



US Army Corps  
of Engineers  
Jacksonville  
District



Site Management and Monitoring Plan for the Yabucoa Harbor, Puerto Rico  
Dredged Material Disposal Site

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FINAL

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## 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. For sites designated prior to January 1, 1995, such as the Yabucoa Harbor, Puerto Rico Dredged Material Disposal Site (YS), WRDA provides that SMMPs shall 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.

This document constitutes the WRDA-required SMMP for the final-designated (40 CFR 228.15 (d) (14)) Yabucoa Harbor, Puerto Rico Dredged Material Site (YS); prepared by USEPA Region 2 (EPA-2) and USACE Jacksonville District (USACE-JD). This SMMP identifies a number of actions, provisions, and practices to manage operational aspects of dredging and disposal activities and to perform site monitoring at the YS.

### 1.1 History of the Yabucoa Harbor, Puerto Rico Dredged Material Disposal Site

An interim Ocean Dredged Material Disposal Site for Yabucoa Harbor was designated in 1986 under MPRSA. The May 1988 Final Environmental Impact Statement for the Designation of Ocean Dredged Material Disposal Sites for Arecibo, Mayaguez, Ponce, and Yabucoa, Puerto Rico examined environmental aspects of the interim Yabucoa site and concluded that the present site was better suited for use as a dredged material disposal site. The present site was subsequently designated as a Final Ocean Dredged Material Disposal Site to receive materials from areas of Yabucoa Harbor.

### 1.2. YS Boundaries

The YS is an approximately 1 square nautical mile area located approximately 6 nautical miles east of the entrance to Yabucoa Harbor positioned in a rectangle bounded by the following North Atlantic Datum of 1983 (NAD83) coordinates:

Degrees, Minutes, Seconds	Degrees, Minutes (decimal)
18° 03' 42" N 65° 42' 49" W	18° 03.70' N 65° 42.82' W
18° 03' 42" N 65° 41' 47" W	18° 03.70' N 65° 41.78' W
18° 02' 42" N 65° 41' 47" W	18° 02.70' N 65° 41.78' W
18° 02' 42" N 65° 42' 49" W	18° 02.70' N 65° 42.82' W

### 1.3 Enforcement Activities at the YS

Since the YS was designated, no significant usage of the site has taken place.

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

### 1.4 Transportation and Disposal Methods Used at the YS

Dredged material disposed at the YS may be removed from project areas using hopper, clamshell, or other types of dredges. Although no specific dredging or disposal technique is required for this site, specific disposal instructions or requirements for each dredged material disposal project will be contained in the Department of the Army (DA) permit issued by the USACE-JD or in the contract specifications prepared for federal projects (see Section 10 of this SMMP).

## **2. 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.

### 2.1. 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.

### 2.2. 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. Applicants and USACE are required to use EPA-designated disposal sites to the maximum extent practicable for ocean disposing of dredged material.

## **3. Dredged Material Testing Requirements**

As part of the permitting process, applicants are required to test/characterize all dredged material proposed for disposal at YS 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 4/USACE-JD 1992 (or most recent revision). "Guidance for Performing Tests on Dredged Material proposed for Ocean Disposal" (otherwise known as the Regional Testing Manual).

EPA Region 2 and USACE-JD will prepare a regional implementation manual that provides guidance specific to ocean disposal of dredged material at the YS and other ocean sites in the Caribbean region. Until this guidance manual is prepared and approved, however, the EPA Region 4/USACE-JD (1992) will be used to evaluate the suitability of dredged material proposed for disposal at the YS.

The suitability of dredged material for ocean disposal must be determined by the USACE-JD and concurred with by EPA Region 2 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 Region 2 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.

#### **4. Anticipated YS Use and Quantity of Material to be Disposed**

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.

The following table reports volumes that are anticipated by the USACE-JD for dredging and disposal at the YS in FY03-FY05

<b>Completion Date</b>	<b>Type of Action</b>	<b>Volume (c.y.)</b>	<b>Composition</b>
FY2003	Maintenance/Deepening	1,000,000	silty sand, fines
FY2004	Maintenance/Deepening	250,000	silty sand, fines
FY2005	Maintenance/Deepening	250,000	silty sand, fines

The only source of material that is expected to be placed at the site during the projected period is maintenance/deepening material from areas of Yabucoa Harbor. Materials will consist of variable percentages of silt, clay, and sand. There are no proposed limitations on the quantity of material that may be placed at the site.

## **5. Inter-Agency Coordination**

### 5.1. Transfer of Information

EPA Region 2 and the USACE-JD jointly manage the Yabucoa Harbor dredged material disposal program and the YS. EPA Region 2 and the USACE-JD will continue to coordinate the exchange of information, YS management and monitoring resources, and the documentation of site management decisions. EPA Region 2 and USACE-JD will continue to provide each other with all pertinent data and information as it becomes available. Any information concerning disposal or dredging violations will be shared between the two agencies upon discovery and/or notification of the violations.

This SMMP constitutes an official agreement between EPA Region 2 and USACE-JD to continue to cooperatively manage and monitor the YS and to coordinate the collection and transfer of information pertinent to the management and monitoring of the YS as set forth herein.

### 5.2. Funding of SMMP Tasks and Activities

The costs of site management and monitoring will be shared between EPA Region 2 and the USACE-JD to the extent allowed by funding levels in any given fiscal year (i.e., cost-sharing will be subject to appropriations).

## **6. 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 YS;
- 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 and enforce compliance with ocean disposal permit conditions;
- d. provide a baseline assessment of conditions at the YS;
- e. outline a program for monitoring the YS;
- f. describe special management conditions/practices to be implemented at the YS;
- g. estimate the quantity of material to be disposed at the YS, 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 YS;
- i. provide a schedule for review and revision of the YS SMMP.

## 7. Site Description/Assessment of Baseline Conditions at YS

MPRSA 102 (c)(3)(A) requires that the SMMP include a baseline assessment of conditions at the site. Baseline conditions measured by EPA Region II in 1984 were summarized in the Environmental Impact Statement prepared to support designation of the YS (EPA, 1988). Detailed bathymetry at YS was obtained in November/December 1996. Water column profiles and sediment samples were taken at and around YS in June, 2001. Physical and chemical parameters were measured in the collected YS sediment samples.

### 7.1. Physical, Meteorological and Oceanographic Features of the YS:

- a. Water depths at the YS range between 570 to 885 m. Bottom depths at the northeastern corner are approximately 570 m and slope to approximately 885 m at the southeastern corner (Battelle, 1997).
  
- b. Easterly trade winds predominate at the YS throughout the entire year, 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).
  
- c. The direction and strength of the trade winds influence surface currents at the YS. The trades blow primarily from the northeast. Moderate (15 cm/s) west-southwesterly subsurface currents have been reported between 100 to 500 meters. Water column structure at the YS is expected to be more or less uniform throughout the year. Salinity and temperature data reveal the existence of a well-mixed layer of surface water. The depth of this surface layer varies with season from less than 30 m (April - December) to deeper than 100 m (varies from 100 to 330 ft). 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.
  
- e. Measurements of baseline dissolved oxygen, chlorophyll 'a' and turbidity levels in the water column at the YS 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.

