FINAL
ENVIRONMENTAL IMPACT STATEMENT

FOR THE

PORT ROYAL
OCEAN DREDGED MATERIAL DISPOSAL SITE DESIGNATION

Cooperating Agency

U.S. Army Corps of Engineers

Charleston District

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1.0 SUMMARY

1.1 Major Conclusions and Findings. Investigations were conducted of the proposed Port Royal ocean dredged material disposal site (ODMDS) and of environmental amenities considered to be within its zone of influence. Physical, chemical, and biological characteristics and their interactive effects were analyzed. All information was compared with relevant provisions of Section 103 of the Marine Protection, Research and Sanctuaries Act of 1972 (MPRSA), as amended. The conclusion is that the designated site meets all evaluation criteria and is suitable for disposal of dredged material.

1.2 Benefits of Proposed Action. There is a lack of land disposal sites in the area for dredged materials. Most nearby land is either privately owned or protected marshlands. Therefore, it is beneficial to use a nearby ocean disposal site to dispose of materials dredged from Port Royal Harbor as part of the ongoing maintenance of that resource.

1.3 Areas of Controversy. At this time, continued maintenance of Port Royal Harbor, South Carolina, is warranted on the basis of project usage and indications of improved economic productivity. In order for maintenance of the project to be continued, U.S. Environmental Protection Agency (EPA) concurrence of the proposed Port Royal ODMDS will be required. Opportunities exist under sections 933 and 204 to provide beach nourishment for storm damage reduction and environmental restoration at Hilton Head Island and Joiner Bank. Development of sections 933 and 204 projects will reduce requirements to dispose of material in the Port Royal ODMDS and keep material in the littoral zone. Ongoing efforts to establish sections 933 and 204 projects on Hilton Head Island and Joiner Bank are continuing.

1.4 Issues to Be Resolved. No issues remain unresolved. Only dredged material suitable for ocean disposal will be disposed in the proposed Port Royal ODMDS. The suitability of dredged material for ocean disposal must be determined by the Corps of Engineers and concurred by EPA prior to disposal.

1.5 Relationship of Alternatives to Environmental Protection Statutes, Executive Orders, and Other Requirements. Table 1 presents the status of the alternatives with environmental requirements.

Table 1. Relationship of Alternatives to Environmental Requirements

Categories	No Action	Candidate Site
Federal Statutes		
Archaeological and Historic Preservation Act, as amended, 16 USC 469, *et seq.*, PL 93-291	F/C	F/C
Clean Air Act, as amended, 42 USC 1987h-7, *et seq.*, PL 91-604	F/C	F/C
Clean Water Act, as amended, (Federal Water Pollution Control Act) 33 SC 1251, *et seq*., PL 92-500	N/A	N/A
Coastal Barrier Resources Act, 16 USC 3501, *et seq*., PL 97-348	F/C	F/C
Coastal Zone Management Act, as amended, 16 USC 1451, *et seq*., PL 92-583	TBD	TBD
Endangered Species Act, as amended, 16 USC 1531, *et seq*., PL 93-205	F/C	F/C
Estuary Protection Act, 16 USC 1221, *et seq*., PL 90-454	N/A	N/A
Federal Water Project Recreation Act, as amended, 16 USC 460-1(12), *et seq*., PL 89-72	F/C	F/C
Fish and Wildlife Coordination Act, as amended, 16 USC 661, *et seq*., PL 85-624	N/A	F/C
Land and Water Conservation Fund Act, as amended, 16 USC 4601-4601-11, *et seq*., PL 88-578	F/C	F/C
Magnuson-Stevens Fishery Conservation and Management Act, as amended, 16 USC 1801, *et seq*., PL 104-208	F/C	F/C
Marine Mammal Protection Act 16 USC 1361, *et seq*., PL 92-522	F/C	F/C
Marine Protection, Research and Sanctuaries Act, 33 USC 1401, *et seq*., PL 92-532	F/C	F/C

Categories	No Action	Candidate Site
National Historic Preservation Act, as amended, 16 USC 470a, *et seq*., PL 89-655	F/C	F/C
National Environmental Policy Act, as amended, 42 USC 4321, *et seq*., PL 91-190	F/C	F/C
Rivers and Harbors Act, 33 USC 401, *et seq*.	F/C	F/C
Watershed Protection and Flood Prevention Act, 16 USC 1001, *et seq*., PL 83-566	N/A	N/A
Wild and Scenic Rivers Act, as amended, 16 USC 1271, *et seq*., PL 90-542	N/A	N/A
Executive Orders		
Floodplain Management (EO 11988)	N/A	N/A
Protection of Wetlands (EO 11990)	N/A	N/A
Protection and Enhancement of Environmental Quality (EO 11514, as amended EO 11991)	F/C	F/C
Protection and Enhancement of the Cultural Environment (EO 11593)	N/A	N/A
Federal Compliance with Pollution Control Standards	F/C	F/C
State Policies		
South Carolina Coastal Management Program	TBD	TBD

F/C = Full Compliance. Having met all requirements of the statute, EO, or other environmental requirements in the current stage of planning (either pre or post authorization).
N/A = Not applicable.
TBD = To be determined.

Source: G.E.C., Inc., 1999.

2.0 PURPOSE AND NEED FOR ACTION

2.1 Background. Construction of the Port Royal Harbor access channel consisting of a 24-foot channel in the Beaufort River and Battery Creek, and a 27-foot turning basin at the head of Battery Creek was completed in June 1956. Completion of the 27-foot entrance channel was completed in May 1959. Since then, the entrance channel to Port Royal shoals more frequently than Beaufort River or Battery Creek. The entrance channel has been dredged nine times between 1980 and 2003. The Turning Basin and Battery Creek have been dredged twice.

2.2 Purpose of the Proposed Action. The economic importance of Port Royal Harbor is clear. The port of Port Royal in the early 1990s saw a decline in tonnage. The lowest tonnage reported by the port was in 1995, with a total tonnage of 62,760 tons. In 1995, the Ports Authority regained operational control, and tonnage has increased. The commodities moved via Port Royal are comprised of cement, clay, feldspar, and aggregate. Several long-term contracts have been put in place and these new contracts and their associated tonnage are projected to make full utilization of the port. Existing and historical tonnage by month from 1995 through 2002 is shown in Table 2.

2.2.1 Discontinuation of the dredging program would result in the port shoaling to 20 feet or less. If this were to occur, the port users would have to develop alternate routes and in some cases, alternative sources and/or distribution points for their commodities.

Table 2. South Carolina State Ports Authority
Monthly Tonnage at Port Royal, South Carolina

Month	Year

	1995	1996	1997	1998	1999	2000	2001	2002
January	6,632	7,753		11,018	44,270	25,467	8,271	22,014
February	4,651	21,887	5,517	24,427	23,653	14,098	8,878	
March	6,703				26,055	37,457		6,804
April		6,610	30,502	18,640	27,030	40,402	483	14,306
May	7,734		7,501	40,302	29,446	3,306	7,371	36,301
June	7,739	7,777	18,162	42,494	38,594	35,571	35,415	23,803
July			14,835	27,744	66,320	48,757	15,006	14,638
August	7,741	7,768	5,704	21,668	4,970	23,582	6,722	
September	7,753		16,105	5,871	2,729	28,332	13,304	14,606
October	7,729	7,720	5,454	94,402	53,954	25,053	28,613	6,903
November	6,078	7,700	13,348	9,152	29,907	2,500		14,712
December		6,578		30,103	26,639	14,800	27,648	
Total	62,760	73,793	117,132	335,821	373,567	284,525	149,710	154,087

2.3 Need for the Proposed Action. Besides commodity shipping, commercial fishing and recreational vessels also utilize the harbor. The need has arisen for a permanently designated disposal site for dredged materials in order to ensure future viability of Port Royal Harbor through continued dredging maintenance of its access channels. The U.S. Army Corps of Engineers (USACE) in its dredging maintenance operations for the harbor, as well as USACE permitted private enterprises, such as marinas and other commercial interests utilizing the harbor and channels, need an ocean disposal site for dredged materials that is available on a long-term basis for future planning. The need for an ocean disposal site has resulted from the extreme limitation and economic unfeasibility of upland disposal sites available in the Port Royal area, and the limitations of nearshore disposal due to the existence of salt marshes.

2.4 Project Authority. The National Environmental Policy Act (NEPA) of 1969, as amended, requires that an Environmental Impact Statement (EIS) be prepared for major Federal actions that may significantly affect the quality of the human environment. This EIS has been prepared to fulfill the NEPA requirements of the EPA and the USACE. This EIS complies with EPA's policy to prepare EISs (30 FR 16186, May 7, 1984) as part of the ODMDS process under Section 102 of the MPRSA of 1972, as amended. This EIS will also satisfy the requirements for NEPA documentation relating to permitting under Section 103 of the MPRSA.

2.4.1 The dumping of all types of materials into ocean waters is regulated by the Marine Protection, Research, and Sanctuaries Act (MPRSA). Section 102 of the Act authorizes the EPA to designate sites for ocean disposal pursuant to criteria established in this section. EPA's site designation does not, by itself, authorize any dredging or dumping of dredged material. EPA Ocean Dumping Regulations

and Criteria, as specified in the Code of Federal Regulations, Title 40, Part 227 (40 CFR Part 227) establishes procedures and criteria for selection and management of ocean disposal sites and evaluation of permits. USACE regulations for the issuance of permits for the transport of dredged material for the purpose of disposal in ocean waters pursuant to Section 103 of the MPRSA are found at 33 CFR Part 324. USACE regulations for Army Corps of Engineers civil works projects involving the discharge of dredged or fill material into waters of the U.S. or the transportation of dredged material for the purpose of disposal into ocean waters pursuant to Section 103 of MPRSA are found at 33 CFR Parts 335-338. This discussion is derived from the Technical Framework (EPA 1992) for evaluating environmental effects of dredged material management alternatives, the national guidance (EPA/CE 1991), and the regional guidance (EPA/CE 1993), which provide guidance in the decision-making process and the use of test data in decision-making.

3.0 ALTERNATIVES

3.1 Introduction. The proposed action is the final designation of an environmentally and economically acceptable ocean disposal site offshore of Port Royal, South Carolina. The designation of an ocean dredged material disposal site does not preempt any other disposal options but does ensure that an ocean disposal option is available.

3.2 Selected Port Royal Ocean Dredged Material Disposal Site. The proposed site is shown in Figure 1. The proposed Port Royal Ocean Disposal Site has an average depth of 36.0 feet with an area of approximately 1.0 square miles. Previous concerns expressed by the South Carolina Department of Natural Resources (SCDNR) regarding the potential of live bottoms being located in the near vicinity of the site were addressed during field investigations conducted by the EPA and SCDNR. In 1997; the EPA recommended that the following coordinates be utilized for determining site location:

32° 05.00’ N and 080° 36.47’ W
32° 05.00’ N and 080° 35.30’ W
32° 04.00’ N and 080° 35.30’ W
32° 04.00’ N and 080° 36.47’ W

3.2.1 The proposed site meets the general criteria for selection as set forth in Section 228.5 of EPA’s Final Revision of Ocean Dumping Regulations and Criteria (40 CFR Part 228.5) of January 11, 1977.

3.2.2 The selected site also meets the 11 specific ocean disposal site criteria set forth in 40 CFR Part 228.6 (see Sections 5.4 through 5.21 and Table 3 of this document). This site has been used, without evidence of environmental degradation, since 1980. Sediments of the selected site are compatible with sediments from the Port Royal Harbor Entrance Channel, the materials most likely to be disposed at the site (see Section 5.8 for a description of materials coming from the harbor). This site is also suitable in terms of practicality and economic feasibility.

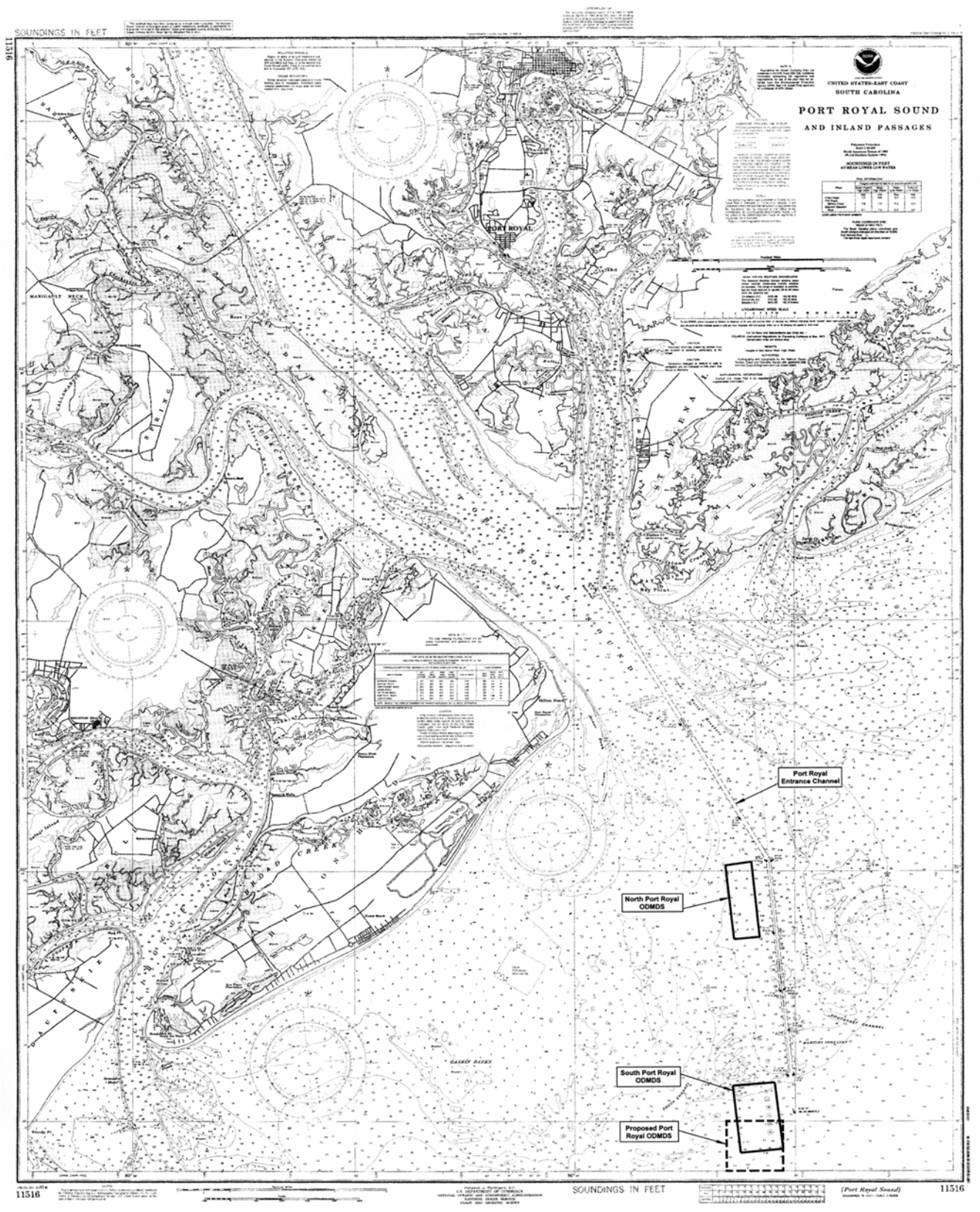

Figure 1
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Table 3. Summary of the Specific Criteria as Applied to The Proposed Port Royal Site

Criteria as Listed in 40 CFR 228.6(a)	Proposed Port Royal Site
1. Geographical position, depth of water, bottom topography and distance from coast.	See Figure 1. Depths at the site average about 36 feet. The site is located on the continental shelf. The site lies about 7.9 nmi from shore.
2. Location in relation to breeding, spawning, nursery, feeding, or passage areas of living resources in adult or juvenile phases.	None concentrated in or restricted to the proposed disposal site. Most breeding, spawning, nursery, and feeding activities take place in coastal waters or at reef areas located shoreward of the site. Passage through the proposed ODMDS is not geographically restricted.
3. Location in relation to beaches and other amenity areas.	The proposed site is located approximately 7.9 nmi from coastal beaches and protected inshore waters.
4. Types and quantities of waste proposed to be disposed of, and proposed methods of release, including methods of packing the waste, if any.	The only material to be disposed in the proposed ODMDS will be dredged material that complies with the EPA Ocean Dumping Regulations (40 CFR 220-229).
5. Feasibility of surveillance and monitoring.	A Site Management & Monitoring Plan has been developed for the proposed Port Royal ODMDS.
6. Dispersal, horizontal transport, and vertical mixing characteristics of the area, including prevailing current direction and velocity, if any.	The nearshore areas of the South Atlantic Bight (SAB) are sufficiently shallow for the entire water column to behave as an Ekman surface layer, with bottom and coastal boundary frictional effects, suggesting that bottom currents in the immediate vicinity of the proposed ODMDS may be determined primarily by wind stress. Tidal fluctuations are also important in determining bottom currents in nearshore areas, and the contributions of these components has not been reported for this area. The bottom currents were measured on the mid-continental shelf of the SAB and found that currents there were dominated by the local semi-diurnal tides. Another study reported that bottom currents in the nearshore area were southerly during 60 percent of the year. Dredged material dispersion studies have not been conducted for this site.
7. Existence and effects of current and previous discharges and dumping in the area (including cumulative effects).	Two ODMDSs have been used since initial construction of the Entrance Channel in 1959. The north ODMDS, located in an area with water depths of less than 20 feet, has not been used since 1979 as the area became too shallow for dredged material disposal. With water depth of 35+ feet, the south ODMDS was last used in 1996 when 475,413 cubic yards of material was removed from the Entrance Channel. No adverse impacts have been noted.
8. Interference with shipping, fishing, recreation, mineral extraction, fish and shellfish culture, areas of special scientific importance, and other legitimate uses of the ocean.	No significant interference is anticipated.
9. The existing water quality and ecology of the site as determined by available data, or by trend assessment or baseline surveys.	Water quality at the proposed ODMDS is variable and is influenced by discharges from inshore systems and infrequent ocean intrusions. Investigations have reported on the circulation of the inner continental shelf of the SAB. Findings suggest that nearshore circulation is primarily influenced by atmospheric conditions, and to a lesser extent by tidal cycles. Therefore, nearshore surface currents are derived primarily from wind stress, and are subject to extreme variability. Water and sediment samples collected from the proposed disposal site and vicinity from the early 1970s through 1997 did not contain elevated concentrations of pesticides, pesticide derivatives, trace metals, PCB, or HMW hydrocarbons. The site supports a benthic and epibenthic fauna characteristic of the continental shelf habitat.
10. Potential for the development of nuisance species in the disposal site.	No evidence of undesirable organisms at the site noted. Disposal should not recruit or promote the development of nuisance species.
11. Existence at or in close proximity to the site of any significant natural or cultural features of historical importance.	No known features.

