the following questions:

What are the short- and long-term fates of the material disposed at the site?

This would include considerations such as:

- Does disposed dredged material remain within the site boundaries or leave the site?
- If any disposed material leaves the site, where does it go? Does it move toward sensitive areas, such as marine sanctuaries or productive fisheries?
- Does disposed material create mounds within the site or result in a dispersed layer on the sea bottom?
- Is there a potential for interference with navigation due to mounding of disposed material?
- Was any material dumped outside of the site boundaries?

What are the short- and long-term environmental impacts of the disposal of material at the site?

This would include considerations such as:

- Has the benthic community structure changed due to disposal activities? ○ Is there an absence of pollution-sensitive biota at the site?

- Are there progressive, non-seasonal changes in water quality, sediment composition, or numbers of pelagic, demersal, or benthic biota at or near the disposal site?
- Has there been an increase in contaminant levels in the sediments or biota at or near the site?
- Are there any other impacts detected inside or outside the site boundaries?

Sections 4.1 and 4.2 below describe the monitoring strategy at the site to address these and other questions and also summarize the management actions that will be considered by the EPA, in coordination with USACE, if thresholds are exceeded.

4.1 Monitoring the Transportation, Disposal, and Fate of Disposed Materials

Monitoring the transportation and disposal process is necessary to confirm that the disposal activities comply with all permit conditions and site restrictions. Monitoring the location and movement of disposed material at the site should be used to ensure that disposed material remains within the designated site boundaries to determine whether any accumulation of disposed material poses a navigational hazard in the area and to confirm that future site use will not exceed the site's capacity. The monitoring activities used to achieve each of these management goals are summarized in Table 4 below.

4.1.1 Baseline Monitoring

Disposal has occurred in the area since 1949. Therefore, no accurate baseline information has been or can be collected. Extensive monitoring was conducted in the interim dumping site prior to final site designation in 1993, as describe in Table 2. This information will serve as the baseline data for the monitoring of the impacts associated with the use of the Fort Pierce ODMDS.

4.1.2 Pre- and Post-Disposal Bathymetric Monitoring Requirements

Pre-Disposal Monitoring. A bathymetric survey will be conducted by the USACE or site user not more than 90 days prior to dredging cycle or project disposal for projects greater than 50,000 cubic yards. Projects less than 50,000 cubic yards are not expected to result in changes in bathymetry greater than 1 foot and therefore will not require a bathymetry survey unless it has been more than 5 years since the last survey. No additional pre-disposal monitoring at this site unless indicated by the agencies.

Post-Disposal Monitoring. The USACE or other site user will conduct a bathymetric survey within 30 days after disposal project completion. Surveys will not be required for projects less than 50,000 cubic yards, unless indicated otherwise in the permit.

- The number and aerial extent of transects required will be the same as in the baseline survey. Bathymetric survey results will be used to ensure that unacceptable mounding is not occurring and to aid in environmental effects monitoring.

All Bathymetric Monitoring. Surveys will conform to the minimum performance standards for Corps of Engineers Hydrographic Surveys as described in the USACE Engineer Manual, (EM) 1110-2-1003, *Hydrographic Surveying,* dated November 30, 2013 http://www.publications.usace.army.mil/Portals/76/Publications/EngineerManuals/EM_1110-2- 1003.pdf] or updates.

- The number and length of transects required will be sufficient to encompass the release zone and a 500-foot-wide area around it. The surveys will be taken along lines spaced at 200-foot intervals or less for single beam surveys and 500 feet or less for multibeam surveys unless a lesser spacing provides 100% coverage.
- The recommended performance standards in Table 3-1 of EM 1110-2-1003 shall be applied. Horizontal location of the survey lines and depth sounding points will be determined by an automated positioning system utilizing a differential global positioning system. The vertical datum will be referenced to prescribed NOAA MLLW datum. The horizontal datum should be referenced to the local State Plane Coordinate System (SPCS) for that area or in Geographical Coordinates (latitude-longitude). The horizontal reference datum should be the North American Datum of 1983 (NAD 83).

4.1.3 Data Reporting

Project Initiation and Violation Reporting. The USACE or other site user shall notify the EPA 15 days prior to the beginning of a dredging cycle or project disposal. The user is also required to notify the USACE and the EPA within 24 hours if a violation of the permit and/or contract conditions related to MPRSA Section 103 or SMMP requirements occur during disposal operations.