### 7.2 Sediment Composition/Chemistry and Benthos at the YS

- a. *Sedimentary Composition:* The YS is located over the southeastern Puerto Rican slope. Bottom sediments at the YS are relatively heterogeneous: sediments are predominantly fine-grained (i.e. silts and clays) with relatively sandier sediments occurring in the southern, deeper portion of the site. Samples of bottom sediments taken from the site the YS average 30 % sand and 69% silt/clay (PPB Laboratories, 2001).
  
- b. *Sediment Chemistry:* The total organic carbon content (TOC) of YS sediments were low



across the site, ranging from 0.44% to 1.1%. Sediment samples collected in 2001 from within and outside the boundaries of the YS were analyzed for concentrations of trace metals, hydrocarbons and chlorinated organic contaminants (i.e., PCBs and selected pesticides). With the exception of extremely low levels of DDT compounds (<0.4 ppb) and individual PCB congeners (<0.15 ppb), sediments at the YS were essentially free of chlorinated organic contaminants. Polycyclic aromatic hydrocarbon levels were low across the site (<350 ppb). All sediment samples were analyzed for trace metal levels; the results are reported in Table 1. Concentrations of certain metals (chromium, copper, iron, nickel, and zinc) were found to be somewhat elevated at 2 stations within the YS. However, trace metal concentrations at the remaining survey stations were not particularly high and within expected ranges for areas receiving some degree of anthropogenic input. Metals levels did not differ significantly between stations taken inside and outside of YS boundaries.

**Table 1. Ranges of concentrations of selected contaminants in sediment samples taken from 18 stations (28 observations) at the YS and its vicinity (Battelle, 2001).**

Parameter (# of stations, observations)	Unit	Concentration, dry wt.
Total PAHs	ng/g (ppb)	23.8 - 343
Silver	ug/g (ppm)	0.03 - 0.23
Arsenic	ug/g (ppm)	ND (0.03) - 12.3
Cadmium	ug/g (ppm)	0.05 - 0.11
Chromium	ug/g (ppm)	9.91 - 15.6
Copper	ug/g (ppm)	15.6 - 48
Mercury	ug/g (ppm)	0.018 - 0.052
Nickel	ug/g (ppm)	5.21 - 11.0
Lead	ug/g (ppm)	4.38 - 9.02
Zinc	ug/g (ppm)	18.9 - 57.9

c. *Benthic Biota*: Benthic samples taken from the vicinity of the YS yield low but highly variable numbers of taxa and individuals. The benthic community is characteristic of fine-grained bottoms, i.e. the community was dominated by deposit-feeding organisms. Numerically dominant taxa in the study area include polychaetes and other burrowing worms (60 – 80% of taxa), with crustaceans and molluscs (primarily gastropods (snails) and pelecypods (bivalves)) each representing between 10 – 15% of taxa. Echinoderms occasionally occurred in samples. Significant differences in community composition between areas within and

outside the YS were not apparent and the diversity and abundance of organisms were positively correlated with increasing heterogeneity of the bottom sediment (JRB, 1984).

### 7.3. Usage of YS by Fish, Marine Mammals and Endangered Species:

a. *Marine mammals and sensitive species:* The YS does not encompass any known breeding, feeding, or nursery areas of marine mammals, sea turtles or birds. Waters off Yabucoa are regularly visited during the winter months (January-mid-March) by migrating Humpback whales (*Megaptera novaeangliae*). 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. Dolphins are common residents and may be present in waters of the YS at any time. West Indian manatees have been sighted in shallower coastal waters of Puerto Rico.

Four species of sea turtles are also known to inhabit Puerto Rican waters. Juvenile green and hawksbill turtles may be found off the eastern shore of Puerto Rico, associated with rafts of *Sargassum*. Waters of the YS are too deep to provide foraging habitat for adults of green, hawksbill or loggerhead turtles. Leatherback marine turtles approach the east shore of Puerto Rico during their nesting season (March-June) and may be present in offshore waters during this time, but basically spend the rest of their adult lives in the temperate zone. The endangered brown pelican is resident to Puerto Rico, but is primarily present inshore.

b. *Fish:* Open waters of YS 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 YS is not a critical area in this regard. Deep waters of the site may be inhabited by various species having wide depth ranges (e.g. elasmobranchs, conger eels, batfishes) as well as slope species (e.g. grenadiers).

### 7.4. 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. NOAA has indicated that these areas are restricted to areas shallower than 200 feet. The center of the YS is approximately 2.5 nautical miles east and south of the nearest 200 foot areas of the shelf edge (Figure 1). The potential for impacts to shelf edge reef areas will be assessed through physical oceanographic studies and sidescan SONAR mapping as initial monitoring efforts in implementation of this SMMP, before determining any further monitoring or management requirements at the site for protecting shelf edge reef resources.

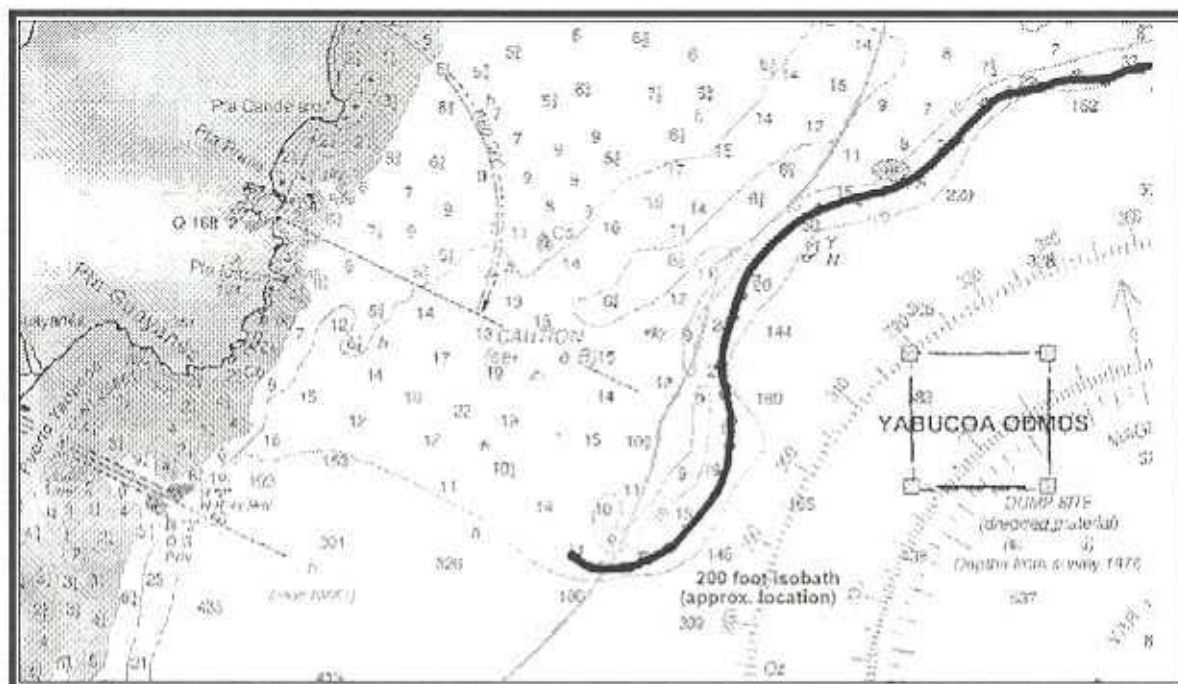


Figure 1. Location of Yabucoa Harbor, Puerto Rico Ocean Dredged Material Disposal Site relative to potential shelf edge reef resources. The 200 foot depth contour lies approx. 2.5 nautical miles west and north of the center of the Yabucoa site.