Source: G.E.C., Inc., 1999.

3.3 No Action. The No Action alternative would not provide USACE and permittees under Section 103 of MPRSA and Section 10 of the Rivers and Harbors Act a designated disposal site. Under Section 103 authority, the USACE, with EPA concurrence, has temporarily designated the proposed ODMDS for continued maintenance and for use by several permittees. Without the Port Royal ODMDS some private marina operators and other commercial interests with the need for marine docking facilities may not be

able to afford the maintenance dredging that is periodically necessary to maintain operating water depth for their activities. The USACE would also incur significantly increased costs in the disposal of materials dredged during routine maintenance of navigation channels serving Port Royal Harbor due to increased shipping distances to other ocean disposal sites or distant upland disposal sites.

3.3.1 This alternative may result in economic hardships placed on Port Royal commercial and private users and create delays in maintenance dredging of the navigation channels by USACE. With the No Action Alternative, it is estimated that sedimentation would result in shoaling of the port to 20 feet or less.

3.3.2 As indicated in Table 4, the No Action Alternative does not completely meet the criteria established by 40 CFR Part 228.6.

3.4 Alternatives Considered But Eliminated From Further Study. In the past, there have been two ocean disposal sites with interim designation associated with Port Royal Harbor. These two sites were designated "north" and "south" ODMDS sites. However, the nearshore or north site has an average depth of only 14 feet. The EPA has determined that this depth is insufficient to serve as an ODMDS. Therefore, the north ODMDS has been eliminated from further study and consideration.

3.4.1 The option of transporting dredged material to sites off the continental shelf for disposal was considered, but this option offered no clear environmental advantage over the proposed ODMDS. There have been fewer studies of the benthic habitat off-shelf than in areas similar to the proposed ODMDS; therefore, less is known about the potential impacts that may occur at off-shelf sites. Also, due to increased distances from Port Royal, utilization of off-shelf sites would result in increased shipping times and costs. For these reasons, the option of utilizing off-shelf sites for disposal of dredged materials was eliminated from further study.

3.4.2 Land disposal sites were also considered. However, the volume of dredged material that will be generated is expected to be in excess of what is considered economically feasible to be transported to even the nearest potential land disposal site. Therefore, the alternative of disposal of the dredged material on land was dropped from further consideration.

3.4.3 Utilizing dredged sand for shore protection remains a viable consideration. However, there are specific requirements for Federal participation in shore protection projects, including the presence of sufficient public parking and beach access within one-quarter mile of any particular shore. Publicly-owned beaches which are limited to use by residents of a community or group of communities are not considered to be open to the general public and are treated as private beaches. Therefore, previous locations which have been studied for placement of sand from the entrance channel have either not met the Federal requirements, have not needed additional sand, or have been unwilling to contribute the funding necessary for transportation of the dredged material to the shore.

4.0 AFFECTED ENVIRONMENT

4.1 Introduction. This section describes the environmental characteristics of the area potentially affected by the continued disposal of dredged materials at the Port Royal Harbor ODMDS. A general location map of the area is presented in Figure 1.

Table 4. Summary of the Specific Criteria Under

The No Action Alternative

Criteria as Listed in 40 CFR 228.6(a)	No Action Alternative
1. Geographical position, depth of water, bottom topography and distance from coast.	Other sites considered are either closer to shore in shallower waters or further offshore in deeper waters. These sites were eliminated from further study.
2. Location in relation to breeding, spawning, nursery, feeding, or passage areas of living resources in adult or juvenile phases.	Other sites considered may be nearer to breeding, spawning, nursery, and feeding activities that take place in coastal waters or reef areas than the proposed ODMDS. Passage through these various sites should not be geographically restricted.
3. Location in relation to beaches and other amenity areas.	Some of the various sites utilized will likely be nearer than 7.9 nmi from coastal beaches and protected inshore waters.
4. Types and quantities of waste proposed to be disposed of, and proposed methods of release, including methods of packing the waste, if any.	The only material to be disposed in the ODMDS will be dredged material that complies with the EPA Ocean Dumping Regulations (40 CFR 220-229)
5. Feasibility of surveillance and monitoring.	A Site Management Plan has been developed for the proposed disposal site.
6. Dispersal, horizontal transport, and vertical mixing characteristics of the area, including prevailing current direction and velocity, if any.	Although some related studies have been conducted for the area, no dredged material disposal site dispersion studies have been conducted for the alternative sites.
7. Existence and effects of current and previous discharges and dumping in the area (including cumulative effects).	Thus far, no adverse effects, including cumulative effects, have been noted for the ODMDSs that have been utilized.
8. Interference with shipping, fishing, recreation, mineral extraction, fish and shellfish culture, areas of special scientific importance, and other legitimate uses of the ocean.	Currently no significant interference has occurred. However, without a designated Port Royal ODMDS, future sites utilized may potentially interfere with shipping, fishing, recreation, or other legitimate uses of the ocean.
9. The existing water quality and ecology of the site as determined by available data, or by trend assessment or baseline surveys.	Specific water quality and ecological studies have not been conducted for the alternative sites.
10. Potential for the development of nuisance species in the disposal site.	Although disposal of dredged material should not recruit or promote the development of nuisance species, no such studies have been conducted at the alternative sites
11. Existence at or in close proximity to the site of any significant natural or cultural features of historical importance.	Prior to disposal at any of the alternative sites, additional studies will be necessary to survey the areas for significant natural or cultural resources.

Source: G.E.C., Inc., 1999.

The information contained in this chapter was drawn from previous reports by SCDNR in 1986 and 1999 and the USACE in 1997. These reports are listed in Appendix A and are hereby incorporated by reference.

4.2 Geological Characteristics. Two ODMDSs have been used since initial construction of the Entrance Channel in 1959. The north ODMDS is located approximately seven miles offshore from Bay Point Island and contains approximately 413 acres (approximately 0.45 square nautical miles). The south ODMDS is near the end of the authorized project about 12 miles offshore of Bay Point Island and contains approximately 918 acres (approximately 1.0 square nautical mile). Location of the ODMDSs relative to the authorized project and Bay Point Island are shown in Figure 1.

4.2.1 The north ODMDS, located in an area with water depths of less than 20 feet, has not been used since 1979 because the area has become too shallow for a hopper dredge. With water depths of 35+ feet, the south ODMDS has been altered from a rectangle to the proposed square disposal site as shown on Figure 1. It was last used for disposal of material from the entrance channel in 2003 when approximately 100,000 cubic yards of material were placed at the proposed disposal site following coordination with EPA. With a limiting depth of 30 feet, the south ODMDS had an original capacity of 17 million cubic yards (MCY). The site is currently 27 percent filled and has an estimated remaining useful life of 50 years.

4.2.2 Both the north and south ODMDSs previously received interim approval by the EPA for dumping of dredged material. Section 506(a) of the Water Resources Development Act of 1992 (WRDA 92) amended Section 102(c) of the Marine Protection, Research, and Sanctuaries Act of 1972 as follows: "Beginning on January 1, 1997, no permit for dumping pursuant to this Act or authorization for dumping under Section 103(e) of this Act shall be issued for a site unless such site has received a final designation pursuant to this subsection or an alternative site has been selected pursuant to Section 103(b)." Therefore, effective 1 January 1997, disposal of dredged material could no longer be placed in the south ODMDS until it receives EPA designation.

4.2.3 In 1988, seven samples were collected from within the Port Royal Entrance Channel by Olsen Associates, Inc. and were analyzed for grain size distribution. Data indicated that the material should be classified as either SP or SM. SP and SM are symbols of the Unified Soil Classification System used to describe sand. SP describes poorly graded clean sand and SM describes silty sands, both of which have more than 50% of the coarse fraction passing the #4 sieve. Additionally, samples were also collected within the navigation channel in 1995 by Olsen Associates, Inc. and again, were analyzed for grain size distribution. The associated report indicates that samples were composed of a predominance of gray, well-graded fine quartz sand with some shell fragments and very few fines. All sediments sampled within the entrance channel were classified as SP. The percent fines varied from 0.3 to 4.0 with an average of 0.8.

4.2.4 The sediments at the proposed Port Royal ODMDS and surrounding area were predominately comprised of medium to fine-grained sands (mean = 83 percent) mixed with moderate amounts of shell hash (mean = 13 percent) and small amounts of silt and clay (mean = 4 percent). The sand component was, on average, moderately to moderately well sorted with mean phi values ranging from 0.9-2.6 (mean = 2.2). The organic matter found at the site and surrounding area was not significantly different (mean = 1.5).

4.2.5 Sediment composition varied significantly at the surrounding areas. Areas to the east and south had significantly lower sand content and higher shell hash content than other areas (<0.05 p). The proposed ODMDS site and surrounding areas to the east and south also had significantly greater sand grain sizes than the proposed ODMDS and areas to the north and west (<0.05 p) (Jutte, *et al.*, 1999).

4.3 Tides and Currents. The direction and speed of oceanic currents in the immediate vicinity of the proposed Port Royal ODMDSs have not been reported, but general circulation of shelf waters in this region has been reported by numerous investigators (Atkinson, 1975, 1976; Bureau of Land Management (BLM), 1981; Mathews, *et al.*, 1980; Mathews and Passhuk, 1977, 1982; Schwing, *et al.*, 1983; Science Applications, Inc. 1981a,b; Texas Instruments, Inc., 1978). In addition, recent investigations have reported on the circulation of the inner continental shelf of the South Atlantic Bight (SAB) (Lee and Brooks, 1979; Lee and Atkinson, 1983; Schwing, *et al.*, 1983). Their findings suggest that nearshore surface circulation is primarily influenced by atmospheric conditions, and to a lesser extent by tidal cycles. Therefore, nearshore surface currents are derived primarily from wind stress, and are

subject to extreme variability. A general surface current rose for the mid-shelf currents off Savannah, Georgia, is presented in Figure 2.

4.3.1 Stapor and Murali (1978) reported littoral drift along Hilton Head Island to be predominantly southwestward with a northeastward drift occurring in the spring and summer months. This coincides with the reports of Bruun (1985), BLM (1981), and others for nearshore currents in the Port Royal Sound area. Science Applications, Inc. (1981a) found that nearshore surface currents were alongshore to the southwest 60 percent of the year.

4.3.2 According to Schwing, *et al.* (1983), the nearshore areas of the SAB (<20m depth) are sufficiently shallow for the entire water column to behave as an Ekman surface layer, with bottom and coastal boundary frictional effects complicating the current patterns. These surface layers respond to wind stress within a few hours, suggesting that bottom currents in the immediate vicinity of the ODMDSs may be determined primarily by wind stress. Tidal fluctuations are also important in determining bottom currents in nearshore areas, and the contribution of these components has not been reported for this area. Butman, *et al.* (1977) measured bottom currents on the mid-continental shelf of the SAB and found that currents there were dominated by the local semi-diurnal tides. Another study (MMS, 1983) reported that bottom currents in the nearshore area were southerly during 60 percent of the years.

4.4 Water Temperature. Average surface water temperature in the vicinity of Port Royal sound ranges from 13°C in February to 28°C in August (Mathews and Pashuk, 1977, 1982). Temperatures in the proposed Port Royal ODMDS and surrounding areas ranged among areas and depths from 27.82 to 28.42°C. The disposal site displayed the greatest range in temperature between surface and bottom values (0.60°C) (Jutte, *et al.*, 1999).

4.5 Salinity. Surface salinities in the proposed Port Royal ODMDS areas fluctuate only slightly over a tidal cycle due to low river discharge into the Port Royal Sound. Average salinities within the Sound are reported in the Port Royal Sound Environmental Study (SCWRC, 1972). Mathews and Pashuk (1977, 1982) reported surface salinities in the area ranging from 31 to 36 ppt during 1973 and 1974. They also found bottom salinities in the nearshore area to parallel surface salinities. Their findings correspond to those found by others during the same time frame. Salinity values in the proposed Port Royal ODMDS and surrounding area ranged from 33.28 to 34.56 ppt (Jutte, *et al.*, 1999). The most variation between surface and bottom measurements within the surrounding area (0.80 ppt) was found at the area west of the proposed ODMDS.

4.6 Physical and Chemical Characteristics. Chemical and physico-chemical water quality parameters that are relevant to the proposed Port Royal ODMDS evaluation include dissolved oxygen (DO), suspended solids, turbidity, trace metals, pesticides, polychlorinated biphenyls (PCBs), and high molecular weight (HMW) hydrocarbons.

4.6.1 During the Port Royal Sound Environmental Study (SCWRC, 1972) water quality data were collected from April through October 1970. The study included analysis of water samples for dissolved oxygen, pH, dissolved solids, suspended solids, phosphates, nitrates, nitrites, pesticides, and heavy metals. Analyses for pesticides and metals were also conducted on sediment samples taken in the sound and rivers. The chemical quality of the waters of Port Royal Sound was generally good. Dissolved oxygen concentrations in the Colleton River dropped below the 5.0 mg/l South Carolina standard during July 1970 without the influence of anthropogenic pollution. Low river discharge and oxygen-demanding material from peripheral marsh was cited as the causes. Comparison of the nitrogen and phosphorus data indicated that concentrations of inorganic nitrogen were frequently undetectable, while significant

quantities of phosphorus (0.02 to 0.09 mg/l) were present. Nitrogen is apparently the major nutrient limiting primary production. Analysis for heavy metals in solution showed levels of mercury, cadmium, and other toxic metals to be below the detection limits of the method employed throughout the study. Analysis for heavy metals in sediments showed cadmium to be less than 0.5 mg/kg throughout the study and mercury levels to be less than 0.04 mg/kg. Pesticides also remained below detection limits throughout the study.

Figure 2

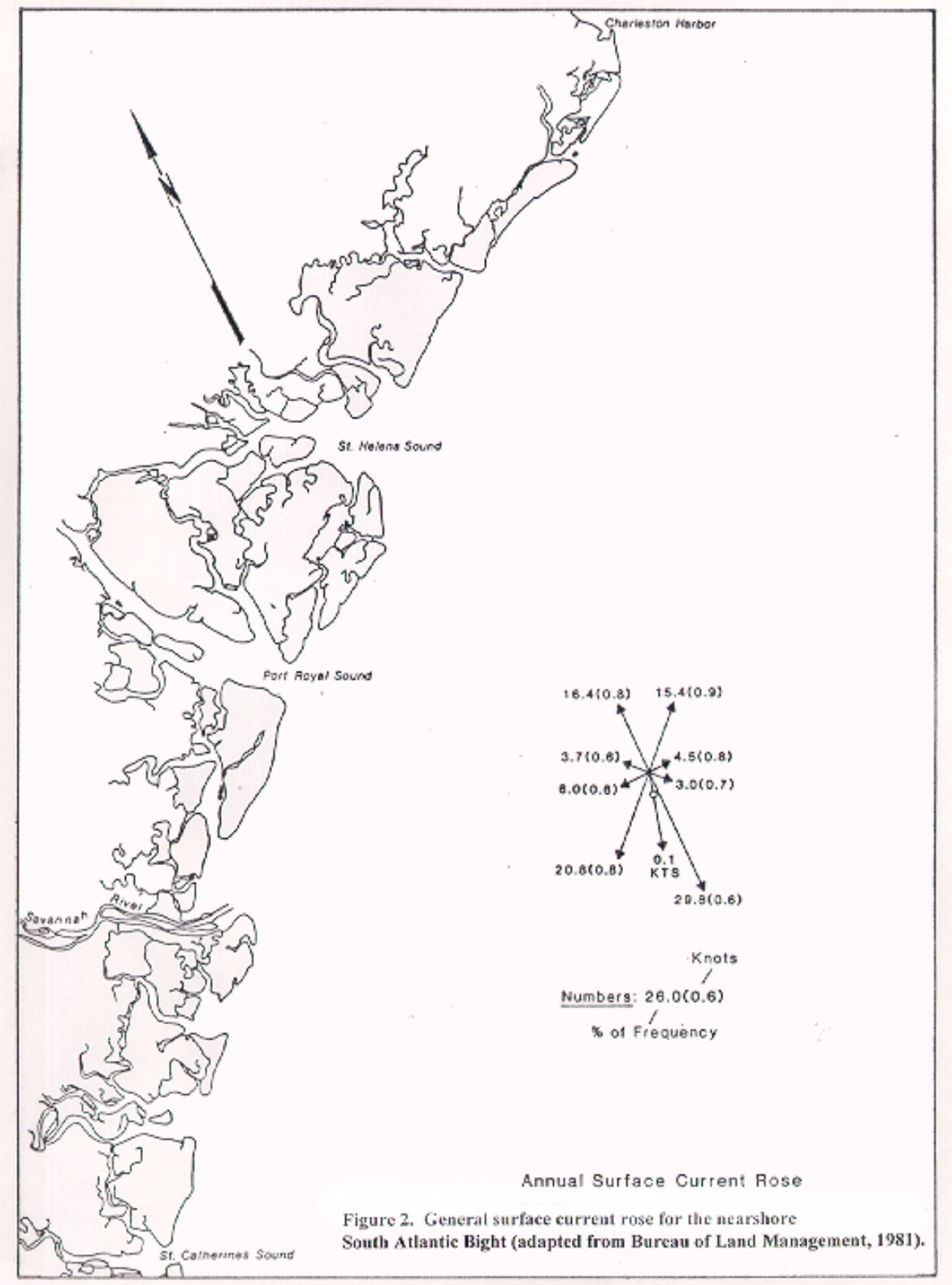

Figure 2. General surface current rose for the nearshore South Atlantic Bight (adapted from Bureau of Land Management, 1981).

