

US Army Corps
of Engineers
Jacksonville
District



Site Management and Monitoring Plan for
Arecibo Harbor,
Mayagüez Harbor,
Ponce Harbor,
San Juan Harbor, &
Yabucoa Harbor
Puerto Rico Dredged Material Disposal Sites

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List of Acronyms

COTP – Captain of the Port

DA – Department of the Army

DMI – Dredged Material Inspector, in this case approved by USACE-SAJ

EPA- U.S. Environmental Protection Agency

EPA-R2 – U.S. Environmental Protection Agency – Region 2

IA – Interagency Agreement

GPS – Global Positioning System

MP – Monitoring Plan

MPRSA – Marine Protection, Research, & Sanctuaries Act of 1972

NMFS – National Marine Fisheries Service

NOAA – National Oceanic and Atmospheric Administration

NODC – National Ocean Data Center

PCBs – Polychlorinated Biphenyls

ODMDS – Ocean Dredged Material Disposal Site

SJH – San Juan Harbor

SJS – San Juan, Puerto Rico Ocean Dredged Material Disposal Site

SMMP – Site Management and Monitoring Plan

SPI – Sediment Profile Imaging

TOC – Total Organic Carbon

USACE – U.S. Army Corps of Engineers

USACE-SAJ – U.S. Army Corps of Engineers – Jacksonville District

USCG – United States Coast Guard

USFWS – United States Fish & Wildlife Service

W/QAPP – Work/Quality Assurance Project Plan

WRDA – Water Resources and Development Act

1. Background

Section 506 of the Water Resources and Development Act (WRDA) of 1992, which amended the Marine Protection, Research, and Sanctuaries Act of 1972 (MPRSA), requires the U.S. Environmental Protection Agency (EPA) and the U.S. Army Corps of Engineers (USACE) to prepare a Site Management and Monitoring Plan (SMMP) for each ocean dredged material disposal site (ODMDS). For sites designated prior to January 1, 1995, such as the five sites in Puerto Rico, WRDA dictated that SMMPs were to be developed by January 1, 1997. Further permitting or authorization of projects for disposal at ocean sites not having SMMPs after that date were prohibited until an SMMP was prepared.

MPRSA 102 (c)(3)(A) requires that the SMMP for an ODMDS include a baseline assessment of conditions at the site. MPRSA 102 (c)(3)(D and E) requires that the SMMP include consideration of the quantity of material to be disposed of at the site, and the presence, nature, and bioavailability of contaminants in the material, as well as the anticipated use of the site over the long-term. MPRSA 102 (c)(3)(F) requires that the SMMP be reviewed and revised no less frequently than 10 years after adoption of the plan, and every 10 years thereafter.

EPA Region 2 (EPA-R2) and USACE Jacksonville District (USACE-SAJ) prepared this document which combines and revises the WRDA-required SMMPs for all five of the final-designated (40 CFR 228.15 (d) (11)) ODMDSs in Puerto Rico: Arecibo Harbor, Puerto Rico Dredged Material Site (AS); Mayagüez Harbor, Puerto Rico Dredged Material Site (MS); Ponce Harbor, Puerto Rico Dredged Material Site (PS); San Juan Harbor, Puerto Rico Dredged Material Site (SJS); and Yabucoa Harbor, Puerto Rico Dredged Material Site (YS). This SMMP identifies actions, provisions, and practices to manage operational aspects of dredging and disposal activities and to perform site monitoring at the five designated ODMDSs in Puerto Rico.

2. Objectives of the SMMP

The objectives of this SMMP are to collect sufficient information to:

- a. provide that no unacceptable environmental impacts occur from the disposal of dredged material at the included ocean dredged material disposal sites;
- b. recognize and correct any potential unacceptable conditions before they cause any unacceptable impacts to the marine environment or present a navigational hazard to commercial waterborne vessel traffic;
- c. determine/enforce compliance with MPRSA permit conditions;
- d. provide a baseline assessment of conditions at the included ocean dredged material disposal sites;
- e. outline a program for monitoring the included ocean dredged material disposal sites;
- f. describe special management conditions/practices to be implemented at the included ocean dredged material disposal sites;
- g. estimate the quantity of material to be disposed at the each included ocean dredged material disposal site, considering the presence, nature, and bioavailability of the contaminants in the dredged material;
- h. specify the intended use and possible closure date, if necessary, of the included ocean dredged material disposal sites;
- i. provide a schedule for review and revision of the Puerto Rico Combined SMMP.

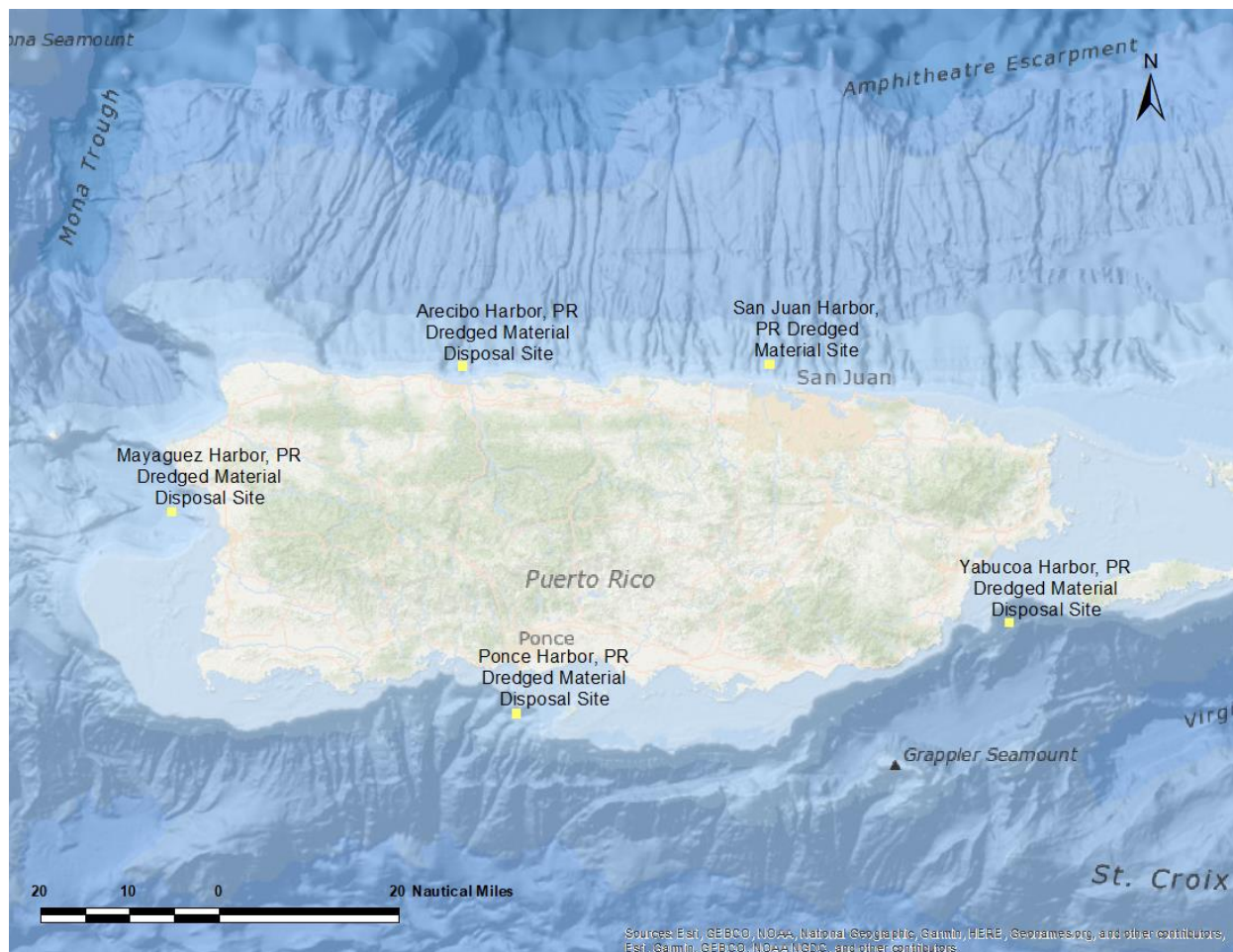


Figure 1. Map showing locations of the five dredged material disposal sites in Puerto Rico.

3. Site Histories and Locations

3.1 Site Histories

Prior to 1974, all dredged material (except for Bar Channel material) taken from San Juan Harbor and its vicinity was placed in upland disposal areas. In 1974, these areas were exhausted, and no new upland site could be obtained for dredged material disposal. Since 1975, all dredged material from San Juan Harbor has been disposed offshore.

The SJS was designated as an Interim ODMDS in 1977 under MPRSA. An interim ODMDS for Mayagüez Harbor was also approved in 1977 via publication in the Federal Register (42 FR 2461 *et seq.*). Interim ODMDSs for Arecibo Harbor, Ponce Harbor, and Yabucoa Harbor were designated in 1986 under MPRSA.

In March 1988, the SJS was designated as a Final ODMDS to receive materials from the San Juan Harbor area. The May 1988 Final Environmental Impact Statement (FEIS) for the Designation of ODMDSs for Arecibo, Mayagüez, Ponce, and Yabucoa, Puerto Rico examined environmental aspects of the interim sites. The FEIS concluded that the interim site for Arecibo Harbor was well suited for use as a dredged material disposal site and it was subsequently designated as a Final ODMDS to receive materials from areas of Arecibo Harbor. The FEIS concluded that alternate sites were better suited for use as dredged material disposal sites for Mayagüez Harbor, Ponce Harbor, and Yabucoa Harbor. The present sites for these three harbors were subsequently designated as Final ODMDSs, with each site designated to only receive materials from areas of the respective named harbor.

The site designations for all five ODMDSs were modified in May 2015 to allow suitable dredged materials at all sites starting on June 22, 2015, without any restrictions on their geographic origin (EPA, 2015).

3.2 Site Size, Location, and Boundaries

All five ODMDSs in Puerto Rico are approximately one square nautical mile (1 nmi²) in area and are located between one and a half and six nautical miles (1.5 – 6 nmi) from the respective harbor entrance as detailed below:

Site	Distance from harbor entrance	Orientation
AS	1.5 nautical miles	N of Arecibo Harbor
MS	6.0 nautical miles	W of Mayagüez harbor
PS	4.5 nautical miles	S of Ponce Harbor
SJS	2.2 nautical miles	NNW of San Juan Harbor
YS	6.0 nautical miles	E of Yabucoa Harbor

The five ODMDs are positioned in rectangles bounded by the following North American Datum of 1927 (NAD27) coordinates:

Site	Degrees, Minutes, Seconds	Degrees, Minutes (decimal)
AS	18° 31' 00" N 66° 43' 47" W	18° 31.000' N 66° 43.783' W
	18° 31' 00" N 66° 42' 45" W	18° 31.000' N 66° 42.750' W
	18° 30' 00" N 66° 42' 45" W	18° 30.000' N 66° 42.750' W
	18° 30' 00" N 66° 43' 47" W	18° 30.000' N 66° 43.783' W
MS	18° 15' 30" N 67° 16' 13" W	18° 15.500' N 67° 16.217' W
	18° 15' 30" N 67° 15' 11" W	18° 15.500' N 67° 15.183' W
	18° 14' 30" N 67° 16' 13" W	18° 14.500' N 67° 16.217' W
	18° 14' 30" N 67° 15' 11" W	18° 14.500' N 67° 15.183' W
PS ¹	17° 54' 00" N 66° 37' 43" W	17° 54.000' N 66° 37.717' W
	17° 54' 00" N 66° 36' 41" W	17° 54.000' N 66° 36.683' W
	17° 53' 00" N 66° 36' 41" W	17° 53.000' N 66° 36.683' W
	17° 53' 00" N 66° 37' 43" W	17° 53.000' N 66° 37.717' W
SJS	18° 30' 10" N 66° 09' 31" W	18° 30.170' N 66° 09.520' W
	18° 30' 10" N 66° 08' 29" W	18° 30.170' N 66° 08.480' W
	18° 31' 10" N 66° 08' 29" W	18° 31.170' N 66° 08.480' W
	18° 31' 10" N 66° 09' 31" W	18° 31.170' N 66° 09.520' W
YS ²	18° 03' 42" N 65° 42' 49" W	18° 03.700' N 65° 42.820' W
	18° 03' 42" N 65° 41' 47" W	18° 03.700' N 65° 41.780' W
	18° 02' 42" N 65° 41' 47" W	18° 02.700' N 65° 41.780' W
	18° 02' 42" N 65° 42' 49" W	18° 02.700' N 65° 42.820' W

¹ To minimize the potential for impacts to shelf edge reef resources, disposal activity is restricted to the southern half of the PS (i.e., south of 17° 53' 30" N (17° 53.50 N)).

² Disposal activity is restricted to the southeastern quadrant of the YS to minimize potential for impacts to shelf edge reef areas.

3.3 Enforcement Activities in Puerto Rico

Enforcement actions have been taken relating to dredged material disposal activities at the PS. During the project for deepening and widening of the Ponce Harbor navigational channel and turning basin and berthing areas associated with the Port of Las Americas development project in 2005-2006, surveillance of the loaded scows revealed that several loads of material were discharged outside PS boundaries and that significant losses of material had occurred from loaded scows while underway due to continued use of malfunctioning scows to transport dredged material. As a result of these actions, EPA-R2 issued four MPRSA violations with significant monetary penalties.

Since their designation, no significant violations and/or enforcement actions have been taken (i.e. actions resulting in fines and/or criminal proceedings) at any of the other PR ODMDSSs. However, both EPA-R2 and the USACE-SAJ have taken corrective actions to bring specific disposal projects into compliance with permit conditions.

3.4 Past and Anticipated Use and Quantity of Material Disposed at ODMDSSs

Disposal volumes (cy) at the five Puerto Rico ODMDSSs in past ten years along with total volumes and averages since interim designation in 1977 and 1986. Source: USACE Ocean Dredged Material Disposal Site Database and USACE records.

Year	Arecibo Harbor	Mayagüez Harbor	Ponce Harbor	San Juan Harbor	Yabucoa Harbor	Total All Sites
2011				378,352		378352
2012	185,673			92,538		278211
2013						0
2014				8,333		8333
2015						0
2016				986,324		986324
2017				139,302		139302
2018						0
2019						0
2020	96,896	94,843		284,444		476183
Total 1976-2020	526,839	156,181	1,400,000	14,279,569	0	16,362,589
Average/year 1976-2020	11,708	3,471	31,111	317,324	0	363,613
Total 2011-2020	282,569	94,843	0	1,889,293	0	2,266,705
Average/year 2011-2020	28,257	9,484	0	188,929	0	226,671
Average/dredging year 2011-2020*	141,285	94,843	NA	314,882	NA	377,784

*Calculated only considering years where there was dredged material disposed of at a particular ODMDS, or any ODMDS for all sites average

The USACE-SAJ anticipates similar volumes for dredging and disposal at the Puerto Rico ODMDSSs in FY21-FY30 as are reported for 2010-2020 in the above table. Dredged material resulting from San Juan Harbor maintenance and deepening projects is anticipated as well as dredged material from continued construction and maintenance of the Rio Puerto Nuevo Flood Control Project. Dredged material from these projects will be placed at the SJS. Materials will consist of variable percentages of silt, clay, and sand. There is a potential dredging project associated with a private facility in Guayanilla Harbor that would result in dredged material being transported to the PS. The quantity of material is not known at this time. There are no known plans for dredging in the harbors associated with the three other Puerto Rico ODMDSSs (AS, MS, and YS). There are no proposed limitations on the quantity of material that may be placed at the sites.