## 8. YS 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.

EPA Region 2/USACE-JD have developed a tiered monitoring approach to investigate the physical, biological, and chemical impacts of ocean disposal of dredged material at sites in the Caribbean. EPA Region 2/USACE-JD's Ocean Disposal Site Monitoring Program (MP) addresses both regulatory and technical issues associated with the disposal of dredged material at the YS. 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 under the YS 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 proportionate to volume of disposal, as necessary. Specific monitoring activities may also be required for individual projects.

### 8.1 Goals of the YS MP

The YS MP will focus on the overall impacts of dredged material on the entire YS and surrounding area. In addition to addressing the Null Hypotheses ( $H_0$ ) (see Section 8.2), the

overall goals of the YSMP are to:

- a. verify that dredged material disposed at the YS does not cause any unacceptable impacts.
- b. assess and monitor (trends) conditions at the YS as defined in 40 CFR Section 228.10, and compare them to baseline data.

8.2 Questions/Null Hypotheses ( $H_0$ ) to be addressed by the YS MP:

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

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$H_{01}$ : Dredged material disposal operations are consistent with the requirements of the ocean dumping permits.

Actions:

- Utilize the USACE-certified disposal inspector (ship rider) reports and information submitted by permittees to determine compliance.
  - Require GPS-based automated disposal surveillance systems on all disposal scows at the YS.
  - Conduct independent surveillance of disposal operations
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$H_{02}$ : Dredged material disposal operations are not causing unacceptable impacts (physical, chemical, and biological) at the YS and surrounding area.

Actions:

- Conduct sediment profile imagery surveys (Tier 2) at the YS and surrounding area.
  - Conduct benthic community structure, sediment chemistry and body burden analyses within the YS when deemed necessary based on results of Tier 2 physical and biological efforts
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$H_{03}$ : Dredged material disposal has no significant impact on endangered species.

Actions:

- Review USACE-certified disposal inspector 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 YS and Yabucoa Harbor vicinity.
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$H_{04}$ : Dredged material disposal does not significantly alter the benthic community structure of the area of the YS.

Actions:

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

## 9. Monitoring Activities/Techniques

### *9.1 Work/Quality Assurance Plan*

The YS MP consists of a three-tiered approach to monitor the physical, chemical and biological effects of dredged material disposed at the YS, the components of these tiers are outlined below in Sections 9.2 to 9.4. 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 the YS. 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-JD and EPA Region 2.

Monitoring and sampling will occur in a stratified, random design to allow quantitative analysis of results; the sampling area may include all or part of the YS, the surroundings and a reference area geographically removed from the effect of dredged material disposal at the YS. W/QAPPs must reflect the design selected by the Agencies for the monitoring tasks.

### *9.2 Physical Monitoring*

Physical monitoring is designed to determine the physical nature and distribution of dredged material during and after disposal at the YS and environs. Measurements of the physical nature of the material proposed for disposal at the YS will 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 YS.

#### *a. 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 the site. 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 disposal at the YS.

Disposals will be modeled using available computer models (e.g., MDFATE and/or 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 the YS.

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-certified disposal inspectors (ship riders) will accompany all scows and hopper dredges disposing at the YS.

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 YS.

*b. 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 the YS to define the footprint of dredged material within and around the site. Sampling locations will be determined jointly by EPA Region 2 and USACE-JD prior to the surveys. Because SPI has not yet been conducted at the site, the optimal length and spacing of radial transects will be determined from the first survey. 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 the site has been active or if modeling predicts exceedance of site boundary. USACE-JD and EPA Region 2 will generally conduct these investigations, however the agencies may require surveys to be conducted by permittees (or by the USACE-JD), 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\*\*\*

*c. 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 the YS 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\*\*\*

*d. 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 YS because of the great depth of the water

In the event that areas that warrant additional concern are identified in the vicinity of the site, arrays of sediment traps may be deployed along the margins of the site and in the direction of dredged material transport. Sediment traps can determine if significant quantities of dredged material are being transported off the 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 the YS 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

9.3. Biological Monitoring

The review of 96-h exposures of sensitive marine organisms to the suspended and liquid phases, and 10-d exposures to the solid phase of dredged material, prior to approval for disposal at YS, provides assurances that no acute toxicity is expected to result from disposal of dredged materials at the YS. 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 the YS may be required.

*a. 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 the YS. 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 the YS. By prohibiting materials that show acute toxicity in 10-d tests from disposal at the YS, the first level of assurance that unacceptable impacts to the benthos or to other marine organisms are not occurring due to the disposal of dredged material is gained.

Impacts to sensitive species (e.g. marine mammals, sea turtles, brown pelicans) will be avoided or minimized through the use of on board observers; disposal will not be allowed to occur in the presence of identified sensitive species. Fisheries issues are re-evaluated for the

YS during each permit/authorization process. (Impacts to fisheries due to disposal operations are not anticipated. In the event that issues regarding fisheries are raised to the USACE-JD and/or EPA Region 2, 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 YS.)

Frequency: Testing and Essential Fish Habitat consultations will be conducted prior to each initial project 103 concurrence. On board disposal inspectors will accompany with each load of material transported for disposal at YS.

*b. Tier 2: Sediment profile imagery (SPI):*

SPI cameras will be used to identify and describe colonization and succession status of communities inside and outside site (SPI also serves as Tier 2 physical monitoring). If, based on comparisons with a reference site, areas outside the 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 5 years when the site has been active or if modeling predicts exceedance of site boundary. USACE-JD and EPA Region 2 will generally conduct these investigations, however the agencies may require surveys to be conducted by permittees (or by the USACE-JD), following disposal of large volume projects.

*c. 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.

Frequency: Impacts within the site are expected due to the disturbances caused by disposal events. Impacts outside the site, or an absence of progress in the succession or in colonization of the 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\*\*\*

*d. 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

#### *9.4. Chemical Monitoring*

Chemical analyses of sediments and tissues of organisms exposed to the material proposed for ocean disposal enables USACE-JD and EPA Region 2 to assess the presence, nature and bioavailability of contaminants in dredged material prior to authorizing disposal at the YS. Periodic collection and analysis of sediment and resident organism tissue samples from the YS and its environs will provide USACE-JD and EPA Region 2 with information necessary to confirm that no unacceptable effects are occurring and to identify long term trends in and around the YS.

##### *a. 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 the YS prior to commencement of any disposal of the material at the 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 the site. Visual inspectors will also be deployed.

Frequency: Conducted with every project.

##### *b. Tier 2: Bulk sediment chemical analysis:*

Bulk sediment chemistry will be conducted on surface samples collected from the YS 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 the site or if SPI imagery suggests that colonization/succession is not occurring at rates comparable to reference sites. It is anticipated that these analyses will be conducted on the order of every 10 years.

*c. 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\*\*\*

*9.5 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 Region 2 and the USACE-JD, with the assistance of an interagency SMMP team consisting of representatives of EPA Region 2, USACE-JD, the Commonwealth of Puerto Rico and other stakeholders. The SMMP team will evaluate existing monitoring data, anticipated or proposed disposals (including consideration of the type and quantity of anticipated material), and other relevant factors to determine appropriate monitoring and management preferences. The actual frequencies and schedules for all jointly funded monitoring will be by mutual agreement of USACE-JD and EPA Region 2.