4.6.2 The South Carolina Department of Health and Environmental Control (DHEC) has monitored several sampling stations in the Port Royal Sound area, three of which were in the immediate vicinity of the dredged channel areas. Data for sediment analysis of samples collected at these sites showed that PCBs remained below 0.01 mg/kg from 1982 through 1985. In addition, mercury remained below 0.3 mg/kg and cadmium remained below 1.3 mg/kg dry weights. Analysis for these constituents in the water column showed negligible concentrations. It appears from these data that water quality in Port Royal Sound remains good and has not degraded since the Port Royal Sound Environmental Study of 1970. It also appears that sediment dredged from Port Royal Sound is free of organic and metal pollutants.

4.6.3 Dissolved oxygen in nearshore waters off South Carolina was recorded over a 50-year period by Churgin and Hdminski (1974). Values ranged from 3.8 to 6.1 ml/l, the highest average concentrations observed during the winter and lowest average concentrations occurring during summer. In the vicinity of Port Royal Sound the dissolved oxygen concentrations in surface waters ranged from 4.42 ml/l in July to 5.66 ml/l in December during 1973 and 1974 (Atkinson, 1975, 1976). These findings agree with those of Mathews and Pashuk (1978, 1982) for the same general area and period of time. Bottom dissolved oxygen concentrations were found to parallel surface concentrations in the nearshore waters.

4.6.4 Dissolved oxygen values in the proposed Port Royal ODMDS and surrounding area ranged from 5.40-5.86 mg/l (mean = 5.6). The most variation between surface and bottom measurements within the surrounding area (0.08) was found at the area west of the proposed ODMDS (Jutte, *et al*, 1999).

4.6.5 According to Jutte, *et al.* (1999), trace metal concentrations found at the proposed Port Royal ODMDS were below published bioeffect levels. No PAH, PCB, or pesticide contaminants were detected in any of the samples analyzed. However, it was noted that the detection levels for most organic analyses were above the published bioeffect levels. As a result, the report states that the disposal site and surrounding areas have not been adequately assessed for the presence of organic contaminants that could adversely affect biological resources.

4.6.6 There appears to be no pesticide data available for the Port Royal Sound area, but Atkinson (1975, 1976) and Atkinson (1978) monitored nutrient concentrations (nitrates and phosphates), dissolved organic carbon, and dissolved mercury concentrations in the shelf waters near Port Royal Sound during 1973 and 1974. Average phosphate concentrations ranged from 0.09 μg-at/l in April to 0.48 μg-at/l in December. Average concentrations ranged from 0.02 μg-at/l in September to 1.40 μg-at/l in December. Average dissolved organic carbon remained relatively constant throughout their study period. Average dissolved mercury concentrations ranged from 22.8 ng/l in September 1973 to 92.0 ng/l in April 1974. Average particulate organic carbon ranged from 0.196 mg C/l in September to 0.368 mg C/l in July 1974. Finally, average particulate nitrogen concentrations ranged from 33.8 μg N/l in September 1973 to 24.0 μg N/l in December 1973, increasing again in the spring (27.0 μg N/l) and summer (32.0 μg N/l).

4.7 Biological Characteristics. The biological communities addressed in this section are the benthic macroinfauna, benthic meiofauna, epibenthic invertebrates, and fish. Species of special concern that may utilize the proposed ODMDS vicinity are also addressed. Biota restricted to the benthic environment are of principal concern in disposal site investigations. Disposal impacts on planktonic communities are generally considered to be temporary, while larger, motile organisms (nekton) are able to avoid disposal operations and localized areas of poor water quality.

4.7.1 The Port Royal Sound Environmental Study (SCWRC, 1972) provided an intensive baseline study of the biological resources present within Port Royal Sound. The report includes data on gross ecological characteristics of the sound as well as detailed descriptions of individual components such as phytoplankton, zooplankton, benthic invertebrates, vascular marsh plants, and fish. The only data presented here is a species list in Table 5. A more complete listing of fauna and flora present in Port Royal Sound has not been published; however, it is clear that Table 5 does not provide a complete list of all species likely present in the sound, especially with respect to the invertebrates.

Table 5. Species List of Fishes and Macroinvertebrates Collected During the Port Royal Sound Environmental Study (SCWRC, 1972).

Fishes	
Acipenseridae – sturgeons	*Opisthonema oglinum* – Atlantic thread herring
Acipenser oxyrhynchus – Atlantic sturgeon	Cynoglossidae – tonguefishes
Anguillidae --- freshwater eels	*Symphurus plagiusa* – blackcheek tonguefish
A*nguilla rostrata* – American eel	Cypinodontidae – killifishes
Antherinidae – silversides	*Cyprinodon variagatus* – sheepshead minnow
Membras martinica – rough silverside	*Fundulus heteroclitus* – mummichog
Menidia menidia – Atlantic silverside	*Fundulus majalis* – striped killifish
Ariidae – sea catfishes	Dasyatidae – stingrays
Bagre marinus – gafftopsail catfish	*Dasyatis americana* – southern stingray
Galeichthys felis – sea catfish	*Dasyatis sagina* – Atlantic stingray
Balistidae – triggerfishes and filedfishes	*Dasyatis sayi* – southern stingray
Alutera schoepfi – orange filefish	*Gymnura micrura* – butterfly ray
Monocanthus hispidus – planehead filefish	Diodontidae – porcupine fishes
Monocanthus setifer – pygmy filefish	*Chilomycterus schoepfi* – striped burrfish
Stephanolephis hispidus – triggerfish	Echeneidae – remoras
Batrachoididae – toadfishes	*Echeneis naucrates* – sharksucker
Opsanus tau – oyster toadfish	Elopidae – tarpons
Belonidae – needlefishes	*Elops saurus* – ladyfish
Strongylura marina – Atlantic needlefish	*Megalops atlantica* – tarpon
Blenniidae – combtooth blennies	Engraulidae – anhovies
Hypsoblennius hentzi – feather blenny	*Anchoa hepsetus* – striped anchovy
Bothidae – lefteye flounders	*Anchoa mitchilli* – bay anchovy
Ancylopsetta quadrocellata – ocellated flounder	Ephippidae –- spadefishes
Citharichthys spilopeterus – bay whiff	*Chaetodipterus faber* – Atlantic spadefish
Etropus crossotus – fringed flounder	Gadidaae – codfishes and hakes
Paralichthys albigutta – Gulf flounder	*Urophycis regius* – spotted hake
Paralichthys dentatus – summer flounder	*Urophycis tenuis* – white hake
Paralichthys lethostigma – southern flounder	Gerreidae – mojarras
Paralichthys squamilentus – broad flounder	*Eucinostomus argenteus* – spotted hake
Scophthalmus aquosus – window pane flounder	*Eucinosiomus gula* – silver jenny
Carangidae – jacks, scads, and pompanos	Gobiesocidae
Caranx hippos – crevalle jack	*Gobiesox strumosus* – cling-fish
Caranx latus – horse-eye jack	Gobiidae – gobles
Chloroscombrus chrysurus – bumper	*Gobiosoma bosci* – naked goby

Oligoplites saurus – leatherjacket	*Microgobius gulosus* – clown goby
Selene vomer – lookdown	*Microgobius thalassinus* – green goby
Trachinotus carolinus – Florida pampano	Hemiramphiade – halfbeaks
Trachinotus falcatus – round pampano	*Hyporhamphus unifasciatus* – halfbeak
Trachinotus goodei – great pampano	Labridae
Vomer setapinnus – Atlantic moonfish	*Halichoeres bivittatus* – wrasse fish
Carcharhinidae – requiem sharks	Lepisosteidae – gars
Apriondon isodon – finetooth shark	*Lepisosteus osseus* – longnose gar
Negaprion brevirostris – lemon shark	Lutjanidae – snappers
Clupeidae --- herrings	*Lutjanus grisseus* – grey snapper
Alosa aestivalis – summer herring	Mugilidae --- mullets
Brevoortia tyrannus – Atlantic menhaden	*Mugil cephalus* – striped mullet
Dorosoma cepedianum – gizzard shad	*Mugil curema* – white mullet
Ophichthidae – snake eels	*Syngnathus louisianae* -- chain pipefish
Ophichthus gomesi – sea serpent (shrimp eels)	Synodontidae – lizardfishes
Ophidiidae – cusk-eels	*Synodus foetans* – inshore lizardfish
Rissola marginata – striped cusk-eel	Tetraodontidae – puffers
Poecilidae – livebearers	*Sphoeroides maculatus* – northern puffer
Poecilia letipinna – sailfin molly	Trichiuridae – cutlassfishes
Pomadasyidae – grunts	*Trichiurus lepturus* – Atlantic cutlassfish
Orthopristis chrysopterus – pigfish	Triglidae – searobins
Pomatomidae – bluefishes	*Prionotus carolinus* – northern searobin
Pomatomus saltatrix -- bluefish	*Prionotus scitulus* – leopard searobin
Rajidae – skates	*Prionotus tribulus* – searrobin
Raja eglanteria clearnose skate	Uranoscopidae – stargazers
Rhinobatidae – guitarfishes	*Astroscopus y-graecum* – southern stargazer
Rhinobatos lentiginosus - Atlantic guitarfish	***Macroinvertebrates***
Sciaenidae – drums	Class Pelecypoda
Bairdiella chrysura – silver perch	*Crassostrea virginica* – Atlantic oyster
Cynoscion nebulosus – spotted seatrout	*Modiolus demissus* – Atlantic ribbed mussel
Cynoscion nothus – bastard weakfish	*Mercenaria mercenaria* – hard shell clam
Cynoscion regalis – weakfish	Class Gastropoda
Larimus fasciatus – banded drum	*Littorina irrorata* – common marsh periwinkle
Leiostomus xanthurus – spot	*Megalampus lineatus* – snail
Menticirrhus americanus – sand whiting	*Nassarius obsoleta* – eastern mud snail
Menticirrhus littoralis – surf whiting	Class Asteroidea
Menticirrhus saxatilis – northern kingfish	*Asterias fobesi* – starfish
Micropogon undulatus – Atlantic croaker	*Luidia* sp. – starfish
Pogonias cromis – black drum	Class Cephalopoda
Sciaenops ocellata – red drum	*Loligo* sp. – squid
Stellifer lanceolatus – star drum	*Loliguncula brevis* – squid
Scombridae – mackerels and tunas	Class Merostomata
Scomberomorus maculatus – Spanish mackerel	*Limulus polyphemus* – horseshoe crab
Serranidae – sea basses	Class Polychaeta
Centropristis striata – black sea bass	*Diopatra cupred*

Soleidae – soles	*Goniada maculata*
Trinectes maculatus – American sole	*Glycera dibranchiata*
Sparidae – porgies	*Laeonereis culveri*
Archosargus probatocephalus – sheepshead	*Lumbrinereis tenuis*
Lagodon rhomboides – sailor's choice	*Nereis succinea*
Sphyraenidae – barracudas	*Phyllodoce fragilis*
Sphyraena barracuda – great barracuda	*Scoloplos fragilis*
Sphyrnidae – hammerhead sharks	Class Crustacea
Sphyrna lewini – scalloped hammerhead	*Callinectes ornatus* – swimming crab
Sphyrna tiburo – bonnethead shark	*Callinectes sapidus* – blue crab
Squalidae – sharks	*Cancer irroratus* – cancer crab
Squalus acanthias – dogfish shark	*Chthamalus fragilis* – barnacle
Stromateidae – butterfishes	*Clibanarius vittatus* – hermit crab
Peprilus alepidotus – southern harvestfish	*Cyathura carinata* – marine Isopod
Peprilus triacanthus – butterfish	*Eurypanopeus depressus* – hermit crab
Poronotus triacanthus – butterfish	*Libinia dubia* – spider crab
Syngnathidae – pipefishes and seahorses	*Menippe mercenaria* – stone crab
Hippocampus erectus – seahorse	*Pagurus spp.* – hermit crab
Syngnathus fuscus – common pipefish	*Palaemonetes spp.* – grass shrimp
Panopeus herbstii – mud crab	*Squilla empusa* – mantis shrimp
Penaeus aztecus – brown shrimp	*Talorchestia longicornis* – beach flea
Penaeus duorarum – brown spotted shrimp	*Trachypenaeus constrictus* – shrimp
Penaeus setiferous – white shrimp	*Uca pugilator* – sand fiddler crab
Sesarma cinereum – wharf crab	*Uca pugnax* -- mud fiddler crab
Sesarma reticulatum – square back crab	*Upogebia affinis* – burrowing shrimp

Source: G.E.C., Inc., 1999.

4.7.2 *An Assessment of Benthic Infaunal Assemblages and Sediments in the Vicinity of the Port Royal Ocean Dredged Material Disposal Site* was conducted in 1997 (Jutte, *et al.*, 1999). Benthic invertebrate, sediment, and contaminant samples were collected using a stratified random sampling design. Two areas (disposal site and border areas) formed five discrete sampling zones. The central disposal site (DS) was surrounded by a border area to the north (BN), south (BS), east (BE), and west (BW). All sampling areas were comparable in size, approximately 1.3 square miles.

4.7.3 More than 25,000 individuals representing 385 taxa were collected from the 50 stations sampled. Mean faunal densities ranged from over 4,000 individuals/m^2 to more than 20,000 individuals/m^2 (Figure 3). Disposal site faunal abundance values were not significantly different from the BN, BW, or BE zones, although significantly fewer organisms were found at the disposal site than the BS zone. The five overall most abundant organisms collected were the annelid *Polygordius* sp., the bivalve *Ervilia concentrica*, the polychaete *Prionospio cristata*, annelids in the class Oligochaeta, and the bivalve *Crassinella lunulata* (Figure 4). These five taxa made up over 40 percent of the total number of individuals collected. The most abundant organism in the BS zone was *Ervilia concentrica*. *Polygordius* sp. was the most abundant organism in the BE, BW zones and disposal site, and the mollusk *Tellina* sp. was most common in the BN zone. A complete listing of all taxa, including abundance per zone and overall abundance, is presented in Appendix C.

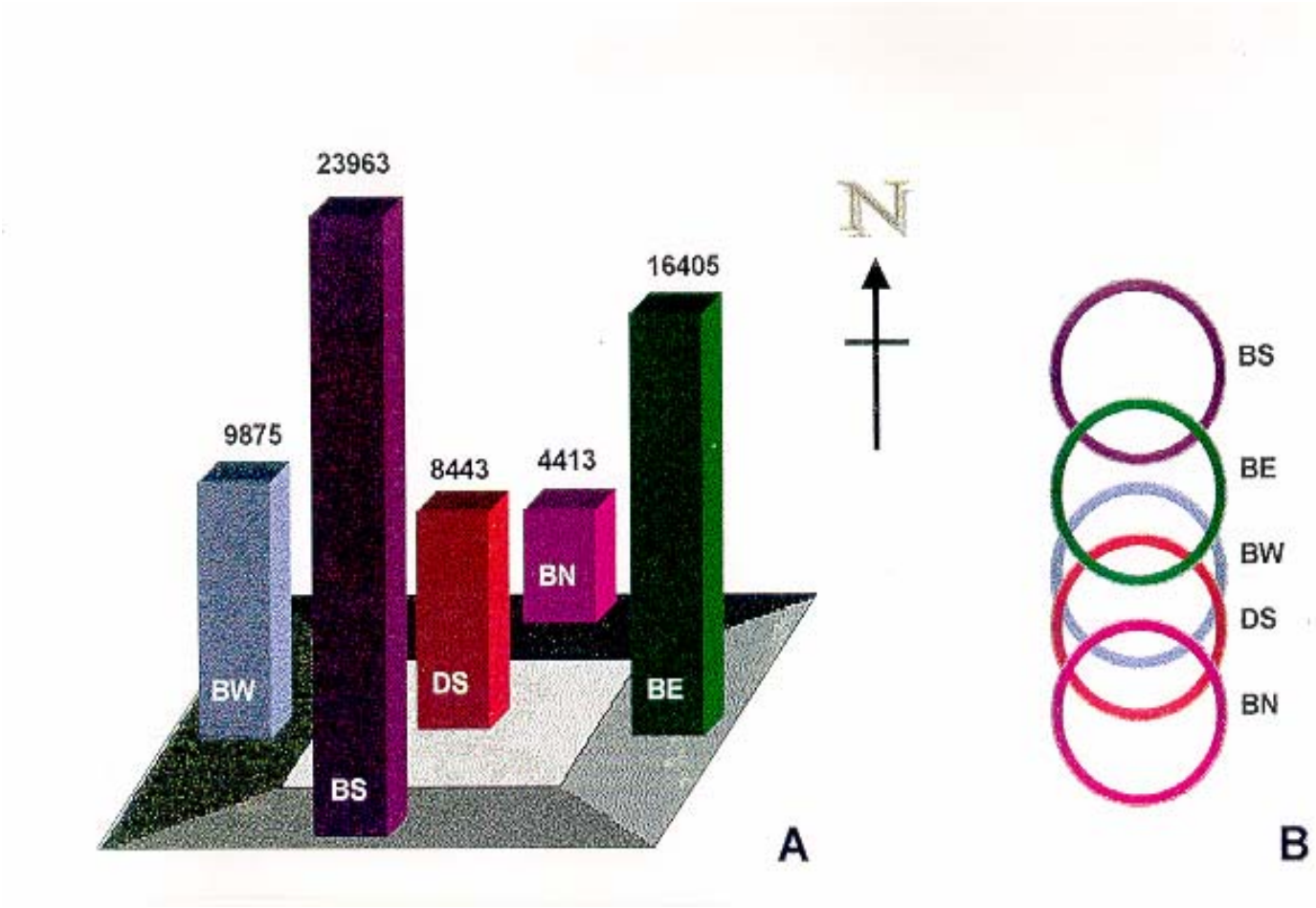

Figure 3. A. Mean faunal density per m^2 at the disposal site and surrounding areas.