4. Site Characteristics

Baseline conditions measured by IE Corporation in 1980 were summarized in the Environmental Impact Statement prepared to support designation of the San Juan Harbor ODMDS (SJS) (EPA, 1982). Additional baseline biological, geological and geochemical data was collected from the SJS and the four other Puerto Rico sites (Arecibo, Mayagüez, Ponce, and Yabucoa) in 1984 by JRB Associates (under contract to EPA). These data were summarized in the Environmental Impact Statement prepared to support designation of the Arecibo Harbor, Mayagüez Harbor, Ponce Harbor, and Yabucoa Harbor Ocean Dredged Material Disposal Sites (ODMDSs) (EPA, 1988). In November - December 1996 EPA-R2 collected side scan sonar, sediment chemistry, and benthic community structure data in and around the Puerto Rico sites to augment the baseline assessments of conditions (Golder Associates, 1997). Sediment samples were taken from the Puerto Rico sites in January 2006. Further efforts will be made to enhance our knowledge of baseline conditions during monitoring operations at the Puerto Rico ODMDSs.

4.1 Physical, Meteorological and Oceanographic Features:

a. *Water Depth:* Water depths at the Puerto Rico ODMDSs range between 60 and 880 meters (m):

Site	Depth Range	Bathymetry Description
AS ¹	101 m – 417 m	101 m along the southern margin to 417 m along the northern border
MS ²	320 m – 400 m	325 m along the eastern border to 400 m along the western border
PS ²	60 m – 540 m	Southern half of the site is deeper, 365-540 m
SJS ³	213 m – 400 m	depths average 292 m: 213 m at the southern boundary to 400 m at the northern boundary
YS ²	600 m – 880 m	shallowest at the northeastern corner, deepest at the southeastern corner

¹EPA 1988 EIS

²Batelle/Golder 1997

³EPA 1982 EIS

c. *Currents:* Currents at all five designated sites in Puerto Rico are greatly influenced by the direction and strength of the trade winds. The trades blow primarily from the northeast. Subsurface currents at most sites are not well defined, but they appear to be weak. This fact is also evidenced by the relatively undisturbed depositional environment within the sites and surrounding area.

- At the SJS and AS the east-west alignment of the coastline in conjunction with the trade winds, results in a westerly alongshore current. Surface currents show general westward drift (mean speed of 31 cm/s) with a significant tidal component (EPA 1982, 1988).
- Surface currents in the Mayagüez area tend to flow northward at flood tide and southward at ebb tide. There are seasonal differences in currents, but flow is generally parallel to the

shore with surface currents varying between 15 and 30 cm/s (EPA 1988). Subsurface currents appear to be weaker at the MS than elsewhere in the Mona Passage.

- Currents measured at the PS were predominately oriented in an easterly direction. Median current speed at 50 m ranged between 3.7 to 7.1 cm/s, and at 90 m ranged between 3.4 to 4.5 cm/s. 90th percentile speeds ranged between 7.2 to 13.8 cm/s and 6.9 to 9.0 cm/s at the two depths, respectively (PRASA 2003).
- At the YS, moderate (15 cm/s) west-southwesterly subsurface currents have been reported between 100 to 500 meters (EPA 1988).

a. Winds: Easterly trade winds predominate throughout the entire year in the region, primarily from the ENE direction. Wind speeds in the area are moderate. The mean annual wind speed is 14.2 km/hr, but shows considerable daily and monthly variation. Maximum wind speeds occur in July (mean monthly velocity = 16.1 km/hr) and minimum wind speeds generally occur in October (11.3 km/hr). Infrequent tropical storms and hurricanes are sometimes severe, occur any time from August to October, and generally produce considerable rainfall (EPA 1982, EPA 1988).

b. Water Column Profile: Water column structure is relatively uniform throughout the year and salinity and temperature data reveal the existence of a well-mixed layer of surface water at most sites. The depth of this surface layer extends tens of meters and varies seasonally. The average annual temperature and salinity of this surface water range between 26-28°C and 35.5 - 36.2 ppt. Below this surface layer, a permanent density gradient (pycnocline) extends to approximately 240 m with a gradual density gradient below the pycnocline at most sites (EPA 1982, EPA 1988).

c. Dissolved Oxygen, Chlorophyll, and Turbidity: Measurements taken at most sites of baseline dissolved oxygen, chlorophyll a and turbidity levels in the water column were generally within ranges typically associated with unpolluted tropical conditions. Maximum chlorophyll a concentrations co-occurred with the top of the pycnocline. Distributions of dissolved oxygen and turbidity were vertically complex; potentially reflecting discontinuities in respiration/production rates in the water column. Suspended solids and turbidity tend to be high in surface waters due to phytoplankton production, increase to a localized maximum near the pycnocline and decrease significantly at depth (EPA 1982, EPA 1988). In contrast to the other sites, at the PS, distribution of dissolved oxygen was relatively uniform throughout the upper water column (to 150 meters) (PRASA 2003).

4.2 Sediment Composition/Chemistry and Benthos

a. Sedimentary Composition:

The physical characteristics of the sediment at all five sites is summarized in the table below:

Site	Physiographic Location	Relative Spatial Heterogeneity	Sand (average %)	Silt/Clay (average %)
AS ¹	Northern PR Slope	Homogenous	31%	69%
MS ¹	Western PR Slope	Homogenous	16%	84%
PS ²	Southern PR Slope	Homogenous	30%	69%
SJS ³	Northern PR Slope	Localized sand and gravel areas	12%	87%
YS ⁴	Southeastern PR Slope	Sandier in southern, deeper portion	30%	69%

¹Data from Battelle Laboratories, 2008

²Data from Battelle Laboratories, 2003

³Data from Battelle Laboratories, 1997

⁴Data from PPB Laboratories, 2001

b. *Sediment Chemistry*: Sediment samples collected from within and outside of the boundaries of each Puerto Rico ODMS in multiple surveys (AS in 2007, MS in 2006, PS in 2003, SJS in 1984, YS in 2001) were analyzed for percent total organic carbon (% TOC), concentrations of trace metals, hydrocarbons, and chlorinated organic contaminants (i.e., PCBs and selected pesticides).

Site	%TOC (average or range)	Chlorinated Organic Contaminants	Polycyclic aromatic hydrocarbons
AS	0.86%	Extremely low levels of DDT compounds and individual PCB congeners	Low, <99 ppb
MS	1.05%	Extremely low levels of DDT compounds and individual PCB congeners	Low, <51 ppb
PS	0.6% – 1.2%	Extremely low levels of DDT compounds and individual PCB congeners	Low, <90 ppb
SJS	0.5% - 2.3%	Low levels of PCBs, no pesticides detected	535-34495 ppb
YS	0.44% - 1.1%	Extremely low levels of DDT compounds and individual PCB congeners	Low, <350 ppb

The SJS contains mostly finer sediments, with sediment %TOC measured values ranging up to 2.3%. All four other ODMSs in Puerto Rico had low average sediment %TOC values (<1.2%). No pesticides were detected in sediment samples from the SJS, while extremely low levels of DDT compounds were detected in sediment samples from the four other sites (AS, MS, PS, and YS). Extremely low levels of individual PCB congeners were detected in sediment samples from all five ODMSs. Polycyclic aromatic hydrocarbon levels were also low across all five ODMSs. Concentrations of certain metals were found to be somewhat elevated within all five ODMSs

with respect to other ocean areas and within expected ranges for areas receiving some degree of anthropogenic input. Metal levels did not differ significantly between stations taken inside and outside of ODMDS boundaries at the AS, PS, SJS, and YS. At the MS, metal concentrations were lower within the ODMDS than at candidate reference stations closer to shore. Ranges of trace metal concentrations at each site can be found in previous individual SMMPs for each site.

c. Benthic Biota: Benthic community surveys were conducted at the MS, PS, SJS, and YS in March 1984 by JRB Associates, data on SJS in the table below is from analysis of more recent benthic samples collected on a survey in 1996. Benthic communities analyzed characterized as fine-grained bottom community dominated by deposit-feeding organisms. Major taxonomic groups at all sites sampled were polychaetes, crustaceans, and molluscs (primarily gastropods (snails) and pelecypods (bivalves)). Minor taxonomic groups found varied by site sampled, across sites they were sipunculids, echinoderms, phoronids, pogonophorans, and cephalochordates.

Site	Abundance and Diversity	Polychaetes (% of taxa)	Crustaceans (% of taxa)	Molluscs (% of taxa)	Minor taxonomic groups
AS	Benthic samples have not been taken from the vicinity of the AS				
MS ¹	Relatively high but variable numbers of taxa and individuals	54%	22%	16%	Sipunculids and echinoderms
PS ¹	Low numbers of taxa and individuals but variable taxa dominance	60-80%	10-15%	10-15%	Echinoderms
SJS ²	Low but highly variable numbers of taxa and individuals	49%	24%	15%	Echinoderms (5%), sipunculids, phoronids, pogonophorans and cephalochordates
YS ¹	Low but highly variable numbers of taxa and individuals	60-80%	10-15%	10-15%	Echinoderms

¹ Batelle/Golder 1997

² EPA 1999 (analysis of 1996 JRB samples)

4.3 Usage of Puerto Rico Sites by Marine Mammals, Fish, and Endangered Species:

USACE recently completed a programmatic, regional EFH and Section 7 ESA consultation process with the Services which covered dredging and placement activities related to projects under the jurisdiction of its Civil Works and Regulatory Programs (and dredging/sand mining in

borrow sites in federal waters under the jurisdiction of the Bureau of Ocean Energy Management (BOEM) Marine Minerals Program) in the Southeast United States, including the islands of Puerto Rico and the U.S. Virgin Islands. At the conclusion of this process, the Services issued the South Atlantic Regional Biological Opinion for Dredging and Material Placement Activities in the Southeast United States (2020 SARBO) which concluded that the covered dredging and placement activities, including placement at the five Puerto Rico ODMDs, are “not likely to jeopardize the continued existence of ESA-listed species or result in adverse effects to designated critical habitats[.]” The SARBO also includes requirements (Reasonable and Prudent Measures (RPMs) and Terms and Conditions (T&Cs) that minimize the impacts to ESA-listed species and designated critical habitats. In addition to SARBO requirements, this SMMP requires certain conditions for barge transport to the ODMDs and site-specific transit and use restrictions to further protect ESA-listed and sensitive species as well as EFH, including coral reefs, as detailed in the following sections.

a. Marine mammals: The designated sites do not encompass any known breeding, feeding, or nursery areas of marine mammals. Fin whales (*Balaenoptera physalus*), sperm whales (*Physeter macrocephalus*), sei whales (*Balaenoptera borealis*), and blue whales (*Balaenoptera musculus*) are all ESA-listed endangered large whale species with ranges that include waters of Puerto Rico. However, none of these species are known to breed or be commonly found in large numbers near Puerto Rico. Humpback whales (*Megaptera novaeangliae*) are present in waters off the coast of Puerto Rico during migration in the winter months (January-mid-March). Humpbacks do not feed while in tropical waters but are often seen spy hopping and engaging in other social display behaviors. Newborn calves may accompany female whales, since both Silver Bank (off N. coast of Hispaniola) and Mona Island (W. of Puerto Rico) are known calving grounds for this species. Whales can pass within less than 1 mile of shore but are also observed further offshore. Presence of humpback whales is possible in proximity to all five Puerto Rico ODMDs, but is most common near the Mayagüez ODMD. Dolphins are common residents and may be present in waters of the ODMDs at any time. The ESA-listed West Indian (Antillean) manatee (*Trichechus manatus manatus*) frequent shallow coastal areas of Puerto Rico, including bays, and generally do not occur in deeper offshore waters. Nevertheless, manatees are occasionally sighted offshore, so the possibility exists that manatees could be present in waters of the Puerto Rico ODMDs. This SMMP requires that all vessels transporting dredged material to any ODMD adhere to all measures required in Appendix D of this SMMP (i.e., NMFS, Southeast Region Vessel Strike Avoidance Measures and Reporting for Mariners) while underway.

b. Sensitive Species: Four species of sea turtles are also known to inhabit Puerto Rican waters: green (*Chelonia mydas*) hawksbill (*Eretmochelys imbricata*); leatherback (*Dermochelys coriacea*); loggerhead (*Caretta caretta*) and olive ridley (*Lepidochelys olivacea*). The latter two of these species are significantly less frequently observed in Puerto Rican waters. Waters of the

ODMDSs are too deep to provide foraging habitat for adults of green, hawksbill or leatherback turtles; however, they can be expected to be transiting through these areas and post-hatchling green and hawksbill turtles may be associated with rafts of *Sargassum*. Leatherback marine turtles approach the south shore of Puerto Rico during their nesting season (March-June) and may be present in offshore waters during this time. Leatherbacks typically spend the rest of their adult lives in the temperate zone. Hawksbill turtles and leatherback turtles are likely to be present in waters around the MS as they transit to and from Puerto Rico west coast and Mona Island beaches during their nesting season (March-June). While underway, dredging contractors must adhere to all measures required in Appendix D of this SMMP (i.e., NMFS, Southeast Region Vessel Strike Avoidance Measures and Reporting for Mariners) and maintain a watch for turtles as well. The endangered Brown pelican is resident to Puerto Rico but is primarily present inshore.

c. Fish: There are four ESA-listed species of fish, sharks, and rays (Nassau grouper, giant manta ray, oceanic whitetip shark, and scalloped hammerhead shark) present in Puerto Rican waters; all are highly mobile species that will choose foraging habitat with favorable characteristics. There are six designated Essential Fish Habitats (EFH) in Puerto Rico for reef fish, pelagic fish, rays, spiny lobster, queen conch, and corals. Juvenile and adult reef fish utilize waters up to 600 feet in depth for foraging but are primarily found in vicinity of coral reef habitat. Open waters of Puerto Rico sites may be feeding grounds for pelagic fish (e.g. tuna, jacks, mackerel) and deeper site waters may be feeding areas for various snappers and other species, but the designated sites are not critical areas in this regard. Deep waters of the sites may be inhabited by various species having wide depth ranges (e.g. elasmobranchs, conger eels, batfishes) as well as slope species (e.g. grenadiers).