*9.6. Monitoring Data Management: Processing, Evaluation and Interpretation*

a. Data collected from YS surveys are to be processed and analyzed by (or as specified by) the USACE-JD, EPA Region 2 (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.

b. EPA Region 2 requires data to be in the National Ocean Data Center (NODC) format, where appropriate. Survey data will be provided to members of the SMMP team in a report generated by the action agency. The report will indicate how the survey related to the SMMP and to previous YS 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, and will identify needs and

projected goals of the next phase of the SMMP.

c. 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 2: YS Monitoring Activities and Frequencies**

**Tier 1** monitoring activities will be conducted with each authorized project, as noted in text

Tier 2 - Monitoring Activity	Anticipated Frequency <sup>a</sup>	Triggered by...	Responsible Entity
Physical- SPI photography	5 Yrs	Usage	USACE-JD/EPA Region 2, or permittee
Biological- SPI photography	5 Yrs	Usage	USACE-JD/EPA Region 2
Chemical- YS Sediments	10 Yrs	Tier 2 Physical and Biological	USACE-JD/EPA Region 2

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

**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.

<sup>a</sup> Listed 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.

## **10. YS 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.

At present, no disposal restrictions related to seasonal variations in ocean current or biotic activity have been determined to be necessary for YS disposal. 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.

### 10.1. Regulatory Framework: Permit Conditions

Disposal of dredged material at ocean disposal sites cannot occur without a Department of the Army (DA) permit (or without the MPRSA Section 103 (e) equivalent for Federal projects). DA permits for disposal of dredged material at the YS are issued by USACE-JD and are valid for a period of three years. Copies of the issued permits and any letters modifying these permits may be obtained from the USACE-JD.

In cases where permits are not issued, as is the case with Federal navigation projects, requirements similar to permit conditions will be incorporated into the 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 all projects. These conditions are equivalent to permit conditions and will be enforceable on the contractor under applicable law.

*a) General Conditions:* General permit restrictions consist generally of standard maritime industry and U.S. Coast Guard requirements.

*b) 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:

- Seasonal restrictions or special conditions regarding dredging and disposal (assigned on a case by case basis);

- Requirements for submission and format requirements of monthly transportation and disposal logs and volume summary sheets.

### 10.2. Violation/Enforcement Cases

a. Dredging or disposal at the YS is to occur only with prior USACE-JD approval and EPA Region 2 concurrence. Projects not in compliance with the DA permit will be subject to enforcement action.

b. If any action takes place which does not conform to authorized dredging and disposal activities described in the permit (contract specification/work order for Federal projects), reauthorization, response letter, or other communicated requirements/restrictions, the Antilles Regulatory Section of the USACE-JD must be notified immediately. In cases where activities beyond the scope of those authorized occur, appropriate action will be determined by the Antilles Regulatory Section, in coordination with EPA Region 2.

c. If dredged material regulated by a specific DA permit issued by the USACE-JD or Federal authorization is discharged due to an emergency situation in order to safeguard life or property at sea in locations or in a manner not in accordance with the terms or conditions of the permit or authorization, the master/operator of the towing vessel and/or the USACE-certified disposal inspector shall immediately notify the USACE-JD by marine VHF or cellular telephone, as required by permit. The USACE-JD shall copy EPA Region 2 on such notification the next business day. In addition, both the towing contractor and the USACE-certified disposal inspector shall make a full report of the incident to the USACE-JD and EPA Region 2 within ten (10) days. The report should contain factual statements detailing the events of the emergency and an explanation of the actions that were ultimately taken.

### 10.3. Site Inspection/Surveillance

a. To ensure compliance with the DA permit conditions and Federal authorization, routine observations of dredging activities in the Yabucoa Harbor area are performed by the USACE-JD.

b. USACE-JD and EPA Region 2 (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.

c. 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 will 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.

## 11. Disposal Reporting Requirements and Data Management

### 11.1. USCG Reporting Requirements:

The dredging/towing contractor must notify the Captain of the Port (COTP) of Yabucoa/USCG for a reference number before each vessel departs the dredging site for the YS. 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.

### 11.2. Record Keeping/Documentation/Data Reporting:

a. Navigation logs will be maintained for each vessel (tugboat/barge) utilized for ocean disposal of dredged material. These logs should include the method of positioning (e.g. RADAR, LORAN-C, GPS, D-GPS, Dead Reckoning, other), accuracy, calibration methods, any problems and actions taken. EPA Region 2 and the USACE-JD recommend that each tugboat/barge utilized for the ocean disposal of dredged material utilize D-GPS for navigation purposes.

b. Disposal logs must be maintained for each vessel that includes all information listed below. The user of the YS will be required to prepare and submit to the USACE-JD daily reports of operations and a monthly report of operations for each month or partial month's work.

Daily reports must include the following data:

(i) Date/Time;

(ii) Vessel name;

(iii) Dump number;

(iv) Map number on which dump is plotted;

(v) Beginning and ending coordinates of the dredging area for each load, and the beginning and ending coordinates and the compass heading at the beginning of each dump;

(vi) Shoal number from which dredged material came; and

(vii) volume and brief description of material disposed.

c. 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 the YS. Surveillance data is to be submitted to the Agencies on a weekly basis in both electronic and hard copy formats. Vessel draft readings must be clearly depicted; superimposed on a figure that includes the dredging area, adjacent shorelines, and YS boundaries.

### 11.3 Federal YS Data Management and Reporting:

A spreadsheet file containing contractor-reported scow volumes information is maintained by the USACE-JD. 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-JD will compile all dredging, disposal and testing data and submit them to USACE Headquarters.

All dredged material disposal data submitted to USACE-JD will be compiled, analyzed and evaluated in a final end-of-the-year report that will be provided to EPA Region 2 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-JD contains information pertaining to the following:

- Permit/Federal Project number
- Permittee or Federal Project name
- Waterway/Reach/Channel
- Was the project maintenance or improvement?
- 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 the YS, noted separately and collectively

### **12. YS 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 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 the YS will lead to unacceptable impacts, then the YS 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 YS.

### 13. References

Battelle (Battelle Ocean Sciences). 1997. Survey Report for Oceanographic Survey of the Five Puerto Rico Dredged Material Ocean Disposal Sites. Report prepared under Contract to U.S. Environmental Protection Agency, HQ and Region 2. Contract No.68-C2-0134, Work Assignment #4-353. May 1997.

Battelle (Battelle Ocean Sciences). 2001. Analytical Chemistry Data Package. Report prepared under Contract to U.S. Army Corps of Engineers New York District for USACE – Jacksonville District. Project No. G004190-0006. October 2001.

EPA. 1982. Environmental Impact Statement (EIS) for the San Juan Harbor, Puerto Rico Dredged Material Disposal Site Designation. Prepared by EPA, HQ. December 1982.

EPA. 1988. Final Environmental Impact Statement (FEIS) for the Designation of Ocean Dredged Material Disposal Sites for Arecibo, Mayaguez, Ponce, and Yabucoa, Puerto Rico. Prepared by EPA, HQ. May 1988.

JRB Associates. 1984. Studies and Sample Analyses For Yabucoa, Puerto Rico Dredged Material Disposal Site. Report prepared under contract to U.S. Environmental Protection Agency, HQ. Contract No. 68-0106388, Work Assignment #63. September 1984.