B. Results of post-hoc comparisons using the Tukey test. Overlapping circles represent the degree that means are different from each other. Circles that do not overlap are significantly different ($p<0.5$). (Jutte, *et al.*, 1999).

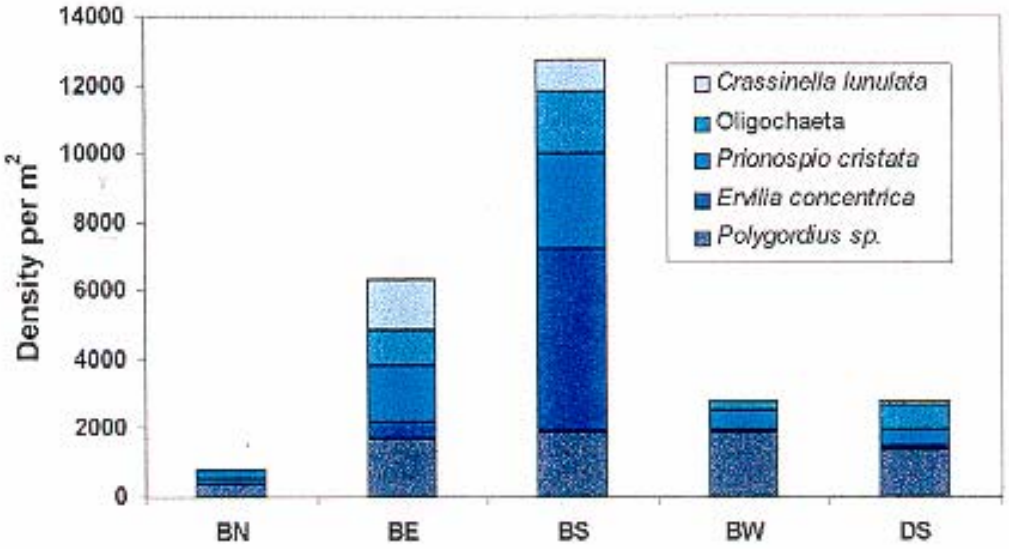

Figure 4. Density of the five most abundant overall species in the Port Royal ODMDS and surrounding areas. (Jutte, *et al.*, 1999).

4.7.4 The benthic assemblages found in the proposed Port Royal ODMDS and surrounding zones were diverse, with the mean number of species per grab (0.04 m^2) ranging from 40 to 87 species. The mean number of species collected per grab showed significant differences among the zones sampled (Figure 5). Significantly fewer species were collected in the DS zone than the BE and BS zones, but there were no significant differences between the DS zone and the BN or BW zones. Diversity indices also showed some variability among zones (Table 6). Species richness was highest in the BE and BS zones, and the highest diversity value was found in the BE zone. Evenness was highest in the BN zone. Diversity indices at the disposal site and the BW zone were identical.

Table 6. Species Diversity Measures for Each Zone Within the Port Royal ODMDS. Each Zone Contains 10 Replicate Samples. H^1 = Shannon-Weiner Index (Calculated with Log Base 2); J^1 = Evenness = H^1/Hmax, Where Hmax = In (# of taxa in sample). The Margalef Index is Used for Species Richness: R = Total Number of Species in Community – 1/In (sample size)

Zone	Mean Number of Species	Number of Individuals	H^1	J^1	Species Richness
BE	84.6	6,562	5.9	0.73	31.5
BN	39.5	1,765	5.4	0.78	16.3
BS	87.1	9,585	5.1	0.64	27.9
BW	67.9	3,950	5.8	0.74	27.2
DS	52.1	3,377	5.8	0.74	27.2

Source: Jutte, *et al.*, 1999.

4.7.5 Cluster analysis of the station groups, formed by similarities in species composition and abundance, indicated that zones BE and BS were very similar, as were zones BW and DS. Zones BE, BS, BW, and DS were more similar to one another than to the outlier, the BN zone.

4.7.6 The overall composition of the fauna with respect to major taxonomic groups represented in the Port Royal ODMDS study is shown in figures 6 and 7. Assemblages present in zones BE, BN, and BS were dominated by polychaetes and mollusks, with high concentrations of the spionid *Prionospio cristata* found in these zones. At the disposal site and BW zone, organisms falling in the "other taxa" category were the most abundant, predominately the annelids *Polygordius* sp. and Oligochaeta, and tanaids in the family Apseudidae.

4.7.7 Polychaete abundances in the BS zone were significantly greater than abundances in the disposal site and zones BW and BN. Abundances of species in the "other taxa" category at the disposal site were significantly greater than abundances found in the BN zone, but significantly lower than abundances found in the BS zone. Mollusk abundances in the disposal site were not significantly different from any other area sampled, although significant differences in mollusk abundance values occurred among the other zones. No significant differences were found in amphipod abundances between zones.

4.7.8 Relative abundances of the higher taxa groups are presented in Figure 7. In the BN and BS zones, polychaetes and mollusks were found in roughly similar proportions, and represented the dominant taxa in these zones. Zones BW, DS, and BE were dominated by polychaetes and organisms in the other taxa category, with mollusks representing the third most abundant taxonomic group.

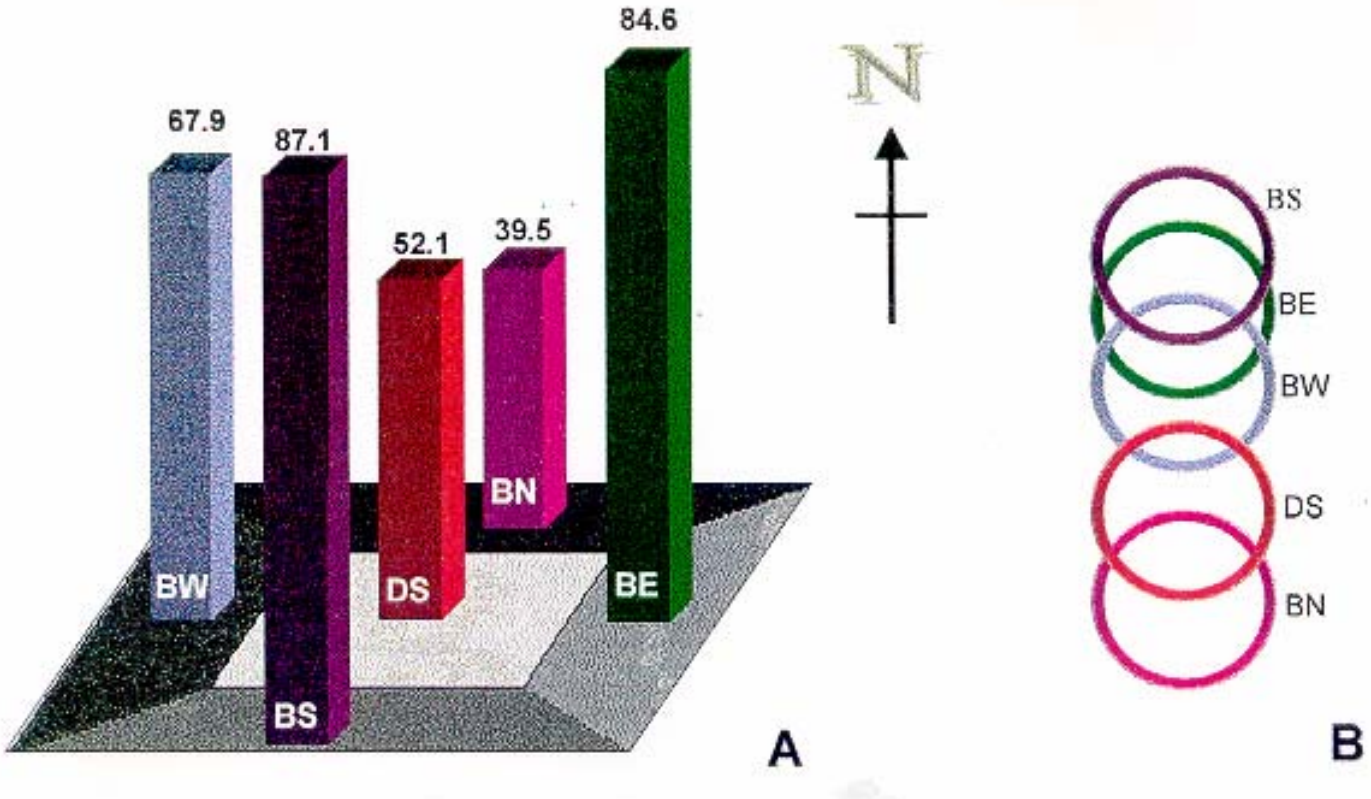

Figure 5. A. Mean number of species collected in grab samples from the disposal site and surrounding areas.

B. Results of post-hoc comparisons using the Tukey test. Overlapping circles represent the degree that means are different from each other. Circles that do not overlap are significantly different ($p<0.5$). (Jutte, *et al.*, 1999).

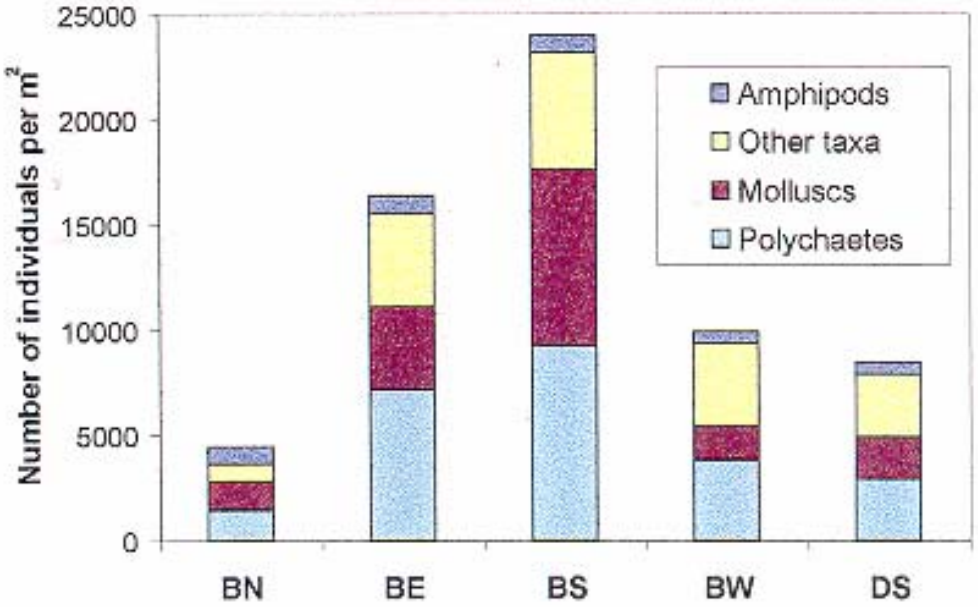

Figure 6. Higher taxonomic composition in the Port Royal ODMDS and surrounding area. (Jutte, *et al.*, 1999).

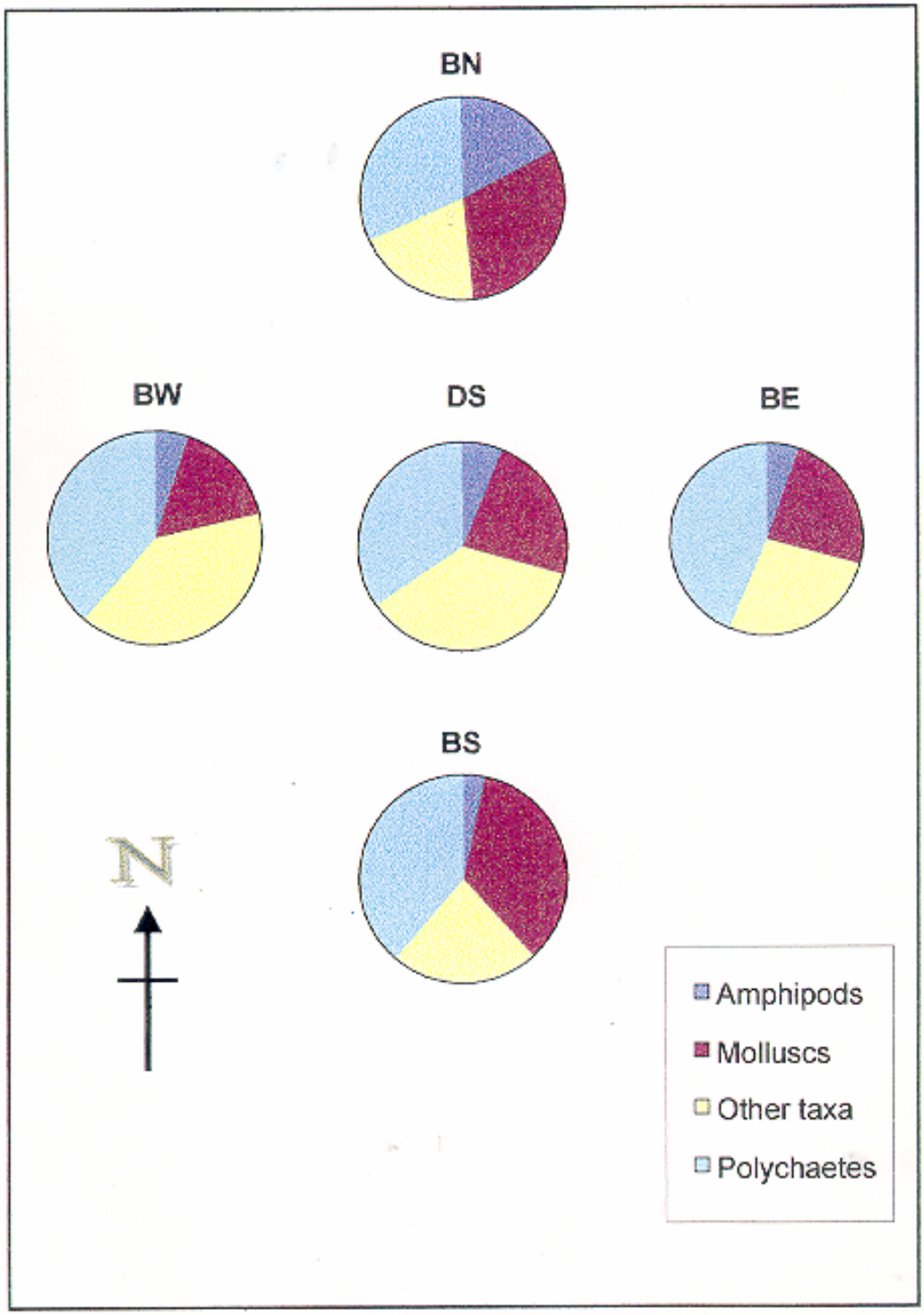

Figure 7. Relative abundance of polychaetes, molluscs, amphipods, and other taxa in the disposal site (DS) and surrounding area. (Jutte, *et al.*, 1999).

4.7.9 Wenner, *et al.* (1979 a, b, c, 1980) characterized the demersal finfish communities of the SAB during 1973, 1974, and 1975. The lizard fish (*Synodus foetens*), sand perch (*Diplectrum formosum*), and southern porgy (*Stenotomus aculeatus*) were found to be present during all samplings. According to Wenner, *et al.* (1980), these three species represent the three most abundant species of demersal fish found in the depth range 9-18m throughout the South Carolina coastal area.

Powles and Stender (1976) reported on the ichthyoplankton in the SAB and found juvenile fish of the following families in the Port Royal Sound area: Clupeidae, Sciaenidae, Bothidae, Gadiade, Carangidae, Mugilidae, and Triglidae.

4.7.10 Commercially important species of shellfish occur in abundance in the Port Royal Sound area, including shrimps, crabs, whelks, and oysters. The Beaufort County coastal area is responsible for 40 to 50 percent of the statewide landings of shellfish on a dollar basis. On the other hand, commercial fin fisheries in Beaufort County are responsible for only a small percentage of the statewide finfish landings.

4.7.11 Disposal of sediments in the proposed Port Royal ODMDS is unlikely to have any effect on oyster and clam fisheries in the area, nor on the sparse fin fisheries of the area. Commercial shrimping occurs primarily within three miles of shore in South Carolina, and the disposal site does not occur within the three-mile limit. Shrimp populations may be altered during disposal operations, but the effects of offshore disposal on shrimp populations have not been adequately studied.

4.7.12 It is unlikely that disposal activities would have a significant effect on larval and post larval shrimp movements due to the relatively small size of the disposal site and the location relative to the Sound entrance.

4.7.13 Recreational finfish catches in the Port Royal Sound area are primarily from head-boat charters to offshore reefs, fishing on private boats for reef fishes and large pelagic species, and pier fishing (Moore, 1977; Hammond and Cupka, 1978). Most recreational finfish catches would not be influenced by disposal activities in the proposed Port Royal ODMDS since piers and reefs do not occur in the immediate vicinity.