A modest, but significant, commercial pot fishery operates off southern Puerto Rico. This fishery, however, is restricted to shallower, inshore shelf waters. Mackerel, sardine, snook and snappers constitute the bulk of landings in this fishery. A hand line fishery targeting snappers also operates off southern Puerto Rico; this fishery operates primarily in shallower water but extends to depths of approximately 600 ft. In addition, there are numerous private recreational and deep-sea charter fishing operations where effort is generally directed at billfish, dorado, tuna, and other pelagic species.

d. Endangered and threatened corals: There are seven species of corals in Puerto Rican waters listed by NOAA-NMFS under the Endangered Species Act (ESA) as threatened: staghorn coral (*Acropora cervicornis*); elkhorn coral (*Acropora palmata*); lobed star coral (*Orbicella annularis*); mountainous star coral (*Orbicella faveolata*); boulder star coral (*Orbicella franksi*); pillar coral (*Dendrogyra cylindris*); and rough cactus coral (*Mycetophyllia ferox*). These corals (except *M. ferox*) are important reef building corals, typically occurring in high energy, shallow water areas. Critical habitat for these corals is located at the shelf edge or in coastal areas (the deepest occurring

of these corals are *M. ferox*, *O. faveolata* and *O. franksi*, which have depth distribution maximums of 90 m). NOAA identified critical habitat for *Acropora* spp. as areas having consolidated hardbottom substrates devoid of macroalgae and sediment cover in depths between the Mean High Water line and 30 meters. In a proposed rule published in November 2020, NOAA identified critical habitat for the five non-*Acropora* threatened species: *O. annularis*, *O. faveolata*, *O. franksi*, *D. cylindrus*, and *M. ferox*. The proposed critical habitat areas for these five species in Puerto Rico are bounded by water depths as listed in the table below:

Species	Water depth range
<i>Orbicella annularis</i>	0.5-20 m (1.6-65.6 ft)
<i>Orbicella faveolata</i>	0.5-90 m (1.6-295 ft)
<i>Orbicella franksi</i>	0.5-90 m (1.6-295 ft)
<i>Dendrogyra cylindrus</i>	1-25 m (3.3-82 ft)
<i>Mycetophyllia ferox</i>	5-90 m (16.4-295 ft)

O. faveolata and *O. franksi* both have the widest water depth range covering the same area within which lie the proposed critical habitat areas for all other threatened coral species. Maps of this range using the NOAA GIS layer for *O. franksi* proposed critical habitat show the proximity of critical coral habitat to each ODMDS (Figures 3-7). All five Puerto Rico ODMDSs are in water deeper than 90 m, making their locations outside of critical habitat areas. Critical habitat for threatened corals as designated by depth ranges occurs along the transport routes typically used by barges to travel to and from the Puerto Rico ocean dredged material disposal sites. The presence of several of these species was documented in shallow waters outside the channel routes to the MS and SJS in video taken from a remotely operated vehicle. NOAA also identifies a species of deep-water coral (*Oculina* spp.) as a species of concern in Puerto Rico. The presence of this species however has not been confirmed on the northern coast of Puerto Rico. Deep water stony coral (*Madracis* spp.) was documented in very sparse distribution in video taken using an ROV at deep water hardbottom areas outside the Mayagüez Harbor entrance in 2011.

4.5 Shelf Edge Reef Resources:

Reef resources on the Puerto Rican shelf and along the shelf edge have been identified by the National Oceanic and Atmospheric Administration (NOAA) as essential fish habitat (EFH). In previous consultations NOAA has indicated that these areas are generally restricted to areas shallower than 200 feet (61 m). Side scan SONAR and remotely operated video mapping have been conducted to locate shelf edge resources around Puerto Rico, and further video documentation of the quality of these habitats will be obtained in the next planned survey to be conducted in 2021.

a. Arecibo Harbor, PR ODMS: In November 2011, a side scan SONAR survey was made of the area between the mouth of Arecibo Harbor and the AS to identify those areas with hard bottom substrates that rise significantly above the seafloor. Several hard bottom areas with vertical relief were identified but mostly lay outside the direct route between Arecibo Harbor and AS (Figure 2). **Scows will be required to maintain a line of transit that passes east of 18° 29.700 N and 66° 42.800 W as well as west of 18° 29.700 N and 66° 42.550 W to minimize the potential for losses of dredged material onto these potentially sensitive areas.**

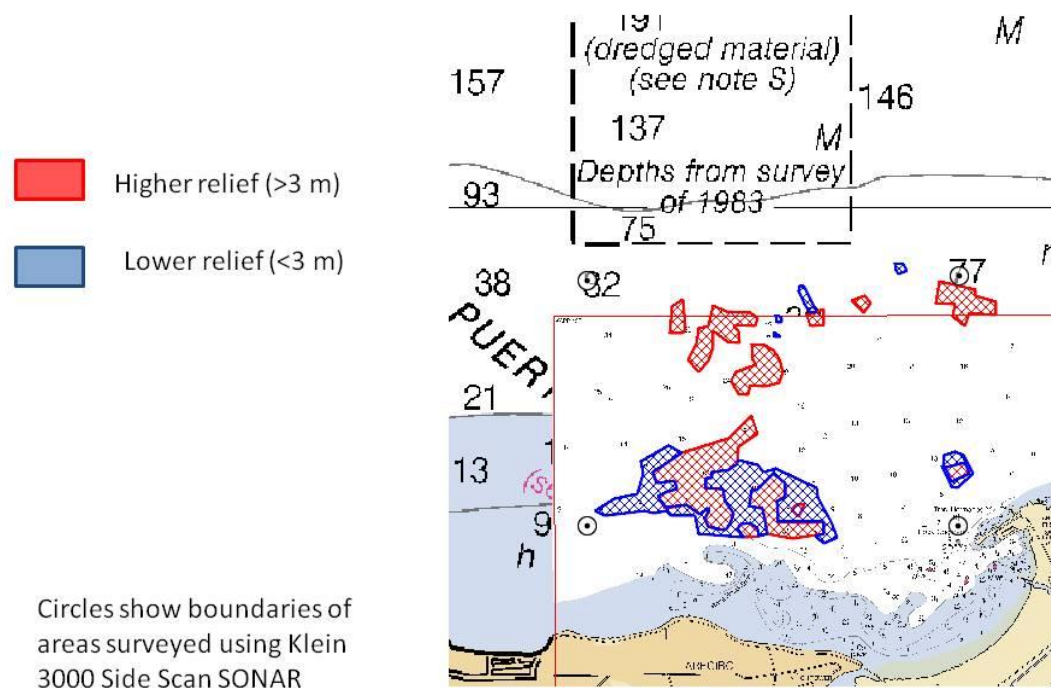


Figure 2. Hard bottom features having significant vertical relief outside Arecibo Harbor. Based on EPA Region 2 side scan SONAR survey (conducted in November 2011).

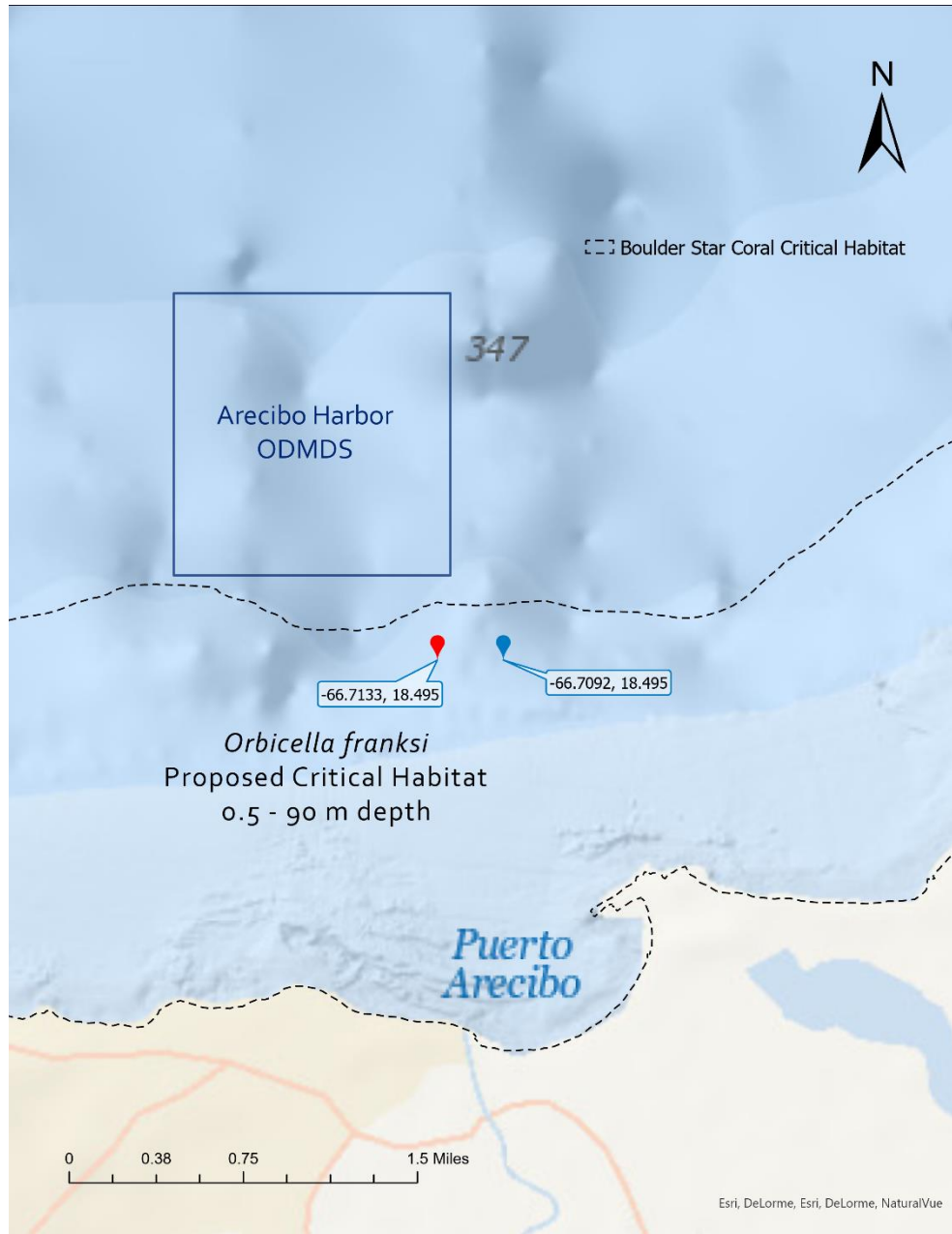


Figure 3. Location of Arecibo Harbor, Puerto Rico Dredged Material Disposal Site (AS) and proposed critical habitat boundaries for *Orbicella franksi* as dashed line (0.5-90 m depth). Transit restriction point shown; barges must maintain a line of transit east of 18° 29.700 N / 66° 42.800 W (red marker) and west of 18° 29.700 N / 66° 42.550 W (blue marker).

b. Mayagüez Harbor, PR ODMDS: As shown in Figure 4, the MS is located far west of any potential shelf edge habitat. The results of the previous video ROV survey support the presence of both ESA-listed species and EFH outside the navigation channel, and that these high value habitats do not occur elsewhere along the direct route to the Mayagüez ODMDS. **Because of navigational safety concerns, scows must use the channel and therefore EPA cannot alter the scow paths landward of the entrance channel markers. Upon leaving the entrance channel, scows will quickly be over deep water that does not support shelf edge reef habitats or ESA-listed corals. Therefore, no designated scow path will be imposed upon dredged material transporters to the Mayagüez ODMDS.**

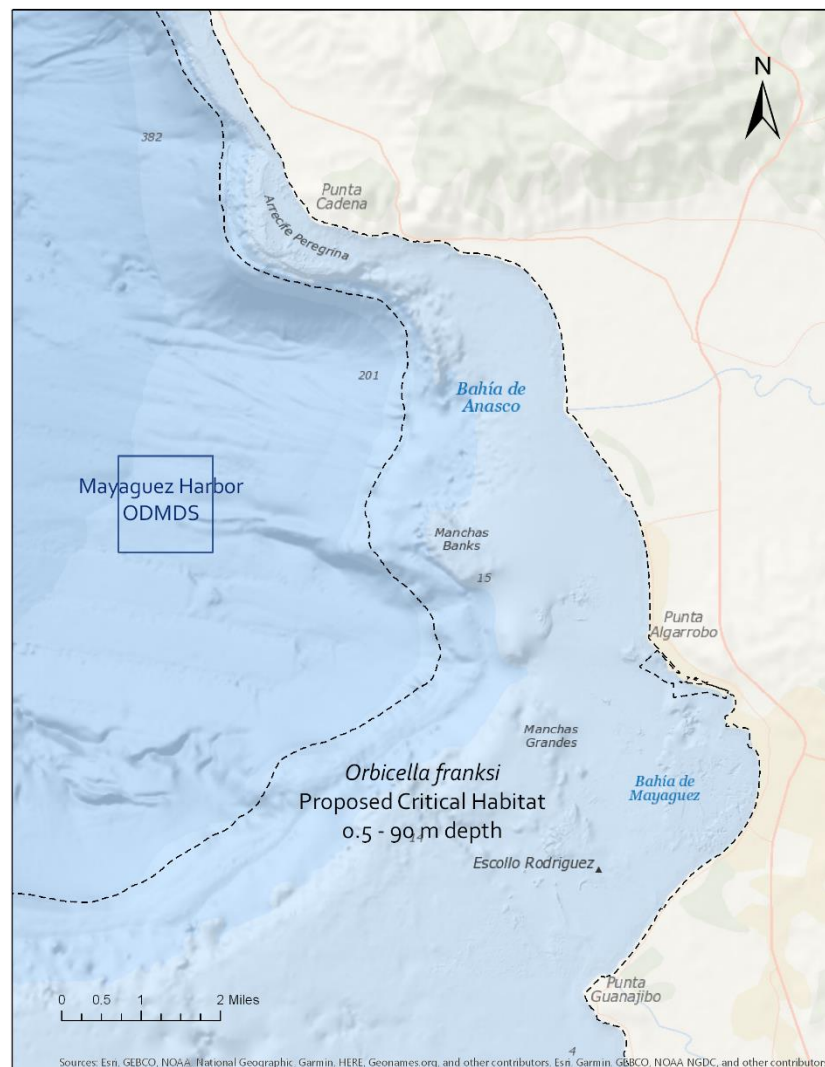


Figure 4. Location of Mayagüez Harbor, Puerto Rico Dredged Material Disposal Site (MS) and proposed critical habitat boundaries for *Orbicella franksi* as dashed line (0.5-90 m depth).

c. *Ponce Harbor, PR ODMDS*: The northeast corner of the PS is adjacent to a shoal area that may contain shelf edge resources (Figure 5). **The potential for impacts to shelf edge reef areas will be minimized by restricting disposal activities to the southern half of the PS.** As it is anticipated that dredged material will be transported to the PS from Guayanilla Harbor, **barges transiting from Guayanilla will be required to maintain a line of transit south of 17° 57.66 N and 66° 45.54 W and 17° 56.4 N and 66° 43.2 W to ensure barges stay over deeper water and away from shallower areas including coral reef along the coast between Guayanilla and Ponce.**