PPB Laboratories. 2001. Final Report for Yabucoa Ocean Disposal Site, Puerto Rico. Report prepared under Contract to U.S. Army Corps of Engineers Jacksonville District. Contract DACW17-97-D-0001, Delivery Order #0072. July 2001.



## **Appendix A: Public Comment and Subsequent Revision to Draft SMMP**

On May 14, 2002, a copy of the draft SMMP for the YS (or a notice of its availability) was mailed to 122 regional stakeholders for review and comment. In addition to these mailings, a notice of availability of this document for public review was published in *El Vocero* and *El Oriental* on May 14 and 15, 2002 (respectively) and a copy of the draft SMMP was posted on the USACE-JD website.

Written comments were received from the Southeast Regional Office of the National Marine Fisheries Service (NMFS) in a letter dated June 11, 2002 (copy attached as Appendix A-1). In this letter, NMFS indicated that the YS was located near the shelf edge reef system, identified as Essential Fish Habitat (EFH) by the Caribbean Fishery Management Council and NMFS for federally-managed species and provided recommendations for an assessment of potential impacts to EFH. USACE-JD and EPA consulted with NMFS via telephone and email culminating in specific monitoring commitments communicated to NMFS in an October 15, 2002 letter (copy attached as Appendix A-2). In a follow up telephone conversation between Mark Reiss (EPA) and Dr. Lisamarie Carruba (NMFS), NMFS indicated that the monitoring satisfied their concerns.

Written comments were also received from the Office of the Governor of Puerto Rico Environmental Quality Board (EQB) in a letter dated August 30, 2002 (Appendix A-3). USACE-JD responded to these concerns in a letter dated September 26, 2002 (Appendix A-4). At an October, 10, 2002 meeting, EQB indicated that the letter and the monitoring commitments outlined in the October 15, 2002 letter to NMFS satisfied their concerns (Appendix A-5).

No other comments were received in response to the draft SMMP.

**With the exception of the inclusion of this Appendix, the only changes made to the draft SMMP as a result of the public review process, were the addition of Section 7-4 entitled "Shelf Edge Resources" and updating of completion dates listed in the table in Section 4.**



UNITED STATES DEPARTMENT OF COMMERCE  
 National Oceanic and Atmospheric Administration  
 NATIONAL MARINE FISHERIES SERVICE  
 Southeast Regional Office  
 9721 Executive Center Drive N.  
 St. Petersburg, Florida 33702  
 (727) 570-5317, FAX 570-5300

June 11, 2002

James C. Duck  
 Chief, Planning Division  
 U.S. Army Corps of Engineers  
 Jacksonville District  
 PO Box 4970  
 Jacksonville, FL 32232-0019

Dear Mr. Duck:

The National Marine Fisheries Service (NMFS) has received your letter of May 10, 2002, which transmitted a copy of the Draft Site Management and Monitoring Plan (SMMP) for the Yabucoa Harbor, Puerto Rico, Dredged Material Disposal Site. The U.S. Environmental Protection Agency (EPA) Region 2 and the U.S. Army Corps of Engineers (COE) Jacksonville District are soliciting comments on the draft SMMP that will be used to create a final version of the plan.

Shell Chemical Yabucoa (Shell) is currently in the process of refurbishing the refinery and associated facilities in Yabucoa as part of a new operation at the facility. The area has been relatively inactive for some time and Shell requires that the harbor be dredged and a dock constructed along the northeastern side of the harbor to allow for the increase in vessel traffic associated with renewed operations. Shell's plans for the area were presented at the Caribbean Regional Response Team Meeting on May 1, 2002, in St. Croix, U.S. Virgin Islands. From 2002 to 2004, it is anticipated that 1,500,000 cubic yards of silty sand and fines will be dredged from the Yabucoa Harbor and deposited in the offshore disposal site.

The National Ocean Service (NOS) benthic maps identify macroalgal plains, extensive coral reefs, and seagrass beds fringing the navigation channel in the area of the harbor. Although water quality conditions did not allow a determination of benthic habitat in the center of the harbor, macroalgal plains were identified as fringing the shoreline. Therefore, dredging activities within the harbor and navigation channel could adversely affect macroalgae, seagrass beds, and nearshore coral reefs, which are identified as Essential Fish Habitat (EFH) in the 1998 Amendment to the Fishery Management Plans (FMP) prepared by the Caribbean Fishery Management Council (CFMC) for queen conch, spiny lobster, corals, and rockfish, and in the FMP for sharks prepared by the NMFS. In addition, the CFMC has identified seagrass beds and nearshore reefs as being EFH Habitat Areas of Particular Concern (HAPC). HAPCs are subsets of EFH that are rare, particularly susceptible to human-induced degradation, ecologically important, or located in an environmentally stressed area. The project area supports hard and soft corals; juvenile and adult spiny lobster, queen conch, yellowtail snapper, and coney; and adult bonded butterflyfish and squirrelfish.



The designated SMMP is located outside the shelf edge at water depths ranging between 1,870 and 2,900 feet. However, the site is near the shelf edge reef system, designated as EFH, and may be within territorial waters designated as part of the Vieques Bay Natural Reserve managed by the Puerto Rico Department of Natural and Environmental Resources, Division of Natural Reserves and Wildlife Refuges. Federally-managed species which utilize the EFH provided by shelf edge reefs and associated benthic habitats include various life stages of red grouper, Nassau grouper, spiny lobster, blackfin snapper, and vermilion snapper, as well as highly migratory species managed by the NMFS such as blue marlin, sharks, and tunas. The potential transport of sediment from the designated disposal site during dumping activities is of concern to the NMFS due to the proximity of extensive shelf edge reefs. Secondary impacts associated with sedimentation of reefal habitats could destroy benthic resources, degrade the overall quality of EFH, and impact the production of Federally managed fisheries dependent on those habitats.

We find that the SMMP failed to provide an EFH assessment as required by regulation at 50 CFR 600.920(e). However, based on our review of the Draft SMMP, the NMFS believes that measures to conserve EFH and associated fisheries are appropriate and necessary if the dredging of Yabucoa Harbor and the associated offshore disposal of dredged material are to be authorized. Accordingly, in keeping with the requirements of §305(b)(4)(A) of the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA), we offer the following:

#### EFH Conservation Recommendations

1. The location of the offshore disposal site in relation to the shelf edge reef shall be clearly identified in the SMMP as shall management practices to be implemented to avoid impacts to these habitats due to transport of sediments and contaminants from the disposal site both during and after each disposal event.
2. Where surface and bottom current measurements indicate that the transport direction from the disposal site may be toward the shelf edge, monitoring of the effects of dredged material transport on shelf edge reef EFH shall be included in the SMMP to ensure that dredged material disposal is not adversely affecting fishery resources.

Please be advised that Section 305(b)(4)(B) of the MSFCMA and NMFS's implementing regulation at 50 CFR Section 600.920(k) require your office to provide a written response to this letter within 30 days of its receipt. If it is not possible to provide a substantive response within 30 days, the EPA should provide an interim response to the NMFS, to be followed by the detailed response at least 10 days prior to final approval of the actions. Your response must include a description of measures proposed by EPA to avoid, mitigate, or offset the adverse impacts of the activity. If your response is inconsistent with our EFH Conservation Recommendations, you must provide a substantive discussion justifying the reasons for not implementing those recommendations.