4.8 Threatened or Endangered Species. Marine or other species classified by the U.S. Fish and Wildlife Service (FWS) and/or National Marine Fisheries Service (NMFS) as endangered or threatened and found in Beaufort County or in coastal waters off Port Royal are listed in the following section.

4.8.1 The following Federally listed species are known to occur or possibly occur in Beaufort County or offshore of Port Royal as of February 2002 (FWS) and September 2002 (NMFS):

E = Federally endangered
T = Federally threatened
C = The FWS or the NMFS has on file sufficient information on biological vulnerability and threat(s) to support proposals to list these species.
CH = Critical Habitat
SC = Federal Species of Concern. These species are rare or limited in distribution but are not currently legally protected under the Endangered Species Act.

Common Name (*Scientific Name*)	Status	Occurrence

West Indian manatee (*Trichechus manatus)* ..... E ..... Known
Bald eagle (*Haliaeetus leucocephalus*) ..... T ..... Known
Swallow-tailed kite (*Elanoides forficatus forficatus*) ..... SC ..... Known
Wood stork (*Mycteria americana*) ..... E ..... Known
Red-cockaded woodpecker (*Picoides borealis*) ..... E ..... Known
Piping Plover (*Charadrius melodus*) ..... T, CH ..... Known
Flatwoods salamander (*Ambystoma cingulatum)* ..... T ..... Known
Pondberry (*Lindera melissifolia*) ..... E ..... Known
Canby's dropwort (*Oxypolis canbyi*) ..... E ..... Possible
Chaff-seed (*Schwalbea americana*) ..... E ..... Known
Cupgrass (*Eriochloa michauxii*) ..... SC ..... Known
Pondspice (*Litsea aestivalis*) ..... SC ..... Known
Southeastern myotis (*Myotis austroriparius*) ..... SC ..... Known
Dusky shark (*Carcharhinus obscurus)* ..... C ..... Possible
Sand tiger shark (*Odontaspis taurus)* ..... C ..... Possible
Night shark (*Carcharinus signatus)* ..... C ..... Possible
Speckled hind (*Epinephelus drummondhayi)* ..... C ..... Possible
Jewfish (*E. itijara*) ..... C ..... Possible
Warsaw grouper (*E. nigritus)* ..... C ..... Possible
Nassau grouper (*E.striatus)* ..... C ..... Possible

Marine Mammals
Finback whale (*Balaenoptera physalus*) ..... E ..... Known
Humpback whale *(Megaptera novaeangliae*) ..... E ..... Known
Northern Right whale (*Eubalaena glacialis*) ..... E ..... Known
Sei whale (*Balaenoptera borealis*) ..... E ..... Known
Sperm whale (*Physeter macrocephalus*) ..... E ..... Known
Blue whale (*Balaenoptera musculus*) ..... E .... NA

Turtles
Green sea turtle (*Chelonia mydas*) ..... T .... Known
Kemp's ridley sea turtle *(Lepidochelys kempii*)* ..... E .... Known
Leatherback sea turtle (*Dermochelys coriacea*)* ..... E .... Known
Loggerhead sea turtle (*Caretta caretta*) ..... T .... Known
Hawksbill sea turtle (*Eretmochelys imbricata*) ..... E .... NA

Fish
Shortnose sturgeon (*Acipenser brevirostrum)** ..... E .... Known
Atlantic sturgeon (*Acipenser oxyrhynchus oxyrhynchus)* ..... C ..... NA

4.8.2 Disposal in the proposed Port Royal ODMDS should have no effect on these species with, perhaps, the exception of the loggerhead sea turtle (*Caretta caretta*). The loggerhead turtle nests on the beaches of Hilton Head Island and St. Phillips Island, on either side of the entrance to Port Royal Sound. In South Carolina, adult females come ashore to nest from mid-May to mid-August, and many use the waters in the vicinity of the proposed Port Royal ODMDS during their migrations (Hopkins and Murphy, 1981).

4.8.3 The Corps follows established precautions during dredging operations to avoid any impacts to sea turtles, manatees, and whales (northern right whale) through visual and scheduling measures. Dredging

specifications include avoidance and notification of sighting requirements based on the potential presence of these species. None of these species are known to have been adversely impacted in the past nor are any adverse impacts expected in future work.

4.9 Essential Fish Habitat. The Magnuson-Stevens Fishery Conservation and Management Act of 1976 requires that Federal agencies consult with the Secretary of Commerce and Fishery Management Council, National Marine Fisheries Service (NMFS) prior to actions taken that may affect essential fish habitat (EFH). The Sustainable Fisheries Act of 1996 amended and renamed that Act to the Magnuson-Stevens Act and requires cooperation among Federal agencies to stop or reverse the continued loss of fish habitat. On December 19, 1997, an interim final rule was published in the Federal Register to implement the EFH provisions of the Magnuson-Stevens Act. This rule establishes guidelines to assist the Regional Fishery Management Councils (Councils) and the Secretary in the description and identification of EFH in fishery management plans (FMPs), including identification of adverse impacts from both fishing and non-fishing activities on EFH, and identification of actions required to conserve and enhance EFH. The intended effect of the rule is to promote the protection, conservation, and enhancement of EFH.

This EIS initiates the EFH consultation requirements of the Magnuson-Stevens Fishery Conservation and Management Act. Implementation of the proposed project would impact approximately 1.5 square miles of marine water column (average depth 36 feet) and non-vegetated bottoms utilized by various life stages of species comprising the red drum, shrimp, and snapper-grouper, coastal migratory pelagic, spiny lobster and calico scallop management complexes. The initial determination is that the proposed action will not have a substantial individual or cumulative adverse impact on EFH or fisheries managed by the South Atlantic Fishery Management Council and the National Marine Fisheries Service (NMFS). Our final determination relative to project impacts and the need for mitigation measures is subject to review by and coordination with the NMFS.

4.9.1 One effort of the FMPs is to identify threatened and endangered marine species and habitats critical to their existence. The Proposed Project is within the South Atlantic Fishery Management Council's (SAFMC) area of jurisdiction, which extends from the Florida Keys to the north coast of North Carolina. In October 1998, the SAFMC released the "Final Habitat Plan for the South Atlantic Region: Essential Fish Habitat Requirements for Fishery Management Plans of the South Atlantic Fishery Management Council" (Final Habitat Plan) (SAFMC, 1998). One June 3, 1999, the Final Habitat Plan was approved by the Department of Commerce.

The Final Habitat Plan identifies the following as managed EFH within the South Atlantic region:

Estuarine emergent wetlands	Marine Areas
Estuarine scrub/shrub mangroves	Live/hard bottoms
Sea grass	Coral and coral reefs
Oyster reefs and shell banks	Artificial/man-made reefs
Intertidal flats	*Sargassum*
Palustrine emergent and forested wetlands	Marine water column
Aquatic beds	
Estuarine water column	

Species under the jurisdiction of the SAFMC include many of those listed in Section 4.8.1. In addition, the SAFMC lists the following species as candidate species worthy of monitoring.

Species	Scientific Name
dusky shark	*Carcharhinus obscurus*
sand tiger shark	*Odontaspis taurus*
night shark	*Carcharhinus signatus*
Atlantic sturgeon	*Acipenser oxyrhynchus oxyrhynchus*
mangrove rivulus	*Rivulus marmoratus*
speckled hind	*Epinephelus drummondhayi*
Warsaw grouper	*Epinephelus nigritus*

4.9.2 In addition to animal species listed by NMFS as threatened and endangered, NMFS also lists Johnson's seagrass as a threatened plant species worthy of protection.

4.9.3 The SAFMC designates the area between approximately the mouth of the Altahama River, Georgia, to approximately Jacksonville, Florida, and from the coast to about 15 nautical miles offshore; and from Jacksonville to approximately Sebastian Inlet, Florida, to about five nautical miles offshore as critical right whale habitat.

4.9.4 The Regional FMPs sets forth fishery species that are to be included as Managed Species. The following group management plans and species are included in the South Atlantic FMP as critical right whale habitat.

Shrimp Fishery Management Plan
- brown shrimp – *Penaeus aztecus*
- pink shrimp – *P. duorarum*
- rock shrimp – *Sicyonia brevirostris*
- royal red shrimp – *Pleoticus robustus*
- white shrimp – *Penaeus setiferus*

Red Drum Fishery Management Plan
- red drum – S*ciaenops ocellatus*

Snapper-Grouper Fishery Management Plan
- blackfin snapper – *Lutjanus buccanella*
- blueline tilefish – *Cauloatilus microps*
- gray snapper – *L. griseus*
- greater amberjack – *Seriola dumerili*
- jewfish – *Epinephelus itajara*
- mutton snapper – *L. analis*
- red porgy – *Pagrus pagrus*
- red snapper – *L. campechanus*
- scamp – *Mycteroperca phenax*
- silk snapper – *L. vivanus*
- snowy grouper – *E. niveatus*
- speckled hind – *E. drummondhayi*
- vermilion snapper – *Rhomboplites aurorubens*
- yellowedge grouper – *E. flavolimbatus*

Warsaw grouper – *E. nigritus*
white grunt – *Haemulon plumieri*
wreckfish – *Polyprion americanus*

Coastal Migratory Pelagics Fishery Management Plan
dolphin – *Coryphaena hippurus*
cobia – *Rachycentron canadum*
king mackerel – *Scomberomorus cavalla*
Spanish mackerel – *S. maculatus*

Golden Crab Fishery Management Plan
golden crab – *Chaceon fenneri*

Spiny Lobster Fishery Management Plan
spiny lobster – *Panulirus argus*

Coral and Coral Reef Fishery Management Plan
varied coral species and coral reef
communities comprised of several hundred species

Calico Scallop Fishery Management Plan
calico scallop – *Argopecten gibbus*

Sargassum Habitat Fishery Management Plan
*Sargassum (*and associated fauna) where it occurs in the EEZ and state waters

4.10 Other Recreation. Beaufort County's waters support a wide variety of recreational activities. Fishing has been addressed previously in this document. Coastal waters are also used for swimming, skiing, sailing, boating, surfing, skin diving, and SCUBA diving. Few of these activities occur in, and none is restricted to, the proposed ODMDS.

4.11 Shipping. The proposed Port Royal ODMDS is located just to the south and west of the entrance channel to the Port of Port Royal. While there are no designated shipping lanes beyond the entrance channel, the general area experiences heavy commercial shipping traffic.

4.12 Military Usage. While the Atlantic Ocean off Port Royal may be used by the United States Armed Forces for training, testing, and research activities, the proposed ODMDS does not lie within any designated fleet operating area.

4.13 Mineral Resources. Mineral resources in the proposed Port Royal ODMDS vicinity are not actively mined.

5.0 ENVIRONMENTAL CONSEQUENCES

5.1 Introduction. Criteria promulgated in 40 CFR Parts 228.5 and 228.6 deals with the evaluation of

ocean disposal locations and requirements for effective management to prevent unreasonable degradation of the marine environment. These criteria have been used as the basis of an environmental assessment of impacts at the candidate site. Criteria in 40 CFR Part 228.5 are titled *General Criteria for the Selection of Sites*, and those in Part 228.6 are titled *Specific Criteria for Site Selection.* Evaluation of the proposed Port Royal ODMDS utilized the literature base, interviews, and baseline data collected at the site to assess compliance with both the general and specific criteria of 40 CFR. Table 2 summarizes the application of the specific criteria to the site. Each of the general and specific criteria is addressed in this section as it relates to the site's suitability as a disposal site.

5.1.1 Geographical position, depth of water, bottom topography and distance from coast [40 CFR 228.6 (a) 1]. The proposed Port Royal ODMDS is approximately 918 acres in area with the following corner coordinates:

32° 05.00' N, 080° 36.47' W
32° 05.00' N, 080° 35.30' W
32° 04.00' N, 080° 35.30' W
32° 04.00' N, 080° 36.47' W

5.1.2 The center coordinates are: 32° 04.50' N and 080° 35.38' W. The general location of the candidate site is shown in Figure 1. The shoreward boundary of the disposal site is located approximately 10.4 nautical miles from Bay Point Island and 7.9 nautical miles from the northern end of Hilton Head Island.

5.1.3 The proposed ODMDS is situated on the continental shelf. Depths at the site average 36 feet.

5.2 Location in Relation to Breeding, Spawning, Nursery, Feeding, or Passage Areas of Living Resources in Adult or Juvenile Phases [40 CFR 228.6 (a) 1]. The most active breeding and nursery areas are located in inshore waters, along adjacent beaches, or in nearshore reef areas. While breeding, spawning, and feeding activities may take place near the proposed ODMDS, these activities are not believed to be confined to, or concentrated in, this area.

5.2.1 While many marine species pass through the proposed ODMDS, passage is not geographically restricted to this area. The probability of significant impact on any marine species from dredged material disposal is negligible. The proposed project will not affect any managed essential fish habitat (EFH).

5.3 Location in Relation to Beaches and Other Amenity Areas [40 CFR 228.6 (a) 3]. Beaches and inshore resources are outside the area to be affected by disposal in the proposed ODMDS. These amenity areas lie approximately 8 to 12 miles inshore of the designated disposal site.

5.3.1 Numerous recreational beaches exist on the coastal and barrier islands in the Port Royal Sound Area (Figure 8). Based on Bruun's (1985) conclusions, although the proposed ODMDS is out of the Port Royal littoral zone, the disposal of relatively clean sand from the entrance channel into the ODMDS may actually help to nourish recreational beaches on Hilton Head Island through migration due to current and wave action. There are also numerous state and Federal parks, preserves, and sanctuaries in the area (Figure 9), but it is unlikely that disposal in the ODMDS will affect these. National historical and archeological sites in the area are shown in Figure 8. None are close enough to the Port Royal ODMDS to be affected by disposal activities similar to those that have occurred in the past. The ODMDS is out of the littoral zone of the Port Royal and coastal South Carolina area.

5.4 Types and Quantities of Waste to be Disposal of and Proposed Methods of Release, Including Methods of Packing the Waste, if any [40 CFR 228.6 (a) 4]. The only material to be disposed of in the proposed Port Royal ODMDS will be dredged material that complies with EPA Ocean Dumping Regulations (40 CFR 220-229). The site is expected to be used for routine maintenance of the authorized Federal channels and all activities permitted under Section 103.

5.5 Feasibility of Surveillance and Monitoring [40 CFR 228.6 (a) 5]. Bottom contours in the area can be monitored through bathymetric survey methods. Monitoring of the proposed Port Royal ODMDS is discussed in the Dredge Material Management Plan (1997) prepared by the U.S. Army Corps of Engineers, Charleston District. This plan is intended to be flexible and may be modified by the responsible agency for cause. A site management and monitoring plan has been developed for the Port Royal ODMDS. The draft plan can be found in Appendix B of this EIS.

5.6 Dispersal, Horizontal Transport, and Vertical Mixing Characteristics of the Area, Including Prevailing Current Direction and Velocity, If Any [40 CFR 228.6 (a) 6]. Nearshore surface circulation is primarily influenced by atmospheric conditions and to a lesser extent by tidal cycles. Therefore, nearshore surface currents, are derived primarily from wind stress, and are subject to extreme variability.

5.6.1 The littoral drift along Hilton Head Island is reported to be predominantly southwestward with a northeastward drift occurring in the spring and summer months. Nearshore surface currents in the Port Royal Sound were found to be alongshore to the southwest 60 percent of the year.

5.6.2 The nearshore areas of the South Atlantic Bight are sufficiently shallow for the entire water column to behave as an Ekman surface layer, with bottom and coastal boundary frictional effects complicating the current patterns. These surface layers respond to wind stress within a few hours, suggesting that bottom currents in the immediate vicinity of the ODMDS may be determined primarily by wind stress. Tidal fluctuations are also important in determining bottom currents in nearshore areas, and the contributions of these components has not been reported for this area. The bottom currents were measured on the mid-continental shelf of the SAB and found that currents there were dominated by the local semi-diurnal tides. Another study reported that bottom currents in the nearshore area were southerly during 60 percent of the years.

5.6.3 A review of bathymetry data from 1991 to present in the vicinity of the proposed Port Royal ODMDS has revealed that no significant accumulation of disposed dredged materials has occurred.

5.7 Existence and Effects of Current and Previous Discharges and Dumping in the Area (including cumulative effects) [40 CFR 228.6 (a) 7]. Two ODMDSs have been used since initial construction of the Entrance Channel in 1959. The north ODMDS, located in an area with water depths of 20 feet, has not been used since 1979 as the area became too shallow for a hopper dredge. With water depth of 35 feet, the south ODMDS continues to be used and was last used in 1996 when 475,413 cubic yards of material was removed from the Entrance Channel.