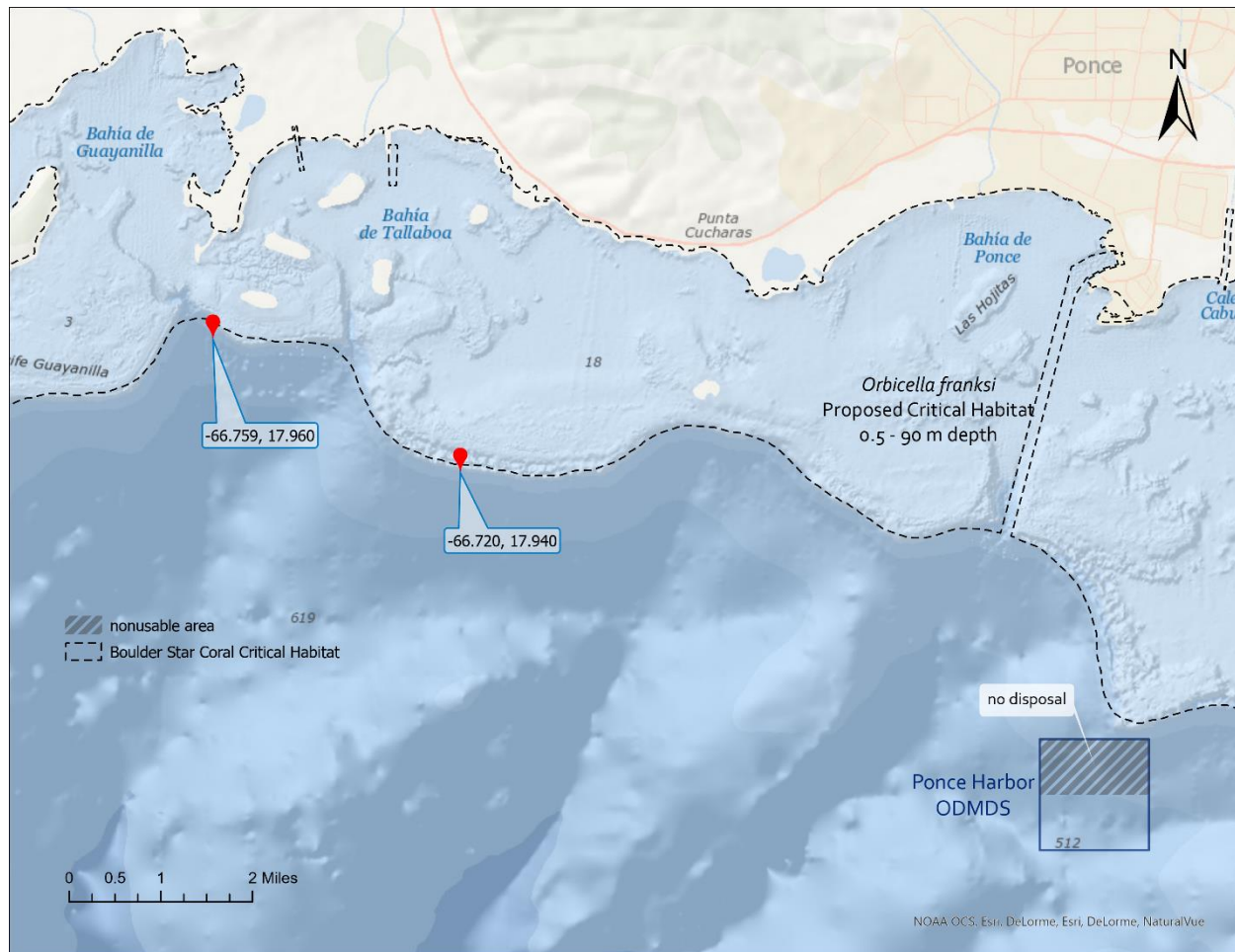


Figure 5. Location of Ponce Harbor, Puerto Rico Dredged Material Disposal Site (PS) and proposed critical habitat boundaries for *Orbicella franksi* as dashed line (0.5-90 m depth). Potential shelf edge resources may be located in the shoals just northeast of the site boundary. Points marked show transit route restriction requiring barges to maintain line of transit south of 17° 57.66 N and 66° 45.54 W as well as 17° 56.4 N and 66° 43.2 W.

To minimize the potential for impacts to ESA corals and shelf edge EFH, disposal activities are restricted to the southern half of the Ponce Harbor, PR ODMDS. This restriction serves to maximize the distance of any disposal activities from the shallower shelf areas to the

northeast corner of the site and also ensures the direct transit route from the Ponce Harbor entrance channel avoids these areas and stays over deep water.

d. San Juan Harbor, PR ODMDS: The SJS is located north of areas that may contain shelf edge resources (Figure 6). Side scan SONAR in 2011 and remotely operated video (ROV) mapping in 2013 showed that coral growth is limited along the coastline east of San Juan Harbor within shelf edge reef depth range.

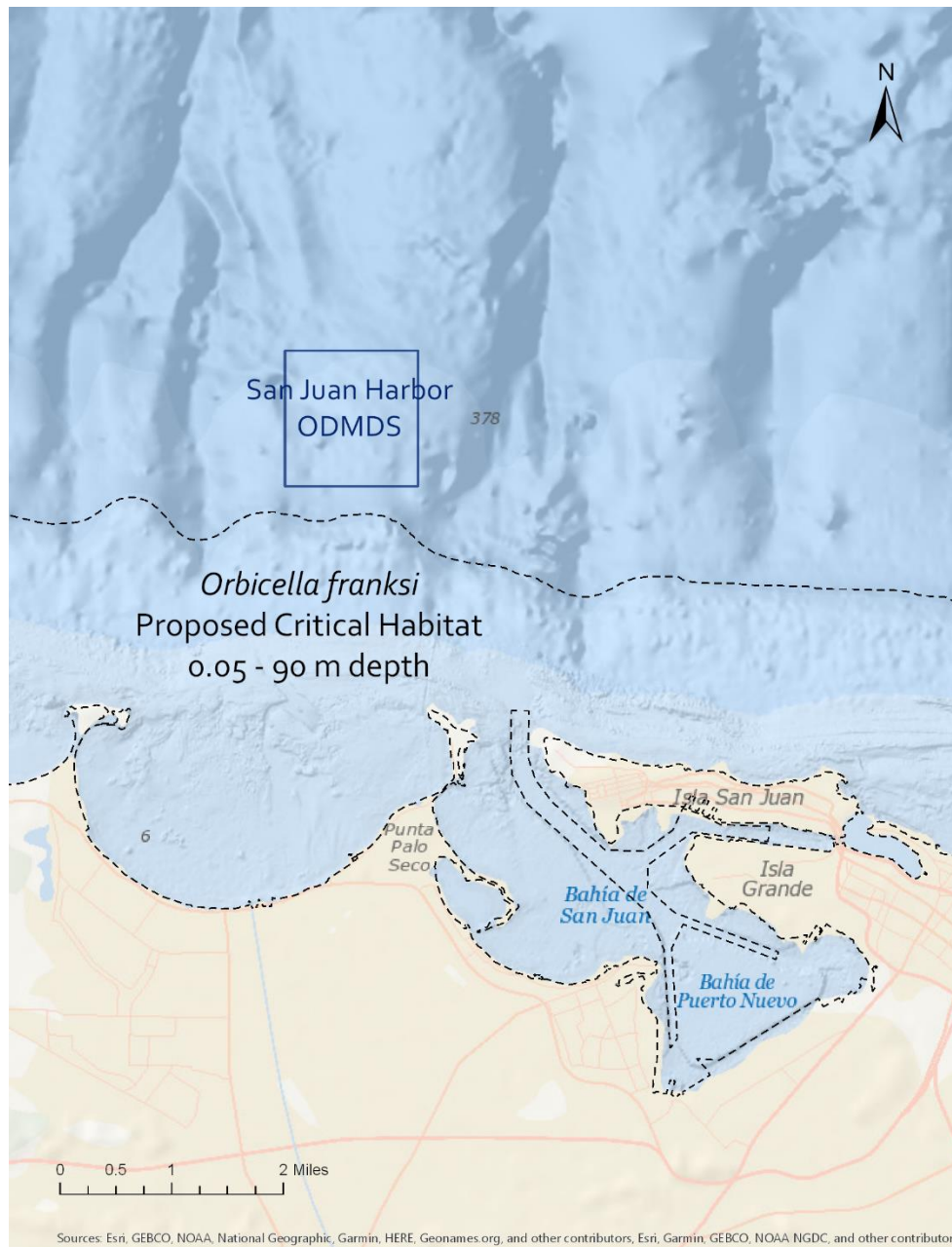


Figure 6. Location of San Juan Harbor, Puerto Rico Dredged Material Disposal Site (SJS) and proposed critical habitat boundaries for *Orbicella franksi* as dashed line (0.5-90 m depth).

A 2013 multibeam and ROV survey of benthic habitats along the transit route to the San Juan Harbor, PR ODMDS found no significant hard bottom habitat along the most direct route.

Because of navigational safety concerns, scows must use the channel and therefore EPA cannot alter the scow paths landward of the entrance channel markers. Upon leaving the entrance channel, scows will immediately be over areas with no significant hard bottom habitat that do not support shelf edge reef habitats or ESA-listed corals. Therefore, no designated scow path will be imposed upon dredged material transporters to the San Juan Harbor, PR ODMDS as the most direct route has least potential impacts to coral reefs.

e. Yabucoa Harbor, PR ODMDS: The northeast corner and western edge of the YS are adjacent to a shoal area shallow enough to be suitable to support shelf edge resources (Figure 7). In 2006, EPA identified various contiguous areas of high and low relief along the shelf edge areas north and west of the Yabucoa Harbor, PR ODMDS. A towed video camera revealed high relief areas to be well defined spur and groove *Acropora* reef. **The potential for impacts to shelf edge reef areas will be minimized by restricting disposal activities to the southeastern quadrant of the YS and by requiring barges transporting dredged material to maintain a line of transit south of 65° 43.62 W 18° 1.38 N.**

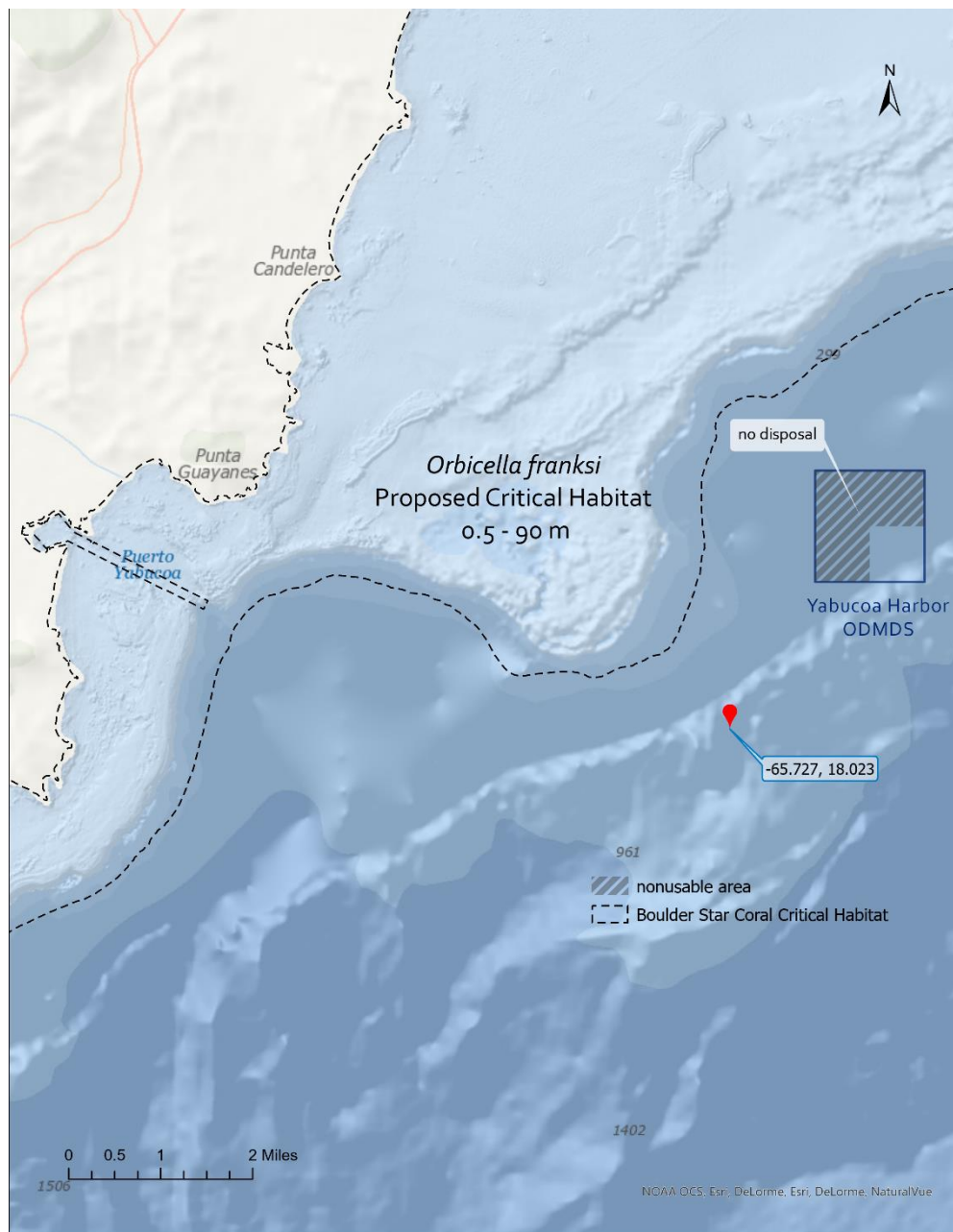


Figure 7. Location of Yabucoa Harbor, Puerto Rico Dredged Material Disposal Site (YS) and proposed critical habitat boundaries for *Orbicella franksi* as dashed line (0.5-90 m depth). Point marked shows transit route restriction. Barges must maintain line of transit south of 65° 43.62 W 18° 1.38 N.

5. Management of Puerto Rico Ocean Dredged Material Disposal Sites

5.1. Regulatory/Statutory Responsibilities Under MPRSA

USACE and EPA have been assigned various duties pertaining to ocean disposal site management under MPRSA. EPA and USACE share responsibility for MPRSA permitting and ocean disposal site designation and management, as briefly summarized below.

a. Section 102 of the MPRSA

Under Section 102, EPA designates recommended times and locations for material disposed at ocean sites (including dredged material) and develops the environmental criteria used in reviewing permit applications.

b. Section 103 of the MPRSA

Under Section 103, USACE is assigned regulatory responsibility for transportation and disposal of dredged material, subject to EPA review and concurrence that the material meets applicable ocean disposal criteria.