Lastly, prior to dredging within the Yabucoa Harbor, an EFH consultation must be completed pursuant to the requirements of the MSFCMA. To initiate that consultation, an EFH assessment must be prepared which identifies the proposed activities, anticipated impacts to EFH, measures to

avoid or minimize adverse impacts, and plans to compensate for unavoidable impacts to EFH. NMFS may provide conservation recommendations on the dredging activities if warranted by the results of the EFH consultation.

Thank you for the opportunity to provide comments on Draft SMMP for the Yabucoa Harbor dredged material disposal site. Questions related to the project and marine fishery resource issues should be directed to Dr. Lisamarie Carrubba at 787/851-3700.

Sincerely,

A handwritten signature in cursive script, appearing to read "Andreas Mager, Jr.", written in dark ink.

Andreas Mager, Jr.  
Assistant Regional Administrator  
Habitat Conservation Division



OCT 15 2002

Andreas Mager, Jr.  
Assistant Regional Administrator  
Habitat Conservation Division  
National Marine Fisheries Service  
Southeast Regional Office  
9721 Executive Center Drive N.  
St. Petersburg, Florida 33702

Dear Mr. Mager,

This letter is in reply to your letter of June 11, 2002 transmitting your Essential Fish Habitat (EFH) conservation recommendations under Section 305 (b) (4) (B) of the Magnuson-Stevens Fishery Conservation and Management Act associated with the draft Site Monitoring and Management Plan (SMMP) for the Yabucoa Harbor, Puerto Rico Ocean Dredged Material Disposal Site (Yabucoa ODMDS). Specifically, your office recommended the following:

1. The location of the offshore disposal site in relation to the shelf edge reef shall be clearly identified in the SMMP as shall management practices to be implemented to avoid impacts to these habitats due to transport of sediments and contaminants from the disposal site both during and after each disposal event; and
2. Where surface and bottom current measurements indicate that transport direction from the disposal site may be toward the shelf edge, monitoring of the effects of dredged material transport on shelf edge reef EFH shall be included in the SMMP to ensure that dredged material disposal is not adversely affecting fishery resources.

The Yabucoa ODMDS is a 1 nautical mile x 1 nautical mile square area of ocean located approximately 6 miles east of the entrance to Yabucoa Harbor. Coordinates for the four corners of the site are listed on page 4 of the draft SMMP. Water depths at the site slope from 570 meters in the northwest corner across the site to 885 meters in the southeast corner. In follow up conversations, Dr. Lisamarie Carrubba of your Lajas office indicated that the shelf reef edge could safely be considered to be restricted to areas with water depths  $\leq 200$  feet.

USACE and EPA will include a section discussing the shelf edge reef resource and a figure in the SMMP that depicts the location of the Yabucoa ODMDS on a NOAA navigational chart of the Yabucoa area. A copy of the proposed section and figure is enclosed herein. The nearest shelf edge reef boundaries (i.e., 200 ft depths) are approximately 2.5 nm west and north of the center of the Yabucoa ODMDS. These boundaries are shown on the figure.

Management options for controlling dispersal of material during disposal operations are extremely limited for deep water sites, such as the Yabucoa ODMDS. The draft SMMP requires disposal events to be monitored using an automated GPS-based surveillance system to ensure that materials are in fact disposed at the site. This will enable USACE and EPA to identify and rectify

any violations (i.e., missed dumps, accidental discharges, or leakage) that might have the potential to impact any shelf reef resources.

USACE and EPA will examine potential transit routes from Yabucoa Harbor entrance to the Yabucoa ODMDS to determine whether there may be preferred routes for laden barges and dredges to minimize impacts to shelf and shelf edge reef resources by avoiding any especially productive reef areas on the shelf and the shelf edge. This study would be conducted using side scan Sonar technology and identified targets would be verified to the extent possible through deployment of divers and/or ROVs. However, please be aware that any decisions made regarding preferred routing will also need to be informed by considerations regarding navigational safety and economic and operational impacts.

We have examined the boundaries of the disposal site relative to the 200 foot (61 m) isobath and available physical oceanographic data for the area. We offer the following substantive responses to your concerns regarding the potential for transport onto and effects to shelf edge reef resources.

Owing to the great depth of the site (>570 m), we anticipate that near bottom currents will be weak and extremely unlikely to re-suspend disposed sediments after they reach the bottom. However, even in the event that bottom currents can re-suspend sediments, we do not believe that they would be transported into the comparatively shallow depths that are associated with the shelf edge reef because of the depth of the site.

It is also unclear to what extent sediments disposed at the Yabucoa ODMDS will actually remain suspended in the surface waters to be available for transport to reef areas. Modeling of deep ocean disposals of dredged sediments at the San Juan Harbor Ocean Dredged Material Disposal Site suggests that the vast majority of sediment that is disposed is jetted below the pycnocline immediately following release from the barge and that the resultant plume is largely confined to deep water and is rapidly diluted.

Available information regarding near surface (50 m) currents was obtained for a location in the general vicinity of the Yabucoa ODMDS (i.e., off Punta Tuna approximately 10.6 nm southwest of the Yabucoa ODMDS). Current direction at this location was variable over the three day period for which the record exists but did show some general tendency for transport in a northeasterly direction at velocities between 1-2 nautical miles/hour (knots).

While this data suggests that prevailing currents at the Yabucoa ODMDS may not be directed toward the direction of the shelf edge reef resource, it is impossible to ascertain this without physical oceanographic information collected at the site itself. Current data collected at Punta Tuna reflect the geometry and topography of that specific area and may not be representative of the Yabucoa ODMDS.

It appears that better data is necessary before we may conclude whether disposal activities at the site have the potential to impact the shelf reef resource identified as Essential Fish Habitat by your office. USACE and EPA propose to conduct the following monitoring to improve our understanding of the potential for impacts to the shelf edge reef:

- 1) Perform a side scan SONAR mapping project of potential shelf edge reef areas (water depths  $\leq 200$  ft) in the general vicinity of the site to determine if and where there may indeed be significant coral resources near the Yabucoa ODMDS. Use divers and/or ROVs to verify species composition of targets identified using SONAR;

- 2) Obtain a better description of current direction and magnitude at the Yabucoa ODMDS site and assess the seasonal (and other) variability in circulation. ADCP technology is anticipated for this effort;
- 3) Perform a side scan SONAR mapping of potential transit routes from Yabucoa Harbor entrance to the Yabucoa ODMDS to determine whether there may be preferred routes for laden barges and dredges to avoid any especially productive reef areas on the shelf and the shelf edge.

With this information, our respective Agencies will be in a better position to assess the potential for transport in the direction to reef resources or to better define studies or modeling to assess whether impacts to the reefs may be anticipated from disposal activities at the Yabucoa site. The draft SMMP contemplates that special studies may be necessary to address specific concerns – therefore, we believe that any follow up studies that may be deemed necessary by our Agencies are provided for in the existing document.

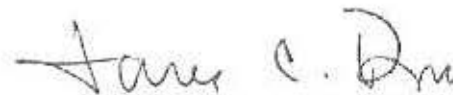
Please indicate in writing any further EFH concerns that you may have that would preclude our finalization of the plan for management and monitoring of the Yabucoa ODMDS. Please note that EFH assessments will be prepared and coordinated with your office for any individual project that is proposed for disposal at the Yabucoa ODMDS.