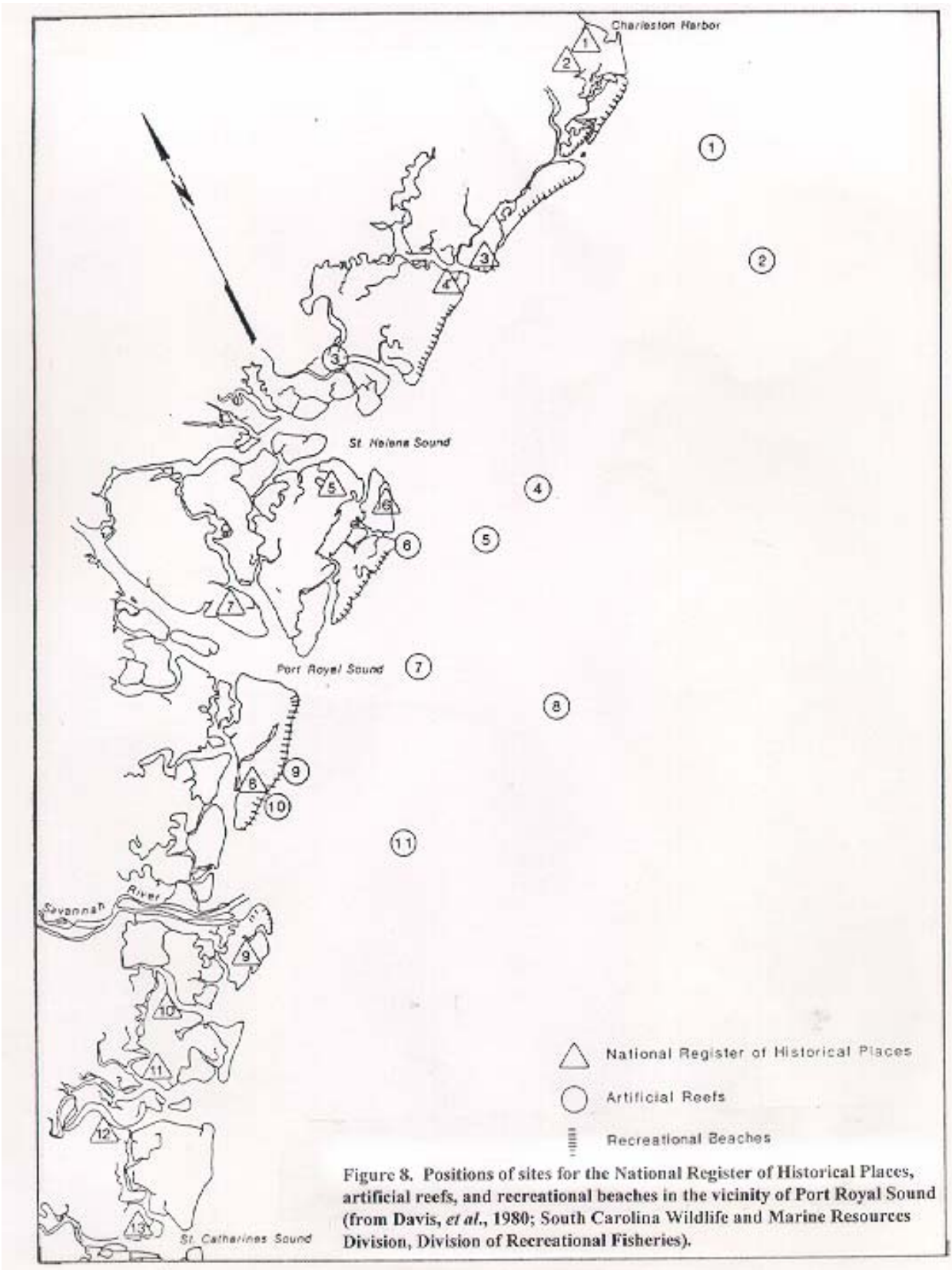

Figure 8. Positions of sites for the National Register of Historical Places, artificial reefs, and recreational beaches in the vicinity of Port Royal Sound (from Davis, *et al.*, 1980; South Carolina Wildlife and Marine Resources Division, Division of Recreational Fisheries).

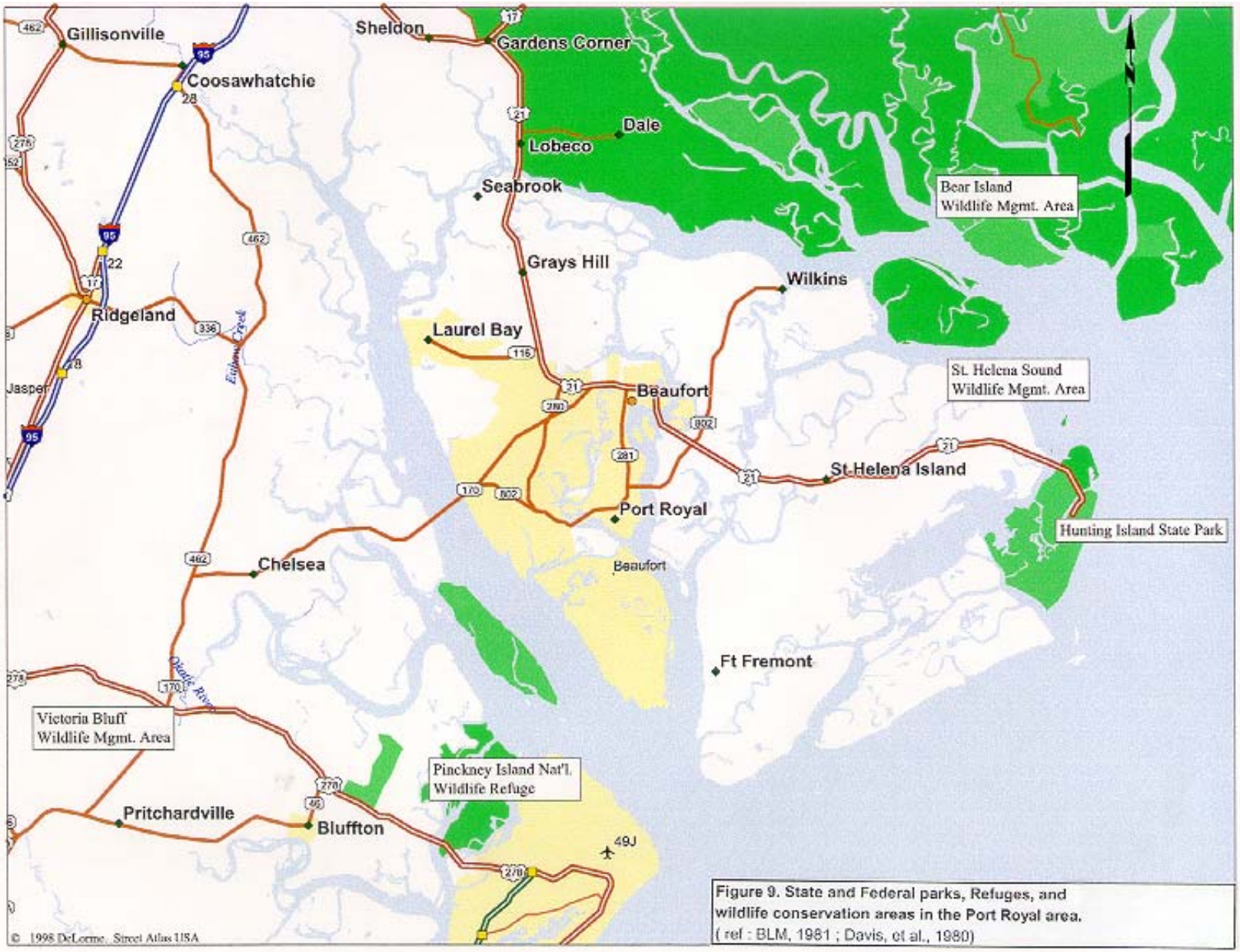

Figure 9. State and Federal parks, Refuges, and wildlife conservation areas in the Port Royal area.
(ref : BLM, 1981 ; Davis, et al., 1980)

5.7.1 Construction of the portions of Port Royal Harbor providing for the 24-foot channel in Beaufort River and Battery Creek and the 27-foot turning basin at the head of the project in Battery Creek was completed in June 1956. The Entrance Channel leading to Port Royal shoals in more frequently than Beaufort River or Battery Creek. In the interval between 1980 and 1996, the Entrance Channel required dredging six times with an average of slightly more than 771,000 cubic yards being removed during each event. Maintenance material removed from the Entrance Channel was disposed of in the south ODMDS. Battery Creek and the Turning Basin were dredged in 1995 with the removal of 144,734 cubic yards of sandy material by means of a clamshell dredge. Disposal of this material was placed in the south ODMDS, as an acceptable upland site was not available. Prior to 1995, Battery Creek and the Turning Basin were last dredged in November 1969 when 53, 578 cubic yards were removed and placed in unconfined wetland disposal areas. Maintenance dredge quantities removed from the project during the past five years is shown in Table 7. No incidents of adverse impacts from these disposal actions are known. Several private users of these waterways, including marinas at Hilton Head, have also utilized the Port Royal ODMDS in the past for disposal of dredge material from their maintenance activities.

Table 7. Federal Dredging History

Year	Dredging History [1,2,3] (Thousand CY per year)	Reach or Segment	Primary Dredging Method	Disposal Site(s) Used (Identifier)
1992	816.0	Entrance Channel	Hopper Dredge	Ocean Disposal
1993				
1994	339.4	Entrance Channel	Hopper Dredge	Ocean Disposal
1995	144.7	Battery Creek (includes Turning Basin)	Mechanical (Clamshell)	Ocean Disposal
1996	475.4	Entrance Channel	Hopper Dredge	Ocean Disposal
1997				
1998	263.0	Entrance Channel	Hopper Dredge	Ocean Disposal
1999				
2000	162.3	Entrance Channel	Hopper Dredge	Ocean Disposal
2001				
2002				
2003	100.0	Entrance Channel	Hopper Dredge	Ocean Disposal

Notes:
[1] Amount dredged by year for each of last 12 years. No data posted if not dredged. Beaufort River last dredged in 1956 when project was being constructed.
[2] All quantities are based on required pay quantities.
[3] Computed average per year of dredged material from the Entrance Channel = 179.7 cu.yds.
Computed average per year of dredged material from Battery Creek = 12.1 cu.yds.

Source: U.S. Army Corps of Engineers, 1997 & 2003

5.8 Interference With Shipping, Fishing, Recreation, Mineral Extraction, Desalination, Fish and Shellfish Culture, Areas of Special Scientific Importance, and Other Legitimate Uses of the Ocean [40 CFR 278.6 (a) 8]. The proposed ODMDS is located just south and west of the entrance channel to the Port of Port Royal, an area of infrequent commercial shipping traffic. Most heavy commercial traffic passes further to the south and east of the proposed disposal area. The infrequent use of this site should not significantly disrupt either commercial shipping or recreational boating.

5.8.1 Commercial and recreational fishing activity is concentrated in inshore and nearshore waters or at offshore artificial reefs and ship wrecks; however, many sites other than the artificial reefs and wrecks are used for fishing. The use of the proposed ODMDS is not expected to impact fishing in any way. The proposed ODMDS lies about 10.4 miles from Baypoint Island. Artificial reef sites and shipwrecks in the vicinity of the proposed ODMDS are listed in Table 8. No significant mounding of dredged materials at the proposed ODMDS site is expected.

Table 8. Artificial Reefs and Wrecks in the Proposed ODMDS Vicinity

Reef/Wreck	Bearing/Distance	GPS Location
Fripp Island Reef	140°/5.8 nm from Fripp Inlet	N32° 15.421' W80° 22.465'
Hunting Island Reef	144°/8.5 nm from Fripp Inlet	N32° 13.055' W80° 20.494'
Fripp Island Drydock Wreck	150°/3.0 nm from Fripp Inlet	N32° 17.112' W80° 24.905'
Parris Island Reef	Located in Broad River, between Parris Island and Daws Island	N32° 18.865' W80° 42.520'
General Gordon Wreck	090°/2.0 nm from Port Royal Sound Channel Buoy 14	N32° 10.115' W80° 33.225'
Fish America Reef	105°/8.4 nm from Port Royal Sound Channel Buoy 2PR	N32° 03.427' W80° 24.851'
Gaskins Bank Wreck	273°/5.7 nm from Port Royal Sound Channel Buoy 5	N32° 06.010' W80° 42.185'
Betsy Ross Reef	105°/8.4 nm from Port Royal Sound Channel Buoy 2PR	N32° 03.427' W80° 24.851'
Hilton Head Reef	195°/5.0 nm from Port Royal Sound Channel Buoy 2PR	N31° 59.948' W80° 35.928'
Eagle's Nest Reef	133°/5.5 nm from Port Royal Sound Channel Buoy 2PR	N32° 01.160' W80° 30.300'
Whitewater Reef	255°/8.5 nm from Port Royal Sound Channel Buoy 2PR	N32° 03.089' W80° 45.003'

Source: South Carolina Department of Natural Resources, 1999

5.8.2 No mineral extraction, desalination or mariculture activities occur in the immediate area. Recreational and scientific resources are present through the area but area not geographically limited to the proposed Port Royal ODMDS or nearby waters.

5.9 Existing Water Quality and Ecology of the Site as Determined by Available Data or by Trend Assessment or Baseline Surveys [40 CFR 228.6 (a) 9]. Water quality at the proposed ODMDS is variable and is influenced by discharges from inshore systems and infrequent ocean intrusions. Investigations have reported on the circulation of the inner continental shelf of the South Atlantic Bight (SBA) (Lee and Brook, 1979; Lee and Atkinson, 1983; Schwing, *et al*., 1983). Findings suggest that near shore circulation is primarily influenced by atmospheric conditions, and to a lesser extent by tidal cycles. Therefore, nearshore surface currents are derived primarily from wind stress, and are subject to extreme variability.

Some bottom habitat and benthic species will be impacted by the deposition of the dredged materials at the proposed ODMDS site. However, this effect is temporary as the benthic species are expected to re-establish on the deposited material within a relatively short time.

5.9.1 Water and sediment samples collected from the proposed disposal site and vicinity from the early 1970s through 1977 did not contain elevated concentrations of pesticides, pesticide derivatives, trace metals, PCB, or HMW hydrocarbons.

5.10 Potential for the Development or Recruitment of Nuisance Species in the Proposed Disposal Site [40 CFR 228.6 (a) 10]. The disposal of dredged materials should not attract or promote the development of nuisance species. No pre-disposal nuisance organisms were identified in the 1997 investigation conducted by SCDNR of the proposed disposal site and none has been reported to occur at previously utilized disposal sites in the vicinity.

5.11 Existence at or in Close Proximity to the Site of Any Significant Natural or Cultural Features of Historical Importance [40 CFR 228.6 (a) 11]. No natural or cultural features of historical importance are known to occur at or in close proximity to the site.

5.12 The Dumping of Materials Into the Ocean will be Permitted Only at Sites or in Areas Selected to Minimize the Interference of Disposal Activities With Other Activities in the Marine Environment, Particularly Avoiding Areas of Existing Fisheries or Shellfisheries, and Regions of Heavy Commercial or Recreational Navigation [40 CFR 228.5 (a)]. The proposed Port Royal ODMDS does not support an active commercial or recreational fishery. Fishery and shellfishing resources are not concentrated in, restricted to, or dependent on the proposed disposal site vicinity.

5.12.1 There are no specially designated shipping lanes in the proposed disposal site vicinity. The candidate ODMDS is located seaward and slightly south of the entrance channel to the Port of Port Royal, and is an area of infrequent commercial shipping traffic. It is not anticipated that future, intermittent use of the site would result in a level of activity that would significantly disrupt shipping.

5.13 Locations and Boundaries of Disposal Sites Will Be So Chosen That Temporary Perturbations in Water Quality or Other Environmental Conditions During Initial Mixing Caused By Disposal Operations Anywhere Within the Site Can Be Expected to Be Reduced to Normal Ambient Seawater Levels or to Undetectable Contaminant Concentrations or Effect Before Reaching any Beach, Shoreline, Marine Sanctuary, or Known Geographically Limited Fishery or Shellfishery [40 CFR 228.5 (b)]. Any temporary perturbations in water quality resulting from disposal operations should be reduced to ambient or undetectable levels within a short distance of the release point. Prevailing currents at this site are along shore and to the southwest 60 percent of the year. The proposed ODMDS lies about 7.9 nautical miles from the nearest landfall. At this location, the likelihood of impacts to nearshore amenities and protected areas is small. The proposed disposal site does not lie in the vicinity of geographically limited fishery or shellfishery resources.

5.14 If, At Any Time During or After Disposal Site Evaluation Studies, It is Determined that Existing Disposal Sites Presently Approved on an Interim Basis for Ocean Dumping Do Not Meet the Criteria for Site Selection Set Forth in sections 228.5 and 228.6, the Use of Such Sites Will be Terminated As Soon As Alternate Disposal Sites Can Be Designated [40 CFR 228.5 (c)]. The proposed site meets the cited criteria.

5.15 The Sizes of Ocean Disposal Sites will be Limited in Order to Localize for Identification and Control Any Immediate Adverse Impacts and Permit the Implementation of Effective Monitoring and Surveillance Programs to Prevent Adverse Long-Range Impacts. The Size, Configuration, and Location of any Disposal Site Will be Determined as Part of the Disposal Site Evaluation or Designation Study [40 CFR 228.5 (d)]. A limited area of about 918 acres (approximately 1.0 square nautical mile) has been proposed as the ODMDS. Bottom contours in the area can be monitored through bathymetric survey methods. Management of the proposed Port Royal ODMDS is discussed further in the *Dredge Material Management Plan* prepared by the Charleston District. This plan is intended to be flexible and may be modified by the responsible agency for cause.

5.16 EPA Will, Wherever Feasible, Designate Ocean Dumping Sites Beyond the Edge of the Continental Shelf and Other Such Sites That Have Been Historically Used [40 CFR 228.5 (e)]. The proposed ODMDS is located on the continental shelf in approximately 36 feet of water. The edge of the continental shelf is many miles seaward of the proposed ODMDS and is not economically feasible to utilize. Environmental effects to off-shelf sites in the Port Royal vicinity have not been studied and are largely unknown. Historically used sites are on the shelf. No incidents of adverse impacts from the use of these disposal sites are known.

5.17 Relationship Between Short-Term Uses and Long-Term Productivity. Use of the proposed ODMDS in the manner described should have no effect on long-term productivity.

