SITE MANAGEMENT AND MONITORING PLAN:

FIVE HAWAIʻI OCEAN DISPOSAL SITES: South Oʻahu, Hilo, Kahului, Nawiliwili, and Port Allen

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The following Site Management and Monitoring Plan (SMMP) for the South O‘ahu, Hilo, Nawiliwili, Kahului, and Port Allen Ocean Dredged Material Disposal Sites (ODMDSs) has been revised to comply with Section 102(c)(3) of the Marine Protection, Research, and Sanctuaries Act (MPRSA) of 1972 (33 U.S.C. Section 1401, et seq.) as amended by Section 506 of the Water Resources Development Act (WRDA) Amendments of 1992 (Public Law 102-580) and has been approved by the following officials of the U.S. Environmental Protection Agency (EPA) Region 9 and the U.S. Army Corps of Engineers (USACE), Honolulu District.

/s/ 7/31/24	/s/ 1/25/2024
Martha Guzman Date	Jennifer Martin Date
Regional Administrator	Chief, Regulatory Division
U.S. Environmental Protection Agency	U.S. Army Corps of Engineers
Region 9	Honolulu District

This plan is effective from the date of the U.S. Environmental Protection Agency and the U.S. Army Corps of Engineers signatures for a term not to exceed ten years. Partial midterm modifications do not extend the term. The MPRSA requires review and revision no less frequently than every ten years.

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1 INTRODUCTION

The Marine Protection, Research, and Sanctuaries Act (MPRSA), also referred to as the Ocean Dumping Act, regulates the transportation and dumping of any material into ocean waters. Under the MPRSA, no permit may be issued for ocean dumping where such dumping will unreasonably degrade or endanger human health or the marine environment.

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 (MPRSA section 103). USACE applies the U.S. Environmental Protection Agency (EPA) ocean dumping criteria when evaluating permit 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 EPA review and written concurrence. EPA may concur with or without conditions or decline to concur (i.e., non-concur) on the permit or Federal project. If EPA concurs with conditions, the final permit or the terms of the Federal project authorization must include those conditions. If 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 disposal of dredged material in the ocean associated with the Federal project. According to USACE regulations at 33 CFR 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, EPA is responsible for the designation of all ocean disposal sites and the management of such designated sites. The EPA's ocean dumping regulations at 40 CFR Part 228 establish procedures for the designation and management of ocean disposal sites. Unless otherwise specifically noted, site management authority for each site set forth in 40 CFR 228.15 is delegated to the EPA Regional office under which the site entry is listed. Management of a site consists of regulating times, rates, and methods of disposal; regulating quantities and types of materials disposed; developing and maintaining effective ambient monitoring programs for the site; conducting disposal site evaluation studies; and recommending modifications in site use and/or designation (40 CFR 228.3(a)).

EPA shares the responsibilities of conducting management and monitoring activities at EPA-designated ODMDSs with USACE. Under MPRSA section 102(c), 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 disposal 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 disposal activities at an ocean disposal site. 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 EPA, in conjunction with USACE, determines that such changes are warranted, including as a result of information obtained from monitoring or due to 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 disposal activities at the South O‘ahu, Hilo, Nawiliwili, Kahului, and Port Allen ODMDSs (i.e., the five Hawai‘i ODMDSs), including monitoring and management activities by the federal agencies. This SMMP also includes Site Use Conditions for USACE to include in future permits issued for disposal at this site (Appendix B). References in this SMMP to matters that “should be required” refer to implementation in a subsequent proceeding to authorize disposal of dredged material, whether in a permit, in a contract or other Federal project specification for the transportation and disposal 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 disposal of dredged material at each ODMDS) that will then impose binding rights and obligations on persons responsible for the authorized transportation and disposal.

Matters that “should be required” are implemented through application of the language included in Appendix B, though the language may vary from the terms of the Appendix as necessary and appropriate. If the translation of terms by USACE warrants further clarification, EPA can ensure implementation of the provisions in Appendix B as necessary through the EPA’s concurrence actions.

1.1 Roles and Responsibilities

EPA and USACE work together to implement the site monitoring program for each of the five Hawai‘i ODMDSs. Specific responsibilities of EPA and USACE are as follows:

EPA: 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 disposal 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) , 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 disposal-related conditions required by a regulation establishing the ODMDS or deviations from transportation-related and disposal-related conduct required or authorized by USACE in a permit or (in the case of Federal projects) the terms of the contract documents.

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

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

There are five EPA-designated ODMDSs serving the Hawaiian Islands. Although this SMMP covers all five Hawai‘i ODMDSs, each site is managed independently, and all of the information required for each site by the 1996 SMMP guidance and the regulations is available within this document. These ODMDSs - located off of South O‘ahu, Hilo, Kahului, Nawiliwili, and Port Allen - were designated by EPA via a final rule published in 1981 (40 CFR 228.15(l)(5-9)), based on a Final Environmental Impact Statement (FEIS) published in 1980 (EPA, 1980; Figure 2-1).

The Hawai‘i ODMDSs SMMP was first updated in 1997, and most recently in 2015 (EPA & USACE, 2015)[1]. To update the 1997 SMMP, EPA first conducted extensive monitoring studies in 2013 at the two most heavily used Hawai‘i ODMDSs: South O‘ahu and Hilo. In 2017, EPA conducted surveys at these three remaining ODMDSs. The site monitoring results from 2013 and 2017 confirmed that there have been no significant adverse impacts to the marine environment from ocean disposal activities at the five Hawai‘i ODMDSs. EPA and USACE propose to continue ODMDS use with a systematic monitoring approach and updated Site Use Conditions (Appendix B) that will apply to all projects proposing to discharge dredged material at any of the Hawai‘i ODMDSs. The improvements in the Site Use Conditions, as well as the ability to implement Project-Specific Conditions as needed, will help ensure that each of these five ODMDSs can continue to be used without any significant adverse impacts.

[1] The 1980 site designation Final EIS, 1981 final rule, 2015 SMMP, a synthesis of the 2013 monitoring studies, and other background documents are available on EPA’s web site at https://www.epa.gov/ocean-dumping/managing-ocean-dumping-epa-region-9.

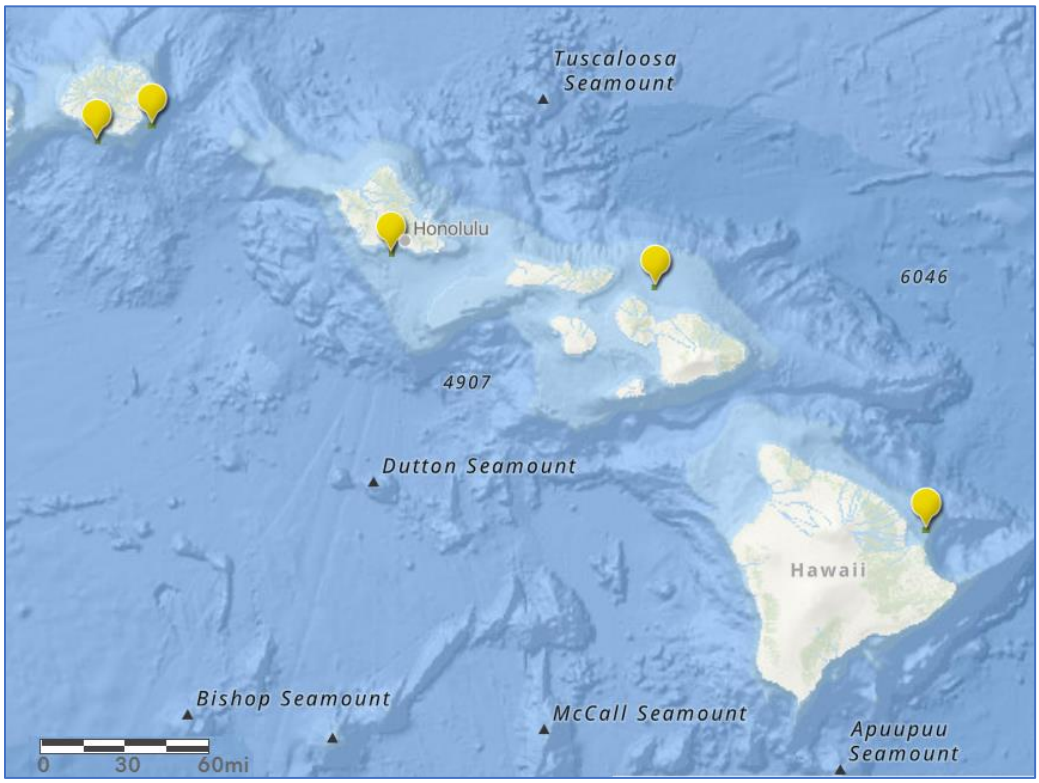

Figure 2-1. The location of the five ODMDSs that serve Hawaiian ports and harbors. Close-up maps are available in the following sections.

2.1.1 Final Rule Text from 40 CFR 228.15(l)(5-9)

The official South O‘ahu, Hilo, Kahului, Nawiliwili, and Port Allen ODMDS designations are published at 40 CFR 228.15(l)(5 – 9). https://www.ecfr.gov/current/title-40/chapter-I/subchapter-H/part-228:

(5) Hilo, HI.

(i) ***Location:*** (center point): Latitude - 19°48′30″ N.; Longitude - 154°58′30″ [2]

(ii) ***Size:*** Circular with a radius of 920 meters.

(iii) ***Depth:*** Ranges from 330 to 340 meters.

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

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

(vi) ***Restriction:*** Disposal shall be limited to dredged material.

[2] These coordinates are in Old Hawaiian Datum. Please refer to Table 2-1 for coordinates in WGS84.

(6) Kahului, HI.

(i) ***Location:*** (center point): Latitude - 21°04′42″ N.; Longitude - 156°29′00″ W
(ii) ***Size:*** Circular with a radius of 920 meters.
(iii) ***Depth:*** Ranges from 345 to 365 meters.
(iv) ***Primary Use:*** Dredged material.
(v) ***Period of Use:*** Continuing use.
(vi) ***Restriction:*** Disposal shall be limited to dredged material.

(7) South O‘ahu, HI.

(i) ***Location:*** (center point): Latitude - 21°15′10″ N.; Longitude - 157°56′50″ W
(ii) ***Size:*** 2 kilometers wide and 2.6 kilometers long.
(iii) ***Depth:*** Ranges from 400 to 475 meters.
(iv) ***Primary Use:*** Dredged material.
(v) ***Period of Use:*** Continuing use.
(vi) ***Restriction:*** Disposal shall be limited to dredged material.

(8) Nawiliwili, HI.

(i) ***Location:*** (center point): Latitude - 21°55′00″ N. Longitude - 159°17′00″ W
(ii) ***Size:*** Circular with a radius of 920 meters.
(iii) ***Depth:*** Ranges from 840 to 1,120 meters.
(iv) ***Primary Use:*** Dredged material.
(v) ***Period of Use:*** Continuing use.
(vi) ***Restriction:*** Disposal shall be limited to dredged material.

(9) Port Allen, HI.

(i) ***Location:*** (center point) Latitude - 21°50′00″ N. Longitude - 159°35′00″ W
(ii) ***Size:*** Circular with a radius of 920 meters.
(iii) ***Depth:*** Ranges from 1,460 to 1,610 meters.
(iv) ***Primary Use:*** Dredged material.
(v) ***Period of Use:*** Continuing use.
(vi) ***Restriction:*** Disposal shall be limited to dredged material.

2.2 SITE LOCATIONS

The South O‘ahu ODMDS (Figure 2-2) is located in Mamala Bay, approximately 4 nautical miles south of the Pearl Harbor entrance, at a depth of 375-475 m (1,230-1,560 ft). It is the only Hawai‘i ODMDS with a rectangular boundary on the seafloor; the four remaining Hawai‘i ODMDSs have circular boundaries. However, the Surface Disposal Zone of the South O‘ahu ODMDS is a circular boundary (see Table 2-1).

The Hilo ODMDS (Figure 2-3) is located approximately 6.5 nautical miles northeast of the Hilo waterfront, at a depth of 330-340 m (1,080-1,115 ft). It is the shallowest of the five Hawai‘i ODMDSs.

The Kahului ODMDS (Figure 2-4) is located approximately 5.5 nautical miles offshore of Maui at its closest point and approximately 11 nautical miles northeast of Kahului Harbor, at a depth of 340-365 m (1,100-1,200 ft). It is the second shallowest of the five Hawai‘i ODMDSs.

The Nawiliwili ODMDS (Figure 2-5) is located approximately 4 nautical miles southeast of Nawiliwili Harbor on Kaua‘i, at a depth of 840-1,120 m (2,750-3,675 ft). It is the second deepest of the five Hawai‘i ODMDSs. The center point of the Surface Disposal Zone of the Nawiliwili ODMDS is situated slightly northwest of the ODMDS center coordinate (see Table 2-1).

The Port Allen ODMDS (Figure 2-6) is located approximately 4 nautical miles south of Port Allen Harbor on Kaua‘i, at a depth of 1,460-1,610 m (4,800-5,275 ft). It is the deepest of the five Hawai‘i ODMDSs.

Table 2-1 shows the coordinates (in WGS84) and dimensions of each ODMDS, as well as its Surface Disposal Zones (SDZ). All disposal operations must occur inside the SDZ, unless specified otherwise in permits. Figure 2-7 shows the relative depth profile of each ODMDS.

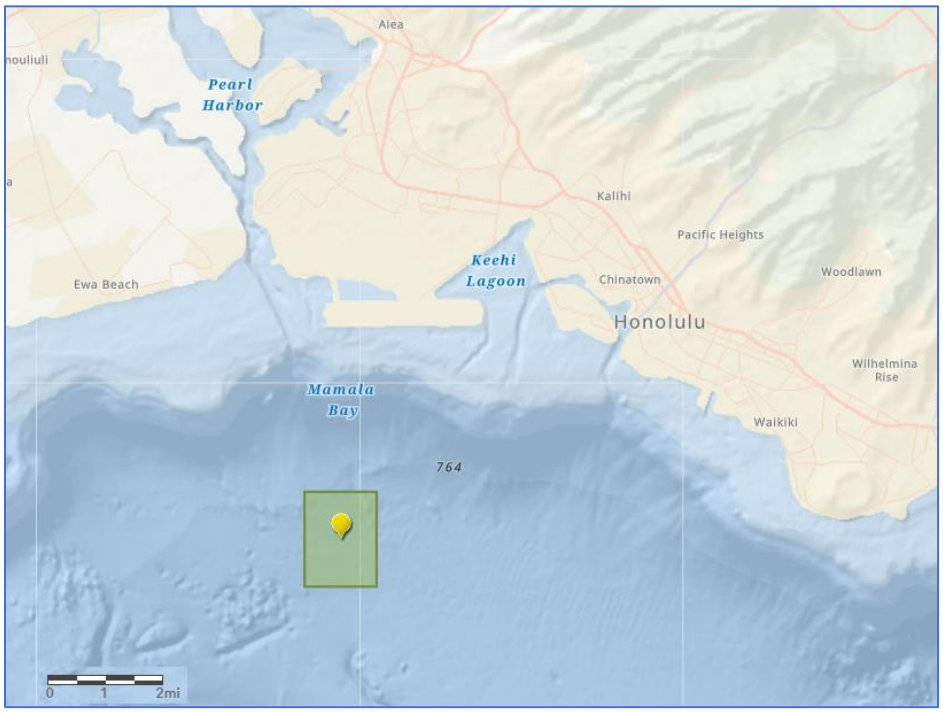

Figure 2-2. The location of the South O‘ahu ODMDS and center point, offshore of O‘ahu, Hawai‘i.

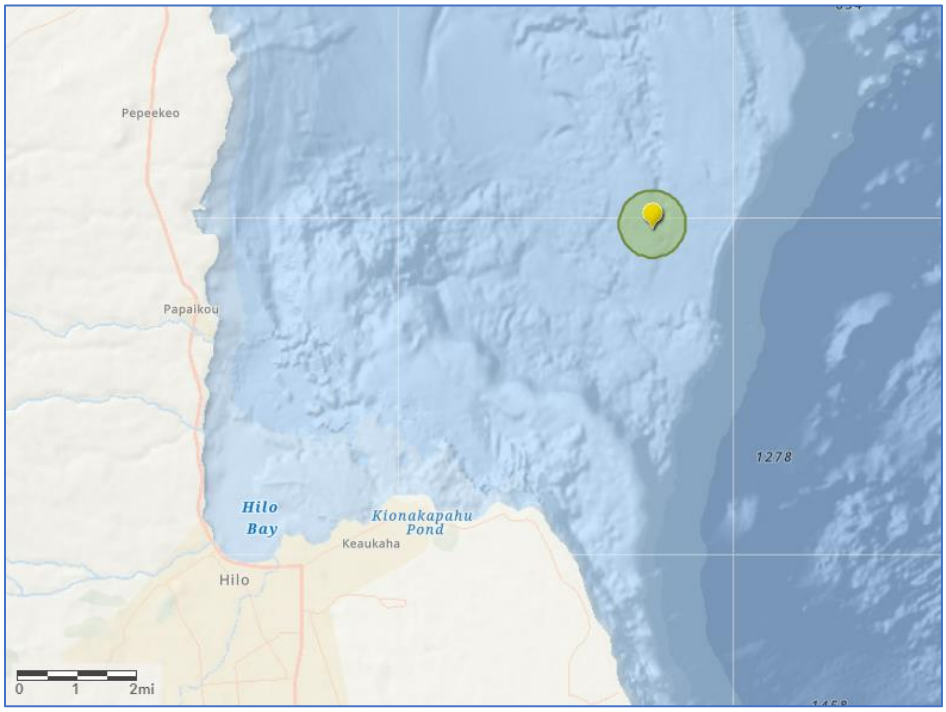

Figure 2-3. The location of the Hilo ODMDS and center point, offshore of Hilo, Hawai‘i.

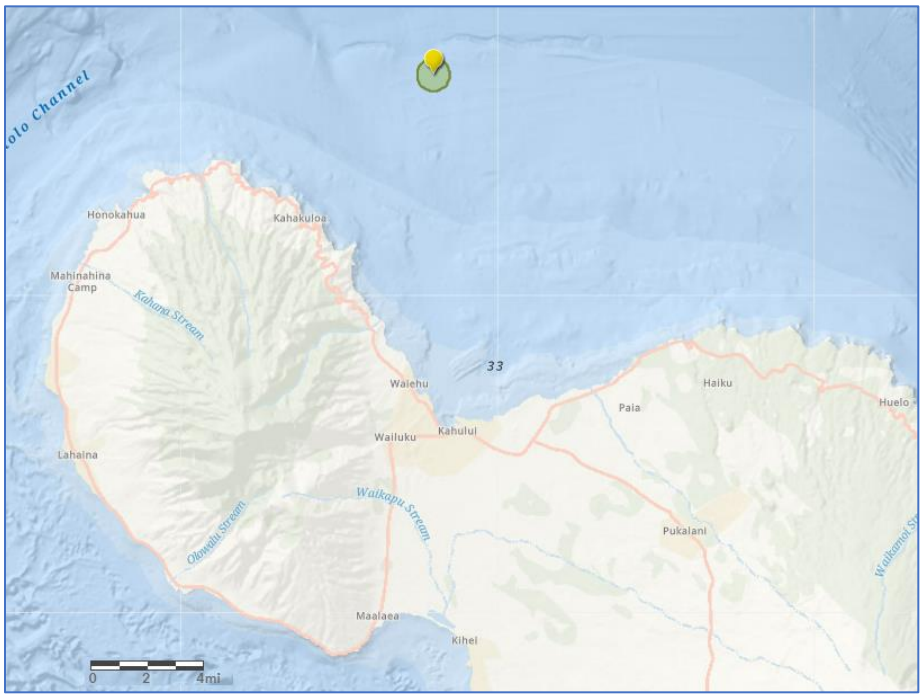

Figure 2-4. The location of the Kahului ODMDS and center point, offshore of Maui, Hawai‘i.