Disposal Monitoring Data. Disposal monitoring data shall be provided to EPA Region 4 electronically on a weekly basis. Data shall be provided per the EPA Region 4 XML format and delivered as an attachment to an email to DisposalData.R4@epa.gov. The XML format is available from EPA Region 4.

Post Disposal Summary Reports. See Section 3.4.3 above.

4.2 Monitoring Environmental Effects of Disposed Material

Monitoring of impacts to the physical, chemical, and biological environment is necessary to ensure that the transport and disposal of dredged material does not result in unreasonable degradation to the marine environment or endanger human health, welfare, or economic potentialities.

The environmental effects monitoring plan for Fort Pierce ODMDS summarized in Table 4 below is structured as a tiered monitoring approach; unacceptable conditions discovered during a lower tier assessment should trigger additional testing or other management action.

The USACE and the EPA periodically assess environmental conditions of the entire site and surrounding area and consider other environmental data that may have been collected by other entities in the area; this information is then used to assess overall site conditions and to conduct trend assessments. Enhanced environmental effects monitoring should be triggered if disposed material is found to have unexpectedly left the site or is observed in unexpected locations during the transportation, disposal, and fate monitoring activities described in Section 4.1. Any monitoring at the site that identifies an issue of potential concern should trigger additional monitoring or management actions.

Future Monitoring Surveys. Based on the type and volume of material disposed and impacts of concern, various monitoring surveys can be used to determine if and where the disposed material is moving and what environmental effect the material is having on the site and adjacent areas.

The ODMDS and surrounding areas will be monitored for unintentional transport of material offsite. If future studies indicate that a sand source is not considered viable, meeting all criteria for beach placement in the state of Florida, then no monitoring of that sand source will be required. Should fine grained disposal material be identified outside the ODMDS in the direction of a viable sand source, in greater than a 5 cm layer and within 1000 feet from the viable sand source, then that specific sand source will be monitored. Should fine grained disposal material be identified within a viable sand source, then disposal actions will be managed per Table 4 to include mitigative actions such as adjusting buffer zones.

A summary of the monitoring strategies for the Fort Pierce ODMDS and thresholds for management actions are presented in Table 4. Should future disposal at the Fort Pierce ODMDS result in unacceptable adverse impacts as documented in trend assessment and other surveys, further studies may be required to determine the persistence of these impacts, the extent of the impacts within the marine system, and/or possible means of mitigation. In addition, this SMMP may require revision based on the outcome of any monitoring program.

Table 4. Monitoring Strategies and Thresholds for Action

Goal	Technique	Sponsor	Rationale	Frequency	Threshold for Action	Management Options When Threshold:	
						Not Exceeded	Exceeded
Short & Long-term Fate of Disposed Dredged Material	Sediment Profile Imaging Or Sediment Mapping (Gamma/CS^3)	Site User/ EPA	Confirm aerial extent of disposal mound (apron) and benthic impact. Confirm not impacting benthic communities outside of the ODMDS	Following major New Work Project	Disposal mound footprint occurs outside ODMDS boundaries (5cm)	Continue to use site without further restrictions	(A) Restrict disposal volumes (B) Modify disposal zones (C) Institute Environmental Effects Monitoring
Monitor Bathymetric Trends	Bathymetry	Site User	Determine the extent of the disposal mound and major bathymetric changes	Pre and post disposal (>50,000 cy or > 5 yrs)	Disposal mound occurs outside ODMDS boundary	Continue Monitoring	(A) Modify disposal method/ placement (B) Restrict disposal volume
Ensure Safe Navigation Depth	Bathymetry	Site User	Determine height of mound and any excessive mounding	Post disposal for significant projects (>50,000cy)	(A) Mound height > -30 feet MLLW (B) Mound height > -25 feet MLLW	Continue Monitoring	(A) Modify disposal method/placement (A & B) Direct disposal operators to avoid areas shallower than 30 feet. (B) Physically level material shallower than 25 feet (B) Notify mariners of mound location and depth (B) Further restrict disposal volumes