5.17.1 The disposal of dredged materials at the proposed Port Royal ODMDS would not result in significant long-term water quality degradation. Water quality impacts of concern with regard to dredged material disposal include those associated with increased turbidity, decreased dissolved oxygen levels, and the release of sediment-bound contaminants such as heavy metals, nutrients, and hydrocarbons, including pesticides and PCBs. Generally, contaminants bound in sediments are not released under conditions normally occurring at open water disposal sites (Burks and Engler, 1978; Saucier, 1978). Most potential contaminants remain sorbed on sediments or are readily scavenged from the water column by particulate matter and metal oxides and precipitated. In addition, only material meeting ocean disposal criteria will be disposed at the site. Further, as noted in Section 4.2.3, the grain size analysis of the dredged material from the entrance channel indicates that the material is predominantly sand and shell, to which contaminants do not generally bind, and therefore would not be found.

5.17.2 Increased turbidity resulting from dredged material disposal is generally short-term and transient (Windom, 1976). Elevated turbidity levels occur during dredged material disposal, but decrease rapidly as suspended sediments settle or disperse.

5.17.3 Temporary decreases in dissolved oxygen would occur during disposal. Given the depth of the well-mixed portion of the water column at the proposed ODMDS, significant off-site impacts are not expected and on-site impacts should be of short duration.

5.17.4 Nutrients bound in sediments would be released to the water column during disposal. Soluble phosphorus would be temporarily released but would be rapidly scavenged from the water column (Burks and Engler, 1978). Soluble nitrogen compounds, particularly ammonia, would also be released during disposal. Ammonia, which is toxic in high concentrations, should be rapidly reduced below harmful concentrations by dilution (Burks and Engler, 1978).

5.17.5 The potential for water quality impacts resulting from the release of trace metals is minor. Most heavy metals are poorly soluble and are readily sorbed by suspended matter and precipitated (Windom, 1976; Burks and Engler, 1978). Hydrocarbons, such as pesticides and PCBs, are generally poorly water-soluble. These substances generally remain sorbed on sediments and are not released during disposal (Windom, 1976; Burkes and Engler, 1978).

5.17.6 The disposal of uncontaminated sediments in compliance with EPA's Ocean Dumping Regulations and Criteria (40 CFR 220-229) would not be expected to result in sediment quality degradation. Periodic bioassay testing (toxicity/bioaccumulation) of proposed dredged material is required to ensure compliance unless the sediments meet the criteria of 40 CFR 227.13 which provides specific standards exempting sediments from testing. The material from the Port Royal Entrance Channel meets these criteria.

5.17.7 Impacts of dredged material disposal upon organisms in the water column are difficult to assess but are generally considered to be minimal and temporary (Pequegnat, *et al*., 1981). Most motile organisms (nekton) can avoid disposal operations and localized areas of poor water quality. Non-motile (planktonic) organisms such as phytoplankton, zooplankton, and ichthyoplankton entrained within the disposal plume would be directly affected. The impacts of disposal on these organisms are difficult to assess in light of the high natural variability of planktonic communities. Significant long-term impacts are not anticipated.

5.17.8 Sedentary and slow-moving benthic and epibenthic biota could be impacted both directly and indirectly by dredged material disposal. Direct impacts would result from the smothering of bottom-dwelling organisms under varying depths of dredge material. These impacts would result in the loss of some of the disposal site biota and the resultant alteration of benthic community structure. The high reproductive potential of most benthic infuana should reestablish predisposal conditions rapidly unless sediment characteristics are significantly different.

5.17.9 Direct impacts would occur at the specific sites of disposal. Recolonization from both the vertical migration of resident infaunal species and the recruitment of species from nearby areas would occur rapidly after completion of disposal operations.

5.18 Irreversible or Irretrievable Commitments of Resources. Resources irreversibly or irretrievably committed through use of the proposed site will include: (1) loss of fuel for the dredges to transport any dredged material to the site; (2) loss of some potentially recyclable material (i.e., sand for alternative uses); and (3) loss of some benthic organisms that will be smothered during disposal operations.

5.19 Environmental Justice. In consideration of directives set forth by Executive Order (EO) 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations*, February 11, 19994, the proposed action will not substantially affect human health or the environment to create disproportionately high or adverse effects on minority or low-income populations.

6.0 THE FOLLOWING CHART PRESENTS THE LIST OF PREPARERS

The following prepared, provided information, or reviewed information for the preparation of this Final Draft Environmental Impact Statement:

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Gary Collins	Oceanographer	USEPA	Reviewer

7.0 PUBLIC INVOLVEMENT

Potentially interested individuals, agencies, and organizations were invited to attend a scoping meeting for the project at the Town Hall Council Chambers, located in Port Royal, South Carolina, on July 10, 1997, at 7:00 p.m. An informal format was designed to provide an interactive forum for concerned individuals to discuss the range of actions, alternatives, and impacts to be considered in the draft EIS. The topics discussed at the meeting are of major importance in determining the significant issues to be analyzed in the depth in the EIS. To complete the scoping process, the Corps of Engineers provided a Scoping letter, dated June 9, 1997, to interested parties. Also included was a survey developed by the SCDNR to identify sensitive bottom habitats that are productive as fishery habitats. Over 750 letters with survey forms were mailed. Responses were requested by July 7, 1997. Only 19 responses were received. Appendix D contains the Letter to Interested Parties, a summary of responses to the SCDNR survey, and the list of addressees to whom letters were mailed during the conduct of the scoping process.

Appendix A

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8.0 REFERENCES

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Appendix B

PORT ROYAL
SITE MANAGEMENT PLAN
FOR THE PORT ROYAL
OCEAN DREDGED MATERIAL DISPOSAL SITE

DRAFT

Site Management Plan

Port Royal
Ocean Dredged Material Disposal Site

DRAFT

The following Site Management Plan for the Port Royal ODMDS has been developed and agreed to pursuant to the Marine Protection, Research, and Sanctuaries Act of 1972, as amended, for the management and monitoring of ocean disposal activities, as resources allow, by the U.S. Environmental Protection Agency and the U.S. Army Corps of Engineers.

_____	_____	_____	_____
Alvin B. Lee	Date	James D. Giattina	Date
Lieutenant Colonel, EN		Director	
Commander		Water Management Division	
U.S. Army Engineer District		U.S.EPA, Region 4	
Charleston, South Carolina		Atlanta, Georgia	

DRAFT

Site Management Plan

INTRODUCTION

It is the responsibility of EPA under the Marine Protection, Research, and Sanctuaries Act (MPRSA) of 1972 to manage and monitor Ocean Dredged Material Disposal Sites (ODMDSs) designated by the EPA pursuant to Section 102 of MPRSA. As part of this responsibility, a management and monitoring plan has been jointly developed by EPA/Region 4 and the Charleston District Corps of Engineers (CE) to specifically address the deposition of dredged material into ODMDSs. The South Carolina Department of Natural Resources (DNR) and the South Carolina State Ports Authority (SPA) have been represented during discussions on the requirements for the Port Royal ODMDS and will continue to be represented on the ODMDS Site Management and Monitoring Plan (SMMP) Team along with the U.S. Fish and Wildlife Service (FWS) and the National Marine Fisheries Service. The SMMP Team will meet annually to discuss upcoming disposal activities, suitable management practices, and monitoring efforts for all the ODMDSs in the Charleston District. Each of these agencies has had opportunity to review and comment on the Environmental Assessment and this associated site management plan for Port Royal.

SITE MANAGEMENT

Section 228.3 of the Ocean Dumping Regulations (40 CFR 220-229) states: "Management of a site consists of regulating times, rates, and methods of disposal and quantities and types of materials disposed of; developing and maintaining effective ambient monitoring programs for the site; conducting disposal site evaluation studies; and recommending modifications in site use and/or designation." The plan may be modified if it is determined that such changes are warranted as a result of information obtained during the monitoring process.

Management Objectives. There are three primary objectives in the management of each ODMDS. These are:

- Protection of the marine environment;
- Beneficial use of dredged material whenever practical; and
- Documentation of disposal activities at the ODMDS.

The following sections provide the framework for meeting these objectives to the greatest extent possible.

Material volumes. No restrictions are presently placed on disposal volumes. Disposal of unrestricted volumes is dependent upon results from future monitoring surveys.

Material suitability. There is no general restriction regarding the type of material that may be placed at the site at this time. However, the suitability of dredged material for ocean disposal must be verified by the CE and agreed to by EPA prior to disposal. This verification will be valid for three years. The verification will involve: 1) a case-specific evaluation against the exclusion criteria (40 CFR 227.13(b)), 2) a determination of the necessity for bioassay (toxicity and bioaccumulation) testing for non-excluded material based on the potential for contamination of the sediment since last tested, and 3) carrying out the testing and determining that the non-excluded, tested material is suitable for ocean disposal. As part of this determination, modeling may be necessary. Input parameters for modeling at the Port Royal ODMDS are included in Appendix B.

Documentation of verification will be completed prior to use of the site. Documentation for material suitability for dredging events proposed for ocean disposal more than 5 years since last verified will be a new 103 evaluation and public notice. Documentation for material suitability for dredging events proposed for ocean disposal less than 5 years but more than 3 years since last verified will be an exchange of letters between the CE and EPA.

Should EPA conclude that reasonable potential exists for contamination to have occurred, acceptable testing will be completed prior to use of the site. Testing procedures to be used will be those delineated in the EPA/CE testing manual ('1991 Green Book') and the Regional Implementation Manual. Only material determined to be suitable through the verification process by the CE and EPA will be placed at the designated ocean disposal site.

Time of disposal. At present no restrictions have been determined to be necessary for disposal related to seasonal variations in ocean current or biotic activity within the site. However, dredging projects which utilize hopper dredges are restricted to operating between November 1st to May 31st due to sea turtle restrictions. As monitoring results are compiled, should any such restrictions appear necessary, disposal activities will be scheduled so as to avoid adverse impacts. Additionally, if new information indicates that endangered or threatened species are being adversely impacted, restrictions may be incurred.

Disposal Technique. No specific disposal technique is required for this site. However, it is the intent of this plan to maximize any advantages of strategic placement of materials. Utilization of any beach-compatible dredged material for beach nourishment is encouraged by EPA. Disposal of coarser material should be planned to allow placement within or accessible to the littoral zone, to the maximum extent practical and following the provisions of the Clean Water Act.

Placement of Materials. Prior to any disposal of dredged materials, an agreement between EPA and CE will be reached concerning the exact placement of these materials. Permits/contracts will specify exact locations for the disposal of any material from the project.

Disposal Monitoring. 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. Accuracy and precision of the locational system will be at least as good as provided by GPS. Required header file field labels to be recorded daily include the following:

(a) Current Date: Month-Day-Year
(b) Contract Number: DACW60-.....
(c) Vessel Name: Name of Vessel
(d) Vessel Captain: Captain's Full Name
(e) Volume of load: Cubic Yards
(f) Distance of Scow From Tow Vessel: Stern of Tow Vessel to Bow of Barge
(g) Disposal technique: Bottom Dump, Pumpout, etc.
(h) Draft-empty: Feet rounded up at 0.5 ft.
(i) Datum: SC State Plane NAD83, etc.
(j) Phase I: Save data every 60 seconds
(k) Phase II: Save data every 06 seconds

Required digital data to be recorded daily are as follows:

(l) Time;
(m) Julian date;
(n) State plane coordinates;
(o) Lat/Long
(p) Compass Heading
(q) Draft
(r) Depth of cut
(s) Pump Drive (RPM)
(t) Pump Discharge Pressure
(u) Pump Vacuum

Within sixty (60) days prior to the commencement of some disposal operations, a baseline bathymetric survey may be conducted of the disposal area and adjacent areas. The survey will be taken along lines spaced on 400-foot intervals and be of sufficient length to adequately cover the area. Accuracy will be $\pm$ 0.5 foot. The survey will be referenced to MLLW and corrected for tide conditions at the time of the survey. As a follow-up to the baseline bathymetric survey, the CE or other site user may also be required to conduct a survey after disposal. The number of transects and accuracy required will be the same as in the baseline survey.

The user will be required to prepare and submit to the CE monthly report of operations for each month or partial month's work.

SITE MONITORING

Part 228 of the Ocean Dumping Regulations establishes the need for evaluating the impacts of disposal on the marine environment. Section 228.9 indicates that the primary purpose of this monitoring program is to evaluate the impact of disposal on the marine environment by referencing the monitoring results to a set of baseline conditions. Section 228.l0(b) states that in addition to other necessary or appropriate considerations, the following types of effects will be considered in determining to what extent the marine environment has been impacted by materials disposed at an ocean site (excerpted):

1. Movement of materials into estuaries or marine sanctuaries, or on to oceanfront beaches, or shorelines;

2. Movement of materials toward productive fishery and shellfishery areas;

3. Absence from the disposal site of pollution-sensitive biota characteristic of the general area;

4. Progressive, non-seasonal, changes in water quality or sediment composition at the disposal site, when these changes are attributable to materials disposed of at the site;

5. Progressive, non-seasonal, changes in composition or numbers of pelagic, demersal, or benthic biota at or near the disposal site, when these changes can be attributed to the effects of materials disposed at the site; and

6. Accumulation of material constituents (including without limitation, human pathogens) in marine biota at or near the site.

Part 228.l0(c) states: "The determination of the overall severity of disposal at the site on the marine environment, including without limitation, the disposal site and adjacent areas, will be based on the evaluation of the entire body of pertinent data using appropriate methods of data analysis for the quantity and type of data available.

Impacts will be classified according to the overall condition of the environment of the disposal site and adjacent areas based on the determination by the EPA management authority assessing the nature and extent of the effects identified in paragraph (b) of this section in addition to other necessary or appropriate considerations."

The monitoring plan for the Port Royal ODMDS does not involve a specific action plan at this time; however, a benthic infaunal survey has been performed by the South Carolina Department of Natural Resources. The results have been documented in a report entitled An Assessment of

Benthic Infaunal Assemblages and Sediments in the Vicinity of the Port Royal Ocean Dredged Material Disposal Site, 1999. Previous baseline site work and subsequent monitoring at this and other ODMDSs to date is sufficient to meet the management objectives for this site. Should a specific action plan be deemed necessary, it will be described and attached as Appendix A. This specific monitoring plan would be implemented in accordance with the availability of funding. Should shortfalls in funding occur, the SMMP team will recommend which aspects of the monitoring plan should receive priority. Results of monitoring will be reviewed by the SMMP team and recommendations made to the CE and EPA on appropriateness and detail of future monitoring efforts.

Modification of ODMDS SMMP. Should the results of the monitoring surveys indicate that continuing use of the ODMDS would lead to unacceptable impacts, then either the ODMDS Management Plan will be modified to alleviate the impacts, or the location of the ODMDS will be modified.

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APPENDIX A

GENERIC SPECIAL CONDITIONS
FOR MPRSA SECTION 103 PERMITS
PORT ROYAL, SC ODMDS

I. DISPOSAL OPERATIONS

A. For this permit, the term disposal operations shall mean: navigation of any vessel used in disposal of operations, transportation of dredged material from the dredging site to the Port Royal, SC ODMDS, proper disposal of dredged material at the disposal area within the Port Royal, SC ODMDS, and transportation of the hopper dredge or disposal barge or scow back to the dredging site.

B. The Port Royal, SC ODMDS is defined as the rectangle with center coordinates of 32°04.50' North by 80°35.88' West and corner coordinates of:

32°05.00' North by 80°36.47' West
32°05.00' North by 80°35.30' West
32°04.00' North by 80°35.30' West
32°04.00' North by 80°36.47' West

C. No more than [NUMBER] cubic yards of dredged material excavated at the location defined in [REFERENCE LOCATION IN PERMIT] are authorized for disposal at the Port Royal, SC ODMDS. The permittee agrees and understands that all dredged material will be placed in such a manner that its highest point will not exceed –32 feet MLW.

D. The permittee shall use an electronic positioning system to navigate to and from the Port Royal, SC ODMDS. For this section of the permit, the electronic positioning system is defined as: a differential global positioning system or a microwave line of site system. Use of LORAN-C alone is not an acceptable electronic positioning system for disposal operations at the Port Royal, SC ODMDS. If the electronic positioning system fails or navigation problems are detected, all disposal operations shall cease until the failure or navigation problems are corrected.

E. The permittee shall certify the accuracy of the electronic positioning system proposed for use during disposal operations at the Port Royal, SC ODMDS. The certification shall be accomplished by direct comparison of the electronic positioning system's accuracy with a known fixed point.

F. The permittee shall not allow any water or dredged material placed in a hopper dredge or disposal barge or scow to flow over the sides or leak from such vessels during transportation to the Port Royal, SC ODMDS. In addition, the permittee understands that no debris is to be place in the ODMDS.

G. A disposal operations inspector and/or captain of any tug boat, hopper dredge or other vessel used to transport dredged material to the Port Royal, SC ODMDS shall insure compliance with disposal operation conditions defined in this permit.

1. If the disposal operations inspector or the captain detects a violation, he shall report the violation to the permittee immediately.
2. The permittee shall contact the U.S. Army Corps of Engineers, Charleston District's Regulatory Division (843) 329-8035 and EPA Region 4 at (404) 562-9395 to report the violation within twenty-four (24) hours after the violation occurs. A complete written explanation of any permit violation shall be included in the post-dredging report.

H. When dredged material is disposed, no portion of the hopper dredge or disposal barge or scow shall be farther than 1,500 feet from the center of the Port Royal ODMDS as defined in Special Condition B.

I. The permittee shall use an automated disposal verification system that will continuously track (1 to 5 minute intervals) the horizontal location and draft condition of the disposal vessel (hopper dredge or disposal barge or scow) to and from the Port Royal ODMDS. This information shall be available in electronic format to the Charleston District Corps of Engineers and EPA Region 4 upon request.