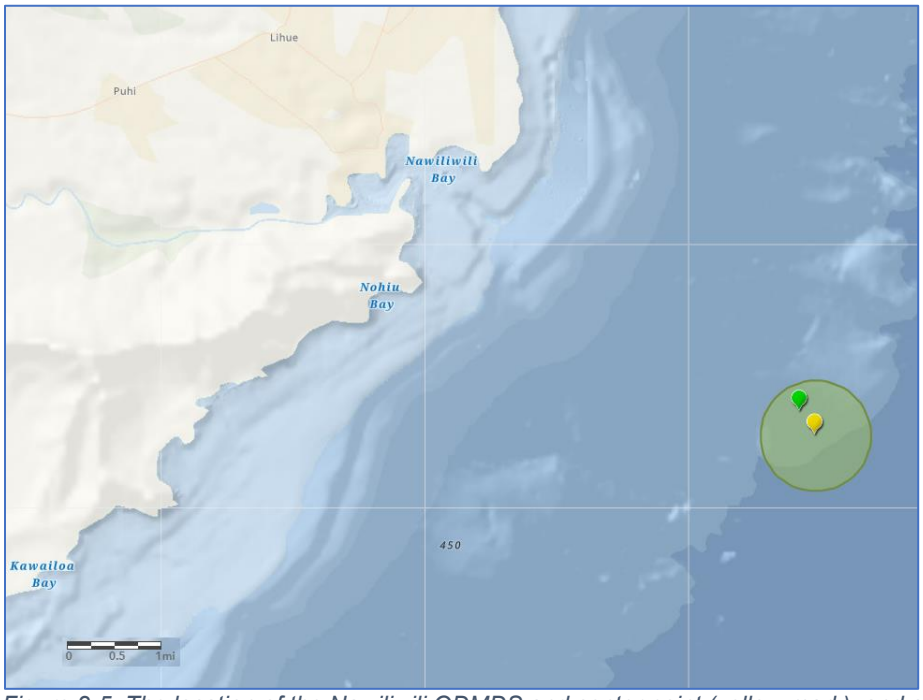

Figure 2-5. The location of the Nawiliwili ODMDS and center point (yellow mark), and center of the updated SDZ (green mark), offshore of Kaua‘i, Hawai‘i.

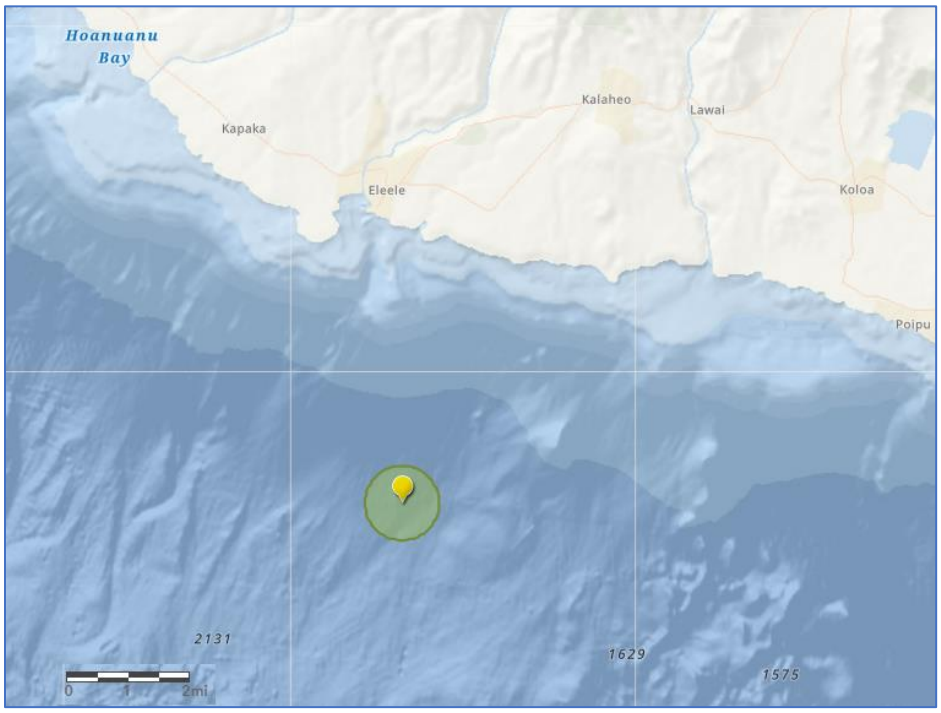

Figure 2-6. The location of the Port Allen ODMDS and center point, offshore of Kaua‘i, Hawai‘i.

Table 2-1. Dimensions and center coordinates for each of the Hawai‘i ODMDSs and their surface disposal zones.

ODMDS	**Depth Range**	**Shape and Dimensions** (Seafloor Footprint)	**Surface Disposal Zone Dimensions**	**Center Coordinates (WGS84)** (Degrees minutes seconds / Decimal Degrees)	
South O‘ahu	375-475 m (1,230-1,560 ft)	Rectangular: 2.0 (W-E) by 2.6 km (N-S) (1.08 x 1.4 nmi)	Circular: 305 m (1000 ft) radius	21° 14' 58.69" N 157° 56' 40.16" W	21.249635 -157.94449
Hilo	330-340 m (1,080-1,115 ft)	Circular: 920 m (3000 ft) radius	Circular: 305 m (1000 ft) radius	19° 48' 19.11" N 154° 58' 20.07" W	19.805307 -154.972242
Kahului	345-365 m (1,130-1,200 ft)	Circular: 920 m (3000 ft) radius	Circular: 305 m (1000 ft) radius	21° 4' 30.37" N 156° 28' 49.91" W	21.075104 -156.480531
Nawiliwili	840-1,120 m (2,750-3,675 ft)	Circular: 920 m (3000 ft) radius	Circular, **offset** 200 m (600 ft) radius[3]: (**21.917127, -159.28328**) (WGS84)	21° 54' 48.51" N 159° 16' 49.96" W	21.913474, -159.280545
Port Allen	1,460-1,610 m (4,800-5,280 ft)	Circular: 920 m (3000 ft) radius	Circular: 305 m (1000 ft) radius	21° 49' 48.71" N 159° 34' 49.99" W	21.830198, -159.580552

[3] Modified following the 2017 Nawiliwili monitoring survey, as the bathymetry indicated the presence of a steep slope that rendered monitoring of the area challenging.

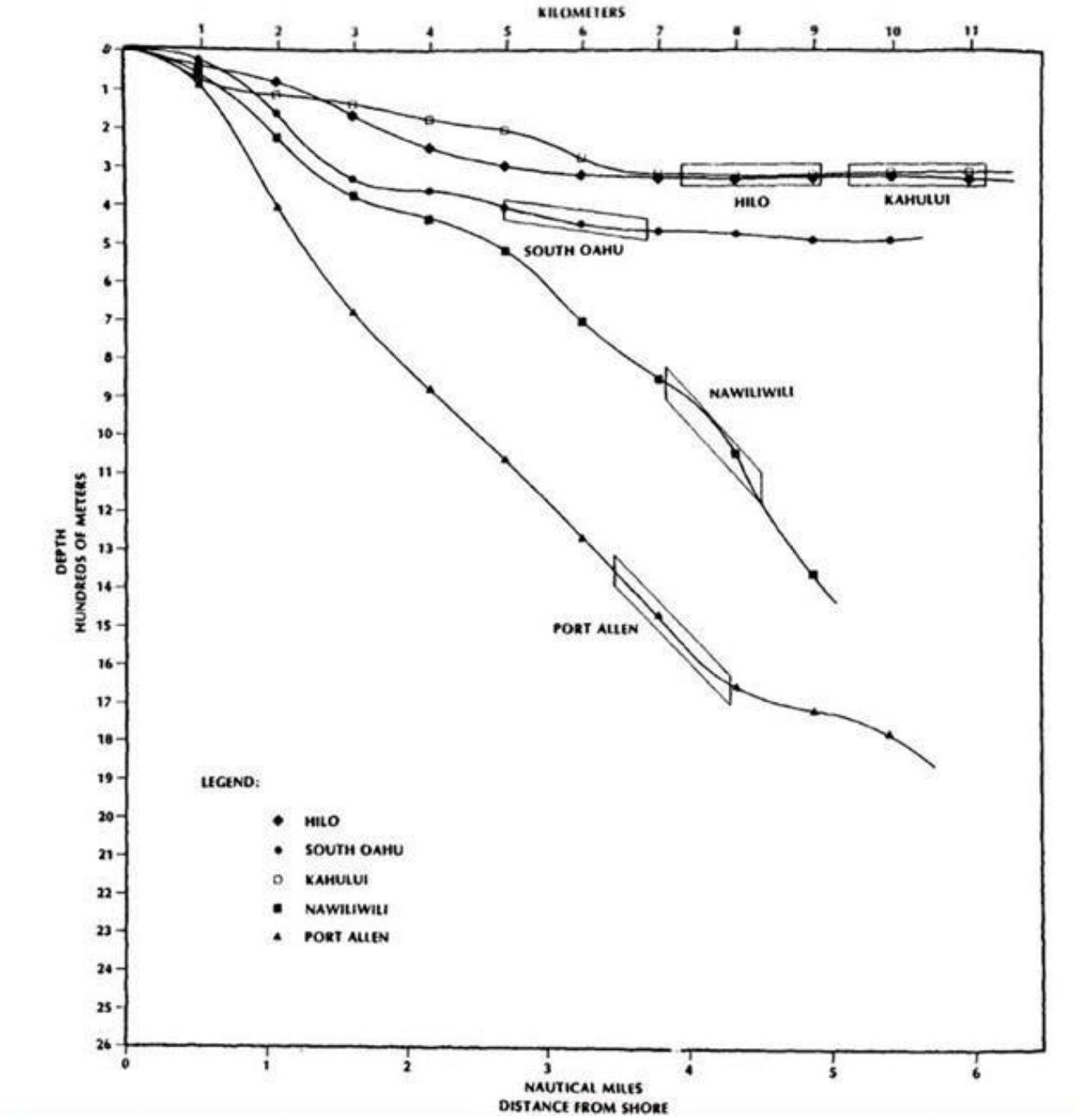

Figure 2-7. Relative depth profiles of each of the five Hawai‘i ODMDSs (EPA, 1980).

2.3 SITE USE

The disposal history at the Hawai‘i ODMDSs confirms the expectation in the FEIS that the South O‘ahu ODMDS would be the most regularly and heavily used of the five Hawai‘i ODMDSs, due to the ongoing dredging needs of the U.S. Navy and periodic dredging of Honolulu Harbor. The FEIS also projected that the other ODMDSs would each receive approximately an order of magnitude less disposal than the South O‘ahu ODMDS.

It is important to note that the volumes disposed at the Hawai‘i ODMDSs represent dredged material that was determined by EPA and USACE to be suitable for ocean disposal based on appropriate physical, chemical, and biological testing as outlined in the national Ocean Testing Manual (OTM) (EPA and USACE, 1991). Material that does not pass these tests is either not dredged or is disposed at an appropriate disposal site, such as a landfill or other contained placement site. The disposal history for each of the five Hawai‘i ODMDSs over the 42 years since designation is summarized below and shown in detail in Table 7-1 (Appendix A).

South O‘ahu: This ODMDS is by far the most frequently and heavily used of the five Hawai‘i ODMDSs. A total of approximately 7.2 million cy of suitable dredged material (~75% of disposal at all Hawai‘i ODMDSs combined) has been disposed at this ODMDS since it was designated in 1981. Most of this volume (~4.5 million cy) was disposed prior to 2000 (see Table 7-1 in Appendix A). EPA began implementing disposal scow tracking and monitoring in the early 2000s.

Hilo: Just under 340,000 cy has been disposed at the Hilo ODMDS since it was designated in 1981. Over 76% of this total has been disposed since 2000.

Kahului: A little over 200,00 cy has been disposed at the Kahului ODMDS since designation. Approximately 28% of this total has been disposed since 2000.

Nawiliwili: Just under 1,350,000 cy of dredged material has been disposed at the Nawiliwili ODMDS since designation. Less than 20% of this material was disposed since 2000.

Port Allen: A little over 500,000 cy of material has been disposed at the Port Allen ODMDS since designation. Approximately 96% of this material was disposed since 2000, predominantly from the Port Allen Deep Draft Harbor Maintenance Dredging Project in 2021.

2.4 PAST MONITORING ACTIVITIES

Baseline assessments and monitoring surveys provide an important record of changes or impacts that have occurred during the use of an ODMDS. Data collected during these surveys are used to inform future monitoring activities and management of each ODMDS. Baseline surveys for the five Hawai‘i ODMDSs were conducted from 1977-1978 to establish the bathymetry, current patterns, and sediment and water physical, chemical, and biological characteristics in and around the ODMDSs.

Until 2013, there was limited field monitoring at any of the five Hawai‘i ODMDSs, due to EPA oceanographic research vessels operating predominantly on the East Coast. In 1993, EPA and USACE coordinated with the U.S. Geological Survey (USGS) to expand an offshore acoustic monitoring effort to include coverage of all of the Hawai‘i ODMDSs (Dadey et al., 1996; Torresan and Gardner, 2000). The USGS surveys confirmed that evidence of past disposal events, including disposal prior to the 1981 ODMDS designations, remained detectable. This was largely visible due to the difference in grain size characteristics between sediment dredged from the relatively shallow harbors compared to the native sediments at the deep ODMDSs. In particular, the USGS survey work found that dredged material was widespread in Mamala Bay, due to the former (pre-1981) use of multiple historical ODMDSs, as well as use of the South O‘ahu ODMDS. It was also evident that short-dumping had occurred outside of the South O‘ahu ODMDS. This finding underlined the importance of improved compliance monitoring of dredged material disposal operations, including tamper-proof “black-box” tracking of disposal vessels to ensure no spilling or leakage occurs during transit to any of the ODMDSs and to record the precise disposal locations within the SDZs. Therefore, in the early 2000s, EPA and USACE began to require “black-box” satellite-based tracking of all disposal scows. Since then, there have been no short-dumps nor spills/leaks during ocean disposal trips, except for a single partial mis-dump at the South O‘ahu ODMDS in 2006.

Starting in 2013, EPA began to prioritize monitoring all actively used designated sites around the country at least once every 10 years, subject to available funding. EPA identified the two most heavily used Hawai‘i ODMDSs (South O‘ahu and Hilo) as among the highest priority nationally in accordance with this goal. In 2013, EPA conducted extensive monitoring of the South O‘ahu and Hilo ODMDSs for the first time since site designation. The decision to prioritize monitoring these two sites with the limited funding available was based on the fact that they had been the only two

Hawai‘i ODMDSs used since 1999, and no comprehensive site monitoring had been conducted since designation in 1981. The most recent surveys of the South O‘ahu and Hilo ODMDSs were conducted in 2013, and those of the Kahului, Nawiliwili, and Port Allen ODMDSs were conducted in 2017. The monitoring activities completed at the five Hawai‘i ODMDSs are described below and outlined in Table 2-2**.**

2.4.1 2013 Monitoring Survey: South O‘ahu and Hilo ODMDSs

EPA conducted the 2013 South O‘ahu and Hilo survey aboard the NOAA *R/V Hi’ialakai*. The objective of this survey was to assess the dredged material footprint at each ODMDS and identify if disposal activities were causing adverse impacts to the marine environment. EPA obtained sediment profile and plan view images from 40 stations in the South O‘ahu survey area and 46 stations in the Hilo survey area (EPA, 2015). EPA also collected sediment grabs from 10 stations in the South O‘ahu survey area and eight stations in the Hilo survey area. All sediment samples were analyzed for grain size and chemical constituents, and a subset were analyzed for benthic infaunal community.

EPA found that dredged material extended past each ODMDS boundary, however this was likely due to the historical dumping of dredged material at multiple former ODMDSs in the vicinity of the South O‘ahu site, as well as short-dumping outside of the ODMDS boundaries prior to the implementation of compliance monitoring in the 2000s. EPA also found that historic and recent dredged material disposal had not caused significant adverse impacts at these ODMDSs and their surrounding areas. Sediment chemistry and benthic communities within and outside the ODMDSs, including in far-field locations, were not statistically different. Although there were expected minor and localized physical impacts from dredged material disposal, no significant long-term adverse impacts were apparent to the benthic environment outside of the ODMDS boundaries. EPA determined that continued use of the South O‘ahu and Hilo ODMDSs should result in no significant adverse effects.

2.4.2 2017 Monitoring Survey: Kahului, Nawiliwili, and Port Allen ODMDSs

When additional funding became available, EPA conducted the 2017 survey of the Kahului, Nawiliwili, and Port Allen ODMDSs aboard the *R/V Norseman II*. EPA collected sediment profile and plan view images at 57 stations in the Kahului survey area, 44 stations in the Nawiliwili survey area, and 48 stations in the Port Allen survey area. EPA

also collected sediment samples from 26 stations in the Kahului survey area, 11 stations in the Nawiliwili survey area, and 11 stations in the Port Allen survey area. All sediment samples were assessed for grain size and chemical constituents, and a subset were analyzed for benthic infaunal community.

The results indicated that the bulk of the dredged material disposed of at each of the three of the ODMDSs appeared to have been deposited properly within the ODMDS boundaries, and disposal activities had not resulted in any adverse contaminant loading or long-term disturbance to benthic communities. Although there were expected minor and localized physical impacts from dredged material disposal, no significant long-term adverse impacts were apparent to the benthic environment outside of the ODMDS boundaries. EPA determined that continued use of the three ODMDSs should result in no significant adverse effects, however the SDZ of Nawiliwili should be shifted slightly northwest to improve accessibility for monitoring.

Table 2-2. Monitoring surveys and other studies conducted in the vicinity of five Hawai‘i ODMDSs.