Goal	Technique	Sponsor	Rationale	Frequency	Threshold for Action	Management Options When Threshold:	
						Not Exceeded	Exceeded
Trend Assessment	Water and Sediment Quality, Benthic Community Analysis (40C.F.R.228.13)	EPA	Periodically evaluate the impact of disposal on the marine environment (40C.F.R. 228.9)	Approximately every 10 years.	(A) Absence from the site of pollution sensitive biota (B) Progressive non- seasonal changes in water or sediment quality	Continue Monitoring	(A) Conduct Environmental Effects Monitoring or Advanced Environmental Effects Monitoring (B) Review dredged material evaluation procedures
Environmental Effects Monitoring	(A) Chemical Monitoring (B) Benthic Monitoring	EPA/ USACE	(A) Determine if chemical contaminants are significantly elevated[1] within and outside of site boundaries (B) Determine whether there are adverse changes in the benthic populations outside of the site and evaluate recovery rates	Implement if disposal footprint extends beyond the site boundaries or if Trend Assessment results warrant.	(A) Contaminants are found to be elevated[1] (B) Adverse changes observed outside of the site that may endanger the marine environment	Discontinue monitoring.	(A) Institute Advanced Environmental Effects Monitoring (B) Implement case specific management options (i.e. Remediation, limits on quantities or types of material). (C) Consider isolating dredged material (capping)

[1] Significantly elevated: Concentrations above the range of contaminant levels in dredged sediments that the Regional Administrator and the District Commander found to be suitable for disposal at the ODMDS.

[2] Examples of sub-lethal effects include without limitation the development of lesions, tumors, development abnormality, and/or decreased fecundity.

Goal	Technique	Sponsor	Rationale	Frequency	Threshold for Action	Management Options When Threshold:	
						Not Exceeded	Exceeded
Advanced Environmental Effects Monitoring	(A) Tissue Chemical Analysis or bioaccumulation modeling (B) Benthic Monitoring	EPA/ USACE	Determine if the site is a source of adverse: (a) bioaccumulation (b) sub-lethal[2] changes in benthic organisms which may endanger the marine environment.	Implement if Environmental Effects Monitoring warrants.	(A) Benthic body burdens and risk assessment models indicate potential for food chain impacts. (B) Sub-lethal effects are unacceptable.	Discontinue monitoring	(A) Discontinue site use (B) Implement case specific management options (i.e., Remediation, limits on quantities or types of material).

Compliance	Disposal Site Use Records in EPA Region 4's XML format	Site User	(A) Ensure management requirements are being met (B) To assist in site monitoring	Weekly during the project	Disposal records required by SMMP are not submitted or are incomplete	Continue Monitoring	Restrict site use until requirements are met

5 MODIFICATION OF THIS SMMP

This plan is effective and available for implementation from the date of the last signature. The regulations designating ODMDSs require site users to comply with specific minimum terms and conditions identified in the SMMP and incorporated into the site designations. The MPRSA Section 102(c)(3) directs the EPA, in conjunction with the USACE, to review and revise this SMMP at least every ten years or sooner if site conditions indicate a need for revision. The EPA and the USACE share responsibility for implementation of the SMMP. Site users may be required to undertake monitoring activities as a condition of their permit. The USACE and any USACE contractor remain responsible for implementation of the SMMP for federal new work and maintenance projects. Conditions for updating this SMMP may include but are not limited to:

- Significant changes in disposal site use (change in frequency, site expansion, de-designation, new dredged material source location, etc.);
- Discovery of significant impacts to the physical, chemical, or biological environment during monitoring activities; and
- Any other conditions or changes at the site or area surrounding the site that may necessitate a review or update to the SMMP.