If you have any questions please do not hesitate to have your staff contact Mr. Mark Reiss of EPA Region 2's Dredged Material Management Team at (212) 637-3799 or Mr. Ivan Acosta of the USACE-Jacksonville District's Planning Division at (904)232-1693.

Sincerely,



Ronald Borsellino  
Deputy Director,  
Division of Environmental Planning and Protection  
U.S. Environmental Protection Agency, Region 2



James C. Duck  
Chief, Planning Division  
U.S. Army Corps of Engineers,  
Jacksonville District

#### 7.4. 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. NOAA has indicated that these areas are restricted to areas shallower than 200 feet. The center of the YS is approximately 2.5 nautical miles east and south of the nearest 200 foot areas of the shelf edge (Figure 1). The potential for impacts to shelf edge reef areas will be assessed through physical oceanographic studies and sidescan SONAR mapping as initial monitoring efforts in implementation of this SMMP, before determining any further monitoring or management requirements at the site for protecting shelf edge reef resources.

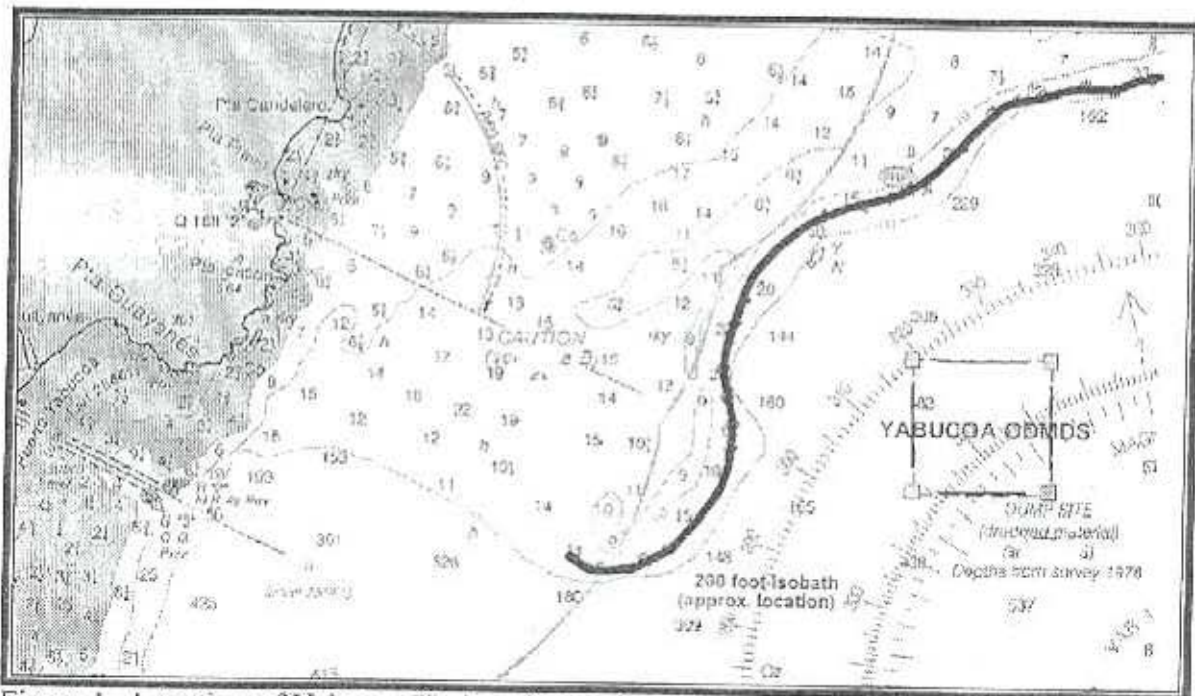


Figure 1. Location of Yabucoa Harbor, Puerto Rico Ocean Dredged Material Disposal Site relative to potential shelf edge reef resources. The 200 foot depth contour lies approx. 2.5 nautical miles west and north of the center of the Yabucoa site.





**UNITED STATES DEPARTMENT OF COMMERCE**  
**National Oceanic and Atmospheric Administration**  
 NATIONAL MARINE FISHERIES SERVICE  
 Southeast Regional Office  
 9721 Executive Center Drive N.  
 St. Petersburg, Florida 33702  
 (727) 570-5317, FAX 570-5300

October 23, 2002 F/SER4:LC

Ronald Borselino  
 Deputy Director  
 Division of Environmental Planning and Protection  
 U.S. Environmental Protection Agency, Region 2  
 290 Broadway  
 New York, NY 10007-1866

Dear Mr. Borselino:

The National Marine Fisheries Service (NMFS) has reviewed your letter dated October 15, 2002, in response to our June 11, 2002, letter on the draft Site Monitoring and Management Plan for the Yabucoa Harbor, Puerto Rico Ocean Dredged Material Disposal Site.

You propose to conduct a series of monitoring studies to determine how best to address NMFS's concerns and Essential Fish Habitat (EFH) Conservation Recommendations. We concur with the need for studies to gather data related to current movement and locations of NMFS trust resources in relation to the disposal site and marine traffic routes. However, we are concerned that the proposed studies are limited to the shelf edge. Therefore, we recommend that the studies also include the entrance to Yabucoa Harbor and its navigation channel as there are well-developed coral reefs in these areas. The mapping of EFH in the area of the harbor and disposal site will allow the designation of navigation routes to minimize the effects of vessel traffic and accidental spills of materials on EFH.

We appreciate your efforts to ensure the protection of EFH. We look forward to reviewing the results of the proposed monitoring studies and assisting you in identifying follow-up studies if needed. Questions should be addressed to the attention of Dr. Lisamarie Carrubba at (787) 851-3700.

Sincerely,

Andreas Mager, Jr.  
 Assistant Regional Administrator  
 Habitat Conservation Division





COMMONWEALTH OF PUERTO RICO  
OFFICE OF THE GOVERNOR

Environmental Quality Board

August 30, 2002

Mr. Iván Acosta  
U.S. Army Corps of Engineers  
Jacksonville District  
Environmental Branch  
400 West Bay Street  
Jacksonville, Florida 32232-0019

**Re: Draft - Site Management and Monitoring Plan for the  
Dredged Material Disposal Site at Yabucoa Harbor, Puerto Rico**

Dear mister Acosta:

We have received and reviewed the Draft of the Site Management and Monitoring Plan (SMMP) submitted by the U.S. Army Corps of Engineers (USACE) and U.S. Environmental Protection Agency (EPA) for the above referenced project. In this Draft SMMP, the USACE and EPA state that comments from individuals on the SMMP will be accepted and considered for the issuance of the Final SMMP.