Date	Survey or study title	Conducted by and reference	Purpose	Results
1977	Analysis & synthesis of oceanic conditions in the offshore region	Neighbor Island Consultants, 1977; Chave and Miller 1977a; Chave and Miller 1977b; Tetra Tech, 1977	Characterize depth ranges, bathymetric profiles, sediment characteristics. Establish current patterns, water chemistry, ecological diversity of column organisms, benthic community.	Baseline surveys for site designations.
1978	Sediment sampling	Goeggel 1978; Chave and Miller, 1978	Characterize bottom sediments using cores, grabs, and dredges.	Baseline surveys for site designations.
1993	Acoustic monitoring	Dadey et al., 1996; Torresan and Gardner, 2000	Evaluate the extent of dredged material disposal in relation to the ODMDS boundaries.	Dredged material was present outside the boundaries of the current and historic ODMDSs, indicating need for disposal vessel tracking.
2013	Monitoring survey of the South O‘ahu and Hilo ODMDSs	EPA, 2015	Collect physical, chemical, and biological sediment data and conduct deep-sea imaging. Conduct sub-bottom profiling at the South O‘ahu ODMDS. Evaluate the effectiveness of site management.	South O‘ahu and Hilo ODMDSs were performing as expected and management measures were effective.

Date	Survey or study title	Conducted by and reference	Purpose	Results
2017	Monitoring survey of the Kahului, Nawiliwili, and Port Allen ODMDSs.	EPA, 2017	Collect physical, chemical, and biological sediment data and conduct deep-sea imaging. Evaluate the effectiveness of site management.	Kahului, Nawiliwili, and Port Allen ODMDSs were performing as expected and management measures were effective. The SDZ of the Nawiliwili site will be moved slightly to improve ease of monitoring.

2.5 SITE CHARACTERIZATION

Each of the five Hawai‘i ODMDSs are in relatively deep-water marine environments. Baseline conditions at each of the five ODMDSs and surrounding environments were originally assessed during the site designation process. Details of the original baseline conditions are included in the site designation FEIS (EPA, 1980). An updated assessment for each of the Hawai‘i ODMDSs is provided below.

2.5.1 Physical Characterization

South O‘ahu ODMDS: The South O‘ahu ODMDS has a mean water depth of 450 m and a smooth bottom. Current velocities are generally between 8 and 15 cm/sec, with the predominant flow directionally variable (EPA, 1980). Native sediments (absent any dredged material deposit) at the ODMDS are sandy (75% sand, 12% gravel, and only 13% silt and clay). Disposal operations have resulted in a shift in physical grain size characteristics compared to baseline conditions. ODMDS sediments now have a higher percentage of silt and clay (33%) and of gravel (22%) (EPA, 2015). These physical changes were expected because dredged material from ports and harbors in Hawai‘i typically have more fines, such as silts and clays, than occur naturally on the deep seafloor of Mamala Bay, and dredging projects on O‘ahu often encounter and dispose of small coral rubble. Despite this shift in grain size, the fundamental physical character of the ODMDS as a relatively featureless sedimentary environment has not changed.

A sub-bottom profiling survey was also conducted at the South O‘ahu ODMDS immediately prior to the 2013 survey. While dredged material was identified within the current ODMDS boundary, deposits of dredged material were still identifiable outside the ODMDS boundaries as well, most likely due to pre-1981 disposal activities at historic ODMDSs, as well as mis-dumping outside of the ODMDS prior to compliance tracking. The analysis of the full sub-bottom data set suggested that the dredged material deposits in and around the South O‘ahu ODMDS generally vary between 3 and 12 feet (1- 4 m) in thickness (Sea Engineering, Inc., 2014).

Hilo ODMDS: The Hilo ODMDS has water depths ranging from 330 to 340 m, with surface currents ranging in velocity from 15 to 36 cm/sec, predominantly northwesterly. Native sediments at the ODMDS are somewhat finer than at South O‘ahu, but are still sandy (77% sand, 22% silt and clay, and only 1% gravel). The benthic habitats near the Hilo ODMDS are also more heterogeneous, including rocky outcrops. Disposal operations have resulted in a slight shift in physical grain size characteristics compared to pre-disposal baseline conditions. ODMDS site sediments on average now have a somewhat lower percentage of sand (60%) and a somewhat higher percentage of silt and clay (30%) (EPA, 2015). One distinction relative to South O‘ahu is that there is an accumulation of small rock and coral rubble at the very center of the Hilo ODMDS. This type of material descends rapidly to the seafloor with little dispersion compared to finer sediments. Since much less sediment has been disposed at the Hilo ODMDS than at the South O‘ahu ODMDS, there has been little opportunity for subsequent disposal events to cover these larger particles at the center of the ODMDS. Also, since most of the disposal at the Hilo ODMDS has taken place after scow tracking became routine in the early 2000s, this rubbly material is more concentrated at the center of the site. Except for the immediate center of the ODMDS, the minor shift in grain size has not changed the fundamental physical character of the ODMDS as a relatively featureless sedimentary environment.

Kahului ODMDS: The Kahului ODMDS has water depths ranging from 345 to 365 m and strong westerly currents with velocities from 50 to 110 cm/sec (EPA, 1980). Native sediments at the ODMDS are sandy (80% sand, 11% gravel, and 9% silt and clay). Disposal operations have resulted in a slight shift in physical grain size characteristics compared to pre-disposal baseline conditions. ODMDS sediments now have a lower percentage of sand (40%) and higher percentage of silts and clays (45% silt and 15% clay). These physical changes were expected because dredged material

from ports and harbors in Hawai‘i typically have more fines, including silts and clays, than occur naturally on the deep seafloor of the ODMDS. Despite this shift in grain size, the fundamental physical character of the ODMDS as a relatively featureless sedimentary environment has not changed.

Nawiliwili ODMDS: The Nawiliwili ODMDS has water depths ranging from 840 to 1,120 m, and southerly surface current velocities range from 20 to 30 cm/sec (EPA, 1980). Native sediments at the Nawiliwili ODMDS are sandy (92% sand, 6% gravel, and 2% silt and clay). Disposal operations have resulted in a slight shift in physical grain size characteristics compared to pre-disposal baseline conditions. ODMDS sediments are still predominantly sand, but have a higher percentage of gravel, silt, and clay (70% sand, 11% gravel, 13% silt, 6% clay). These physical changes were expected because dredged material from ports and harbors in Hawai‘i typically have more fines, including silts and clays, than occur naturally on the deep seafloor of the ODMDS. Similarly, dredging projects on Kaua‘i have encountered and disposed of small coral rubble.

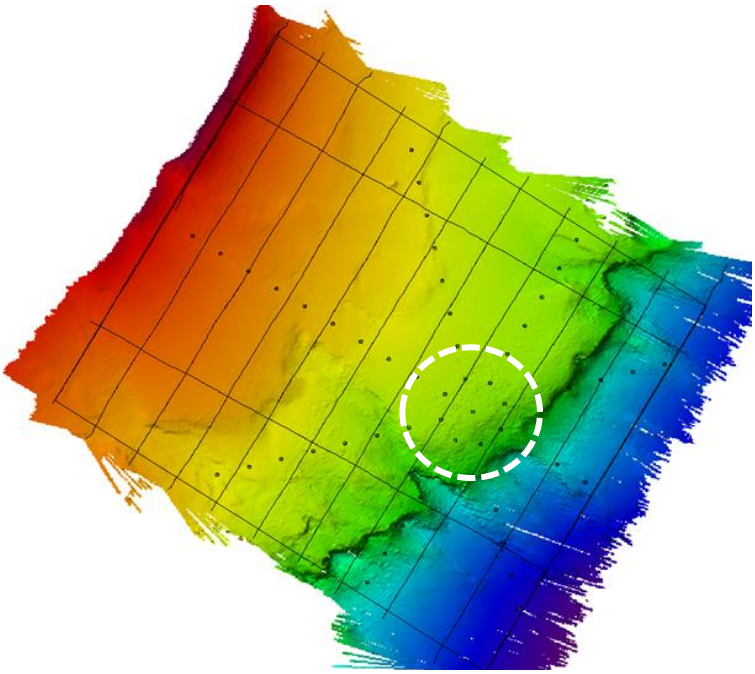

Figure 2-8. Multibeam Echosounder results from the 2017 survey of the Nawiliwili ODMDS and surrounding areas, with the Nawiliwili ODMDS boundary (white dashed circle) superimposed.

Multibeam Echosounder (MBES) data collected during the 2017 survey indicated that the Nawiliwili ODMDS is situated on the edge of the shelf. Historical bathymetry from the site designation had lower resolution, so the position of the southern ODMDS edge along the shelf cliff was not known. Because this location renders monitoring more challenging, EPA has determined that the SDZ of the Nawiliwili ODMDS should be moved slightly to the Northwest. This shift would allow for material to be deposited in a relatively featureless location that is easier to monitor.

Port Allen ODMDS: The Port Allen ODMDS has water depths ranging from 1,460 to 1,610 m, and northwesterly current velocities of 5 to 50 cm/sec (EPA, 1980). Native sediments at the Port Allen ODMDS are predominantly sandy (63% sand, 1% gravel, 36% silt and clay). Disposal operations have resulted in a slight shift in physical grain size characteristics compared to pre-disposal baseline conditions. ODMDS sediments now have a lower percentage of sand (36%) and a higher percentage of silt and clay (44% silt and 19% clay). These physical changes were expected because dredged material from ports and harbors in Hawai‘i typically have more fines, including silts and clays, than occur naturally on the deep seafloor of the ODMDS. Despite this shift in grain size, the fundamental physical character of the ODMDS as a relatively featureless sedimentary environment has not changed.

2.5.2 Chemical Characterization

South O‘ahu ODMDS: Limited sediment chemistry from the 1980 FEIS was compared with the samples collected in 2013 (EPA, 2015). Dredged material disposal operations at the South O‘ahu ODMDS since 1981 have not appreciably increased contaminant loading neither inside the ODMDS, nor relative to the surrounding environs. One minor exception is copper, which on average is slightly elevated in the ODMDS (59 ppm) compared to the 1980 baseline (31 ppm). The copper concentration inside the ODMDS was higher than the NOAA ERL screening level (34 ppm) but much lower than the ERM screening level (270 ppm), where toxicity effects are likely to occur. All sediments discharged at the ODMDS must be fully evaluated to ensure they are physically, chemically, and biologically suitable before approval for ocean disposal is granted. Thus, the observed copper concentrations, if originating from dredged material approved for disposal, are not considered to represent an environmental risk.

Hilo ODMDS: Limited sediment chemistry from the 1980 FEIS was compared with samples collected in 2013 (EPA, 2015). Dredged material disposal operations at the Hilo ODMDS since 1981 have not appreciably increased contaminant loading neither inside the ODMDS, nor relative to the surrounding environs. The one minor exception, again, is copper, which on average was slightly elevated (42 ppm) compared to the 1980 baseline (36 ppm). However, the slightly elevated copper concentration was found shoreward and outside of the ODMDS. Possible explanations include contaminants from other shore-side sources, or historic short-

dumping from disposal scows (prior to the early 2000’s). The elevated copper concentration outside the ODMDS was slightly higher than the NOAA ERL screening level (34 ppm) but much lower than the ERM screening level (270 ppm). As discussed earlier, sediments that contain pollutants in toxic amounts are prohibited from being discharged. All sediments discharged at the ODMDS must be fully evaluated to ensure they are suitable before approval for ocean disposal is granted. Thus, the observed copper concentrations, if originating from dredged material approved for disposal, are not considered to represent an environmental risk.

Kahului ODMDS: Limited sediment chemistry from the 1980 FEIS was compared with samples collected in 2017. Dredged material disposal operations at the Kahului ODMDS since 1981 have not appreciably increased contaminant loading neither inside the ODMDS, nor relative to the surrounding environs. Most of the contaminant levels have instead decreased, in comparison to the baseline. The one minor exception, again, is copper, which on average was only very slightly elevated (25.6 ppm) compared to the 1980 baseline (24.6 ppm). This slightly elevated copper concentration only consists of a very minor increase, and average concentrations remain below the NOAA ERL screening level (34 ppm).

Nawiliwili ODMDS: Limited sediment chemistry from the 1980 FEIS was compared with samples collected in 2017. Dredged material disposal operations at the Nawiliwili ODMDS since 1981 have not appreciably increased contaminant loading neither inside the ODMDS, nor relative to the surrounding environs. All of the contaminant levels have instead decreased, in comparison to the baseline.

Port Allen ODMDS: Limited sediment chemistry from the 1980 FEIS was compared with samples collected in 2017. Dredged material disposal operations at the Port Allen ODMDS since 1981 have not appreciably increased contaminant loading neither within the ODMDS, nor relative to the surrounding environs. Most of the contaminant levels have instead decreased, in comparison to the baseline. The one minor exception again, is copper, which on average was slightly elevated (39.6 ppm) compared to the 1980 baseline (21.1 ppm). However, prior to the 2017 survey, the Port Allen ODMDS had only received less than 21,000 cy from a single project, in 1999. Therefore, it is likely that this slight increase in copper concentrations may have been due to other sources of contamination, such as possible contamination from other shore-side sources. The observed copper concentration was slightly

higher than the NOAA ERL screening level (34 ppm) but much lower than the ERM screening level (270 ppm) where toxicity effects are likely to occur. As discussed earlier, all sediments discharged at the ODMDS must be fully evaluated to ensure they are suitable before approval for ocean disposal is granted. Thus, the observed copper concentrations, if originating from dredged material approved for disposal, are not considered to represent an environmental risk.

2.5.3 Biological Characterization

South O‘ahu ODMDS: In 2013, EPA collected and processed sediment samples from both inside and outside the South O‘ahu ODMDS to characterize the benthic infaunal community. The 1980 FEIS characterized the benthic community as typical for abyssal depths, with low infaunal abundance relative to shallow depth communities. Results from the 2013 survey indicated that infaunal abundances were similar to baseline, despite the grain-size shift described above, and there were no statistically significant differences in community structure between stations within and outside of the ODMDS, including far-field stations (EPA, 2015). Although percent abundances of some taxa within the ODMDS appeared to be slightly lower in 2013 than in 1980, even these minor differences are most likely attributable to natural variability across the study area rather than to disposal activities. This conclusion is supported by abundances of these same taxa being greater inside the ODMDS compared to outside it in 2013.

The sediment profile image results from the 2013 survey indicated that successional stage of organisms on the dredged material mound, including the relic off-site material to the north, was fairly uniformly stage 1 on 3. Stage 1 on 3 is indicative of secondary succession, whereby surface-dwelling stage 1 organisms (rapid recolonizers) co-exist at the same time and place with stage 3 fauna (advanced fauna). While this demonstrates relatively rapid recolonization and a well-established infaunal community in the finer, more carbon-rich dredged sediments, it is a different community than would be supported by the native fine sand at this location in the absence of dredged material disposal.

Analysis of the plan view images from the 2013 survey indicated that, except for the two stations on hard bottom, the native seafloor around the South O‘ahu ODMDS is a muddy carbonate sand with rippled bedforms and relatively low abundance of epifauna. Other than the occasional hermit crab or other decapods such as shrimp or

Brachyurans, the presence and abundance of epifauna was directly proportional to the amount of rock/rubble/outcrop present on the flat sandy bottom. Anything that provided a hard surface or additional vertical relief for niche/topographic diversity became a suitable substratum to which organisms could attach (tunicates, cnidarians, bryozoans) or hide within (echinoderms), which subsequently attracted more fish to that particular location.

Hilo ODMDS: In 2013, EPA collected and processed sediment samples from both inside and outside the Hilo ODMDS to characterize the benthic infaunal community. The 1980 FEIS characterized the benthic community at the Hilo ODMDS as typical for abyssal depths, with low infaunal abundances relative to shallow depth communities. Compared to data presented in the FEIS, few differences were apparent from the 2013 survey. Certain infaunal taxa appear to be slightly lower inside the ODMDS compared to outside in 2013 (though not statistically significantly) (EPA, 2015). However, the same taxa were lower both inside and outside the ODMDS. Similarly, mollusks were more abundant region-wide than they were in 1980. A total of approximately 130,000 cy of material was disposed at the Hilo ODMDS in 2011 and 2012, therefore it is possible that these minor changes may be a consequence of benthic community recovery inside the ODMDS.

The sediment profile image results from the 2013 Hilo ODMDS survey indicated that there was not much difference between stations with and without dredged material. Since far less dredged material had been discharged at the Hilo ODMDS than at the South O‘ahu ODMDS, less disturbance to the native sediments around the site had occurred. Most stations were dominated by stage 1 on 3 communities, but more heterogenous communities were present to the east and northeast of the site as well. These stations had either no apparent dredged material, or only trace thicknesses of dredged material, therefore the different community structure at these stations likely reflects natural heterogeneity of benthic habitat types in this area rather than any particular effect from dredged material deposition.

Analysis of the plan view images from the 2013 survey indicated that the Hilo sediments had a higher percentage of fine sediments, attracting higher densities of small prey as evidenced by burrow holes, along with more frequent occurrence of rocky outcrops both inside and outside the ODMDS boundaries. These characteristics attracted a generally more abundant and varied epifauna and fish assemblage. Unlike the South O‘ahu ODMDS, the areas of the highest accumulation

of dredged material, near the center of the ODMDS, appeared to have the lowest faunal attractiveness. However, higher densities of fish and anthozoans as well as more frequent evidence of burrowing infauna were seen throughout the suvey area as a whole, compared to South O‘ahu.

Kahului ODMDS: In 2017, EPA collected and processed sediment samples from both inside and outside the Kahului ODMDS to characterize the benthic infaunal community. The 1980 FEIS characterized the benthic community at the Kahului ODMDS as typical for abyssal depths, with low infaunal abundances relative to shallow depth communities. The FEIS also stated that the ODMDS is dominated in abundance and diversity by small infauna and tube-dwelling polychaetes. The 2017 results appear to be similar to the FEIS, with the results demonstrating the ODMDS is dominated by Annelida. The 2017 monitoring also indicated that there were no significant differences between samples collected within and outside of the ODMDS, including far-field stations. This would indicate that the dredged material disposed at the Kahului ODMDS has not had long-term, adverse impacts to the benthic community structure.

Sediment profile image results from the 2017 survey indicated that benthic infaunal and epifaunal communities at the Kahului ODMDS were robust. Nearly every station, both inside and outside of the ODMDS, had at least one replicate with evidence of mature stage 3 fauna. Analysis of the plan view images indicated that the seafloor surface at the Kahului ODMDS and surrounding areas was mostly sculpted by the biological activity of infaunal and epifaunal communities present, including sea cucumbers that created winding tracks across the seafloor. Burrowing anemones were encountered in the plan view images at a number of stations and other epifaunal organisms, such as sea cucumbers and sea stars, were also observed.

Nawiliwili ODMDS: In 2017, EPA collected and processed sediment samples from both inside and outside the Nawiliwili ODMDS to characterize the benthic infaunal community. The 1980 FEIS characterized the benthic community at the Nawiliwili ODMDS as typical for abyssal depths, with low infaunal abundances relative to shallow depth communities. The FEIS also stated that the ODMDS is dominated in abundance and diversity by small infaunal and tube-dwelling polychaetes. Because the Nawiliwili ODMDS was so heterogeneous, benthic community grab samples were not successfully collected inside the ODMDS for comparison to the benthic

community outside the ODMDS during the 2017 monitoring survey. Therefore, impact to the ODMDS cannot be directly assessed through benthic community samples.