6 REFERENCES

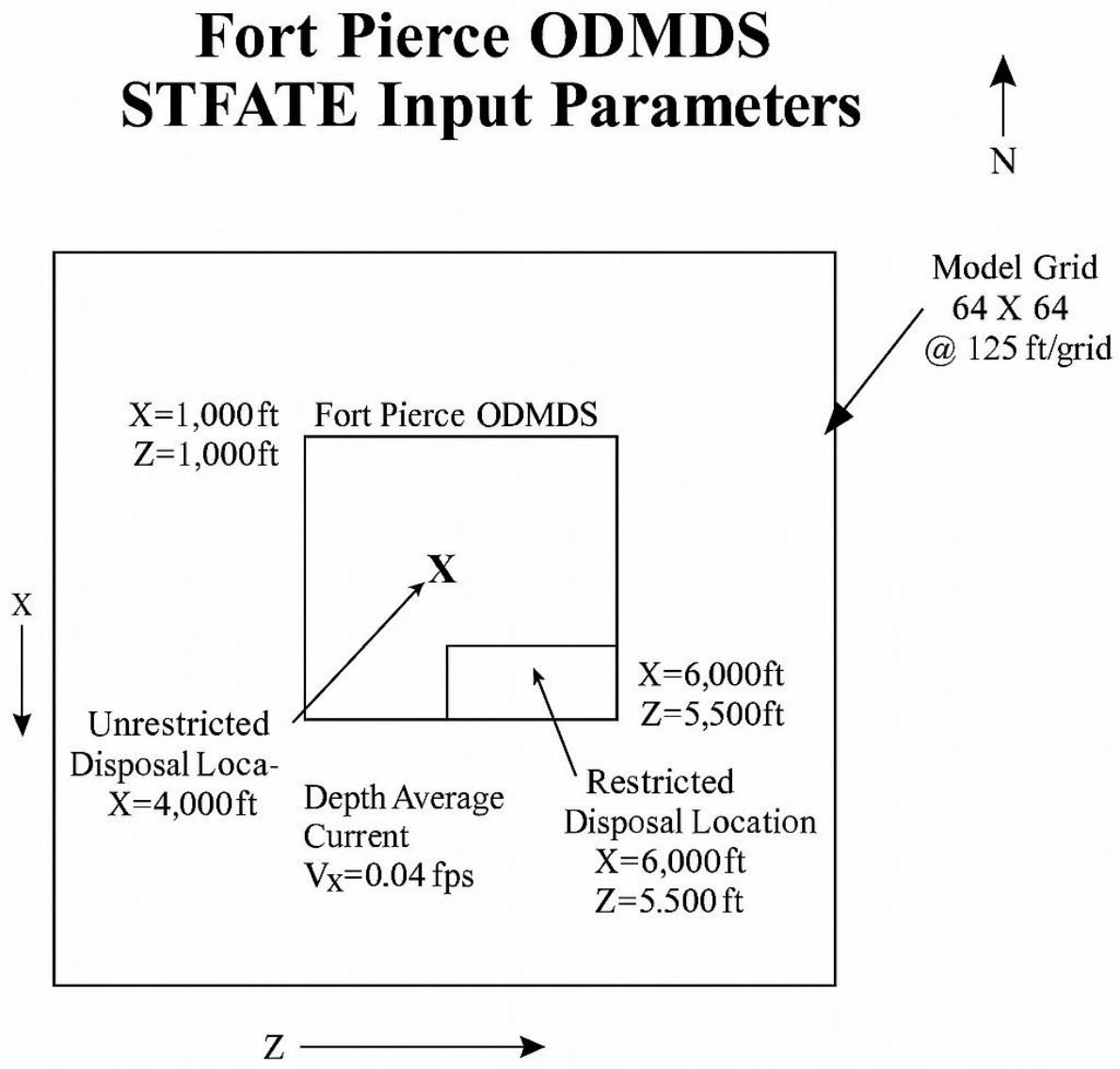
1. ANAMAR, 2011. *Final Report Site Designation Studies for a New Ocean Dredged Material Disposal Site off Jacksonville, Florida: Spring and Fall 2010 Survey Results*. Prepared for U.S. Army Corps of Engineers Jacksonville District. Contract Number W912EP-09-C-0058. April 2011.
2. Center for Applied Isotope Studies. 1998. *Postdisposal Areal Mapping of Sediment Chemistry at the Fort Pierce, Florida ODMDS*. Submitted to U.S. Environmental Protection Agency Region 4, Wetlands, Coastal and Water Quality Branch.

3. Center for Applied Isotope Studies. 2003. Postdisposal Areal Mapping of Sediment Chemistry at the Fort Pierce, Florida ODMDS. Submitted to U.S. Environmental Protection Agency Region 4, Wetlands, Coastal and Water Quality Branch. August 2013.
4. Ferry, Roland E. and McArthur, Christopher J. 2002. *Evaluation of Shelf, Harbor, and Disposed Dredged Sediments as Potential Sources of Deposited Muds on South Florida Reefs.* Dredging '02 Proceedings of the Third Specialty Conference on Dredging and Dredged