5.2. Dredged Material Testing Requirements

As part of the permitting process, applicants are required to test/characterize all dredged material proposed for disposal at an ODMDs to determine if it meets the ocean disposal criteria (i.e., is suitable for ocean disposal). Dredged material testing procedures/requirements (including quality assurance requirements) are contained in the following documents:

-Ocean Dumping Regulations (40 CFR Part 227, “Criteria for the Evaluation of Permit Applications for Ocean Dumping of Materials”)

-EPA/USACE 1991. “Evaluation of Dredged Material Proposed for Ocean Disposal, Testing Manual” as amended (otherwise known as the ‘Green Book’).

-EPA Region 2/USACE-NYD 2016 (or most recent revision). “Guidance for Performing Tests on Dredged Material proposed for Ocean Disposal” (otherwise known as the Regional Testing Manual).

EPA-R2 and USACE-SAJ will prepare a regional implementation manual that provides guidance specific to ocean disposal of dredged material at the Puerto Rico ODMDs. Until this guidance manual is prepared and approved, however, the EPA-R2 /USACE-NYD (2016) manual (or its most recent) revision will be used to evaluate the suitability of dredged material proposed for disposal at designated sites in Puerto Rico.

The suitability of dredged material for ocean disposal must be determined by the USACE-SAJ and concurred with by EPA-R2 in writing prior to each authorization. The determination of suitability

will be valid for three years from the time of testing, unless it is determined that conditions at the dredging site may have changed significantly since that time (e.g., chemical spills). EPA-R2 may extend the authorization for an additional period without further testing if: 1) conditions at the dredging site are deemed to not have changed significantly since the time of testing (reduced levels of testing effort may, in fact, be required to confirm this); and 2) no unacceptable impacts have occurred or are expected at the dredging and disposal sites.

5.3. Transportation and Disposal Methods

Dredged material disposed of at all Puerto Rico ODMDs may be removed from project areas using hopper, clamshell, or other types of dredges. Dredged material has been placed at Puerto Rico ODMDs primarily utilizing split-hull barges. Specific instructions/requirements, including the transit and site use restrictions detailed below, are contained in the Department of the Army (DA) permits issued by the USACE-SAJ, listed as contract specifications in Federal dredging contracts, and provided to contractors in placement guidelines associated with each dredging project (see the following Section V.4 of this SMMP).

Site	Scow Transit Restrictions	Dumping Restrictions
AS	Required to pass east of 18° 29.700 N/ 66° 42.800 W and west of 18° 29.700 N/ 66° 42.550 W	Future restrictions will be documented in permit
MS	Future restrictions will be documented in permit	Future restrictions will be documented in permit
PS	For transit from Guayanilla: required to maintain a line of transit south of 17° 57.66 N and 66° 45.54 W and 17° 56.4 N and 66° 43.2 W	Disposal activity is restricted to the southern half of the PS
SJS	Future restrictions will be documented in permit	Future restrictions will be documented in permit
YS	Required to maintain a line of transit south of 65° 43.62 W and 18° 1.38 N	Disposal activity is restricted to the southeastern quadrant of the YS

5.4. Disposal Permit Conditions/Enforcement

MPRSA 102 (c)(3)(C) requires that the SMMP include special management conditions or practices to be implemented at the site that are necessary for the protection of the environment.

EPA-2 and the USACE-JD have used their experiences with dredged material disposal at the SJS and PS to develop guidelines for disposal of dredged material at all ODMDSs in Puerto Rico and to ensure that any future dredged material disposal takes place in accordance/compliance with applicable permit or contract conditions.

Within approximately ten days prior to the start of dredging of ODMDS-suitable material, a pre-construction meeting is held with dredging contractor representatives, permittees, and, members of the USACE-SAJ Regulatory Branch personnel for projects, or with USACE dredging contractor and Construction/Operations Division personnel for Federal construction and/or maintenance dredging projects. Permit requirements and placement conditions are discussed to ensure that everyone is familiar with SMMP requirements prior to the start of ODMDS-material dredging.

a. Regulatory Framework: Permit Conditions

Department of the Army (DA) permits will be issued for Puerto Rico ODMDS disposal activities involving non-Corps projects, and typically are valid for a period of three years. Copies of the issued permits or the letters modifying these permits are maintained and made available upon request by the USACE-SAJ, which issues the documents. Placement of dredged material cannot occur at any Puerto Rico ODMDS without a permit (or MPRSA Section 103 (e) equivalent, e.g. Federal projects authorized by Congress).

1. General Conditions: General permit restrictions reflecting standard maritime industry and U.S. Coast Guard requirements so that a waterborne/sea-going activity can be carried out within the minimum or basic guidelines set, primarily for safety reasons, by the regulating authority. In most, if not all, cases the U.S. Coast Guard is that authority.

2. Special/Specific Conditions: Special and/or specific permit restrictions will be listed in the text of the permit and will include, but not necessarily be limited to:

a. Seasonal restrictions or special conditions regarding dredging and disposal (assigned on a case by case basis). At present, no disposal restrictions related to seasonal variations in ocean current or biotic activity have been determined to be necessary for disposal at Puerto Rico ODMDSs. Should any such restrictions appear necessary as monitoring results are compiled, they will be incorporated into future ocean disposal authorizations. Additionally, if new information indicates that endangered, or threatened, species are being adversely impacted, restrictions will be implemented.

b. Requirements for the submission of transportation and placement logs. USACE-SAJ approved Dredged Material Inspectors (DMIs) are required to document each placement trip on the **Transportation and Placement Log Form** (Appendix A) and notify the USACE-SAJ. The permittee shall hire a DMI independent of the dredge contractor.

c. Reporting requirements for un-anticipated events and discrepancies.

d. Guidance pertaining to aspects of the disposal activity; including boundary coordinates, release/discharge procedures, and requirements to discharge within specific areas. The guidance within the permit is also supplemented by the Guidelines provided in Appendix B of this document.

b. Federal Authorization

In cases where permits are not issued, as is the case with Federal Navigation Projects, the above permit conditions will be incorporated into dredging contract specifications (see MPRSA Section 103 (e)). When USACE vessels, or their contractors, conduct the dredging, they will comply with the same requirements, monitoring, and safeguards that are included in permits issued to third party contractors. Permit-like instructions specifying all requirements are to be contained within the work specifications/orders for the project. These conditions are equivalent to permit conditions and will be enforceable on the contractor under applicable law.

c. Violation/Enforcement Cases

1. Disposal at a Puerto Rico ODMDS is to occur only with prior USACE-SAJ approval and EPA-R2 concurrence. Projects not in compliance with the DA permit will be subject to enforcement action.

2. A USACE-SAJ approved Dredged Material Inspector (DMI) must accompany all trips for placement of dredged material at a Puerto Rico ODMDS and be present during all dredged material discharge events in order to certify compliance with the USACE-SAJ permit conditions. The DMI must report independently to the applicant (not to the dredging contractor). The DMI is required to complete, sign, submit and maintain within the official record a Transportation and Placement Log Form specific to the ODMDS for each event (Appendix A).

3. The DMI must also complete, sign and submit an Inspector Checklist of requirements associated with each placement trip (Appendix C). The three sections of the Inspector Checklist are completed by the DMI during three phases of transportation and discharge. Many checklist items relate to the dredging site. Ensuring that all required equipment and procedures are followed prior to departure from the dredging site helps ensure safe and accurate discharge of dredged material at each Puerto

Rico ODMDS. Any item on the checklist that receives a “NO” answer, meaning that a required procedure has not been followed, or required equipment is not present or operable, requires an immediate telephone call to USACE-SAJ for follow-up action.

4. If any action takes place which does not conform to authorized activities described in any permit (Contract Specification and/or Work Order for Federal Projects), reauthorization, response letter, or other communicated requirements/restrictions, the USACE-SAJ should be notified immediately by the DMI. In cases where activities beyond the scope of those authorized occur, appropriate action will be determined by consultation between EPA-R2 and the USACE-SAJ.

d. Site Inspection/Surveillance

1. To ensure compliance with the DA permit conditions and Federal authorization, routine observations of dredging activities in Puerto Rico are performed by the USACE-SAJ.

2. USACE-SAJ and EPA-R2 (and/or their designated representatives), reserve all rights under applicable law to free and unlimited access to and/or inspection of:

- the dredging project site (including the dredge plant, towing vessel and scow) at any time during the project;

- any equipment used for towing, surveying, monitoring or navigation;

- any and all records pertaining to specific (Federal or non-Federal) dredging and disposal projects including logs, reports, memoranda, notes, etc.

3. For all disposal activities, the dredging contractor will be required to prepare and operate under an approved electronic verification plan for all disposal operations. As part of this plan, the contractor will provide an automated system that is operated by an independent (third party) contractor to continuously track the horizontal location and draft condition (vertical) of the disposal vessel from the point of dredging to the disposal area, and return to the point of dredging.

5.5. Disposal Reporting Requirements and Data Management

a. USCG Reporting Requirements:

The dredging/towing contractor must notify the Captain of the Port (COTP) of Harbor/USCG for a reference number before each vessel departs the dredging site for an ODMDS. Every trip made under the permit authorization is required to be recorded and endorsed by the master of the tow or the person acting in such a capacity.

b. Record Keeping/Documentation/Data Reporting:

1. Navigation logs will be maintained for each vessel (tugboat/barge) used for ocean disposal of dredged material. These logs should include accuracy, calibration methods, and any problems and actions taken associated with navigation. EPA-R2 and the USACE-SAJ require that each tugboat/barge used for the ocean disposal of dredged material use D-GPS for navigation purposes.
2. An electronic Transportation and Discharge Log form must be completed by the DMI to provide a record of each voyage involving an actual disposal event at any Puerto Rico ODMDS. An example of the log form is included in Appendix A. The log forms must be emailed to USACE-SAJ and EPA-R2 within two hours of any discharge at any ODMDS. An electronic copy of each log form is to be saved with a filename that includes trip number and retained within a dedicated project folder to allow for auditing of information. These notification systems ensure that the USACE-SAJ and EPA-R2 are completely informed of daily dredging and disposal activities undertaken within Puerto Rico.
3. The DMI must also complete, sign and submit an **Inspector Checklist** of requirements associated with each placement trip (Appendix C). An electronic copy of the checklist for each trip must be retained with the corresponding TDL form in the dedicated project folder to allow for auditing of information. The three sections of the Inspector Checklist are completed by the DMI during three phases of transportation and discharge. Many checklist items relate to the dredging site. Ensuring that all required equipment and procedures are followed prior to departure from the dredging site helps ensure safe and accurate discharge of dredged material at all Puerto Rico ODMDSs.
4. GPS-based automated disposal surveillance (i.e., vessel draft and position) data must be maintained for each vessel used to transport and dispose of dredged material at any Puerto Rico ODMDS. Surveillance data is to be submitted to the Agencies on a weekly basis in electronic format. Reports should include views of loaded and unloaded paths taken by vessels used for transportation and disposal of dredged material at any ODMDS and the discharge location at an ODMDS. This information must be superimposed on a figure that includes the dredging area, adjacent shorelines, and ODMDS boundaries). In addition, a graphical depiction of draft versus time must be provided with the above information.

Discharge locations must be made available for EPA and USACE inspection via a website within 12 hours of discharge. The website must allow several view sizes to observe the location of discharge. Vessel draft readings must be clearly discernible; superimposed on a figure that includes the dredging area, adjacent shorelines, and ODMDS boundaries.

5. Records must be kept of all sea turtle and marine mammal sightings that include date and number of individuals by species. A report including these records covering all vessel trips to and from an

ODMDS for a project must be submitted to the resource agencies (NOAA, FWS, PR DNER) 30 days after the close of the project.

c. Federal Puerto Rico ODMDS Data Management and Reporting

A spreadsheet file containing contractor-reported scow volumes information is maintained by the USACE-SAJ. All disposal records and submitted monthly disposal volumes for each project are proofread, verified and any discrepancies are corrected before entry of data into this spreadsheet. On a yearly basis, USACE-SAJ will compile all dredging, disposal and testing data and submit them to USACE Headquarters.

All dredged material disposal data submitted to USACE-SAJ will be compiled, analyzed and evaluated in a final end-of-the-year report that will be provided to EPA-R2 during the first quarter of each calendar year and/or upon request. An annual report will not be necessary if there has been no disposal activity during the previous calendar year.

The data file maintained by USACE-SAJ contains information pertaining to the following:

- Permit/Federal Project number
- Permittee or Federal Project name
- Waterway/Reach/Channel
- Was the project maintenance or improvement?
- Disposal area/buoy at which the material was released/discharged
- Coordinates at which the material was released/discharged
- Disposal activity commencement and completion dates
- Volume of material disposed
- The year-to-date volumes of private (non-federal) and federal navigation projects disposed at each Puerto Rico ODMDS, noted separately and collectively

5.6. Inter-Agency Coordination

a. Transfer of Information

EPA-R2 and the USACE-SAJ jointly manage the Puerto Rico dredged material disposal program and the AS, MS, PS, SJS, and YS. EPA-R2 and the USACE-SAJ will continue to coordinate the

exchange of information, management and monitoring resources, and the documentation of site management decisions at the Puerto Rico ODMDs. EPA-R2 and USACE-SAJ will continue to provide each other with all pertinent data and information as it becomes available. Specifically, upon discovery/notification, any information concerning disposal/dredging violations will be shared between EPA-R2 and the USACE-SAJ.

This SMMP constitutes an official agreement between EPA-R2 and USACE-SAJ to continue to cooperatively manage and monitor the AS, MS, PS, SJS, and YS and to coordinate the collection and transfer of information pertinent to the management and monitoring of the Puerto Rico ODMDs as set forth herein.

b. Funding of SMMP Tasks and Activities

The costs of site management and monitoring will be shared between EPA-R2 and the USACE-SAJ to the extent allowed by funding levels in any given fiscal year (i.e., cost-sharing will be subject to appropriations).

Consistent with Section 102(c)(3) of the MPRSA, the SMMP developed by EPA-R2 in conjunction with the USACE-SAJ shall include a program for monitoring the site that includes the responsible agency(ies) for each monitoring activity. The SMMP and, as applicable, permit conditions will also specify when site users will be required to undertake monitoring activities associated with their projects in accordance with 40 CFR § 228.9. Each Agency will bear its own costs for activities it undertakes in furtherance of the responsibilities established in the SMMP except as provided for in duly executed Interagency Agreements (IAs) pursuant to the Economy Act or the cooperative authority of Section 203 of the MPRSA.

The USACE-SAJ will support the monitoring and management of Puerto Rico ODMDs. IAs between EPA-R2 and the USACE-SAJ are encouraged in order to pool resources to implement SMMP activities. When appropriate, the USACE-SAJ may provide funds to EPA-R2 via an IA for studies of prevailing current conditions, transport pathways, mapping of coral reef resources and assessments of baseline sediment conditions at or near Puerto Rico ODMDs through contractual mechanisms. EPA-R2 has the highly specialized expertise and resources to conduct advanced technical work at the Puerto Rico ODMDs and to complement USACE-SAJ capabilities by providing support in specific areas of expertise in oceanography, marine ecology, and marine instrumentation that are required for work at the Puerto Rico ODMDs.