Sediment profile imaging was also conducted in 2017, however the rocky substrata and coarse dredged material resulted in shallow prism penetration depths and precluded the determination of infaunal successional stage at many stations. Nevertheless, the one sediment profile image replicate that achieved sufficient penetration near the center of the Nawiliwili ODMDS indicated the presence of stage 3 fauna. Additionally, disposal volumes at the Nawiliwili ODMDS are relatively low, and preliminary screening of chemistry results indicated that dredged material disposed did not appear to result in contaminant loading; most of the analytes were below the ERL, and the few concentrations above screening levels were found both inside and outside of the ODMDS. Therefore, all available results from the 2017 survey and the pre-disposal testing data indicate that dredged material disposed at the Nawiliwili ODMDS did not result in long-term, adverse impacts to the benthic environment. The plan view images captured a wide variety of epifaunal organisms throughout the survey area, including anemones, gastropods, crabs, sea cucumbers, shrimp, and urchins.

Port Allen ODMDS: In 2017, EPA collected and processed sediment samples from both inside and outside the Port Allen ODMDS to characterize the benthic infaunal community. The 1980 FEIS characterized the benthic community at the Port Allen ODMDS as typical for abyssal depths, with low infaunal abundances relative to shallow depth communities. The FEIS also stated that the ODMDS is dominated in abundance and diversity by small infaunal and tube-dwelling polychaetes. The 2017 results appear to be similar to the FEIS, with the results demonstrating that the ODMDS is dominated by Annelida. The 2017 monitoring also indicated that there were no significant differences between samples collected within and outside of the disposal ODMDS, including far-field stations. This would indicate that the dredged material disposed at the Port Allen ODMDS has not resulted in long term, adverse impacts to the benthic community structure.

The sediment profile images collected in 2017 also indicated that infaunal and epifaunal communities in the Port Allen ODMDS survey area were robust. Nearly every station had at least one replicate with evidence of mature stage 3 fauna. Opportunistic stage 1 fauna were often documented in the presence of stage 3 fauna, resulting in a stage 1 on 3 designation. Evidence for the presence of stage 3 fauna

included large-bodied infauna, deep subsurface burrows, and/or deep feeding voids. Stage 1 taxa were indicated by the presence of very small tubes at the sediment–water interface. The plan view images captured a variety of epifaunal organisms throughout the survey area, including brittle stars, hermit crabs, sea cucumbers, and shrimp.

2.5.4 Discussion of critical amenities

Ocean disposal is only permitted at sites selected to minimize the interference of disposal with other activities in the marine environment, particularly avoiding areas of existing fisheries or shellfisheries, and regions of heavy commercial or recreational navigation. Dredged material disposal activities have occurred at the Hawai‘i ODMDSs since the early 1980’s. Historical disposal at the sites has not interfered with commercial nor recreational navigation, commercial fishing, or sportfishing activities.

Transit routes to the sites may intersect with coral reef areas, however disposal vessels using the Hawai‘i ODMDSs are typically required to track and report their routes and drafts to ensure that no material leaks into sensitive areas during transit. Both the previous and updated Site Use Conditions (Appendix B) also require that permittees consider the weather forecast in deciding loading capacity. The updated Site Use Conditions further restrict loading to 80% capacity. Additionally, the sites are sufficiently removed from shore and fishery resources to allow water quality perturbations caused by dispersion of disposal material to be reduced to ambient conditions before reaching environmentally sensitive areas.

No known shipwrecks or other cultural resources occur in the vicinity of the Hawai‘i ODMDSs. Overall, the seabed at the sites is considered to be non-dispersive, and sediments at the sites are expected to settle and remain offshore, with no expected impacts to shore areas. The sites are not located within active oil or natural gas leases, nor within active renewable energy leases. They also do not intersect with BOEM oil and gas planning areas nor with areas with such resource potential. While there are BOEM wind planning areas offshore of O‘ahu, these areas are not within the vicinity of the South O‘ahu ODMDS.

Beginning in 2018, EPA conducted informal programmatic consultations with the National Marine Fisheries Service under the Endangered Species Act (ESA) and the Magnuson-Stevens Fishery Conservation and Management Act, and with the U.S. Fish

and Wildlife Service under ESA, for the continued use of each of the Hawai‘i ODMDSs. These consultations were completed in 2021 (EPA, 2021). EPA determined that the continued disposal of approved, suitable dredged material at these sites under an updated SMMP may affect, but is not likely to adversely affect, certain species listed as threatened or endangered under the ESA. EPA similarly determined that continued operations may affect Essential Fish Habitat (EFH), however the effects are expected to be minimal.

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 (MPRSA section 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 CFR 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 ocean dumping criteria. To apply the criteria, the Ocean Testing Manual, sometimes referred to as the Green Book (EPA/USACE, 1991) provides 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 criteria prohibit the ocean dumping of uncharacterized materials (40 CFR 227.5(c)).
- Identifying management conditions to be implemented by 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, 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 3.11 summarize the disposal operation conditions that will be considered for management of each of the five Hawai‘i ODMDSs as described in 40 CFR 228.15(l)(5 – 9). Enforceable conditions for dredged material disposal operations

at each of the five Hawai‘i ODMDSs 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 EPA's concurrence if the permit or authorization documents do not already require such conditions.

The complete set of Site Use Conditions is available in Appendix B. The language in Appendix B is intended to be applicable to dredging projects permitted by USACE (Federal and non-federal) as well as to USACE-authorized federal dredging projects, regardless of whether Government owned and operated dredging equipment or contracted equipment is used. EPA may determine not to include one or more of the conditions identified in Appendices B. 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 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 Ocean Dumping Criteria Compliance Process

USACE uses the ocean dumping criteria when evaluating permit requests for (and implementing Federal projects involving) the transportation of dredged material for the purpose of dumping it into ocean waters. All disposal of dredged material in the ocean must comply with the ocean dumping criteria, and 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 EPA's concurrence prior to authorization of transportation and disposal of dredged materials, and authorizing documents must contain any conditions included in EPA's concurrence. EPA and USACE will coordinate early in the contracting process so the USACE can incorporate any EPA concurrence conditions into project authorization documents.

Dredging projects that are not Federal projects involving ocean disposal of dredged material require 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/ocean-dumping/ocean-disposal-dredged-material.

3.2 Dredged Material Characterization

Prior to any disposal of dredged material at any of the five Hawai‘i ODMDSs, EPA and USACE must evaluate the project applying the ocean dumping criteria (40 CFR Part 227) and USACE must specifically authorize the disposal under MPRSA section 103. It is important that EPA and USACE agree on the sampling and analysis plan (SAP) for each project *prior* to any sampling of proposed dredged material.

Guidance for a process to determine the suitability of dredged material proposed for disposal at the five Hawai‘i ODMDSs is described in the Ocean Testing Manual, sometimes referred to as the Green Book (EPA/USACE, 1991).

Steps include:

1) Case-specific evaluation of proposed material against the exclusion criteria (40 CFR 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 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 EPA have determined to be suitable and in compliance with the Ocean Dumping Criteria (40 CFR Part 227) may be considered for transportation and disposal at the five Hawai‘i ODMDS. No disposal activities may occur at any ODMDS until EPA reviews the testing data results and transmits its written concurrence that the material is acceptable for disposal at the ODMDS.

Additional information describing the types of material disposed at each ODMDS (source location, sediment type, etc) are discussed in section 2.3 of this document.

3.3 Ensuring Origin of Material During Dredging

Pre-Construction/ Pre-Dredging Meeting: The permittee should organize a pre-construction meeting (which may be virtual) to include EPA, personnel from the permittee's organization, and personnel from the prime dredging Contractor and any subcontractor involved in transporting the disposal vessels to the ODMDS. The purpose of the meeting is to ensure that the permittee and any Contractor(s) have received and understand EPA's ocean disposal Site Use Conditions attached to the project concurrence or authorization (see Appendix B for expected language).

***Dredging Operations Plan*:** A dredging operations plan (DOP) is a plan that outlines the methods and schedule for conducting dredging activities. The DOP should be sent to EPA for review and approval following EPA ocean disposal concurrence prior to commencement of dredging. After EPA approval of the DOP, any deviations from the original DOP should be sent to EPA for approval. The elements and timelines that are expected in the DOP are outlined in the complete set of Site Use Conditions in Appendix B and include SOPs and BMPs for ensuring only authorized material is dredged.

Preventing Disposal of Uncharacterized Material, Unsuitable Material, Trash, and Debris; Use of Grizzly: In order to exclude large trash and debris (including rocks and coral rubble) from being disposed at the ODMDS, all mechanically dredged material should be placed into scows through a steel mesh or chain "grizzly" with openings of no more than 12 inches by 12 inches. Material retained on the grizzly should be removed and disposed of separately at an appropriate land-based facility.

Dredging Footprint Documentation: To ensure that only authorized material is disposed at the ODMDS, the project is expected to have a system that documents the specific location from which dredged material transported for ocean disposal was removed and the associated date and time. The permittee should compile and submit the records to EPA on a monthly basis.

3.4 DREDGED MATERIAL TRANSPORTATION

Scow Certification Form: The permittee should submit a Scow Certification form to EPA and USACE for review and approval prior to the commencement of any ocean disposal operations. The Scow Certification should be used to document items including estimated bin volume of material loaded, location from which the material was dredged, the marine weather forecast, and the details of the disposal location and timing. The permittee should compile and submit these records to EPA on a monthly basis. The permittee (or prime dredging contractor) should also have an appropriate communications hierarchy and protocols in place to provide the quality control inspector with the authority to ensure that the Site Use Conditions pertinent to the scow are met and to prevent the scow from departing for a disposal trip if the Conditions are not fulfilled. EPA may require for a certain project that both the permittee (or prime dredging contractor) quality control inspector and an independent quality control inspector certify in writing that the vessel meets the conditions and requirements of a Scow Certification form for each disposal trip.

Preventing Leaking or Spilling: The permittee should ensure that doors remain closed during loading and transport, and that dredged material is not leaked nor spilled from disposal vessels while stationary or during transit to the ODMDS. For enforcement and compliance assurance purposes, closed doors should be defined to require both physically closed doors and a properly functioning hull status monitor indicating that the doors are closed. Transportation of dredged material should only be allowed when weather and sea state conditions will not interfere with safe transportation and will not create risk of spillage, leaking, or other loss of dredged material during transit. Disposal vessels should not be loaded beyond a level at which dredged material would be expected to be spilled in transit under anticipated sea state conditions. At maximum, vessels should not be loaded beyond 80% capacity, unless otherwise specified in the project-specific conditions. No disposal vessel trips should be initiated when the National Weather Service has issued a gale

warning for local waters during the time period necessary to initiate and complete dumping operations.

3.5 DISPOSAL LOCATIONS AND TIMES

Surface Disposal Zone (SDZ): The regulation at 40 CFR 227.28 requires that the release of dredged material into the ODMDS occur at least 330 feet (100 meters) inside ODMDS boundaries. 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. EPA and USACE may establish release zones within the site to maintain compliance with the ocean dumping criteria in 40 CFR 227.28. For the Hawai‘i ODMDSs specifically, no portion of the disposal vessel from which the materials are to be released (*e.g.,* hopper dredge or barge) should be further than 305 m (1,000 ft) from the center of the ODMDS, or 200 m for the Nawiliwili ODMDS, unless specified by a project-specific special permit condition. When discharging dredged material within the ODMDS, Except for the Nawiliwili ODMDS, the center coordinates of the ODMDS (Table 2-1) are also the center coordinates of the SDZ. No more than one disposal vessel should be present within the SDZ at any time.

Disposal authorization documents (e.g., a permit or Federal project contract term) should require that disposal be initiated within the applicable release zone boundary and completed (i.e., doors closed) prior to leaving the ODMDS.

There are no current restrictions on disposal times, however such restrictions may be implemented on a project-specific basis.

3.6 DISPOSAL VESSEL TRACKING

Disposal Vessel Instrumentation and Tracking: The primary tracking system for recording ocean disposal operations and ensuring that no material is released outside of the ODMDS SDZ should be disposal vessel-based. Each disposal vessel should have a primary navigation/tracking system functioning during the time of loading of dredged material onto the disposal vessel through the return transportation of the vessel from each disposal trip to the dredging site. No material should be loaded into the disposal vessel, and no trip should be initiated, without a functioning primary navigation/tracking system. This system should record

information including vessel positioning, speed, heading, draft, and the location and timing of the disposal event. The permittee should compile and submit these records to EPA on a monthly basis.

Back-Up Navigation System: No disposal trip should be initiated without a functioning primary tracking system for recording ocean disposal operations. However, if the primary disposal vessel tracking system fails during transit, the navigation system on the pushing or towing vessel meeting the minimum accuracy requirements listed above may be used to complete that disposal trip by maneuvering the pushing or towing vessel so that, given the compass heading and any tow cable length to the scow (“lay back”), the estimated scow position would be within the SDZ. In such cases, the pushing or towing vessel’s position, any tow cable length, and the compass heading to the disposal vessel should be recorded and reported on the Scow Certification form. Further disposal operations should cease until the primary disposal-tracking capabilities are restored.

If the draft sensor for the primary disposal vessel tracking system fails while the disposal vessel is stationary, loading of the disposal vessel should cease until capabilities are restored. If only the GPS tracking fails, then EPA and USACE should be informed of the coordinates at which the disposal vessel is stationed, and the draft should continue to be recorded and posted in accordance with the vessel disposal tracking data posting (described below). However, transit should not occur until GPS tracking capabilities are restored.

3.7 Disposal Reporting

Posting Disposal Vessel Tracking Data on the Internet: Within 24 hours of the completion of each disposal trip, data recorded from the primary disposal tracking system should be posted by a third-party contractor to an internet site accessible by EPA and USACE, and any other entity specified by EPA or USACE in project-specific permits. The records should include the disposal vessel transit routes, locations of disposal, estimated bin volume, and vessel speed and draft from the time of loading until completion of transit from the ODMDS.

Record-Keeping, and Monthly Reporting: In addition to posting disposal vessel tracking data on the internet, the permittee should collect and maintain daily records, including the approved and fully completed Scow Certification forms and dredging

footprint documentation. All daily records should be compiled at a minimum for each month during which ocean disposal operations occur, and provided in reports, certified accurate by the dredging contractor and the permittee, to both EPA and USACE. The monthly reports should also include a cover letter summarizing the specific dredging units dredged during the month, the total estimated volume of material dredged during the month, any problems complying with the Site Use Conditions, any significant deviations from the anticipated project conditions, the cause(s) of the problems, any steps taken to rectify the problems, and whether the problems occurred again during dredging of suitable units or on subsequent disposal trips.

Project Completion Report: Following the completion of ocean disposal operations, the permittee should submit to EPA Region IX and the Honolulu District USACE a project completion report. The project completion report should contain a cover letter summarizing the number of disposal trips and disposal volumes, any issues with complying with the Site Use Conditions, and comparison of the pre- and post-bathymetry of the dredging footprint and surrounding areas to show the depths achieved within the project, and how they correspond to the authorized project depth.

3.8 COMPLIANCE ISSUE REPORTING

E-Mail Alerts: Any degree of apparent dumping outside the SDZ of the ODMDS, or any apparent substantial leakage/spillage or other loss of material while stationary or during transport to the ODMDS should be tracked by the third-party tracking system and automatically reported via email to EPA and USACE within 24-hours.

24-Hour Notification for Potential Leaks, Mis-Dumps, and Dredging of Unsuitable or Uncharacterized Material: Any anticipated, potential, or actual variances from compliance with the Site Use Conditions should be reported to EPA and USACE within 24 hours of discovering such a situation. EPA and USACE should also be notified within 24 hours if any conditions arise that indicate that dredged material previously deemed suitable for ocean disposal by EPA may have unanticipated levels of constituents.

3.9 Additional Project-Specific Conditions

For any Hawai‘i ocean disposal project, EPA or USACE may include additional project-specific conditions that they determine are necessary to facilitate safe use of the ODMDS, to prevent potential harm to the environment, to facilitate accurate monitoring of ODMDS use, or to facilitate compliance with the requirements of the MPRSA. For example, project-specific conditions could include timing restrictions to avoid sensitive environmental periods, such as peak coral spawning times, or operational restrictions on the methods and location of transportation and disposal.

3.10 Alternative Permit/Project Conditions

Alternatives to the standard permit conditions may be authorized in advance if the permittee demonstrates to the satisfaction of EPA and USACE that: the alternative conditions are sufficient to accomplish the specific intended purpose of the original permit condition; they will not increase the risk of harm to the environment or the health or safety of persons; and they will not impede monitoring of compliance with the MPRSA, the ocean disposal regulations, or the project’s permit.

4 SITE MONITORING

Site monitoring is conducted to ensure the environmental integrity of a disposal site and the areas surrounding the ODMDS 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 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 specific project-related issues that arise. Multi-year trend analyses are outlined in the Ocean Dumping Regulations at 40 CFR 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 revise the SMMP. Results from these surveys should be used to assess the need for additional targeted or more complex studies.

The monitoring program for the five Hawai‘i ODMDSs is designed to address the following questions:

What are the short- and long-term fates of the material disposed at the ODMDS*?* This would include considerations such as:

- Does disposed dredged material remain within the ODMDS boundaries or leave the ODMDS?
- If any disposed material leaves the ODMDS, 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?
- Was any material dumped outside of the ODMDS boundaries?

What are the short- and long-term environmental impacts of the disposal of material at the ODMDS*?* 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 sediment composition, habitat quality, benthic community, or other environmental parameters at or near the disposal ODMDS?
- Has there been an increase in contaminant levels in the sediments or biota at or near the ODMDS?
- Are there any other impacts detected inside or outside the ODMDS boundaries?

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

4.1 Compliance Monitoring During a Project: the Origin, Transportation, and Disposal of Dredged Materials

Monitoring the origin of material is necessary to confirm that only material that has been tested in accordance with the Ocean Testing Manual, and approved for ocean disposal by EPA and USACE, may be disposed at the Hawai‘i ODMDSs. Monitoring the origin of dredged material is essential to protecting the marine environment in and around the

ODMDS. Monitoring 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 ODMDS boundaries, that rubble material does not result in mounding or creation of essential fish habitat, and to confirm that future ODMDS use will not exceed the ODMDS's capacity. Given the depths of the Hawai‘i ODMDSs, creation of navigational hazards due to mounding is not a concern. The typical compliance monitoring activities used to achieve each of these management goals are summarized in sections 4.1.1-4.1.3 and Table 4-1 below.

4.1.1 Monitoring The Origin of Dredged Material

As described in Sections 3.1-3.11, once a dredging project is approved and permitted (or authorized in the case of federal projects) for ocean disposal at one of the Hawai‘i ODMDSs, a variety of compliance monitoring measures are included in the Section 103 Permit (or authorization). Please refer to Appendix B for the expected set of Site Use Conditions. Example requirements that are in place to monitor the suitability of dredged material disposed at the Hawai‘i ODMDSs would include, but not be limited to, submission by the permittee of:

- A DOP that outlines project specifications, including the sequence of dredging, equipment used, SOPs to prevent over-dredging, etc.;
- Dredge footprint tracking reports, demonstrating only characterized and suitable material is dredged and disposed;
- Notifications within 24 hours for compliance issues (including for issues with material suitability); and
- Reports, including monthly reports and a project completion report.