   Material Disposal. Coasts, Oceans, Ports, and Rivers Institute (COPRI) of ASCE, May 5, 2002, Orlando, FL, USA.
5. National Oceanic and Atmospheric Administration. 1994. *Fort Pierce, Florida Dredge Material Discharge Study*, A report to the U.S. Army Corps of Engineers, November 1994.
6. National Oceanic and Atmospheric Administration. 2002. *Fort Pierce, Florida ADCP Currents and Waves Measurements August 15 to October 28, 2002*
7. National Oceanic and Atmospheric Administration Chart 11474, Bethel Shoal to Jupiter Inlet. Last corrected: 10/17/2023. Available from: https://www.charts.noaa.gov/PDFs/11474.pdf. *NOTE S: Regulations for Ocean dumping Sites are contained in 40 C.F.R., Parts 220-229. Additional information concerning the regulations and requirements for use of the sites may be obtained from the EPA*.
8. Reed, John K. 1996. *Preliminary Survey of Mud Deposits on the Mid-Shelf Reefs off Fort Pierce, St. Lucie County, Florida.* Submitted to U.S. EPA, U.S. Army Corps of Engineers, Florida Department of Environmental Protection, National Marine Fisheries Service, and St. Lucie County Port and Airport Authority.
9. U.S. Army Corps of Engineers. 2013. USACE Engineering Manual, EM1110-2-1003, *Hydrographic Surveying*. Available from: https://www.publications.usace.army.mil/USACE-Publications/Engineer-Manuals/u43544q/487964726F67726170686963/.
10. USACE and Bureau of Ocean Energy Management. 2020. South Atlantic Division Endangered Species Act Section 7 Consultation Regional Biological Opinion for Dredging of Material Placement Activities in the Southeast United States, National Oceanic and Atmospheric Administration, Consultation Number SERO-2019-03111, date revised 30 July 2020.
11. U.S. Environmental Protection Agency. 1983. *Environmental Impact Statement (EIS) for Jacksonville Harbor, Florida Ocean Dredged Material Disposal Site Designation*, February 1983.
12. U.S. Environmental Protection Agency Region 4. 1997. *Survey Report: Status of Monitoring and Management of the Fort Pierce Ocean Dredged Material Disposal Site*, October 1997
13. U.S. Environmental Protection Agency Region 4. 1999. *Fort Pierce ODMDS Multiple Dump Modeling*.

14. U.S. Environmental Protection Agency Region 4, 2001. *Survey Report: Fort Pierce ODMDS Sidescan Sonar Survey & Canaveral ODMDS Current Meter Deployment*. EPA Region 4, Wetlands, Coastal and NonPoint Source Branch. July 2001.
15. U.S. Environmental Protection Agency Region 4, 2013. *Fort Pierce ODMDS 2011 Status and Trends.* EPA Region 4 – Science and Ecosystem Support Division. EPA Project #12-0029. November 2013.
16. U.S. Environmental Protection Agency and U.S. Army Corps of Engineers, 1991. *Evaluation of Dredged Material Proposed for Ocean Disposal (Ocean Testing Manual)*, February 1991. Prepared by Environmental Protection Agency Office of Marine and Estuarine Protection and Department of Army United States Army Corps of Engineers under the EPA Contract No. 68-C8-0105.
17. U.S. Environmental Protection Agency and U.S. Army Corps of Engineers, 1996. *Guidance Document for Development of Site Management Plans for Ocean Dredged Material Disposal Sites*, February 1996. Prepared by Environmental Protection Agency Office of Water and Department of Army United States Army Corps of Engineers.
18. U.S. Environmental Protection Agency Region 4 and U.S. Army Corps of Engineers South Atlantic Division, 2008. *Regional Implementation Manual Requirements and Procedures for Evaluation of the Ocean Disposal of Dredged Material in Southeastern Atlantic and Gulf Coastal Waters*, August 2008.
19. U.S. Environmental Protection Agency Region 4 and U.S. Army Corps of Engineers South Atlantic Division. 2023. Southeastern U.S. Inactive Ocean Dredged Material Disposal Sites Site Management and Monitoring Plan.