EPA-R2 staff is uniquely capable to oversee the technical merits or limitations of any work products arising from any contractor providing individual site monitoring and management information services through contractual mechanisms.

c. Project specific coordination

Prior to issue of new permits for private dredging projects, Antilles Regulatory Section and EPA-R2 will discuss special conditions of the permit. As monitoring requirements and placement conditions change, the special conditions may also be changed to help ensure permit holders conduct dredged material disposal operations as safely and efficiently as possible in Puerto Rico. Likewise, prior to Federal dredging projects, contract specifications are reviewed and updated as necessary to reflect changes in monitoring requirements and placement conditions.

6. Puerto Rico Combined ODMDS Monitoring Program

MPRSA 102 (c)(3)(B) requires that the SMMP for a given dredged material ocean disposal site include a program for monitoring the site. In this combined SMMP, the program described applies to all five sites in Puerto Rico: the AS, MS, PS, SJS, and YS. Site-specific provisions are included and indicated as necessary.

EPA-R2/USACE-SAJ have developed a tiered monitoring approach to investigate the physical, biological, and chemical impacts of ocean disposal of dredged material at sites in Puerto Rico. EPA-R2/USACE-SAJ's Ocean Disposal Site Monitoring Program (MP) addresses both regulatory and technical issues associated with the disposal of dredged material at the Puerto Rico ODMDSs. The tiered approach described herein is comprised of levels of increasing investigative intensity designed to generate the technical information necessary to properly manage the disposal site in an environmentally sound and cost-effective manner.

Monitoring effort at each designated site under the Puerto Rico MP is dependent upon volume and frequency of disposal. In general, if no disposal occurs, then no monitoring will be required. Inversely, in a period during which there is disposal activity, monitoring would be conducted at that site proportionate to volume of disposal, as necessary. Specific monitoring activities may also be required for individual projects.

6.1. Goals of the Puerto Rico Combined ODMDS MP

The Puerto Rico Combined ODMDS MP will focus on the overall impacts of dredged material on entire extent of all designated ODMDS locations and surrounding areas. In addition to addressing the Null Hypotheses (H_0) (see Section VI.2), the overall goals of the Puerto Rico Combined MP are to:

- a. Verify that dredged material disposed at the Puerto Rico ODMDSs does not cause any unacceptable impacts.

- b. Assess and monitor conditions (trends) at the Puerto Rico ODMDs as defined in 40 CFR Section 228.10, and compare them to baseline data.

6.2. Questions/Null Hypotheses (H_0) to be addressed by the Puerto Rico ODMD MP:

The Puerto Rico Combined ODMD MP will focus specifically on verifying the following four null hypotheses (H_0) for individual projects and/or disposal locations:

H₀₁: Dredged material disposal operations are consistent with the requirements of the ocean dumping permits.

Actions:

- Use the USACE-approved DMI reports and information submitted by permittees to determine compliance.
- Require GPS-based automated disposal surveillance systems on all disposal scows at all designated sites in Puerto Rico.
- Conduct independent surveillance of disposal operations

H₀₂: Dredged material disposal operations are not causing unacceptable impacts (physical, chemical, and biological) at the Puerto Rico ODMDs and surrounding areas.

Actions:

- Conduct sediment profile imagery surveys (Tier 2) at the designated sites and surrounding area.
- Conduct benthic community structure, sediment chemistry and body burden analyses within the sites when deemed necessary based on results of Tier 2 physical and biological efforts

H₀₃: Dredged material disposal has no significant impact on endangered species.

Actions:

- Review USACE-approved DMI reports to ensure that no dredged material disposal occurs in the presence of any marine mammals/endangered turtles.
- Monitor marine mammals/sea turtle sightings, landings (bycatch), and strandings in the Arecibo, Mayagüez, Ponce, San Juan, and Yabucoa vicinities.

H₀₄: Dredged material disposal does not significantly alter the benthic community structure of the area of the designated site areas.

Actions:

- Use sediment profile imaging (SPI) photography to assess sediment and benthos distribution.
- Conduct Tier 3 benthic community structure monitoring in and around the sites.

6.3. Monitoring Activities/Techniques

a. Work/Quality Assurance Project Plan

The Puerto Rico Combined ODMDS MP consists of a three-tiered approach to monitor the physical, chemical and biological effects of dredged material disposed at Puerto Rico ODMDSs, the components of these tiers are outlined below in Sections *b.* to *d.* Information from these monitoring activities will be extremely important for determining the potential for unacceptable impacts to occur due to disposal of dredged material at all designated sites in Puerto Rico. For this reason, the data obtained in these surveys must be of high quality. All monitoring work conducted in accordance with this SMMP must conform to a work/quality assurance project plan (W/QAPP) that has been reviewed and approved by USACE-SAJ and EPA-R2.

Monitoring and sampling will occur using a design that allows quantitative analysis of results; the sampling area may include all or part of one or more Puerto Rico ODMDSs, the surroundings and a reference area geographically removed from the effect of dredged material disposal at the designated sites. W/QAPPs must reflect the design selected by the Agencies for the monitoring tasks.

b. Physical Monitoring

Physical monitoring is designed to determine the physical nature and distribution of dredged material during and after disposal at each Puerto Rico ODMDS and environs. Measurements of the physical nature of the material proposed for disposal at each ODMDS allow first order tracking of physical impacts at the site and support modeling of initial mixing and seafloor deposition following disposal. Sediment profile imaging (SPI) will be used to confirm the fate of the material following disposal. SPI technology consists of a frame-mounted apparatus that enables a camera to take a picture of the sediment-water interface. Useful information can be obtained from the pictures to produce fine scale description of the spread of material on the bottom and its effect on the environment. Under certain circumstances, the collection and analysis of sediment samples may be required to fully assess the final disposition of dredged material discharged at the Puerto Rico ODMDSs.

Tier 1: Dredged Material Testing/Modeling of Disposal Events/Disposal Inspection

Grain size distribution, percent moisture, Atterberg limits, and total organic content of proposed materials will be measured for all dredged materials proposed for disposal at a Puerto Rico ODMDS. This data is acquired in support of the evaluation of dredged material proposed for ocean disposal, as required by the 1991 Green Book and the regional implementation manual governing ocean disposal of dredged material.

Disposals will be modeled using available computer models (e.g., STFATE) to estimate the footprint and plume anticipated from a proposed project prior to commencement of disposal at the site. Results will be used to determine disposal locations at each Puerto Rico ODMDS.

GPS-based automated disposal surveillance technology will be used to ascertain that loading and disposal of dredged material is occurring at authorized locations, that material is not being lost en route to the site, and that material has been discharged within the site boundaries. This technology simultaneously records the draft and position of the vessel to which it is attached. USACE-approved DMIs will accompany all scows and hopper dredges disposing at all Puerto Rico ODMDSs.

Frequency: Testing and modeling conducted prior to each initial MPRSA concurrence. GPS-based automated disposal surveillance to be conducted with each scow load of material transported for disposal at Puerto Rico ODMDSs

Tier 2: Sediment profile imagery (SPI)

Sediment profile imagery (SPI) cameras will be deployed at an array of stations extending radially outward from the center of an ODMDS to define the footprint of dredged material within and around the site. Sampling locations will be determined jointly by EPA-R2 and USACE-SAJ prior to the surveys. Because SPI has not yet been conducted at the sites, the optimal length and spacing of radial transects will be determined from the first survey at each site. From these images, grain size, sediment color and roughness can be determined and used to identify and map dredged material on the bottom (images obtained using SPI will also be used in Tier 2 biological evaluation of the site).

Frequency: SPI records will be collected approximately every 5 years when a site has been active. USACE-SAJ and EPA-R2 will generally conduct these investigations, however the agencies may require surveys to be conducted by permittees (or by the USACE-SAJ), following disposal of large volume projects.

Note: The results of SPI will be used to adjust the Tier 1 model and/or disposal operations, as necessary

Tier 3: Sediment sampling and analysis

In cases where additional information is required to refine the final disposition of discharged dredged materials, it may be required to actually collect sediment samples from within an ODMDS and its vicinity for analysis. Box core sediment samples will be collected from areas of interest inside and/or outside the site. Grain size distribution, percent moisture and total organic content of sediment samples will be analyzed. Tier 3 physical monitoring may be conducted alone or in conjunction with Tier 2/3 chemical (bulk sediment chemistry/body burden analyses) or Tier 3 biological efforts (benthic community analyses). Samples of the sediment will be collected using

appropriate methods to allow for Tier 2 chemical analysis (bulk sediment chemistry). Organisms screened from the sediment will be preserved and archived in a manner that allows Tier 3 biological (benthic community analysis) and/or chemical analyses (body burden analysis).

Frequency: The need for and the areal extent of Tier 3 physical monitoring efforts will be determined by Tier 2 physical and biological evaluations (i.e., SPI). In addition, Tier 2 monitoring may require confirmation/validation using box core samples.

Note: Sediment samples can also be used to assist in the interpretation of SPI imagery through examination of features present in the sample

Special Studies (Physical)

In the event that high resolution of site bathymetry is required, a survey using mid-water multibeam sounding equipment would be conducted at the site. This type of technology is required for obtaining bathymetry at the Puerto Rico ODMDSs because of the great depth of the water. However, owing to the high cost of this type of surveying and the expectation that accretion of deposited sediments will not result in seafloor features (this expectation is based on the results of monitoring of a deep-water dredged material ocean disposal site off San Francisco, CA) it is envisioned that bathymetric surveys of the designated sites in Puerto Rico will not be conducted on a regular basis.

If areas that warrant additional concern are identified in the vicinity of the site, arrays of sediment traps may be deployed along the margins of a site and in the direction of dredged material transport. Sediment traps can determine if significant quantities of dredged material are being transported off a site in the direction of the resource of concern. The traps would have to be deployed for approximately six months of active disposal and would be compared to sedimentation rates at a reference site, i.e. an area that is within the area of influence of hydrographic regimes affecting an ODMDS but that is unaffected by dredged material disposal. It is not envisioned that sediment traps will need to be deployed on a regular basis.

Additional studies and technologies may be used as required to address specific data needs but are not intended for application on a routine basis. Examples include sub-bottom profiling and side scan sonar technologies.

Frequency: As needed

c. Biological Monitoring

The review of 96-hour exposures of sensitive marine organisms to the suspended and liquid phases, and 10-day exposures to the solid phase of dredged material, prior to approval for disposal at any Puerto Rico ODMDS, provides assurances that no acute toxicity is expected to result from disposal of dredged materials at an ODMDS in Puerto Rico. Determination of long-term trends in the

benthic community however will require SPI photography or collection and analysis of benthic samples. SPI photography provides useful information on the abundances, taxa, and successional stage of communities present at a given location without the expense of sampling. Under certain circumstances, actual sampling and analysis of benthic communities in and around an ODMDS may be required.

Tier 1: Review of Testing Results/Monitoring for Sensitive and Fisheries Species Impacts

Toxicity of all project material proposed for ocean disposal will be assessed using sensitive marine organisms and the procedures outlined in the 1991 Green Book and the regional implementation manual governing disposal at Puerto Rico ODMDSs. The results of toxicity tests will be used in conjunction with the STFATE mixing model to ensure that disposal of the project material does not result in violations of the initial mixing requirements following disposal at an ODMDS. By prohibiting materials that show acute toxicity in 10-d tests from disposal at an ODMDS, the first level of assurance that adverse impacts to the benthos or to other marine organisms are not occurring due to the disposal of dredged material is gained. The results of bulk sediment and bioaccumulation tests will be used by USACE-SAJ and EPA-R2 to identify and track impacted zones and direct biological sampling efforts at the higher monitoring tiers. Impacts to sensitive species (e.g. marine mammals, sea turtles, brown pelicans) will be avoided or minimized using on-board observers; disposal will not be allowed to occur in the presence of identified sensitive species. Fisheries issues are re-evaluated for the ODMDSs during each permit/authorization process. (Impacts to fisheries due to disposal operations are not anticipated, however in the event that issues regarding fisheries are raised to the USACE-SAJ and/or EPA-R2, the agencies will consult with resource authorities at NMFS, USFWS and the Commonwealth of Puerto Rico to review the issues in the context of dredged material disposal at the ODMDSs.)

Frequency: Testing and Essential Fish Habitat consultations will be conducted prior to each initial project 103 concurrence. DMIs will accompany each load of material transported for disposal at a Puerto Rico ODMDS.

Tier 2: Sediment profile imagery (SPI)

SPI cameras will be used to identify and describe colonization and succession status of communities inside and outside a site (SPI also serves as Tier 2 physical monitoring). If, based on comparisons with a reference site, areas outside a site appear to be biologically impacted by disposal activities then the areal extent of impact will be considered in the decision to pursue higher tier testing involving box core sampling (Tier 2 Chemical, Tier 3 Physical/ Chemical/ Biological) and may result in conditions placed on permits or contract specifications.

Frequency: SPI records will be collected approximately every five years when a site has been active or if modeling predicts exceedance of site boundary. USACE-SAJ and EPA-R2 will

generally conduct these investigations, however the agencies may require surveys to be conducted by permittees (or by the USACE-SAJ), following disposal of large volume projects.

Tier 3: Benthic sampling and analysis

Tier 3 biological monitoring entails counting and identifying benthic organisms collected with box cores to define the status and health of the benthic community (e.g. species identification, diversity, biomass, trophic status, successional stage). Identification of organisms will be to lowest practicable taxonomic unit. Sampling of benthos will occur in a stratified, random design to allow quantitative analysis of results; the sampling area may include all or part of one or more ODMDS, the surroundings, and a reference area geographically removed from the effect of dredged material disposal.

Frequency: Impacts within a site are expected due to the disturbances caused by disposal events. Impacts outside a site, or an absence of progress in the succession or in colonization of a site for extended periods of time after cessation of disposal, may be cause for concern and therefore prompt more definitive study in higher tiers of investigation (i.e. Tier 3 biological, Tiers 2/3 chemical). These indications would be detected using SPI in Tier 2.

Note: Tier 3 biological monitoring results will also be used to assist in the future interpretation of features present in SPI imagery

Special Studies (Biological)

In the event that concerns regarding local populations of fish or other species (e.g. crustacean macrofauna or sensitive species) are identified, standardized quantitative surveys and/or body burden surveys may be required. These surveys would use appropriate gear for capturing the target species (e.g. benthic sleds or trawls) and again use a reference area for comparisons.

Frequency: As needed

d. Chemical Monitoring

Chemical analyses of sediments and tissues of organisms exposed to the material proposed for ocean disposal enables USACE-SAJ and EPA-R2 to assess the presence, nature and bioavailability of contaminants in dredged material prior to authorizing disposal at an ODMDS in Puerto Rico. Periodic collection and analysis of sediment and resident organism tissue samples from each active ODMDS and its environs will provide USACE-SAJ and EPA-R2 with information necessary to confirm that no unacceptable effects are occurring and to identify long term trends in and around each ODMDS.