4.1.2 Monitoring Dredged Material Transportation and Disposal

As described in Sections 3.1-3.11, once a dredging project is approved and permitted (or authorized in the case of federal projects) for ocean disposal at one of the Hawai‘i ODMDSs, a variety of compliance monitoring measures are included in the Section 103 Permit (or authorization). Please refer to Appendix B for the complete set of Site Use Conditions. Example requirements in place to monitor the transportation and disposal of material at the Hawai‘i ODMDSs would include, but not be limited to:

- Forms certifying that the scow is not overloaded, the sea-state is acceptable for transport, and tracking systems are functional;
- Satellite tracking of all disposal vessels to ensure that disposal activities occur only where and as authorized;
- Sensors on all disposal vessels to ensure no significant leakage or spilling of dredged material occurs during loading or transit to the ODMDS, especially during transit through the nearshore zone where corals, seagrasses, and sensitive animals are most likely to be present;
- Tracking and sensor information reported online within 24 hours for each disposal trip (refer to Appendix A for a visual example of tracking reported)
- Notifications within 24 hours for compliance issues (including of leaks or mis-dumps); and
- Reports, including monthly reports and a project completion report.

4.1.3 Monitoring Site Capacity

The five Hawai‘i ODMDSs are in deep water compared to many ODMDSs nationwide, and only relatively small volumes of suitable dredged material are disposed at most of the ODMDSs at infrequent intervals. No unacceptable adverse impacts from previous disposal have been identified through site monitoring conducted to date, and significant adverse effects are not expected in the future based on current sediment quality acceptability and compliance monitoring. Therefore, it is anticipated that use of the five Hawai‘i ODMDSs will not have capacity concerns in the foreseeable future.

Table 4-1. Summary of activities to monitor the origin, transportation, disposal, and fate of disposed material and thresholds for action at each of the five Hawai‘i ODMDSs.

Management Goal	Monitoring Activity	Responsible Entity	Purpose	Frequency	Threshold for Action	If Threshold Not Exceeded	If Threshold Exceeded
Only authorized material is dredged and disposed of at each of the five Hawai‘i ODMDSs.	DOP, dredge footprint report, monthly reports, project completion report, e-mail alerts and 24-hour notification for any leaks, misdumps, issues with material origin.	Site User	Ensure there are no adverse impacts to the marine environment from disposal of unauthorized material at each of the five Hawai‘i ODMDSs.	DOP provided prior to project initiation; monthly reports and dredge footprint tracking provided monthly; project completion report provided 60 days following the project completion date to EPA.	Records required by the 103 concurrence conditions are not submitted or are incomplete.	Continue compliance monitoring.	Site use may be restricted until requirements outlined in the 103 concurrence conditions are met.
					Review of records indicates dredging of unsuitable or uncharacterized material.	Continue compliance monitoring.	Permittee should : • Notify EPA R9 & USACE. 24-hour notice should be given to EPA R9 & USACE; • Investigate why non-compliance occurred; and • Rectify the issue before a subsequent disposal trip. EPA & USACE to enact corrective actions or take appropriate enforcement action.
No material is leaked or mis-dumped outside of the SDZ of each of the five Hawai‘i ODMDSs.	Scow certification forms, satellite tracking of disposal vessel location, speed, and draft, monthly reports, project completion report, e-mail alerts and 24-hour notification for any leaks, misdumps, issues with material origin.	Site User	Ensure that there are no adverse impacts to the marine environment from disposal of material outside of the SDZ of the five Hawai‘i ODMDSs.	Satellite tracking reports uploaded online daily; monthly reports and scow certification forms provided monthly; project completion report provided 60 days following the project completion date to EPA.	Records required by the 103 concurrence conditions are not submitted or are incomplete.	Continue compliance monitoring.	Site use may be restricted until requirements outlined in the 103 concurrence conditions are met.
					Review of records indicates disposal outside ODMDS boundary, excessive leakage on route to disposal, or other mis-dumping.	Continue compliance monitoring.	Permittee should : • Notify EPA R9 & USACE. 24-hour notice should be given to EPA R9 & USACE; • Investigate why non-compliance occurred; and • Rectify the issue before a subsequent disposal trip. EPA & USACE to enact corrective actions or take appropriate enforcement action.

4.2 FIELD MONITORING: ENVIRONMENTAL EFFECTS OF DISPOSED MATERIAL

Monitoring 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 the five Hawai‘i ODMDSs summarized in Table 4-2 below is structured as a tiered monitoring approach; unacceptable conditions discovered during a lower tier assessment should trigger additional testing or other management action.

USACE and 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. Typical survey areas for the five Hawai‘i ODMDSs are included in Appendix A. It is important that no external activities (e.g., spills, disposal under a different permit, etc.) affect the areas surrounding each ODMDS, as these areas are used to assess the impact of dredged material on the ODMDS and surrounding environment.

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 quality, transportation, and disposal monitoring activities described in Section 4.1 or the fate monitoring activities described in this section. Any monitoring at the site that identifies an issue of potential concern should trigger additional monitoring or management actions.

4.2.1 Dredged Material Footprint (Tier I)

Monitoring the fate of disposed materials during periodic site surveys involves mapping the physical footprint of dredged material deposition within and surrounding the ODMDS boundaries. The “footprint map” has several valuable purposes, including:

- ***Confirming that deposition of dredged material is occurring as predicted*:** Material disposed properly within the SDZ is expected to deposit primarily within the ODMDS boundary. Significant deposits outside the ODMDS boundary may indicate mis-dumping or that oceanographic conditions at the ODMDS are different than expected. Mis-dumping would

predominantly be identified by disposal vessel tracking and addressed as a project-specific enforcement matter. However, if oceanographic conditions are causing dredged material to deposit in an unexpected area, site management actions may be needed.

- ***Identifying locations for potential subsequent chemical and biological sampling*:** Tier II monitoring involves comparing the chemical and biological characteristics of sediment samples collected within the dredged material footprint to those collected outside the footprint. Therefore, footprint mapping is conducted prior to Tier II sample collection, in order to inform appropriate sample locations.
- ***Long-term physical trend assessment:*** Footprint maps compiled over multiple site monitoring surveys can be compared to help assess ODMDS performance over time. This can help identify the need for potential long-term management actions well before unacceptable impacts may occur. Examples of management actions may include expanding ODMDS boundaries or moving the location of the SDZ.

Different tools and approaches may be used to conduct successful footprint mapping surveys. For the relatively deep water in which each of the five Hawai‘i ODMDSs is located, some tools are more useful for identifying dredged material deposits, while other tools are more useful for identifying other kinds of features on the seafloor such as reef outcroppings, etc. The choice of appropriate method(s) will be based on the focus of the individual survey and the degree of information already available from previous mapping surveys, if any. Footprint mapping surveys may include one or more of the following:

- ***Sediment Profile Imaging (SPI) and Plan View (PV) surveys:*** This method is the most commonly used to map the thickness of dredged material at each of the five Hawai‘i ODMDSs. It combines both horizontal plan view and vertical cross- sectional photographs of the surface sediments. Unlike the footprint mapping survey tools described below, the high-resolution vertical cross-sectional SPI photographs can distinguish dredged material layers as thin as a few millimeters, and up to about 20 centimeters. They can also often distinguish recently deposited material from previous years’ deposits. Therefore, the SPI system is an appropriate tool for identifying the extent of the dredged material footprint. In addition to mapping dredged material

presence and absence at a sampling station, SPI images can also provide an assessment of benthic community and benthic habitat quality, by identifying such visual parameters as the depth of the biologically mixed zone and the relative stage of benthic organism recolonization of the sediment.

- ***Multibeam bathymetric surveys:*** In recent years multibeam surveys have been employed successfully at many ODMDSs in Region IX. High-resolution multibeam bathymetric surveys are useful for mapping bottom features such as reef outcrops and for identifying dredged material deposits based on backscatter. Multibeam surveys also provide detailed depth information about the seafloor and are generally more accurate as to geographic location of identified features than side-scan surveys because the instruments are mounted directly to the survey vessel's hull and the collected data is synchronized with the ship's GPS system. However, at the depth range of the Hawai‘i ODMDSs, multibeam-collected depth information, while accurate to a meter or less and potentially useful for the central dredged material mound in the SDZ, are less useful for delineating thinner dredged material deposits at the edges of the dredged material footprint.
- ***Sub-bottom profiling surveys:*** Unlike multi-beam surveys, which provide a plan view of the seafloor, sub-bottom profiling can identify cross-sectional views of discrete layers of sediments and underlying bedrock many meters beneath the seafloor. The cross-sectional views from sub-bottom profiling surveys are also much deeper than those provided by SPI, however the resolution is much coarser; thicker portions of dredged material deposits over native sediments can be identified by the contrast of backscatter signal, yet sub-bottom profiling surveys generally cannot distinguish sediment layers that are less than a meter in thickness. As such this method may be more valuable, for example, to monitor the cumulative growth of a centrally located disposal mound over a long period of time, as opposed to identifying the outer areas or edges of recently deposited material.

4.2.2 Environmental Effects Monitoring (Tier II)

Evaluating environmental effects is the next priority after establishing the dredged material footprint. This monitoring objective generally involves retrieving sediment samples from numerous locations in and around the ODMDS and analyzing the

samples in the laboratory for physical and chemical parameters, as well as for benthic community analysis, if funds allow or if warranted, as described below. Using information from the footprint mapping survey, samples are selected from locations representative of both dredged material that has deposited at the ODMDS (“onsite” or “footprint” samples), and native sediment further removed from the ODMDS and unaffected by dredged material (“offsite” samples) for comparison.

Various physical and chemical analyses may be appropriate depending on the ODMDS, its history, and the management issues to be addressed. However, sediment samples for both dredged material evaluation and site monitoring are typically analyzed for physical parameters such as grain size, conventional chemical parameters such as organic carbon content, and a suite of potential pollutants including heavy metals, organotins, polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), pesticides, and dioxin-like compounds (see Table 7-2 in Appendix A). The analysis may also capture additional emerging contaminants of concern.

The results of physical and chemical analyses of onsite and offsite sediments, including any reference site sediments, are evaluated to determine whether:

- ***ODMDS (“Onsite” or “footprint”) sediment chemistry levels are more elevated than expected in comparison to the pre- disposal testing chemistry profile of sediments approved for ocean disposal:*** The chemistry results from ODMDS or “footprint” samples helps confirm whether the pre-disposal testing program is adequately regulating the quality of material permitted to be disposed at the ODMDS. If results indicate that the chemistry appears to be significantly higher than expected, then adjustments to dredged material evaluation procedures may potentially be considered, including higher resolution sampling and analysis. Additionally, directed, specific contaminant monitoring or further testing through Tier III may be necessary to define the extent of management action required.
- ***“Offsite,” nearby sediments are significantly more contaminated than baseline conditions or previously monitored conditions:*** The chemistry results from “offsite” samples indicates whether contaminants in dredged material disposed at the ODMDS are having potential impacts outside the ODMDS boundary. In such a case, analysis of benthic community samples may be triggered. Potential changes to site management measures may also

be evaluated, including adjustments to the SDZ.

In practice, EPA often collects and preserves benthic community samples during sediment physical and chemistry sampling. However, processing and analysis of benthic community samples may not necessarily occur unless triggered as described above. If triggered, benthic community monitoring involves comparison of the benthic infaunal community inside versus outside the ODMDS. Since some differences are normal and expected – caused by localized physical disturbance from dredged material deposition, textural differences between the native sediments and the dredged material, depth, or other environmental parameters - analysis of benthic community samples is not always triggered unless the monitoring of the dredged material fate or of the sediment physical and chemical analysis indicates that there may be significant or long-term impacts to the environment outside of the ODMDS.

4.2.3 Advanced Environmental Effects Monitoring (Tier III)

Advanced environmental effects monitoring is triggered if sediment quality and benthic community appear to be significantly degraded within the ODMDS, or if there appear to be significant impacts outside the ODMDS. This tier of monitoring consists of collecting sediment grabs from locations where impacts have been detected through the prior tiers of testing, as well as in reference areas. Sediments will then be used to conduct acute toxicology bioassays and tissue bioaccumulation testing in the laboratory, according to the procedures and organisms outlined in the OTM (1991).

4.2.4 Reference Sites

Sediment from an appropriate designated reference site is tested as a key point of comparison for each project dredged material evaluation. Prior to 2013, subtidal sand from Lanikai Beach, O‘ahu, was used as the conservative reference sediment in pre-disposal sediment testing programs for proposed dredging projects throughout Hawai‘i. Although the Lanikai Beach sand is useful for evaluating the quality of dredged material projects, EPA sought to identify more representative areas for comparison to site monitoring results. EPA evaluated data from the 2013 monitoring South O‘ahu survey and identified station “SO-SE4” as an appropriate reference site. However, in 2022, EPA determined that the SO-SE4 station may be too proximate to the South O‘ahu ODMDS, and a further-field station is likely to be more representative of unimpacted

conditions. Therefore, EPA has selected the following location as the updated **South O‘ahu Reference site, or SOR**, located at 21.224031, -157.917420 (21° 13.4419’ N, 157° 55.0452’ W; Figure 4-1). The SOR is the reference site for each of the five Hawai‘I ODMDSs.

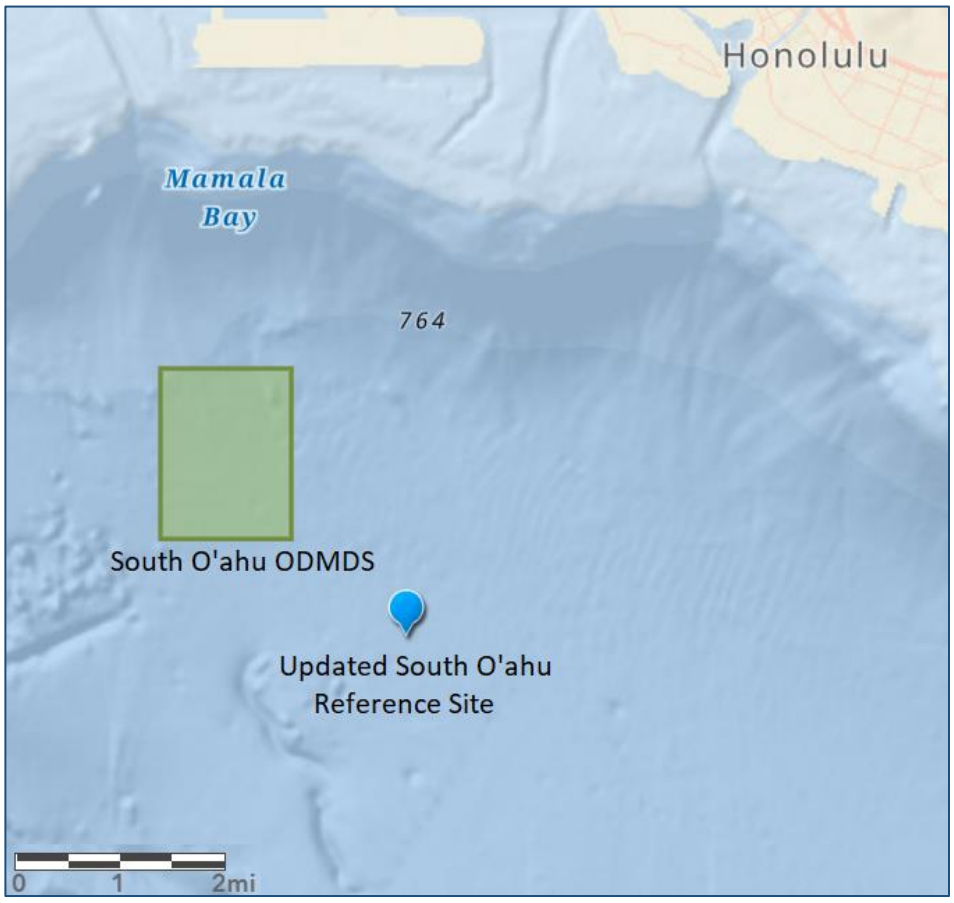

Figure 4-1. Location of the updated South O‘ahu, Reference (SOR) Site in Relation to the South O‘ahu ODMDS. The SOR is located at 21.224031, -157.917420 (21° 13.4419’ N, 157° 55.0452’ W) (WGS84).

Table 4-2. Environmental impact monitoring activities and thresholds for action at each of the five Hawai'i ODMDSs.

Frequency	Responsible entity	Monitoring Activity	Purpose	Threshold(s) for Action	If Threshold Not Exceeded	If Threshold Exceeded
Tier I: Dredged Material Footprint and Habitat Mapping						
Approximately every 10 years	EPA	Sediment mapping (generally SPI; multi-beam surveys may be conducted if needed or if funds allow). Preliminary assessment of benthic community and habitat quality.	Determine extent of dredged material. Evaluate health of the benthic community and habitat through SPI parameters.	Presence of >10 cm of non-historic dredged material outside of ODMDS boundaries. Indication of significant or long-term impacts to the benthic community and habitat outside of the ODMDS boundaries.	Continue monitoring on prescribed schedule.	• Conduct Tier II Monitoring • Review and potentially alter site management measures
Tier II: Environmental Effects Monitoring						
Implement if disposal footprint extends beyond the site boundaries, or as funding allows.	EPA	Sediment grain size and chemistry (sediment grabs). Collect and analyze benthic community samples as funds allow.	Determine if sediment chemical contaminants are significantly elevated within, and outside of, site boundaries. Evaluate benthic community parameters.	Contaminants are found to be elevated in dredged sediments. Progressive, non-seasonal, long-term changes in sediment quality. Indication of significant or long-term impacts to the benthic community outside of the ODMDS boundaries.	Discontinue specific event monitoring.	• Conduct directed, specific contaminant monitoring to define extent of management action required. • Perform biological testing on ODMDS samples (Tier III) • Review and potentially alter dredged material evaluation procedures. • Review and potentially alter site management measures.
Tier III: Advanced Environmental Effects Monitoring						
Implement if sediment quality and benthic community appear to be significantly degraded within the ODMDS, or to have impacts outside the ODMDS, or if funding allows.	EPA	Acute toxicology bioassays and tissue bioaccumulation testing (sediment grabs).	Determine whether there are adverse changes in the benthic community outside of the ODMDS as the result of disposal operations.	Adverse changes observed to the benthic community outside of the site that may endanger the marine environment.	Discontinue specific event monitoring.	• Review and potentially alter dredged material evaluation procedures. • Review and potentially alter site management measures. • Consider restricting site use or potentially discontinuing/de-designating the site.

5 MODIFICATION OF THIS SMMP

This plan is effective and available for implementation from the date of signature. The regulations designating ODMDSs should require ODMDS users to comply with specific minimum and terms and conditions identified in the SMMP and incorporated into the site designations. EPA, in conjunction with USACE, should review and revise this SMMP at least every ten years or sooner if ODMDS use and conditions at the ODMDS indicate a need for revision. Conditions for updating this SMMP may include but are not limited to:

- Significant changes in ODMDS use (change in frequency, ODMDS 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 ODMDS or area surrounding the ODMDS that may necessitate a review or update to the SMMP.