7 APPENDIX A – STFATE WATER QUALITY MODEL STANDARD INPUT PARAMETERS



SITE DESCRIPTION

Parameter	Value	Units

Number of Grid Points (left to right)	64	
Number of Grid Points (top to bottom)	64	
Spacing Between Grid Points (left to right)	125	ft
Spacing Between Grid Points (top to bottom)	125	ft
Constant Water Depth	45	ft
Roughness Height at Bottom of Disposal Site	.005[1]	ft
Slope of Bottom in X-Direction	0	Deg.
Slope of Bottom in Z-Direction	0	Deg.
Number of Points in Ambient Density Profile Point[2]	2	
Ambient Density at Depth = 0 ft	1.023	g/cc
Ambient Density at Depth = 45 ft	1.023	g/cc

AMBIENT VELOCITY DATA

Parameter	Value	Units
Water Depth	45	ft
Profile[3]	Logarithmic	

[1] Model Default Value
[2] NOAA 2002
[3] EPA 2011

Vertically Averaged X-Direction Velocity	0.04	ft/sec
Vertically Averaged Z-Direction Velocity	0.0	ft/sec

INPUT, EXECUTION AND OUTPUT

Parameter	Value	Units
Location of the Upper Left Corner of the Disposal Site - Distance from Top Edge	1,000	ft
Location of the Upper Left Corner of the Disposal Site - Distance from Left Edge	1,000	ft
Location of the Lower Right Corner of the Disposal Site - Distance from Top Edge	7,000	ft
Location of the Lower Right Corner of the Disposal Site - Distance from Left Edge	7,000	ft
Duration of Simulation	14,300	sec
Long Term Time Step	600	sec

DISPOSAL OPERATION DATA - RESTRICTED AREA

Parameter	Value	Units
Location of Disposal Point from Top of Grid	4,000	ft
Location of Disposal Point from Left Edge of Grid	4,000	ft
Dumping Over Depression	0	

DISPOSAL OPERATION DATA - FINE GRAINED MATERIAL AREA

Parameter	Value	Units
Location of Disposal Point from Top of Grid	6,000	ft
Location of Disposal Point from Left Edge of Grid	5,400	ft
Dumping Over Depression	0	

COEFFICIENTS

Parameter	Keyword	Value
Settling Coefficient	BETA	0.000[1]
Apparent Mass Coefficient	CM	1.000[1]
Drag Coefficient	CD	0.500[1]
Form Drag for Collapsing Cloud	CDRAG	1.000[1]
Skin Friction for Collapsing Cloud	C.F.R.IC	0.010[1]
Drag for an Ellipsoidal Wedge	CD3	0.100[1]
Drag for a Plate	CD4	1.000[1]
Friction Between Cloud and Bottom	FRICTN	0.010[1]
4/3 Law Horizontal Diffusion Dissipation Factor	ALAMDA	0.011[2]
Unstratified Water Vertical Diffusion Coefficient	AKYO	Pritchard Expression

[1] Model Default Value

[2] Calculated from NOAA Field Work (1994)

Cloud/Ambient Density Gradient Ratio	GAMA	0.250[1]
Turbulent Thermal Entrainment	ALPHAO	0.235[1]
Entrainment in Collapse	ALPHAC	0.100[1]
Stripping Factor	CSTRIP	0.003[1]

Fort Pierce ODMDS Background Water Concentration.	
Chemicals of Concern	**Background Concentration Levels (µg/l)**
Arsenic	1.27[1]
Cadmium	0.01 [1,3]
Chromium (VI)	0.26 [1]
Copper	0.29 [1]
Lead	0.041 [1]
Mercury	0.1[1,3]
Nickel	0.27 [1]
Selenium	0.05 [1,3]
Silver	0.01[1,3]
Zinc	1.58[1]
Cyanide	0[2]
Tributyltin (TBT)	0.01[2,3]
Aldrin	0.005[1,3]

[1] Average values from the 2011 Status and Trend Survey at the Fort Pierce ODMDS

[2] Average values from the 2007 Status and Trend Survey at the Canaveral ODMDS [3]

Analyte not detected. Value based on one half the Method Reporting Limit.

[2] Analyte detected limits are well above the WQC. If analytes are detected in the dredged material elutriate, a concentration of zero will be assumed at the ODMDS.