Tier 1: Review of ocean disposal testing results

Bulk sediment chemistry (and a measure of its bioavailability through biological tests) of proposed dredged material will be determined using the procedures outlined in the 1991 Green Book and

the regional implementation manual governing disposal at an ODMDS prior to commencement of any disposal of the material at a site.

GPS-based technology will be used to ascertain that loading and disposal of dredged material is occurring at the authorized locations and that material is not being lost en route to a site. Visual inspectors (DMIs) will also be deployed.

Frequency: Conducted with every project.

Tier 2: Bulk sediment chemical analysis

Bulk sediment chemistry will be conducted on surface samples collected from each active ODMDS and its environs. This data will be used to help determine the areal extent and distribution of dredged material and specific contaminants. Depending on site management data needs, the list of contaminants for a given effort may include all contaminants of concern or a few contaminants selected for their usefulness as tracers of dredged material or for their ecological significance. All sediment samples collected for bulk chemistry analysis will also be analyzed for grain size and total organic carbon content (Tier 3 Physical Monitoring). Modeling of the theoretical bioaccumulation potential of non-polar organic contaminants will be used to estimate bioavailability and to determine whether there is a potential for bioaccumulation of these contaminants to unacceptable levels and need for body burden analyses.

Frequency: The need for Tier 2 chemical monitoring will be determined from the results of SPI conducted under Tier 2 biological and physical monitoring. Possible triggers include observations that dredged material appears to have spread significantly outside of a site or if SPI imagery suggests that colonization/succession is not occurring within a site at rates comparable to reference sites. It is anticipated that these analyses will be conducted on the order of every 10 years.

Tier 3: Analysis of body burdens of contaminants in benthic organisms

Conduct tissue chemical analysis of organisms from box core samples collected during Tier 3 Physical/Biological Monitoring. The species selected for body burden analyses will reflect their abundances in collected samples. The substrate in which collected organisms were residing will also be sampled and analyzed [Tier 2 chemical analyses (bulk sediment chemistry) and Tier 3 physical analyses (grain size/TOC/percent moisture)] and tissue lipid levels will be analyzed, to the maximum extent practicable. Ideally, Tier 3 chemical monitoring will also be conducted synoptically with an evaluation of the health of the benthic community (Tier 3, biological monitoring).

Frequency: Tier 3 chemical evaluation will be conducted if TBP modeling using Tier 2 (bulk sediment) chemistry results suggests that there is the potential for unacceptable bioaccumulation of contaminants from the dredged material or if sediment levels exceed reference concentrations by an order of magnitude.

Note: The results of Tier 3 analysis will be used (in conjunction with Tier 2 chemical (bulk sediment chemistry) and Tier 3 physical results (TOC)) to refine the inputs used in future TBP modeling

e. Frequency of Monitoring/Need for Higher Tier Investigations

Monitoring at Tier 1 will be conducted prior to disposal of each authorized project. An anticipated schedule for monitoring is listed in Table 2, however if results indicate the need for further investigations, any required monitoring (Tiers 2 and 3) would be initiated. Specific circumstances that “trigger” advancing to higher tiers of monitoring will be decided by EPA-R2 and the USACE-SAJ, in consultation with the Commonwealth of Puerto Rico and other stakeholders. Existing monitoring data, anticipated or proposed disposals (including the type and quantity of anticipated material), and other relevant factors will be considered to determine appropriate monitoring and management preferences. The actual frequencies and schedules for all jointly funded monitoring will be by mutual agreement of USACE-SAJ and EPA-R2.

f. Monitoring Data Management: Processing, Evaluation and Interpretation

1. Data collected from surveys are to be processed and analyzed by (or as specified by) the USACE-SAJ and EPA-R2 (or their respective contractors). These data are used to make management decisions regarding dredged material disposal operations and permit decisions and must therefore be of reliable quality and in a consistent format.

2. EPA-R2 requires data to be in the National Ocean Data Center (NODC) format, where appropriate. Survey data will be summarized in a report generated by the action agency. The report will indicate how the survey related to the SMMP and to previous surveys. Reports should be provided within 90 days after completion. Exception to the time limit will be possible if outside contracts stipulate a longer period of time. The report will provide data interpretations, conclusions, and recommendations relative to needs and goals of the SMMP.

Data collected will be made available to Federal and Commonwealth agencies and other stakeholders, as appropriate. Reports summarizing data will also be made available.

Table 1: Monitoring Activities and Frequencies for Puerto Rico ODMDs

Tier 1 monitoring activities will be conducted with each authorized project, as noted in text
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Tier 2 - Monitoring Activity	Anticipated Frequency ^a	Triggered by...	Responsible Entity
Physical- SPI photography	5 Yrs	Usage	USACE-SAJ/EPA-R2, or permittee
Biological- SPI photography	5 Yrs	Usage	USACE-SAJ/EPA-R2
Chemical- SJS Sediments	10 Yrs	Tier 2 Physical and Biological	USACE-SAJ/EPA-R2

Tier 3 - Monitoring Activity	Anticipated Frequency ^a	Triggered by...	Responsible Entity
Physical-Sediment Analyses	10 Yrs	Volume, Usage	USACE-SAJ/EPA-R2
Chemical- Benthic Tissue	as needed	Tier 2 Chemical and Biological	USACE-SAJ/EPA-R2
Biological-Community Analysis	as needed	Tier 2 Chemical and Biological	USACE-SAJ/EPA-R2

Special Studies will be performed when deemed necessary to confirm that unacceptable effects are not occurring or to address any identified deficiencies in comprehension of baseline.

^a Listed numbers of years are presented as targets for the anticipated frequency of conducting this monitoring tier. Targets are not intended to be binding and are dependent on site use history. Schedules and frequencies may vary between individual Puerto Rico ODMDs based on differential use and survey histories.

7. SMMP Review and Revision

MPRSA 102 (c)(3)(F) requires that the SMMP include a schedule for review and revision of the SMMP which shall not be reviewed and revised less frequently than 10 years after adoption of the plan, and every 10 years thereafter.

A need for modification of the use of the AS, MS, PS, SJS, or YS because of unacceptable impacts is not anticipated due to the management and monitoring outlined in this SMMP. However, should the results of monitoring surveys indicate that continuing use of any Puerto Rico ODMDs will lead to unacceptable impacts; the SMMP will incorporate further restrictions/revisions to alleviate the impacts. The SMMP will be reviewed annually, in conjunction with monitoring data, by the interagency SMMP team to identify necessary revisions for management of the ODMDs in Puerto Rico.

EPA-R2 and the USACE-SAJ will convene a Scientific Review Panel, consisting predominantly of professionals from the fields of engineering, oceanography, and representatives of governmental resource agencies, as necessary, to review the SMMP and relevant monitoring data. Membership will include qualified representatives from academia, federal agencies, state agencies, public interest groups, port representatives, and consultants. Attendance at meetings will be by invitation only.

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APPENDIX A- USACE TRANSPORTATION AND DISCHARGE LOG

Date:_____ Dredging Contractor:_____

ODMDS (circle one): AS MS PS SJS YS

Project Information

Name and Reach:_____

Permit No. (If applicable):_____

Trip Number: _____

Tug Scow and Dredge Information

Tug _____ Name:_____

Scow _____ Dredge _____

Tug Capt. _____ Scowman _____

Inspector Name:_____

Loading/Pre-Transit Information

Time of Loading Completion (hh:mm:ss):_____

Volume (cubic yards): _____ Percent Rock: _____

Descript.: (e.g., color, water content, type):_____

Scow Draft: Fore (ft): _____ Aft (ft): _____

Scow Condition:_____

Discharge Site Conditions

Wind: Direction _____ Speed _____

Sea State: _____ Wave Height: _____

Visibility _____

Transit/Placement Information

Time of Departure:_____

Marine Mammals/Sea Turtles Sighted (Yes / No)

START - Time (DOORS OPEN):_____

Speed (kts) _____ Bearing _____ Draft (ft., immed. before opening) _____

Latitude (dec. deg.) _____ Longitude (dec. deg.) _____

END -- Time (DOORS CLOSED):_____

Speed (kts) _____ Bearing _____ Draft (immed. after closing) _____

Latitude (dec. deg.) _____ Longitude (dec. deg.) _____

NOTES:____Periodic Draft/Time/Position observations to be recorded here; conclusion as to whether there is evidence of potential leakage recorded here, statement as to which, if any items on Inspector Checklist required reporting/follow up; other observations as necessary

APPENDIX B - DISCHARGE GUIDELINES FOR AN AS, MS, PS, SJS, YS DISPOSAL PROJECT

1. Vessel speeds **must** not exceed 3 knots during discharge, weather and sea conditions permitting.

2. To help ensure proper discharge within the ODMDs, and reduce the need for loaded scows to return to the dredging site, the following discharge protocol **must** be followed:

a) Prior to leaving the dredging site, scows **must** be inspected to ensure correct operation of mechanical features. Scows **must** also be inspected for the presence of any conditions that may cause navigation problems. The scow radio-control system (if used on the project) and scow monitoring systems **must** be inspected for correct operation. If any problems with the scow, radio-control system, or scow monitoring systems are encountered, corrections **must** be made before offshore transport of the scow may proceed. However, when the primary scow monitoring systems (PSMS) are malfunctioning, dredged material may be transported from the dredging site if scow monitoring contractor personnel are onboard, or are communicating with the USACE-SAJ approved DMI to fix/service the equipment. Alternatively, the backup scow monitoring system (BSMS) may be used while problems with the PSMS are being corrected. However, the BSMS is considered to be emergency backup equipment and may only be used on two consecutive trips offshore. The BSMS is not to be used as a long-term backup to the PSMS.

b) Scows **must** be monitored for possible leaks. After leaving the dredging site, the DMI should check the PSMS scow draft count values on a periodic basis and record the draft/time/position observations in the notes section of the transportation and discharge log form (in the notes section) along with a conclusion as to whether there is any evidence of possible leakage. If the counts begin to significantly change during transport, either leakage of dredge material from the scow may be occurring (counts decreasing), or the scow's hull may be taking on water (counts increasing). However, depending on the specific location of a leak, the opposite trend may occur, according to the direction of a list caused by a leak. Scows suspected of leaking **must** be inspected before using the scow again. If any leaks are found, they **must** be repaired prior to using the scow again.

c) Scows **must** be brought to the ODMDs using the DGPS (Differential Global Positioning System) navigation systems of the tugboat and scow. Scow position will be monitored by the PSMS onboard the tugboat. Discharge in ODMDs boundaries will be documented by the DMI using the PSMS while the scow position and draft information are monitored automatically by the PSMS.

d) If the PSMS does not show reliable DGPS coordinates in the vicinity of the ODMDs, the tugboat DGPS and BSMS **must** be used to estimate the scow position during discharge. Length of toelines **must** be estimated and the bearing to the scow from the towing vessel course **must** also be noted at the time of discharge. Tow lengths **must** be less than 200 feet unless ocean/weather conditions require longer lines for safe navigation. The DMI **must** record the following information if this option is used:

1) coordinates of the tug at the start and end of discharge

- 2) estimated length and bearing of tow line (distance from tug stern to scow bow)
- 3) estimate of lateral displacement of scow from target longitude

e) Discharge **must** only occur at the ODMDS when reliable GPS coordinates are displayed by navigation systems onboard the towing vessels or scows being used at the ODMDS.

f) If the PSMS fails after leaving the dredging site, the scow **must** not be used again until a fully operational PSMS is installed. If scow monitoring contractor personnel are onboard, or communicating by telephone with the DMI, to correct problems, or the BSMS is functional, offshore transport may occur. However, the BSMS is considered to be emergency backup to the PSMS, is not to be routinely used for offshore discharge, and may only be used on two consecutive offshore discharge trips.

g) If the PSMS is not functioning properly, discharge **must** occur within the ODMDS only if the scow and towing vessel are both within the ODMDS at the time scow doors are opened.

h) If a situation arises that requires emergency dumping of dredged material outside of the ODMDS, all reasonable efforts to dump outside of navigation channels and into areas deeper than 200 feet **must** be made.

i) If radio communication with the scow is lost, preventing operation of radio-controlled scows, a person **must** board the scow to either fix the problem or operate the scow. Persons must only ride aboard scows certified for passengers by the U.S. Coast Guard. Extreme care must be taken when boarding a scow at sea. Anyone on a scow **must** have at least two working radios. Voice contact, through radio or direct communication, **must** be maintained with the scowman while riding aboard the scow. Scow opening **must** only occur when a direct, voice command has been given to the scowman, or radio communication with radio-controlled scows is maintained. If the radio control system cannot be fixed, the scow **must** be towed to the designated discharge location and manually discharged following steps (d) through (f). If the scow's engine cannot be operated by the radio-control system, and the scow is boarded to attempt to fix the engine, the scow **must** be located at the designated discharge position if the scow's engine is started. Past use of radio-controlled scows revealed that manually starting a scow's engine after a failed radio-controlled engine start could cause the "scow open" command to be completed, causing the scow to dump at the location of engine startup. Any problems with a radio control system **must** be fixed prior to subsequent use of the scow.

3. Voice contact, through radio or direct communication, **must** be maintained with the scowman (if used) for the duration of trips. Scow opening **must** only occur when a direct, voice command has been given to the scowman, or, in the case of radio-controlled scows, direct radio communication with the scow is maintained. A backup radio **must** be onboard all manned scows. Hand signals **must never** be used to direct the scowman regarding scow opening/closing. Radio checks with the scowman **must** be performed prior to departing the dredge site and enroute in the vicinity of the harbor mouth. Manned scows **must not** be transported to the discharge location without at least two working modes of radio communication. Radios **must** have adequate power sources and extra sets of batteries **must** be kept with any battery operated radios. DMIs will note

in their logs the status of radio checks made prior to site departure and enroute to the discharge location, in the comments section of the log form.

4. Scows containing dredged material **must not** be towed from the dredging site for ocean discharge unless all of the following items are present and fully operational aboard the towing vessel:

- Legible copy of the permit or contract specifications, as related to scow loading, transport, and dredged material discharge;
- A legible copy of the Discharge Guidelines and ODMDS boundary coordinates received at the pre-construction meeting, or any additional instructions or guidelines as related to scow loading, transport, and dredged material discharge
- PSMS and BSMS*, including bin level sensor on scow
- DGPS navigation system aboard tug
- Radio-control system for scow operation (if scowman is not used)
- Radio and backup radio system aboard scow (if scowman is used)
- Fathometer aboard tug
- a fully operational fax machine must be onboard the towing vessel for use by the SAJ Inspector within 2 hours of each discharge event at the ODMDS
- an 8" – 12" wide protractor with degrees printed or embossed on the curved surface
- 4" – 8" long dividers for scaling distances off of maps and charts
- scow loading tables for each scow used to transport dredged material
- access to the towing vessel DGPS, fathometer, and radar
- fully operable personal cellphones in possession of each DMI at all times with active phone numbers unique to each phone available for placing and receiving calls at all times
- suitable location for completing paperwork associated with DMI duties
- Full compliance with any other contract or regulatory requirements related to dredged material discharge

* If the PSMS is not functioning properly at the time a scow is ready to be transported from dredging site, the BSMS may be used while the PSMS problems are being corrected.