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7 APPENDIX A – SITE DESCRIPTION AND ADDITIONAL SITE INFORMATION

Table 7-1. Disposal volumes (cy) at each of the five Hawai‘i ocean disposal sites from 1981-2022 (Source: EPA compliance tracking records and USACE Ocean Disposal Database (USACE, 2023)).

Year	South O‘ahu	Hilo	Kahului	Nawiliwili	Port Allen	Total - All ODMDSs
1981	0	0	0	0	0	0
1982	0	0	0	0	0	0
1983	71,400	0	0	313,900	0	385,300
1984	2,554,600	0	0	0	0	2,554,600
1985	12,000	0	0	0	0	12,000
1986	0	0	0	0	0	0
1987	111,200	0	0	0	0	111,200
1988	57,400	0	0	0	0	57,400
1989	75,000	0	0	0	0	75,000
1990	1,198,000	80,000	58,000	343,000	0	1,679,000
1991	134,550	0	0	0	0	134,550
1992	233,000	0	0	0	0	233,000
1993	0	0	0	322,400	0	322,400
1994	0	0	0	0	0	0
1995	0	0	0	0	0	0
1996	27,800	0	0	0	0	27,800
1997	0	0	0	0	0	0
1998	0	0	0	0	0	0
1999	27,500	0	91,000	114,600	20,900	254,000
2000	0	0	0	0	0	0
2001	0	0	0	0	0	0
2002	53,500	0	0	0	0	53,500
2003	183,500	0	0	0	0	183,500
2004	540,000	0	0	0	0	540,000
2005	0	3,000	0	0	0	3,000
2006	160,400	0	0	0	0	160,400
2007	266,500	0	0	0	0	266,500

Year	South O‘ahu	Hilo	Kahului	Nawiliwili	Port Allen	Total - All ODMDSs
2008	0	0	0	0	0	0
2009	126,200	0	0	0	0	126,200
2010	0	0	0	0	0	0
2011	18,260	63,879	0	0	0	82,139
2012	0	70,981	0	0	0	70,981
2013	312,080	0	0	0	0	312,080
2014	351,920	0	0	0	0	351,920
2015	0	0	0	0	0	0
2016	53,900	118,300	57,200	64,700	0	294,100
2017	0	0	0	0	0	0
2018	0	0	0	0	0	0
2019	126,160	0	0	185,500	0	311,660
2020	235,000	0	0	0	0	235,000
2021	111,995	0	0	0	479,765	591,760
2022	130,300	0	0	0	0	130,300
Total 1981-2021	**7,172,165**	**336,160**	**206,200**	**1,344,100**	**500,665**	**9,559,290**
Average/ year	**170,766**	**8,004**	**4,910**	**32,002**	**11,921**	**227,602**
Total 2000-2022	**2,669,715**	**256,160**	**57,200**	**250,200**	**479,765**	**3,713,040**
Average/ year 2000-2022	**116,075**	**11,137**	**2,487**	**10,878**	**20,859**	**161,437**

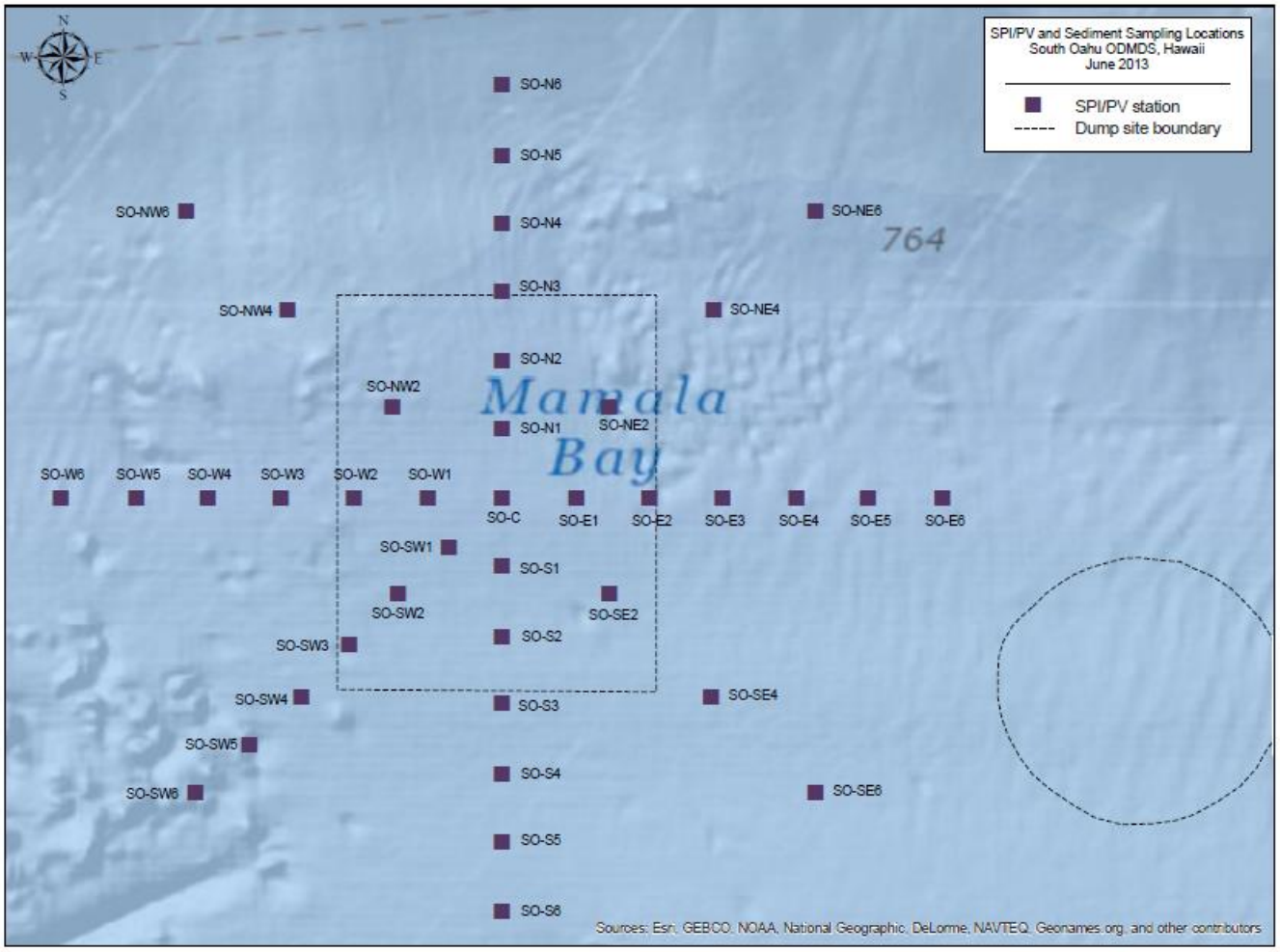

Figure 7-1. Typical South O‘ahu ODMDS survey area (stations from the 2013 survey).

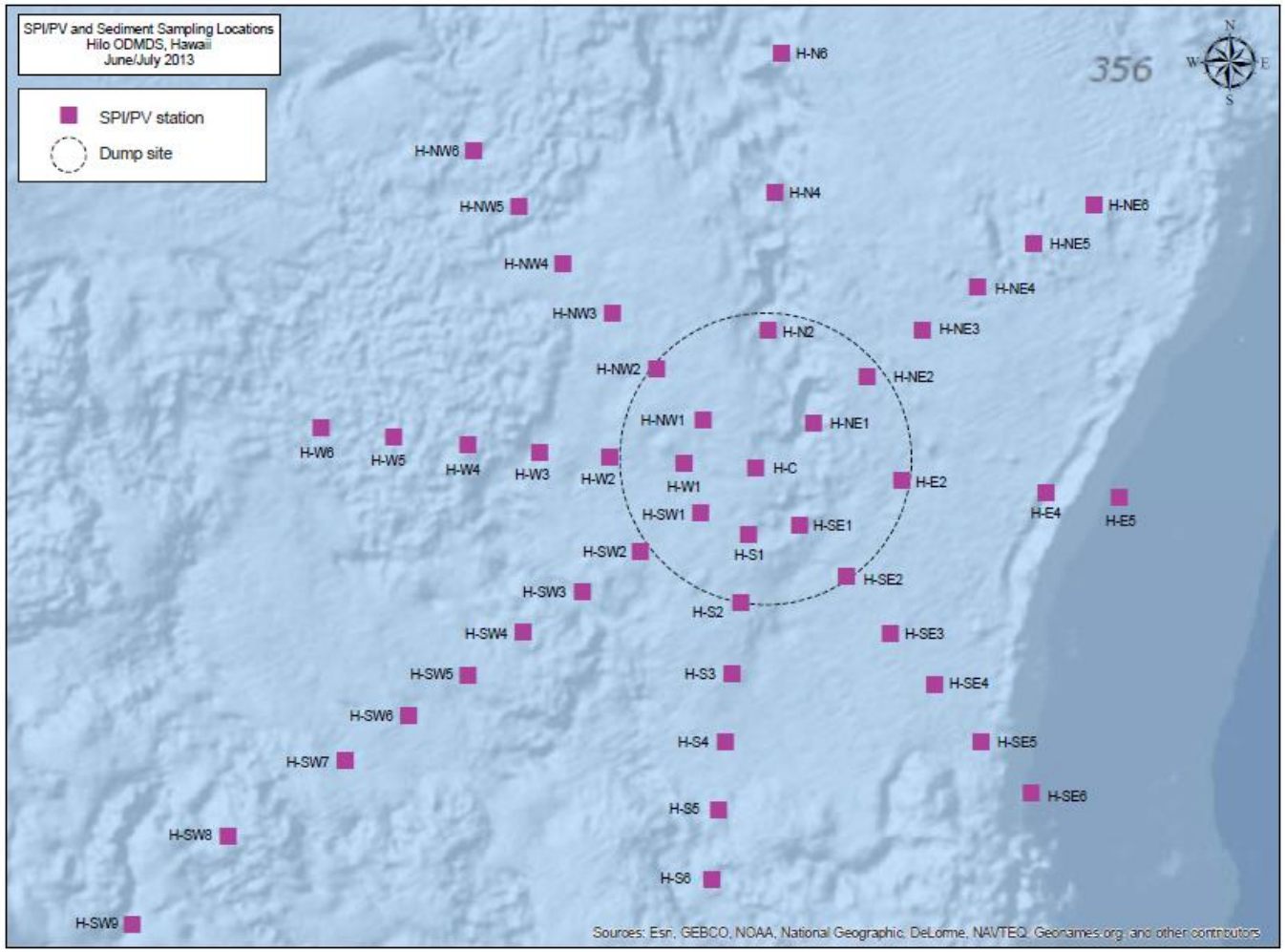

Figure 7-2. Typical Hilo ODMDS survey area (stations from the 2013 survey).

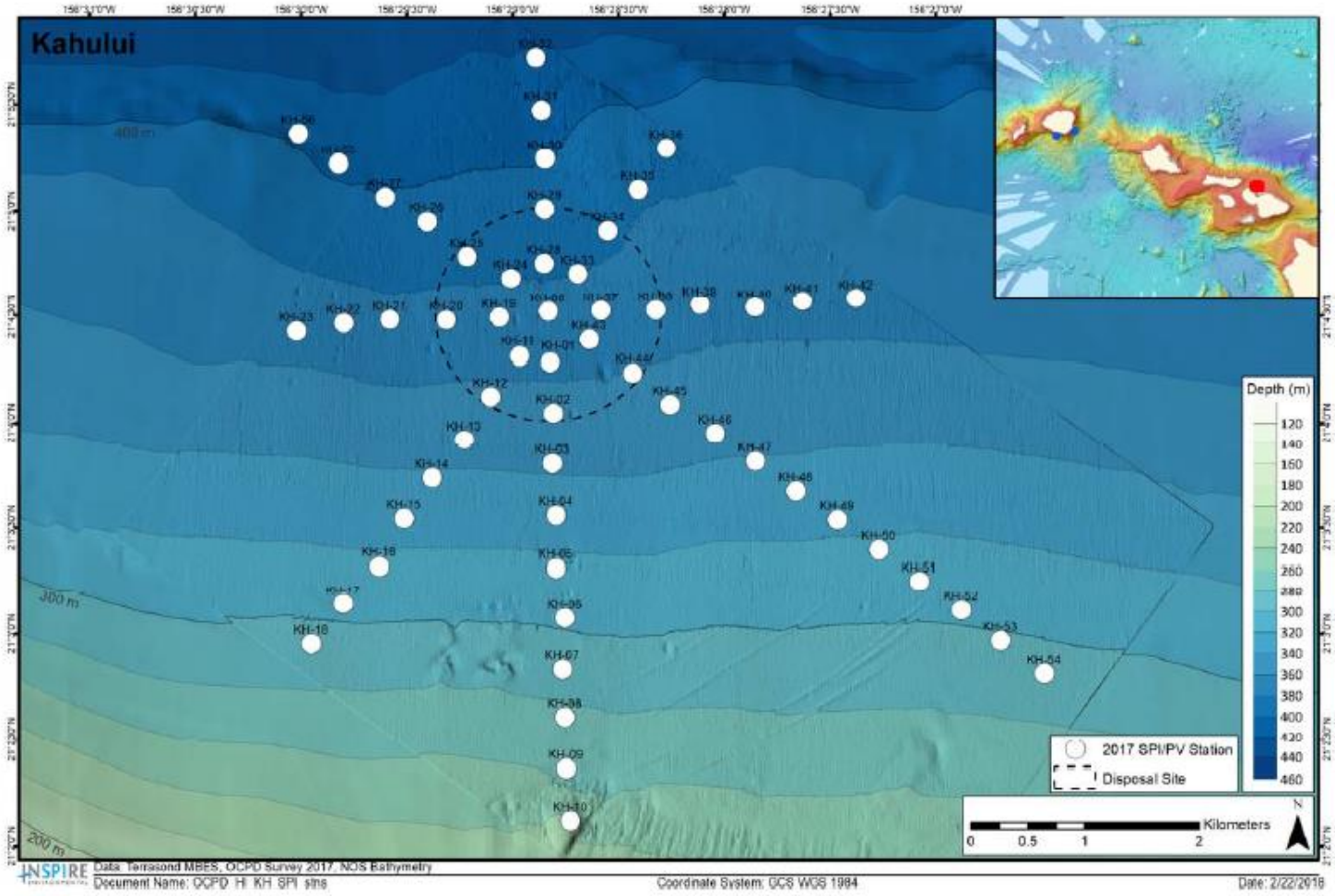

Figure 7-3. Typical Kahului ODMDS survey area (stations from the 2017 survey).

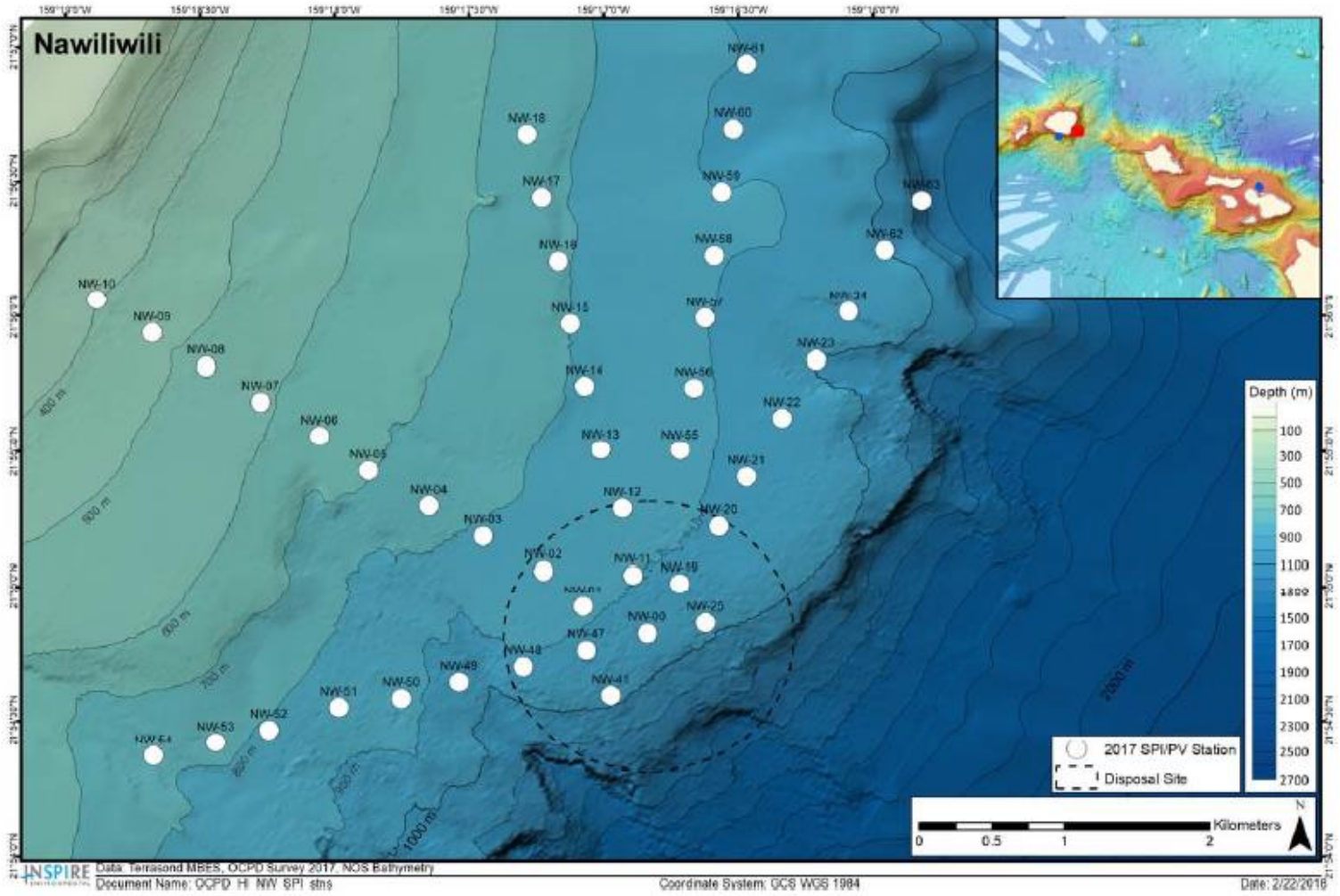

Figure 7-4. Typical Nawiliwili ODMDS survey area (stations from the 2017 survey).