Chlordane	0.005 [1,3]
4, 4'-DDT	0.013 [1,3]
Dieldrin	0.005 [1,3]
alpha - Endosulfan	0.005 [1,3]
beta - Endosulfan	0.010 [1,3]
Endrin	0.010 [1,3]
gamma-BHC (Lindane)	0.0025 [1,3]
Heptachlor	0.004 [1,3]
Heptachlor Epoxide	0.005 [1,3]
Toxaphene	.05 [1,3]
Pentachlorophenol	5 [1,3]

8 APPENDIX B – DISPOSAL HISTORY

Historic Volumes of Dredged Material Placed in the Fort Pierce ODMDS and Vicinity

Year	Volume (cubic yards)*	Composition
1949	164,423	Unknown
Not known	63,412	Unknown
Not known	153,190	Unknown
1955	76,700	Unknown
1956-57	73,656	Unknown
1958	6,587	Unknown
1959	23,988	Unknown
1966	184,916	Unknown
1974	12,276	Sand
1976	14,566	Sand
1980	14,592	Sand/Shell
1982-83	106,268	Silty Sand
1985	11,000	Shell/Sand
1993-94	77,000	Silty Sand
1995	724,000[1]	Clays, Silts and Sand
2002	142,989	Silt and fine to medium sand
2014	246,930	Silty Sand
2022	90,675	Silty Sand

**in situ* volumes

[1] Construction Project

9 APPENDIX C – BATHYMETRIC SURVEYS

Pre/Post Bathymetry Surveys Conducted by the USACE Jacksonville District

Date	Survey Title	Conclusion
1996	*Post-disposal Bathymetry Survey following Harbor Improvement Project*	One meter mound identified in western half of ODMDS.
Sept. 2001	*Pre-disposal Bathymetry Survey*	Depth maintained at greater than 35 feet throughout the ODMDS.
Nov. 2001	*Post-disposal Bathymetry Survey*	Depth maintained at greater than 34 feet throughout the ODMDS.
Oct. 2002	*Pre-disposal Bathymetry Survey*	Depth maintained at greater than 35 feet throughout the ODMDS.
April 2003	*Pre/Post-disposal Bathymetry Survey*	Depth maintained at greater than 34 feet throughout the ODMDS.
Sept. 2004	*Post-disposal Bathymetry Survey*	Accretions of 2 to 8 feet of material within the disposal zone since 2002. No measurable change in depth outside of the ODMDS boundaries. Depth maintained at greater than 32 feet throughout the ODMDS.
June 2007	*Pre/Post-disposal Bathymetry Survey*	Accretions of material to the south of the disposal zone since 2004. No measurable change in depth outside of the ODMDS boundaries. Depth maintained at greater than 32 feet throughout the ODMDS.

Feb. 2008	*Pre-disposal Bathymetry Survey*	Minimum Depth of 30 feet.
July 2008	*Post-disposal Bathymetry Survey*	Minimum Depth of 26 feet.
Jan. 2010	*Pre-disposal Bathymetry Survey*	Minimum Depth of 30 feet.
April 2010	*Post-disposal Bathymetry Survey*	Minimum Depth of 30 feet.

Oct. 2010	*Pre -disposal Bathymetry Survey*	Depth maintained at >30 feet throughout the ODMDS
Feb. 2011	*Mid-Project Bathymetry Survey*	Minimum Depth of 29 feet.
Oct. 2011	*Mid-disposal Bathymetry Survey*	Depth maintained at >29 feet throughout the ODMDS
Dec. 2011	*Mid-disposal Bathymetry Survey*	Depth maintained at >29 feet throughout the ODMDS
Jan. 2012	*Mid-disposal Bathymetry Survey*	Depth maintained at >27 feet throughout the ODMDS
Apr. 2012	*Mid-disposal Bathymetry Survey*	Depth maintained at >29 feet throughout the ODMDS
June 2012	*Mid-disposal Bathymetry Survey*	Depth maintained at >28 feet throughout the ODMDS
Aug. 2012	*Post-disposal Bathymetry Survey*	Depth maintained at >29 feet throughout the ODMDS
Aug. 2013	*Post-disposal Bathymetry Survey*	Depth maintained at >29 feet throughout the ODMDS

Jan. 2014	*Pre -disposal Bathymetry Survey*	Depth maintained at >28 feet throughout the ODMDS
March 2014	*Post-disposal Bathymetry Survey*	Depth maintained at >28 feet throughout the ODMDS
Sept. 2014	*Pre-disposal Bathymetry Survey*	Depth maintained at >28 feet throughout the ODMDS
Dec. 2014	*Post-disposal Bathymetry Survey*	A one-meter mound was formed within the southeast release zone. Deposits of up to 0.5 meters were observed outside the release zone, but within the ODMDS to the north.