After the corresponding evaluation of the documents submitted, the Water Quality Area (WQA) of the Puerto Rico Environmental Quality Board (PREQB) has the following comments:

1. A certification of compliance with Article 4 (c) of Law No. 9 of June 18, 1970, regarding to an environmental document must be submitted to the WQA. Therefore, an Environmental Impact Statement or an Environmental Assessment must be submitted for the above referenced project, to the Scientific Assessment Area of this Board for the corresponding evaluation. We recommend that you or personnel of your staff contact Mrs. Iris Cuadrado Gómez, Director, Scientific Assessment Area at phone number 767-8181 ext. 2304 or 2305 in order to comply with this requirement and provide us all pertinent information and discussion of the possible impacts of the project on the environment.
2. In page 4, the Yabucoa Harbor Dredged Material Disposal Site (YS) boundaries are delimited by the coordinates provided. Nevertheless, the document must specify the distance in meters (or feet) of the boundaries in relation to the Yabucoa Harbor shoreline.
3. In page 11, Monitoring Program, indicates that if no disposal occurs, then no monitoring will be required and for the contrary, in a period during which there is disposal activity, monitoring would be conducted proportionate to volume of disposal, as necessary. Therefore, the document must specify how will be determined the proportion of the monitoring program by the volume

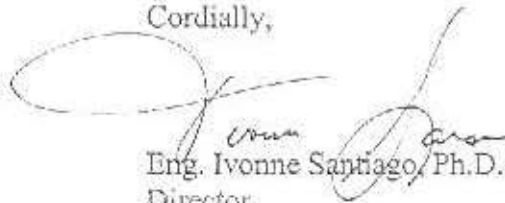
Mr. Iván Acosta  
Draft - YS SMMP  
Page 2

of dredged material to be disposed. Also, the monitoring program must specify the number, frequency and type of the samples.

4. In page 17, Frequency of Monitoring, indicates that: "Specific circumstances that *trigger* advancing to higher tiers of monitoring will be decided by EPA Region 2 and the USACE-JD, with the assistance of an interagency SMMP team consisting of representatives of EPA Region 2, USACE-JD, the Commonwealth of Puerto Rico and other stakeholders". Nevertheless, the YS SSMP must include the Commonwealth agencies that will constitute part of the team, if any agreement with such agencies was realized jointly with USACE-JD and EPA Region 2.
5. Part of the project is located near a coastal zone. Thus, a federally compatible consultation with the Program of Coastal Zone Management of the Puerto Rico Planning Board, must be made and evidence of such action must be submitted to this Board.
6. Copy of the Quality Assurance Project Plan (QAPP) for the project must be submitted to the WQA of this Board for our review and evaluation.
7. All dredged activities to be performed and disposal of dredged material to be discharged, at Yabucoa Harbor, must comply with the water quality standards of the Puerto Rico Water Quality Standards Regulation.

If you have any questions concerning this matter, please contact me or Eng. Régis Martínez Minguela, of Non-Industrial Permits Section at 767-8181 ext. 2525.

Cordially,



Eng. Ivonne Santiago, Ph.D.  
Director  
Water Quality Area

c: Mr. Mark Reiss, EPA-Region 2

IAE/COR/Corresp./Yabucoa Harbor Dredging



REPLY TO  
ATTENTION OF

DEPARTMENT OF THE ARMY  
JACKSONVILLE DISTRICT CORPS OF ENGINEERS  
P. O. BOX 4970  
JACKSONVILLE, FLORIDA 32232-0019

SEP 26 2002

Planning Division  
Environmental Branch

Eng. Ivonne Santiago, Ph.D.  
Director, Water Quality Area  
Commonwealth of Puerto Rico  
Environmental Quality Board  
National Plaza Building  
431 Ponce de León Avenue  
Post Office Box 11488  
San Juan, Puerto Rico 00910

Dear Eng. Santiago:

Please refer to your letter of August 30, 2002, where you provided comments on the issuance of a final Site Management and Monitoring Plan (SMMP) for the Dredged Material Disposal Site at Yabucoa Harbor, Puerto Rico. Each of your comments (1 through 7) are addressed as follows:

1. A Final Environmental Impact Statement for the Designation of Ocean Dredged Material Disposal Site for Yabucoa, Puerto Rico, was prepared, coordinated and approved by the Environmental Protection Agency (EPA) on May 1988.
2. The distance (in kilometers) of the Yabucoa Harbor Dredged Material Disposal Site in relation to the Yabucoa Harbor shoreline will be added to the SMMP.
3. Will monitor as per National Marine Fisheries Service letter.
4. A tiered, or hierarchical, approach to testing and evaluation allows the use of a necessary and sufficient level of testing for each specific dredging operation. The initial tiers (Tiers I and II) use existing information and relatively simple, rapid procedures for determining potential environmental impact of the dredged material in question. For certain dredged material with readily apparent potential for environmental impact (or lack thereof), information collected in the initial tiers may be sufficient for making decisions. However, more extensive evaluation (Tiers III and IV) may be needed for other materials with less clear potential for impact or for which the information is inadequate. Successive tiers incorporate more intensive evaluation procedures that provide more detailed information about

-2-


potential impact of the dredged material. The intent of the tiered approach is to use resources efficiently by testing only as intensely as is necessary to provide sufficient information for making decisions. The Puerto Rico Environmental Quality Board and Puerto Rico Department of Environmental and Natural Resources should be participants at the SMMP interagency group team.

5. The Coastal Zone Management Program is not applicable to this monitoring and management plan. The designated disposal site is located in Federal Waters at 6 Nautical miles from the Yabucoa coastline. It is thus outside the 3 Nautical Mile limit of Commonwealth waters. Monitoring activities for the shoreline and site will be included as conditions in the project's plans and specifications. Sampling Plans and Protocols have been prepared, coordinated, and executed in accordance with the green book (Evaluation of Dredged Material Proposed for Ocean Disposal, Testing Manual) as established by the U.S. Army Corps of Engineers (Corps) and the EPA.

6. There is no QAPP associated with the SMMP according to EPA.

7. The SMMP is a requirement under section 506 of the Water Resources and Development Act (WRDA) of 1992, which amended the Marine protection, research and Sanctuaries Act of 1972 (MPRSA) for disposal sites designated prior to January 1, 1995, such as the Yabucoa Ocean Dredged Material Disposal Site. This action does not require Water Quality Certification. However, any proposed dredging project would have to apply for an individual permit under Section 10 of the Rivers and Harbors Act of 1899 and Section 103 of the MPRSA. Such an application would be submitted to the Regulatory Division of the Corps for evaluation, coordination, and approval. At that time, the project sponsor will obtain a water quality certification for that specific activity.

Sincerely,



James C. Duck  
Chief, Planning Division

CESAJ-PD-EP

27 November 2002

## MEMORANDUM FOR RECORD

SUBJECT: Meeting in Reference to the Puerto Rico Environmental Quality Board letter dated June 11, 2002, regarding the Yabucoa Harbor Dredged Material Disposal Site Management and Monitoring Plan (SMMP).

1. The meeting took place on 10 October 2002. Present were Mr. Regis Martínez Minguela, Chief, Non-industrial Permits, Puerto Rico Environmental Quality Board (EQB), and Mr. Ivan Acosta, Chief, Special Projects Section, Environmental Branch, Planning Division, US Army Corps of Engineers (Corps), Jacksonville District. Also present was Ms. Leslie Rivera, Civil Engineer, Corps' Antilles Office. The matter under discussion was the above-mentioned EQB letter and the subsequent Corps reply, as well as the Corps response to the National marine Fisheries service (NMFS) on Essential Fish Habitat (EFH) issues in the disposal area.
2. The EQB stated that there were no further concerns on the matter and that they did not see any problems in finalizing the SMMP. The EQB also stated that their EFH concerns were addressed in our response to the NMFS and the additions and revisions to the SMMP.



IVAN ACOSTA, REM  
Chief, Special Projects Section