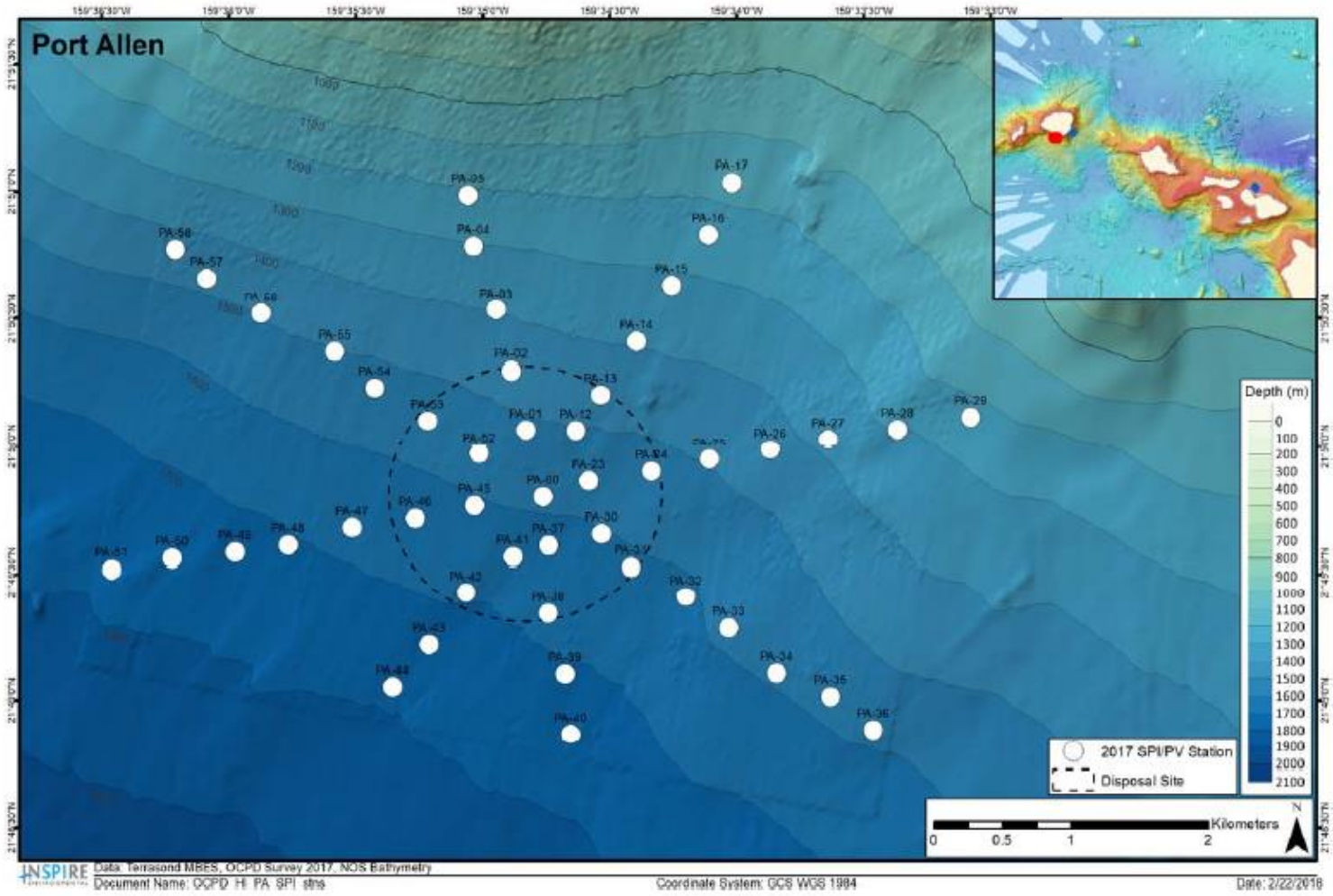

Figure 7-5. Typical Port Allen ODMDS survey area (stations from the 2017 survey).

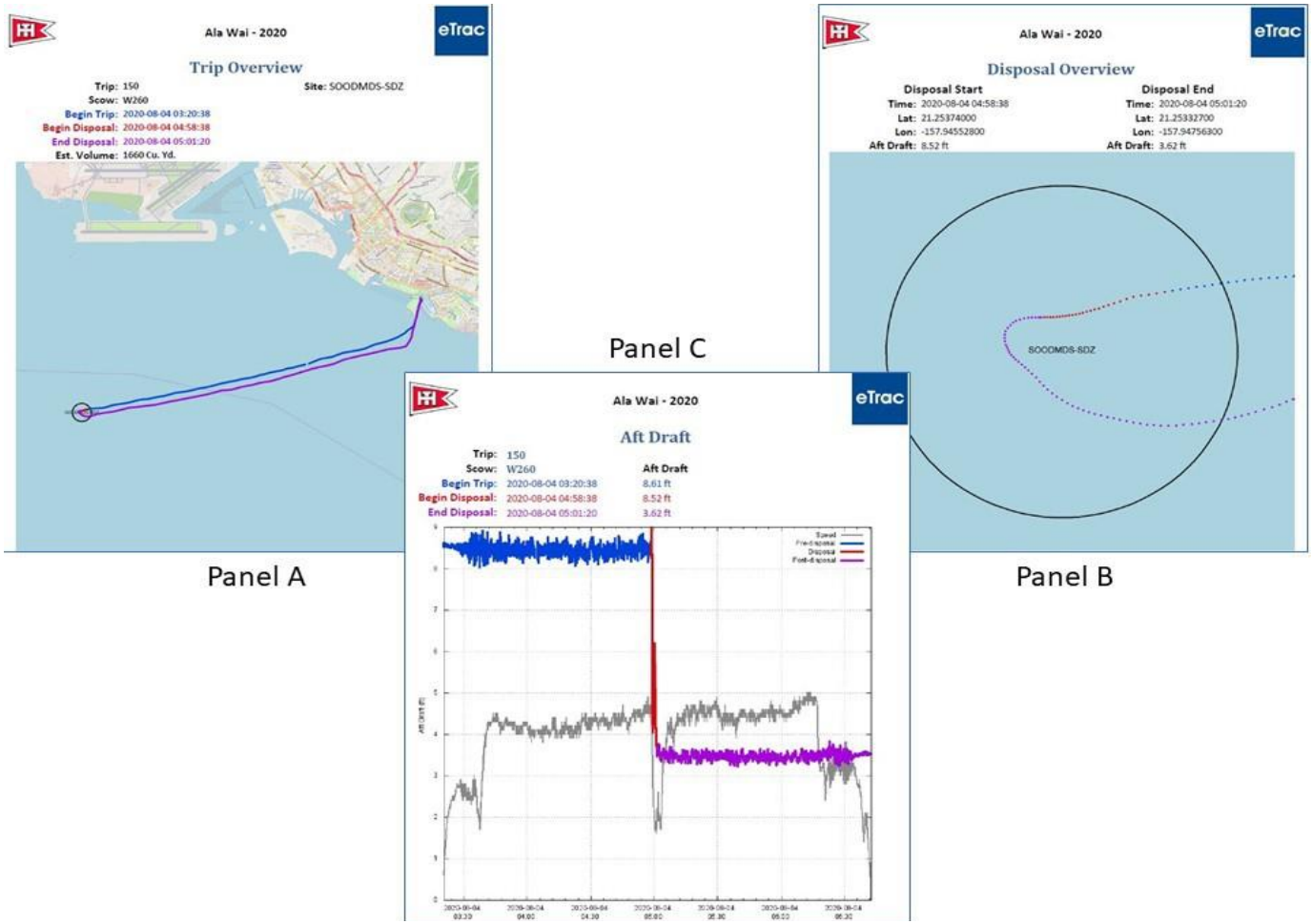

Figure 7-6. Example of a tracking report for an individual disposal trip. Panel A shows the vessel's route to and from the disposal site, with the blue line indicating the vessel is loaded and purple indicating it is empty following disposal. Panel B is a closeup of the disposal site's SDZ, showing the disposal (in red) occurring fully within the zone. Panel C shows the vessel's draft and speed throughout the trip, confirming no substantial loss of material from the vessel during transport.

Table 7-2. Typical parameters analyzed for site monitoring surveys at each of the five Hawai‘i ODMDSs. This same list is also used for dredged material evaluations.

Analyte	Method	Target Reporting Limit
Conventionals		
Grain Size	ASTM 1992	N/A
Total Organic Carbon	USEPA 9060A	0.20%
TSS	SM 2540 D	5 mg/L
TVS	SM 2540E	N/A
TPH	SW-846	N/A
TRPH	1664M	25 mg/kg
Metals		
Arsenic	EPA 6020	1 mg/kg
Cadmium	EPA 6020	0.5 mg/kg
Chromium	EPA 6020	2 mg/kg
Copper	EPA 6020	3 mg/kg
Lead	EPA 6020	3 mg/kg
Mercury	EPA 7471A	0.5 mg/kg
Nickel	EPA 6020	5 mg/kg
Selenium	EPA 7742	0.1 mg/kg
Silver	EPA 6020	0.2 mg/kg
Zinc	EPA 6020	3 mg/kg
Pesticides		
Aldrin	EPA 8081A	2 µg/kg
a-BHC	EPA 8081A	2 µg/kg
b-BHC	EPA 8081A	2 µg/kg
g-BHC (lindane)	EPA 8081A	2 µg/kg
d-BHC	EPA 8081A	2 µg/kg
Chlordane	EPA 8081A	10 µg/kg
Chlordane (technical)	EPA 8081A	10 µg/kg
2,4'-DDD	EPA 8081A	2 µg/kg
2,4'-DDE	EPA 8081A	2 µg/kg
2,4'-DDT	EPA 8081A	2 µg/kg
4,4'-DDD	EPA 8081A	2 µg/kg
4,4'-DDE	EPA 8081A	2 µg/kg
4,4'-DDT	EPA 8081A	2 µg/kg
Dieldrin	EPA 8081A	2 µg/kg
Endosulfan I	EPA 8081A	2 µg/kg
Endosulfan II	EPA 8081A	2 µg/kg

Analyte	Method	Target Reporting Limit
Endosulfan sulfate	EPA 8081A	2 µg/kg
Endrin	EPA 8081A	2 µg/kg
Endrin aldehyde	EPA 8081A	2 µg/kg
Heptachlor	EPA 8081A	2 µg/kg
Heptachlor epoxide	EPA 8081A	2 µg/kg
Toxaphene	EPA 8081A	10 µg/kg
Butyltins		
Mono-butyltin	Krone 1989	1 µg/kg
Di-butyltin	Krone 1989	1 µg/kg
Tri-butyltin	Krone 1989	1 µg/kg
Tetra-butyltin	Krone 1989	1 µg/kg
PAHs		
Acenaphthene	EPA 8270C	20 µg/kg
Acenapthylene	EPA 8270C	20 µg/kg
Anthracene	EPA 8270C	20 µg/kg
Benz(a)anthracene	EPA 8270C	20 µg/kg
Benzo(a)pyrene	EPA 8270C	20 µg/kg
Benzo(e)pyrene	EPA 8270C	20 µg/kg
Benzo(b)fluoranthene	EPA 8270C	20 µg/kg
Benzo(g,h,i)perylene	EPA 8270C	20 µg/kg
Benzo(k)fluoranthene	EPA 8270C	20 µg/kg
Biphenyl	EPA 8270C	20 µg/kg
Chrysene	EPA 8270C	20 µg/kg
Dibenz(a,h)anthracene	EPA 8270C	20 µg/kg
Dibenzothiophene	EPA 8270C	20 µg/kg
Dimethylnaphthalene, 2, 6	EPA 8270C	20 µg/kg
Fluoranthene	EPA 8270C	20 µg/kg
Fluorene	EPA 8270C	20 µg/kg
Indeno(1,2,3-cd)pyrene	EPA 8270C	20 µg/kg
Methylnaphthalene, 1-	EPA 8270C	20 µg/kg
Methylnaphthalene, 2-	EPA 8270C	20 µg/kg
Methylphenanthrene, 1-	EPA 8270C	20 µg/kg
Naphthalene	EPA 8270C	20 µg/kg
Perylene	EPA 8270C	20 µg/kg
Phenanthrene	EPA 8270C	20 µg/kg
Pyrene	EPA 8270C	20 µg/kg
Trimethylnaphthalene, 2,3,5-	EPA 8270C	20 µg/kg

Analyte	Method	Target Reporting Limit
PCBs		
PCB-8	8082A ECD	0.5 µg/kg
PCB-18	8082A ECD	0.5 µg/kg
PCB-28	8082A ECD	0.5 µg/kg
PCB-31	8082A ECD	0.5 µg/kg
PCB-33	8082A ECD	0.5 µg/kg
PCB-44	8082A ECD	0.5 µg/kg
PCB-49	8082A ECD	0.5 µg/kg
PCB-52	8082A ECD	0.5 µg/kg
PCB-56	8082A ECD	0.5 µg/kg
PCB-60	8082A ECD	0.5 µg/kg
PCB-66	8082A ECD	0.5 µg/kg
PCB-70	8082A ECD	0.5 µg/kg
PCB-74	8082A ECD	0.5 µg/kg
PCB-87	8082A ECD	0.5 µg/kg
PCB-95	8082A ECD	0.5 µg/kg
PCB-97	8082A ECD	0.5 µg/kg
PCB-99	8082A ECD	0.5 µg/kg
PCB-101	8082A ECD	0.5 µg/kg
PCB-105	8082A ECD	0.5 µg/kg
PCB-110	8082A ECD	0.5 µg/kg
PCB-118	8082A ECD	0.5 µg/kg
PCB-128	8082A ECD	0.5 µg/kg
PCB-132	8082A ECD	0.5 µg/kg
PCB-138	8082A ECD	0.5 µg/kg
PCB-141	8082A ECD	0.5 µg/kg
PCB-149	8082A ECD	0.5 µg/kg
PCB-151	8082A ECD	0.5 µg/kg
PCB-153	8082A ECD	0.5 µg/kg
PCB-156	8082A ECD	0.5 µg/kg
PCB-158	8082A ECD	0.5 µg/kg
PCB-170	8082A ECD	0.5 µg/kg
PCB-174	8082A ECD	0.5 µg/kg
PCB-177	8082A ECD	0.5 µg/kg
PCB-180	8082A ECD	0.5 µg/kg
PCB-183	8082A ECD	0.5 µg/kg
PCB-187	8082A ECD	0.5 µg/kg

Analyte	Method	Target Reporting Limit
PCB-194	8082A ECD	0.5 µg/kg
PCB-195	8082A ECD	0.5 µg/kg
PCB-201	8082A ECD	0.5 µg/kg
PCB-203	8082A ECD	0.5 µg/kg
Dioxins		
Total TCDD TEQ	EPA 8290	1 ng/kg
2,3,7,8-TCDD	EPA 8290	0.002 µg/kg
1,2,3,7,8-PeCDD	EPA 8290	0.005 µg/kg
1,2,3,4,7,8-HxCDD	EPA 8290	0.005 µg/kg
1,2,3,6,7,8-HxCDD	EPA 8290	0.005 µg/kg
1,2,3,7,8,9-HxCDD	EPA 8290	0.005 µg/kg
1,2,3,4,6,7,8-HpCDD	EPA 8290	0.005 µg/kg
OCDD	EPA 8290	0.005 µg/kg
2,3,7,8-TCDF	EPA 8290	0.005 µg/kg
1,2,3,7,8-PeCDF	EPA 8290	0.005 µg/kg
2,3,4,7,8-PeCDF	EPA 8290	0.01 µg/kg
1,2,3,4,7,8-HxCDF	EPA 8290	0.002 µg/kg
1,2,3,6,7,8-HxCDF	EPA 8290	0.005 µg/kg
2,3,4,6,7,8-HxCDF	EPA 8290	0.005 µg/kg
1,2,3,7,8,9-HxCDF	EPA 8290	0.005 µg/kg
1,2,3,4,6,7,8-HpCDF	EPA 8290	0.005 µg/kg
1,2,3,4,7,8,9-HpCDF	EPA 8290	0.005 µg/kg
OCDF	EPA 8290	0.01 µg/kg

8 APPENDIX B – SITE USE CONDITIONS

Site Use Conditions For MPRSA Section 103 Permits: South O‘ahu, Hilo, Kahului, Nawiliwili, Port Allen Ocean Dredged Material Disposal Sites (ODMDS)

MPRSA section 102(c)(3) directs EPA in conjunction with USACE to develop a site management and monitoring plan (SMMP) for ODMDSs; such plans are implemented through MPRSA permits issued by USACE or through Federal projects subject to the same criteria, evaluation factors, procedures, and requirements as permits (including through terms and conditions in contracts for Federal projects).

EPA in conjunction with USACE developed the language below for inclusion in permits, though the Conditions are intended to be included on a case-by-case basis. Neither the SMMP nor this Appendix directly impose requirements specific to permitted activity. Instead, the SMMP and this Appendix recommend conditions that USACE should impose and, if not, that EPA should require in concurring on the permit. The regulation designating an ODMDS also may impose conditions on a permittee directly. The terms of any particular permit incorporating the language from this Appendix (including as modified) would impose requirements specific to the permitted activity. USACE is not obligated to impose any particular permit term based on the template language, though USACE may elect to do so; the language is provided to facilitate USACE permit development and to provide notice to third parties. For any future permit, EPA’s concurrence review would confirm that appropriate terms are included to assure adequate implementation of the SMMP, and EPA would consider this Appendix to guide its review. EPA may condition its concurrence on compliance with specified terms and conditions derived from this Appendix, or other terms and conditions deemed appropriate to implement this SMMP or the MPRSA, and in such cases USACE must include in the permit the terms and conditions specified by EPA.

8.1 DEFINITIONS

"Permit" as used herein means ocean dumping permits issued by USACE under Section 103 of the MPRSA, and USACE contracts or other authorizations for USACE dredging projects (see MPRSA Section 103(e) and 40 CFR § 220.2(h)). The ocean disposal Site Use Conditions included in EPA's project-specific concurrences must be reflected in or attached to the permit or authorization for every project as provided in Section 103(c) of the MPRSA and 40 CFR § 220.4(c).

"Permittee" is the entity with overall responsibility for the project, such as USACE itself for USACE Federal (civil works) projects or another public or private entity named in a permit issued by USACE. The permittee is responsible for overall compliance with all of EPA's ocean disposal Site Use Conditions, including reporting requirements.

"Contractor" as used herein means any entity engaged to carry out the permitted work. Contractors are also responsible for complying with all relevant ocean disposal Site Use Conditions including reporting requirements. Contractors may include the prime dredging Contractor, as well as any third-party inspector, or Contractor otherwise involved in any tracking, recording, and reporting according to the Site Use Conditions below.

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

"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 the hull or doors in the bottom of the hull.

"Transit" or ***"Transport"*** to the ODMDS begins as soon as dredged material loading into the disposal vessel is completed and a towing vessel begins moving the disposal vessel to the disposal site.

"Suitable Material" means dredged material that has been adequately characterized and determined by EPA to be physically compatible with the disposal site, to be non-toxic, and to contain no more than "trace" levels of constituents (see 40 CFR § 227.6).

"**Suitable Unit**" means a dredging unit of defined dimensions and geographic boundaries that contains only material deemed suitable by EPA through pre-disposal evaluation (see above definition for suitable material).

"Surface Disposal Zone" or "SDZ" is the 305 m (1,000 foot) radius at the center of the ODMDS (see **Table 1** below), within which the disposal vessel must discharge all of the dredged material.

8.2 STANDARD CONDITIONS

1. ***Pre-Construction/ Pre-Dredging Meeting:*** The permittee must organize a pre-construction meeting (which may be virtual) to include EPA, personnel from the permittee's organization, and personnel from the prime dredging Contractor and from any subcontractor involved in transporting the disposal vessels to the ODMDS. The purpose of the meeting is to ensure that the permittee and any Contractor(s) have received and understand EPA's ocean disposal Site Use Conditions. This meeting must be held at least 21 calendar days prior to the start of dredging.