5. Scows containing dredged material **must not** be towed from the dredging site for ocean discharge unless ocean/weather conditions are forecast to allow safe and accurate discharge of dredged material within the ODMDS.

6. Dredged material **must** never be discharged anywhere outside of the ODMDS boundary except in cases of emergency. Any discharges at outside the boundaries will be investigated for potential enforcement actions.

7. Scow monitoring equipment, discharge guidelines, and other aspects of dredged material discharge at the ODMDS may be changed. Notice of any changes will be provided to the dredging contractor for implementation as soon as practicable.

8. Transportation and discharge log (TDL) forms will be completed electronically or by hand within 30 minutes of discharge at the ODMDS. An electronic copy of the TDL form is to be emailed to EPA-R2 and USACE-SAJ within two hours of scow's return from ODMDS. Printed copies of TDL forms **must** be signed by the DMI after completion of each trip and placed in a file/folder for submission to USACE-SAJ after project completion or when the DMI permanently or temporarily discontinues working on the project.

9. Disposal Inspectors who have been approved by USACE-SAJ (DMIs), but have not previously worked on a New York District or USACE-SAJ (i.e., EPA-R2) dredging project, must be accompanied by scow monitoring contractor personnel, or by a DMI who has been working on the project, during the first two trips the DMI works on the project. DMIs who have previously worked on at least one New York District or USACE-SAJ (i.e., EPA-R2) dredging project, but who have not worked on this project, must be accompanied by scow monitoring contractor personnel during their first trip serving as a DMI on this project.

10. Possible changes in the discharge guidelines may be provided after dredging begins.

11. To help ensure that dredged material is transported and placed at the ODMDS in accordance with the guidelines described above, the attached checklist has been prepared. Items in the checklist **must** be reviewed by the DMI at the dredging site, while underway, and at the ODMDS. Each item that is pertinent to the trip **must** be answered with a "YES" or "NO" answer, along with other information specific to a checklist item. Any item on the checklist that receives a "NO" answer **must** be reported immediately to the USACE-SAJ at NAME OF CONTACT, and a dredging contractor representative not onboard the towing vessel. If the "NO" answer is related to the scow monitoring systems, the scow monitoring contractor **must** also be notified immediately at NAME OF CONTACT. Each discharge trip **must** use a checklist, to be completed by the DMI working aboard the towing vessel. Checklists **must** be signed and dated by the DMI and placed in a file. All original, signed checklists associated with this project **must** be submitted to the USACE-SAJ on a weekly basis for the duration of the project. Checklists **must** be hand delivered or mailed to:

USACE ADDRESS HERE

12. Original copies of TDL forms for each trip to the ODMDS, signed and dated by the DMI on duty during each trip, **must** be submitted to NAME OF CONTACT at the above address at the completion of the project.

13. Switching of tugs once an ocean discharge trip has begun **must not** occur. Towing of any scow loaded with dredged material must be monitored by the scow monitoring equipment/software and documented by a DMI riding aboard the towing vessel.

14. While underway, dredging contractor must adhere to all measures required in Appendix D of this SMMP (i.e., NMFS, Southeast Region Vessel Strike Avoidance Measures and Reporting for Mariners)
15. Upon arrival at the ODMDS, the DMI (dredging inspector) must maintain a watch at all times for marine mammals and sea turtles. Discharge of dredged material may not occur when there is a turtle or mammal present at the site; discharge must not occur until the sighted animal has left the disposal area. Animals may not be harassed in any manner to make them leave the area.
16. Failure to adhere to the specifications discussed in these discharge guidelines may result in revocation of the dredging permit and/or a monetary fine.
17. If there are any questions pertaining to the guidance given in this document, or additional clarification of procedures is needed, please contact either Julia Perzley of the EPA at (212) 637-3798 or Mark Reiss of the EPA at (212) 637-3799.

Appendix C - Inspector Checklist

ODMDS (circle one): AS MS PS SJS YS

DREDGING PROJECT/REACH: _____

TUG NAME: _____ SCOW _____

TRIP NUMBER: _____ DATE _____

INSPECTOR NAME: _____

INSPECTOR SIGNATURE: _____

Answer YES or NO to the following questions. Circle other choices and/or fill in blanks as appropriate. Any item on the checklist that receives a “NO” answer **must** be reported immediately to USACE-SAJ at: POINT OF CONTACT and a dredging contractor representative not onboard the towing vessel. If the “NO” answer is related to the scow monitoring systems, the scow monitoring contractor **must** also be notified immediately at POINT OF CONTACT. Items receiving “NO” answers **must** be indicated on the TDL form using the letter-number code next to each item description and described on the TDL form comments section. A supplemental report **must** be prepared and emailed to USACE-SAJ at POINT OF CONTACT to explain any discrepancies/deviations from the Inspector checklist.

PART A. DREDGING SITE

A1___ A legible copy of the contract specifications, as related to scow loading, transport, and dredged material discharge, is in possession of the DMI.

A2___ A legible copy of the Discharge Guidelines and ODMDS boundary coordinates received at the pre-construction meeting, or any additional instructions or guidelines as related to scow loading, transport, and dredged material discharge, is in possession of the DMI.

A3___ The scow being used to transport the dredged material is mechanically sound, does not leak, and has no visible damage that may cause leaking.

A4___ A regularly used scow was used, no backup scow was used.

A5___ A scow loading table for the scow being towed is aboard the towing vessel and available for the DMI to use.

A6___ The material being dredged has been observed by the DMI for general characteristics (grain size, color, consistency). Majority of material is dry/thick/watery, color:_____, mud/sand/gravel/rock.

A7___ For scows loaded with any rock (rock is defined as any stones greater than 2.5 inches in diameter), the estimated rock percent has been recorded on the TDL form.

A8__ An estimate of the volume of material in the scow has been calculated by the DMI using the scow loading table and recorded on the TDL form.

A9__ Scow contains less volume of dredged material than the maximum volume allowed for discharge during a single trip.

If a scow contains a volume of dredged material greater than the maximum volume allowed for discharge during a single trip, the volume **must** be decreased below the maximum volume before the dredged material can be transported away from the dredge site.

A10__ The scow monitoring systems (PSMS and BSMS) are fully operational and are functioning. Any scow monitoring system malfunctions **must** be reported **immediately** to the scow monitoring contractor POINT OF CONTACT. Transportation vessels are not allowed to leave the dredging site with any dredged material if a PSMS is not fully operational. However, if scow monitoring system contractor personnel are onboard the transporting vessel to service the equipment, or in communication with the DMI via cellphone or radio, the vessel may depart from the dredging site while malfunctions are being repaired/corrected. Alternatively, if the BSMS is functional, the scow may be transported from the dredging site. If the PSMS is not functional, the BSMS may only be used on two consecutive offshore discharge trips.

A11__ The scow draft pressure value, as displayed by the PSMS system, has been recorded on the TDL form.

A12__ A fathometer is fully operational, functioning, and installed on the transporting vessel.

A13__ A radio onboard the transporting vessel is operable and can receive NOAA marine weather forecasts and ocean conditions.

A14__ Current and forecasted marine weather and ocean conditions at the designated discharge location have been monitored on the radio and will allow safe and accurate discharge of dredged material. Winds at a reporting station closest to the discharge location are presently blowing _____ from the _____, with _____ ft seas. Winds forecast for the discharge location are _____ from the _____, with _____ seas.

A15__ DGPS navigation system is fully operational, functioning, and installed aboard the transporting vessel.

A16__ A radar system is fully operational, functioning, and installed aboard the transporting vessel.

A17__ Radio-control system for scow operation (if scowman is not used) is fully operational and functioning.

A18__ Radio and backup radio system, for communication between scows and towing vessels, are aboard scow (if scowman is used), are fully operational and functioning.

A19__ A fully operable cell phone that can send and receive calls is in the possession of the DMI onboard the towing vessel.

A20__ A protractor is available for use by the DMI aboard the towing vessel.

A21__ A compass, for map/chart distance scaling, is available for use by the DMI aboard the towing vessel.

A22__ An up-to-date nautical chart that includes the discharge area is available for use by the DMI.

A23__ DMI is provided full access to fathometer, radar, vessel DGPS, and any other equipment/information necessary to conduct DMI duties.

A24__ Radio and backup radio checks with the scowman's radios have been performed with no problems detected, if a scowman is used.

A25__ Full compliance with any other contract or regulatory requirements related to dredged material discharge has been met.

A26__ Time of departure from dredging site has been recorded on the TDL form.

A27__ All other information relative to the dredging site has been entered into the TDL form.

PART B . ENROUTE TO THE DISCHARGE LOCATION

B1__ In the vicinity of the Harbor mouth, radio and backup radios aboard the scow have been checked to ensure they are both functioning, if a scowman is used.

B2__ Scow draft is being monitored with PSMS.

B3__ If the DMI is also a NMFS-approved marine mammal/endangered species observer, observation and appropriate reporting is conducted.

B4__ Scow draft pressure varies less than 20 points, or 1.5 feet of draft, from the value at the dredge site.

B5__ A gradual increase or decrease in scow draft pressure values (or actual scow draft) is not observed.

B6__ If visible, scow does not appear to be listing.

B7___ Water behind scow has been observed, if possible, to ensure that no turbid water plumes are present.

B8___ Towing vessel DGPS and scow DGPS positions agree using a fixed reference position (channel marker, buoy, etc.)

B9___ Marine weather and sea conditions present and forecast to be present at the discharge location are periodically monitored. An updated marine forecast does not predict conditions that require returning to the dredging site to await safer conditions.

PART C. IN THE VICINITY OF THE DESIGNATED DISCHARGE LOCATION

For discharge at the SJS:

C1___ Scow radio control equipment operates without any problems.

C2___ Discharge occurred in ODMDS boundaries and was coordinated with towing vessel crew.

C3___ Scow draft information immediately prior to scow door opening has been recorded on the TDL form.

C4___ TDL form was completed using the scow monitoring system, or by hand if the scow monitoring system malfunctions, within 30 minutes of scow door opening.

C5___ Scow monitoring equipment, transportation vessel navigation equipment, and all other equipment related to discharge of dredged material worked without any problems.

C6___ All activities associated with discharge of dredged materials appeared to be conducted in a safe manner.

C7___ Nothing occurred that may have resulted in incorrect discharge of dredged material.

C8___ TDL form and any supplemental reports e-mailed to POINT OF CONTACT within 2 hours of scow door, or hopper bin, opening.

C9___ A copy of the TDL form has been electronically signed by the DMI and saved to a file/folder to become part of the permanent record of the trip. A disc containing all the folder and all TDL forms, checklists and supplemental reports and information **must** be submitted to USACE-SAJ when offshore transport of dredged material associated with the project ends, or when the DMI finishes working on the project.

APPENDIX D - Vessel Strike Avoidance Measures and Reporting for Mariners

NOAA Fisheries Service, Southeast Region (Revised September 2008)

Background

The National Marine Fisheries Service (NMFS) has determined that collisions with vessels can injure or kill protected species (e.g., endangered and threatened species, and marine mammals). The following standard measures should be implemented to reduce the risk associated with vessel strikes or disturbance of these protected species to discountable levels. NMFS should be contacted to identify any additional conservation and recovery issues of concern, and to assist in the development of measures that may be necessary.

Protected Species Identification Training

Vessel crews should use an Atlantic and Gulf of Mexico reference guide that helps identify protected species that might be encountered in U.S. waters of the Atlantic Ocean, including the Caribbean Sea, and Gulf of Mexico. Additional training should be provided regarding information and resources available regarding federal laws and regulations for protected species, ship strike information, critical habitat, migratory routes and seasonal abundance, and recent sightings of protected species.

Vessel Strike Avoidance

In order to avoid causing injury or death to marine mammals and sea turtles the following measures should be taken when consistent with safe navigation:

1. Vessel operators and crews should maintain a vigilant watch for marine mammals and sea turtles to avoid striking sighted protected species.
2. When whales are sighted, maintain a distance of 100 yards or greater between the whale and the vessel.
3. When sea turtles or small cetaceans are sighted, attempt to maintain a distance of 50 yards or greater between the animal and the vessel whenever possible.
4. When small cetaceans are sighted while a vessel is underway (e.g., bow-riding), attempt to remain parallel to the animal's course. Avoid excessive speed or abrupt changes in direction until the cetacean has left the area.
5. Reduce vessel speed to 10 knots or less when mother/calf pairs, groups, or large assemblages of cetaceans are observed near an underway vessel, when safety permits. A single cetacean at the surface may indicate the presence of submerged animals in the vicinity; therefore, prudent precautionary measures should always be exercised. The vessel should attempt to route around the animals, maintaining a minimum distance of 100 yards whenever possible.

6. Whales may surface in unpredictable locations or approach slowly moving vessels. When an animal is sighted in the vessel's path or in close proximity to a moving vessel and when safety permits, reduce speed and shift the engine to neutral. Do not engage the engines until the animals are clear of the area.

Additional Requirements for the North Atlantic Right Whale

1. If a sighted whale is believed to be a North Atlantic right whale, federal regulation requires a minimum distance of 500 yards be maintained from the animal (50 CFR 224.103 (c)).

2. Vessels entering North Atlantic right whale critical habitat are required to report into the Mandatory Ship Reporting System.

3. Mariners should check with various communication media for general information regarding avoiding ship strikes and specific information regarding North Atlantic right whale sighting locations. These include NOAA weather radio, U.S. Coast Guard NAVTEX broadcasts, and Notices to Mariners. Commercial mariners calling on United States ports should view the most recent version of the NOAA/USCG produced training CD entitled "A Prudent Mariner's Guide to Right Whale Protection" (contact the NMFS Southeast Region, Protected Resources Division for more information regarding the CD).

4. Injured, dead, or entangled right whales should be immediately reported to the U.S. Coast Guard via VHF Channel 16.

Injured or Dead Protected Species Reporting

Vessel crews should report sightings of any injured or dead protected species immediately, regardless of whether the injury or death is caused by your vessel.

Report marine mammals to the Southeast U.S. Stranding Hotline: 877-433-8299

Report sea turtles to the NMFS Southeast Regional Office: 727-824-5312

Report all species to the Caribbean Stranding Network: 787-399-1900

If the injury or death of a marine mammal was caused by a collision with your vessel, responsible parties should remain available to assist the respective salvage and stranding network as needed. NMFS' Southeast Regional Office should be immediately notified of the strike by email (takereport.nmfs@noaa.gov) using the attached vessel strike reporting form.

For additional information, please contact the Protected Resources Division at:

NOAA Fisheries Service

Southeast Regional Office

263 13th Avenue South

St. Petersburg, FL 33701

Tel: (727) 824-5312

Visit us on the web at <http://sero.nmfs.noaa.gov>

Additional Resources:

Puerto Rico Department of Natural and Environmental Resources (DNER): 787-724-5700

USFWS Caribbean Ecological Services Field Office: 787-851-7297