2. ***Dredging Operations Plan*:** A dredging operations plan (DOP) is a plan that outlines the methods and schedule for conducting dredging activities. The DOP must be sent to EPA for review and approval following EPA ocean disposal concurrence, but at least 15 calendar days prior to commencement of dredging. After EPA approval of the DOP, any deviations from the original DOP must be sent to EPA for approval at least seven (7) calendar days prior to implementing any changes. The DOP must, at a minimum, include the following elements:

   a. Maps of dredging footprint, including all areas characterized in the SAP, both suitable and unsuitable units clearly labeled as such;
   b. When unsuitable units are present, include:
      i) The sequence of dredging of each unit, if there are unsuitable units that must be avoided or handled for alternative disposal in proximity to suitable units approved for ocean disposal;
      ii) Configurations and protocols of dredging and disposal vessels to be used in the dredging operation, including anchoring or mooring maps, if there is unsuitable material within 50 m of the footprint;
   c. Specifications of the dredging equipment to be used;
   d. Protocols for dredging and disposal vessel positioning alongside the dredging footprint, including superimposition of any sensitive habitat within 50 m of the footprint;
   e. Standard Operating Procedures (SOPs) for preventing dredging deeper in vertical extent or outside approved dredging boundaries, taking into consideration the specific equipment to be used;
   f. Best management practices to be employed, as relevant to the specific dredging location, dredging equipment and vessel, and transit to the ODMDS, including any buffers between sensitive resources, backflow control, etc.;
   g. The list of Points of Contact (POCs) for various aspects of the dredging project within USACE, the permittee's organization, and any relevant contractors. This list

should include project management, compliance tracking, environmental coordination, contract management, etc.;

h. The remainder of the EPA Site Use Conditions listed below.

3. ***Prohibition on Disposal of Uncharacterized Material, Unsuitable Material, Trash, and Debris; Use of Grizzly:*** Only dredged material determined in advance by both EPA and USACE to be suitable material for ocean disposal may be discharged at the ODMDS. Uncharacterized dredged material, trash, and other debris are prohibited from being discharged at the ODMDS. In order to exclude large trash and debris (including rocks and coral rubble) from being disposed at the sites, all mechanically dredged material must be placed into scows through a steel mesh or chain “grizzly” with openings of no more than 12 inches by 12 inches. Material retained on the grizzly must be removed and disposed of separately at an appropriate location and may not be disposed at the ODMDS. EPA and USACE may, on a case-by-case basis, waive the requirement to use a grizzly if they determine that trash and debris are unlikely to be present in the area to be dredged.

4. ***Dredging Footprint Documentation:*** To ensure that only approved, suitable material is disposed at the ODMDS, the project shall have a system that documents the specific location from which dredged material transported for ocean disposal was removed. The system shall be calibrated for accuracy daily, and indicate and record the following information associated with each dredge bucket drop:

   a. position of the bucket on the seafloor (i.e., the ‘bucket print’), for each bucket deployment, superimposed on the dredging unit delineation, to a minimum accuracy of 1 m (3 ft) in World Geodetic System 1984 (WGS84); and
   b. time and date associated with each bucket drop.

   This data shall be compiled on a daily basis throughout the dredging operation and submitted to EPA as part of the monthly reports per Condition 13. The dredge footprint documentation system must also include a real-time display, visible to the dredge operator, showing the position of the dredging equipment relative to the boundaries of the suitable dredged material footprint.

   If dredging and ocean disposal of material from outside of, or below, the footprint of approved, suitable material occurs (i.e., any unsuitable or uncharacterized material), EPA Region IX and the USACE Honolulu District must be notified within 24 hours per Condition 12 below.

5. ***Scow Certification Form:*** The permittee shall submit a Scow Certification form to EPA and USACE for review and approval prior to the commencement of any ocean disposal operations. The Scow Certification will be used to document, at a minimum:

   a. the estimated bin volume of material dredged and loaded into each disposal vessel (to be completed prior to transport for disposal);
   b. the location from which the material in each barge was dredged (i.e., the specific dredge unit identifier) (to be completed prior to transport for disposal);
   c. the marine weather forecast and sea-state conditions (i.e., appropriate NOAA buoys) anticipated during the transit period (to be completed prior to transport for disposal);
   d. the time that each disposal vessel departs for, arrives at, and returns from the ODMDS (to be completed immediately following disposal operations); and
   e. the exact coordinates and time of each disposal event (to be completed during or immediately following each disposal event).

   EPA may require for a certain project that both the permittee (or prime dredging contractor) and an independent quality control inspector (“*independent”* means an individual not directly reporting to the project manager) certify in writing that the vessel is not over-loaded, and otherwise meets the conditions and requirements of a Scow Certification form for each disposal trip. In this case, the permittee (or prime dredging contractor) and the independent quality control inspector shall complete the relevant portions of the Scow Certification form prior to transport for disposal, and the remaining portions immediately following disposal at the ODMDS.

   The permittee (or prime dredging contractor) shall have an appropriate communications hierarchy and protocols in place to provide the quality control inspector with the authority to ensure that the Site Use Conditions pertinent to the scow, including the loading and sea state Conditions (see Condition 6), are met and to prevent the scow from departing for a disposal trip if they are not fulfilled. The permittee (or prime dredging contractor) shall submit the completed Scow Certification form to EPA and USACE in accordance with the monthly reporting required (see Condition 13).

6. ***Prohibition on Leaking or Spilling:*** The permittee shall ensure that dredged material is not leaked nor spilled from disposal vessels while stationary or during transit to the ODMDS. Transportation of dredged material shall only be allowed when weather and sea state conditions will not interfere with safe transportation and will not create risk of spillage, leaking, or other loss of dredged material during transit. Disposal vessels must not be loaded beyond a level at which dredged material would be expected to be spilled in transit under anticipated sea state conditions (i.e.,

should be filled to less than 80%; more restrictive load limits may be implemented for a specific project). No disposal vessel trips shall be initiated when the National Weather Service has issued a gale warning for local waters during the time period necessary to initiate and complete dumping operations.

7. ***Surface Disposal Zone (SDZ):*** When discharging dredged material within the ODMDS, no portion of the disposal vessel from which the materials are to be released (e.g., hopper dredge or barge) shall be further than 305 m (1,000 ft) from the center of the ODMDS[4], unless specified by a project-specific special permit condition. Except for the Nawiliwili ODMDS, the center coordinates of the ODMDS (**Table 1**) are also the center coordinates of the SDZ. No more than one disposal vessel may be present within the SDZ at any time.

Table 1. Dimensions and center coordinates for each Hawai‘i ODMDS and the Surface Disposal Zone (SDZ).

ODMDS	Depth Range	Shape and Dimensions (Seafloor Footprint)	Surface Disposal Zone Dimensions	Center Coordinates of the ODMDS (WGS84)
South O‘ahu	375-475 m (1,230-1,560 ft)	Rectangular: 2.0 (W-E) by 2.6 km (N-S) (1.08 x 1.4 nmi)	Circular: 305 m (1000 ft) radius	21° 14' 58.69" N 157° 56' 40.16" W
Hilo	330-340 m (1,080-1,115 ft)	Circular: 920 m (3000 ft) radius	Circular: 305 m (1000 ft) radius	19° 48' 19.11" N 154° 58' 20.07" W
Kahului	345-365 m (1,130-1,200 ft)	Circular: 920 m (3000 ft) radius	Circular: 305 m (1000 ft) radius	21° 4' 30.37" N 156° 28' 49.91" W
Nawiliwili	840-1,120 m (2,750-3,675 ft)	Circular: 920 m (3000 ft) radius	Circular, **offset** 200 m (600 ft) radius[5]: (**21° 55' 1.66" N, 159° 16' 59.81" W**) (WGS84)	21° 54' 48.51" N 159° 16' 49.96" W
Port Allen	1,460-1,610 m (4,800-5,280 ft)	Circular: 920 m (3000 ft) radius	Circular: 305 m (1000 ft) radius	21° 49' 48.71" N 159° 34' 49.99" W

8. ***Disposal Vessel Instrumentation and Tracking:*** The primary tracking system for recording ocean disposal operations and ensuring that no material is released outside of the ODMDS SDZ shall be disposal vessel-based. Each disposal vessel shall have a primary navigation/tracking system functioning during the time of loading of dredged material onto the disposal vessel through the return transportation of the vessel from each disposal trip to the dredging site. No material

[4] 200 m (600 ft) for the Nawiliwili ODMDS.
[5] Modified following the 2017 Nawiliwili monitoring survey, as the bathymetry indicated the presence of a steep slope that rendered monitoring of the area challenging.

shall be loaded into the disposal vessel, and no trip shall be initiated, without such a system functioning. This system shall be calibrated for accuracy at a minimum at the beginning of each ocean disposal project, and automatically indicate and record the following information:

a. position of the disposal vessel, to a minimum accuracy of 3 m (10 ft) in WGS84 during transport to, disposal at, and return from the ODMDS;
b. speed and heading of the disposal vessel during transport to, disposal at, and return from the ODMDS;
c. fore and aft draft of the disposal vessel (sensors as near vessel centerline as possible) from the time that loading begins, to the time of return of the disposal vessel to the dredging site following disposal at the ODMDS;
d. fore and aft bin height (top of dredged material load in the bin or hopper) (sensors as near vessel centerline as possible) from the time that loading begins, to the time of return of the disposal vessel to the dredging site following disposal at the ODMDS; and
e. time and location of each disposal event (e.g., the discharge phase)

This system must record these data at a maximum 1-minute interval while outside the disposal site boundary, and at a maximum 15-second interval while inside the disposal site boundary and the SDZ. The primary system must also include a real-time display, located in the wheelhouse or otherwise visible to the helmsman, showing the position of the disposal vessel relative to the boundaries of the ODMDS and its SDZ, superimposed on the appropriate National Ocean Service (NOS) chart so that the operator can confirm proper position of the disposal vessel within the SDZ before discharging the dredged material. No automatic rebooting of the system shall occur during transit to, and disposal at, the ODMDS.

9. ***Back-Up Navigation System:*** No disposal trip shall be initiated without a functioning primary tracking system for recording ocean disposal operations. However, if the primary disposal vessel tracking system fails during transit, the navigation system on the pushing or towing vessel (e.g., tug, if any), meeting the minimum accuracy requirements listed above, may be used to complete that disposal trip by maneuvering the pushing or towing vessel so that, given the compass heading and any tow cable length to the scow (“lay back”), the estimated scow position would be within the SDZ. In such cases the pushing or towing vessel’s position, any tow cable length, and the compass heading to the disposal vessel must be recorded and reported on the Scow Certification form. Further disposal operations using such a vessel must cease until the primary disposal-tracking capabilities are restored.
If the draft sensor for the primary disposal vessel tracking system fails while the disposal vessel is stationary, loading of the disposal vessel must cease until capabilities are restored. If only the GPS tracking fails, then EPA and USACE must be informed of the coordinates at which the disposal vessel is stationed, and the draft

must continue to be recorded and posted in accordance with Condition 10 below. However, transit must not occur until full primary tracking (GPS and draft) capabilities are restored.

10. ***Posting Disposal Vessel Tracking Data on the Internet:*** Within 24 hours of the completion of each disposal trip, data recorded from the primary disposal tracking system must be posted by a third-party contractor to an internet site accessible by EPA Region IX, the Honolulu District USACE, and any other entity specified by EPA or USACE in project-specific permits.

    The internet site must be searchable by disposal trip number and date, and at a minimum for each disposal trip, it must provide a visual display of:

    a. the disposal vessel transit route to/from the ODMDS;
    b. the beginning and ending locations of the disposal trip to and from the ODMDS, from the dredging site;
    c. the disposal vessel speed throughout the disposal trip to and from the ODMDS from the dredging site;
    d. the disposal vessel draft from start of loading throughout the completion of the disposal trip to and from the ODMDS, from the dredging site;

    The requirement for posting this information on the internet is independent from the reporting requirements listed in Conditions 11-14 below.

11. ***E-Mail Alerts:*** The third-party system must also generate and distribute “e-mail alerts” regarding any degree of apparent dumping outside the SDZ of the ODMDS (i.e., “mis-dumping”), and regarding any apparent substantial leakage/spillage or other loss of material while stationary or during transport to the ODMDS. Substantial leakage/spillage or other loss shall be defined as an apparent loss of draft of one foot or more between the time that loading of the disposal vessel with dredged material begins and the time the disposal phase (discharge) begins.

    E-mail alerts must be sent within 24 hours of the dredging contractor or permittee becoming aware of the apparent issue to Juliette Chausson (Chausson.Juliette@epa.gov) and Hudson Slay (Slay.Hudson@epa.gov) at EPA Region IX, to [HONOLULU DISTRICT PM] and CEPOH-RO@usace.army.mil at the Honolulu District USACE.

12. ***24-Hour Notification Requirement for Potential Leaks, Mis-Dumps, and Dredging of Unsuitable or Uncharacterized Material:*** The permittee shall report any anticipated, potential, or actual variances from compliance with these Standard Conditions, and any additional project-specific Special Conditions, to EPA Region IX and the Honolulu District USACE within 24 hours of discovering such a situation. For any variances from compliance, the permittee shall report to EPA the geographic

coordinates (in WGS 84) of the incident (including, for example, where a potential leak, mis-dump, or dredging of unsuitable or uncharacterized sediments may have occurred). Additionally, the permittee shall report to EPA Region IX and the Honolulu District USACE within 24 hours if any conditions arise that indicate that dredged material previously deemed suitable for ocean disposal by EPA may have unanticipated levels of constituents (e.g., as indicated by the presence of an oily sheen, significant debris, etc). A message from an operational “e-mail alert” system, as described in Condition 11 above, will be considered as fulfilling this 24-hour notification requirement for mis-dumps or potential leaks, however the permittee must ensure that EPA also receives, within two (2) business days, any necessary location information per this Condition.

In addition, the permittee shall prepare and submit a detailed report of any such compliance problems on a weekly basis by noon the following Monday (HST), to EPA Region IX and the Honolulu District USACE. These reports shall describe the cause(s) of the problems, any steps taken to rectify the problems, and whether the problems occurred on subsequent dredging events or disposal trips.

13. ***Record-Keeping, and Monthly Reporting:*** In addition to the requirements in Condition 10 for posting data on the internet, the permittee shall collect and maintain daily records. These records shall include the approved and fully completed Scow Certification forms. The permittee shall also collect and maintain dredging footprint documentation for the entirety of any dredging activity, including both electronic data and printouts from the GPS-based primary dredging equipment tracking system showing the location of the dredging equipment superimposed on a map of the suitable dredged material footprint, and the times and dates associated with the location data.

    Additionally, the permittee shall collect and maintain, for each disposal vessel, from the beginning of loading to the return to the dredging site following disposal, both electronic data and printouts from the GPS-based primary disposal tracking system (or the backup navigation tracking system when appropriate) showing vessel location and associated time stamp, disposal vessel draft readings, disposal coordinates, and the time and position of the disposal vessel when dumping was commenced and completed.

    All daily records shall be compiled at a minimum for each month during which ocean disposal operations occur, and provided in reports, certified accurate by the dredging contractor and the permittee, to both EPA and USACE by the 15th day of the following month. Each monthly report shall include the Scow Certification forms, disposal vessel electronic tracking (or back-up system data, dredging footprint documentation, any appropriate weather/sea-state printouts or data, and documentation relevant to any system failures or violations of any of the Site Use Conditions via pdf (or other format deemed acceptable by EPA and USACE).

The monthly reports shall also include a cover letter summarizing the specific dredging units dredged during the month, the total estimated volume of material dredged during the month (estimated bin volume), any problems complying with the Site Use Conditions, any significant deviations from the anticipated project conditions (e.g., presence of oily sheen, smell, other indications of contamination, changes in dredging equipment, etc.), the cause(s) of the problems, any steps taken to rectify the problems, and whether the problems occurred again during dredging of suitable units or on subsequent disposal trips.

14. ***Project Completion Report:*** Within 60 calendar days following the completion of ocean disposal operations, the permittee shall submit to EPA Region IX and the Honolulu District USACE a project completion report. The project completion report shall, at a minimum, contain:
    a. A cover letter summarizing:
        i) The total number of disposal trips and the overall volume of material (estimated bin volume as well as *in-situ* volume calculated from a post-dredge survey) disposed at the ODMDS for the project;
        ii) The comparison of the total volume dredged with the volume anticipated in the SAP; and
        iii) Whether any of this dredged material was excavated from outside the areas authorized for ocean disposal or was dredged deeper than authorized by the permit.
    b. The comparison of the pre- and post-bathymetry of the dredging footprint and surrounding areas to show the depths achieved within the project footprint (and any areas that may have been disturbed outside the footprint), and how they correspond to the project depth. The bathymetry must have sufficiently defined colors to allow for rapid assessments of areas along 1-foot intervals; and
    c. The compilation of the monthly reports required under Site Use Condition 13.

8.3 Additional Project-Specific Conditions

For any Hawai‘i ocean disposal project, EPA or USACE may include additional project-specific conditions that they determine are necessary to facilitate safe use of the ODMDS, to prevent potential harm to the environment, to facilitate accurate monitoring of site use, or to facilitate compliance with the requirements of the MPRSA. For example, project-specific conditions could include timing restrictions to avoid sensitive environmental periods, such as peak coral spawning times, or operational restrictions on methods of transportation and disposal.

8.4 Alternative Permit/Project Conditions

Alternatives to these standard permit conditions may be authorized in advance if the permittee demonstrates to the satisfaction of EPA and USACE that: the alternative conditions are sufficient to accomplish the specific intended purpose of the original permit condition; they will not increase the risk of harm to the environment or the health or safety of persons; and they will not impede monitoring of compliance with the MPRSA, the ocean disposal regulations, or the project's permit.

8.5 Compliance with Disposal Site Use Requirements

The permittee and all contractors or other third parties who perform an activity authorized by this permit on behalf of the permittee shall be separately liable for a civil penalty for each violation of any term of this permit committed alone or in concert with the permittee or other parties. Liability shall be individual, rather than joint and several, and shall not be reduced in any fashion to reflect the liability assigned to and civil penalty assessed against the permittee or any other third party as defined in MPRSA section 105(a), 33 U.S.C. § 1415(a). If the permittee or any contractor or other third party knowingly violates any term of this permit (either alone or in concert), the permittee, contractor or other party shall be individually liable for the criminal penalties set forth in MPRSA section 105(b), 33 U.S.C. § 1415(b).

Enforcement action for a violation or non-compliance with any Standard, project-specific, or alternative ocean disposal permit condition may be initiated by EPA and/or USACE as appropriate. Examples include but are not limited to: disposal of unsuitable or uncharacterized material; disposal outside the designated boundaries of the site due to mis-dumping or spillage; disposal at a time or in a manner not specifically authorized; failure to initiate or maintain required tracking systems; and failure to maintain or provide required records. If a compliance or enforcement action is initiated, consequences may include interruption or cessation of disposal operations, monetary penalties, or additional monitoring activities to be carried out by the permittee.