1. Required digitally recorded data are: dump number, location from which the dredged material came, brief description of material in each dump (e.g., clean coarse sand; sand and shell sand mixed with clay and shell; dark organic silt); number of cubic yards on each dump; the beginning and ending coordinates for each dump and the compass heading at the beginning of each dump; date and time of each dump; and the map number on which the dump is plotted. This information will be available to the Charleston District Corps of Engineers on a daily basis. Upon completion of each dredging operation, the permittee agrees to prepare a computer-generated report, which encompasses the required information. This data will be coded into the MS-DOS data base program dBase III+. The attached "Database (dBase III) program for storage and

retrieval of data on Ocean Disposal" provides guidelines for this report. The District will provide the permittee one 5.25" or 3.5" floppy disk containing the file structure for the database to be created. The permittee will make multiple copies of this structure in case of any computer problems and will record data in no other structure without written permission from the District Engineer.

2. The permittee agrees to prepare a series of maps at an appropriate scale that will clearly show the individual dumps. Each dump will be labeled using the same number that is used to record the dump in the daily log and the database. A cumulative summary map(s) of all dumps will be submitted to the District Engineer at the end of the dredging operation. The cumulative summary map(s) is required in addition to the submittal of daily logs. The permittee may continue to use the same map until the density of dumps makes it difficult to identify the individual dumps by number. Maps will be labeled as map numbers in a series, and the lowest and highest dump numbers that appear on each map will be shown as part of the map title. At the end of the work, the permittee will compile the maps, as necessary, into a series and reduce the maps to eleven inches on the small side and folded into a bound (8 ½" X 11") report, with the daily dump logs.

3. The permittee shall use South Carolina State Plane or latitude and longitude coordinates (North American Datum 1983). State Plane coordinates shall be reported to the nearest 0.10-foot and latitude and longitude coordinates shall be reported as degrees and decimal minutes to the nearest 0.01 minutes.

J. The permittee shall conduct a bathymetric survey of the Port Royal ODMDS within two months prior to project disposal and within 30 days following project completion.

1. The number and length of the survey transects shall be sufficient to encompass the Port Royal ODMDS and a 0.25 nautical mile wide area around the site. The transects shall be spaced at 400-foot intervals or less.

2. Vertical accuracy of the survey shall be ±0.5 feet. Horizontal location of the survey lines and depth sounding points will be determined by an automated positioning system utilizing either microwave line of site system or differential global positioning system. The vertical datum shall be mean lower low water (m.l.l.w) and the horizontal

datum shall use South Carolina State Plane or latitude and longitude coordinates (North American Datum 1983). State Plane coordinates shall be reported to the nearest 0.10-foot and latitude and longitude coordinates shall be reported as degrees and decimal minutes to the nearest 0.01 minutes.

K. Between December 1 and March 31, NMFS requires monitoring by endangered species observers with at-sea large whale identification experience to conduct daytime observations for whales. During daylight hours, the vessel must take precautions to avoid whales. During evening hours or when there is limited visibility due to fog or sea states of greater than Beaufort, 3, the vessel must slow down to 5 knots or less when traversing between areas if whales have been spotted within 15nm of the vessel's path within the previous 24 hours. In addition, vessel shall maintain a 500-yard buffer zone between the vessel and any sighted whale.

L. Essential Fish Habitat (EFH). The Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA), 16 USC 1801 et seq. Public Law 104-208 reflects the Secretary of Commerce and Fishery Management Council authority and responsibilities for the protection of essential fish habitat. The Act specifies that each Federal agency shall consult with the Secretary with respect to any action authorized, funded, or undertaken, or proposed to be authorized, funded, or undertaken by such agency that may adversely affect any EFH identified under this act. EFH is defined in the Act as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." Detailed information on federally managed fisheries and their EFH is provided in the 1998 amendment of the Fishery Management Plans for the South Atlantic Region prepared by the South Atlantic Fishery Management Council (SAFMC). The 1998 generic amendment was prepared as required by the MSFCMA.

II. REPORTING REQUIREMENTS

A. The permittee shall send the U.S. Army Corps of Engineers, Charleston District's Regulatory Division and EPA Region 4's Wetlands, Coastal and Water Quality Branch (61 Forsyth Street, Atlanta, GA 30303) a notification of commencement of work at least thirty (30) days before initiation of any dredging operations authorized by this permit and referenced by the permit number. In addition, the permittee agrees to contact the U.S. Coast Guard at (843) 727-7683 prior to disposing of any material in the ocean disposal site.

B. The permittee shall submit to the U.S. Army Corps of Engineers weekly disposal monitoring reports. These reports shall contain

the information described in Special Condition I.I.

C. The permittee shall send one (1) copy of the disposal summary report to the Charleston District's Regulatory Branch and one (1) copy of the disposal summary report to EPA Region 4 documenting compliance with all general and special conditions defined in this permit. The disposal summary report shall be sent within 30 days after completion of the disposal operations authorized by this permit. The disposal summary report shall include the following information:

1. The report shall indicate whether all general and special permit conditions were met. Any violations of the permit shall be explained in detail.

2. The disposal summary report shall include the following information: Corps permit number, actual start date and completion date of dredging and disposal operations, total cubic yards disposed at the Port Royal, SC ODMDS, locations of disposal events, and pre and post disposal bathymetric survey results (in hard and electronic formats).

III. PERMIT LIABILITY

A. The permittee shall be responsible for ensuring compliance with all conditions of this permit.

B. The permittee and all contractors or other third parties who perform an activity authorized by this permit on behalf of the permittee shall be separately liable for a civil penalty of up to $50,000 for each violation of any term of this permit thy commit alone or in concert with the permittee or other parties. This liability shall be individual, rather than joint and several, and shall not be reduced in any fashion to reflect the liability assigned to and civil penalty assessed against the permittee or any other third party as defined in 33 U.S.C. Section 1415(a).

C. If the permittee or any contractor or other third party knowingly violates any term of this permit (either alone or in concert), the permittee, contractor or other party shall be individually liable for the criminal penalties set forth in 33 U.S.C. Section 1415(b).

APPENDIX B

Numerical Model(STFATE) Input Parameters
Water Column Evaluations
Numerical Model (STFATE) Input Parameters
Port Royal ODMDS

SITE DESCRIPTION

Parameter	Value	Units
Number of Grid Points (left to right)	45	
Number of Grid Points (top to bottom)	45	
Spacing Between Grid Points (left to right)	350	ft
Spacing Between Grid Points (top to bottom)	350	ft
Constant Water Depth	36	ft
Roughness Height at Bottom of Disposal Site	.005[1]	ft
Slope of Bottom in X-Direction	0	Deg.
Slope of Bottom in Z-Direction	0	Deg.
Number of Points in Ambient Density Profile Point	2	
Ambient Density at Depth = 0 ft	1.0215	g/cc
Ambient Density at Depth = 36 ft	1.0220	g/cc

AMBIENT VELOCITY DATA

Parameter	Value	Units
Water Depth	36	ft
Profile	Logarithmic	
Vertically Averaged X-Direction Velocity	0.0	ft/sec
Vertically Averaged Z-Direction Velocity	0.33	ft/sec

DISPOSAL OPERATION DATA

Parameter	Value	Units
Location of Disposal Point from Top of Grid	7,875	ft
Location of Disposal Point from Left Edge of Grid	7,875	ft
Dumping Over Depression	0	

INPUT, EXCECUTION AND OUTPUT

Parameter	Value	Units
Location of the Upper Left Corner of the Disposal Site - Distance from Top Edge	1,800	ft
Location of the Upper Left Corner of the Disposal Site - Distance from Left Edge	1,800	ft
Location of the Lower Right Corner of the Disposal Site - Distance from Top Edge	13,950	ft
Location of the Lower Right Corner of the Disposal Site - Distance from Left Edge	13,950	ft
Duration of Simulation	14,400	sec
Long Term Time Step	600	sec

COEFFICIENTS

Parameter	Keyword	Value
Settling Coefficient	BETA	0.000[1]
Apparent Mass Coefficient	CM	1.000[1]
Drag Coefficient	CD	0.500[1]
Form Drag for Collapsing Cloud	CDRAG	1.000[1]
Skin Friction for Collapsing Cloud	CFRIC	0.010[1]
Drag for an Ellipsoidal Wedge	CD3	0.100[1]
Drag for a Plate	CD4	1.000[1]
Friction Between Cloud and Bottom	FRICTN	0.010[1]
4/3 Law Horizontal Diffusion Dissipation Factor	ALAMDA	0.0225[2]
Unstratified Water Vertical Diffusion Coefficient	AKYO	Pritchard Expression
Cloud/Ambient Density Gradient Ratio	GAMA	0.250[1]
Turbulent Thermal Entrainment	ALPHAO	0.235[1]
Entrainment in Collapse	ALPHAC	0.100[1]
Stripping Factor	CSTRIP	0.003[1]

[1]Model Default Value
[2]Calculated from NOAA Field Work at Fort Pierce (1994)

Appendix C

TOTAL ABUNDANCE OF EACH SPECIES SAMPLED IN THE PORT ROYAL ODMDS AND SURROUNDING AREA DURING AUGUST 1997

(Jutte et al. 1999)

Appendix C. Total abundance of each species sampled in the Port Royal ODMDS and surrounding area during August 1997.
(A = amphipod; M = mullosc; P = polychaete; O = other taxa).

			Zone				
Species Name	**Higher Taxa**	**Total Abundance**	**BE**	**BN**	**BS**	**BW**	**DS**
Acanthohaustorius bousfieldi	A	3	2	0	1	0	0
Acanthohaustorius millsi	A	1	0	0	0	0	1
Acanthohaustorius shoemakers	A	2	2	0	0	0	0
Acanthohaustorius similis	A	13	5	0	7	1	0
Acanthohaustorius sp.	A	1	0	0	1	0	0
Acrocirridae sp.	P	7	1	0	4	0	2
Acteocina candei	M	11	2	5	0	0	4
Acteocina cf, inconspicua	M	37	10	0	27	0	0
Acteocina sp.	M	7	4	0	0	0	3
Acteon candens	M	13	1	0	10	1	1
Acuminodeutopus naglei	A	72	18	0	49	4	1
Aglaophamus sp.	P	106	26	22	1	46	11
Albunea paretii	O	1	0	0	0	1	0
Amakusanthura magnifica	O	7	2	0	4	1	0
Amastigos caperatus	P	34	1	12	0	21	0
Americhelidium americanum	A	78	9	26	1	14	28
Ampelisca agassizi	A	18	3	0	6	3	6
Ampelisca cristata microdentata	A	9	3	0	1	1	4
Ampelisca sp.	A	161	75	0	47	6	33
Ampelisca vadorum	A	27	4	0	18	5	0
Ampelisca verrilli	A	7	4	0	3	0	0
Ampharetidae	P	1	0	0	0	0	1
Anachis obesa	M	13	1	0	7	4	1
Anachis sp.	M	1	1	0	0	0	0
Anadara transversa	M	186	42	0	57	42	45
Ancistrosyllis hartmanae	P	34	6	1	13	14	0
Anomia simplex	M	6	3	0	2	0	1
Anoplodactylus petiolatus	O	3	0	0	1	2	0
Anthozoa	0	118	1	0	49	58	10
Aonides paucibranchiata	P	17	6	0	10	0	1
Aoridae	A	3	2	0	1	0	0

Appendix C. Total abundance of each species sampled in the Port Royal ODMDS and surrounding area during August 1997.
(A = amphipod; M = mullosc; P = polychaete; O = other taxa).

			Zone				
Species Name	**Higher Taxa**	**Total Abundance**	**BE**	**BN**	**BS**	**BW**	**DS**
Aphelochaeta sp.	P	29	11	0	18	0	0
Aplacophora	M	4	1	0	2	0	1
Apopdonospio dayi	P	113	9	54	0	22	28
Apseudidae sp. A	0	238	54	4	11	147	22
Apseudidae sp. B	O	43	8	0	13	1	21
Arabella iricolor	P	1	0	0	1	0	0
Arabellidae	P	2	0	0	1	0	1
Argissa hamatipes	A	17	6	1	2	5	3
Aricidea (Acmira) catherinae	P	39	9	1	15	12	2
Aricidea (Acmira) cerrutii	P	7	2	0	3	0	2
Aricidea (Acmira) sp. A	P	7	3	0	2	1	1
Aricidea (Acmira) sp. D	P	10	2	2	5	1	0
Aricidea (Acmira) taylod	P	16	11	1	0	2	2
Aricidea (Aricidea) fragilis	P	2	2	0	0	0	0
Aricidea (Aricidea) wassi	P	1	1	0	0	0	0
Aricidea sp.	P	3	0	0	0	2	1
Armandia agilis	P	15	0	12	1	2	0
Armandia maculata	P	15	7	0	5	1	2
Armandia sp.	P	48	16	6	20	6	0
Asabellides oculata	P	1	1	0	0	0	0
Aspidosiphon sp. A	O	92	39	0	40	3	10
Aspidosiphon sp. B	O	14	8	0	3	1	2
Astarte sp.	M	1	0	0	1	0	0
Asthenothaerus hemphilli	M	24	7	1	0	9	7
Astyris lunata	M	83	27	0	14	24	18
Atrina sp.	M	2	0	0	0	0	2
Autolytinae	P	1	0	0	0	1	0
Automate vermanni	O	9	5	0	1	3	0
Axiothella sp. A	P	37	6	0	22	7	2
Batea cathadnensis	A	60	10	1	30	9	10
Bathyporeia parked	A	6	0	2	0	0	4
Bhawania heteroseta	P	74	32	0	33	4	5

Appendix C. Total abundance of each species sampled in the Port Royal ODMDS and surrounding area during August 1997.
(A = amphipod; M = mullosc; P = polychaete; O = other taxa).

Species Name	Higher Taxa	Total Abundance	BE	BN	BS	BW	DS
Biffarius biformis	O	1	1	0	0	0	0
Bivalvia	M	173	43	13	82	22	13
Bivalvia sp. D	M	2	0	0	2	0	0
Bodotriidae sp. A	O	13	4	0	8	1	0
Bodotriidae sp. B	O	1	1	0	0	0	0
Bodotriidae sp. C	O	28	4	14	0	7	3
Boguea enigmatica	P	49	38	0	11	0	0
Bowmaniella floridana	O	5	0	1	2	2	0
Branchiostoma caribaeum	O	246	83	6	94	39	24
Brania clavata	P	65	22	0	25	13	5
Brania sp.	P	5	0	0	5	0	0
Brania wellfleetensis	P	12	3	0	7	2	0
Caecum imbricatum	M	9	8	0	1	0	0
Caecum johnsoni	M	148	51	0	74	1	22
Caecum regulare	M	40	0	29	1	0	10
Caecum sp.	M	31	0	0	30	1	0
Calappidae	O	11	5	0	6	0	0
Calliostoma yucatecanum	M	3	1	0	1	1	0
Calyptraea centralis	M	20	3	0	16	1	0
Calyptraeidae	M	3	3	0	0	0	0
Capitella capitata complex	P	1	1	0	0	0	0
Capitellidae	P	2	0	0	0	0	2
Cardiidae	M	2	2	0	0	0	0
Cardiomya omatissima	M	2	1	0	0	0	1
Caulleriella sp. B	P	23	5	2	11	5	0
Cerapus tubularis	A	13	1	1	1	9	1
Ceratocephale oculata	P	8	3	0	2	3	0
Ceratonereis irritabilis	P	272	92	0	97	55	28
Chione grus	M	4	3	0	1	0	0
Cirratudae Genus A	P	5	0	0	0	4	1
Cirratulidae	P	3	0	2	0	0	1
Cirriformia sp. A	P	25	2	8	0	12	3
					Zone		

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Species Name	Higher Taxa	Total Abundance	BE	BN	BS	BW	DS
Cin-ophorus sp. A	P	2	0	0	1	1	0
Corbula cf. dietziana	M	2	0	0	2	0	0
Crassinella lunulata	M	1028	595	6	369	10	48
Crassinella martinicensis	M	216	52	2	126	33	3
Crepidula maculosa	M	1	0	0	1	0	0
Crepidula plana	M	17	4	0	7	6	0
Crepidula s p.	M	4	3	0	0	0	1
Cyathura burbancki	O	95	4	0	43	30	18
Cyclaspis varians	O	101	16	3	23	43	16
Cyclostremiscus beaufi	M	4	4	0	0	0	0
Cylichnella bidentata	M	411	39	55	3	91	223
Demonax microphthalmus	P	21	6	0	6	9	0
Dentaliidae	M	1	1	0	0	0	0
Dentalium eboreum	M	6	4	0	0	2	0
Dentalium sp.	M	13	0	1	1	9	2
Diopatra cuprea	P	22	5	0	9	6	2
Diopatra sp.	P	8	1	0	0	4	3
Diopatra tridentata	P	2	0	0	1	1	0
Diplodonta sp.	M	152	54	8	54	15	21
Dipolydora hartmanae	P	59	24	1	31	0	3
Dipolydora socialis	P	51	18	1	15	12	5
Dissodactylus mellitae	O	15	1	8	0	6	0
Divaricella quadrisulcata	M	2	0	0	0	0	2
Dorvillea rudolphi	P	10	5	0	3	0	2
Dosinia discus	M	51	8	7	10	7	19
Drilonereis sp.	P	2	1	0	0	1	0
Echinoidea	O	14	5	2	5	0	2
Echiura	0	2	1	1	0	0	0
Edotea triloba	O	13	2	1	2	7	1
Elasmopus laevis	A	23	5	0	2	12	4
Ensis directus	M	2	1	1	0	0	0
Enteropneusta	0	3	0	0	0	3	0
					Zone		

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Species Name	Higher Taxa	Total Abundance	BE	BN	BS	BW	DS
Epitonium greenlandicum	M	2	0	0	0	2	0
Epitonium rupicola	M	1	0	0	0	0	1
Epitonium sp.	M	6	4	0	0	0	2
Ericthonius brasiliensis	A	14	3	0	1	4	6
Ervilia concentrica	M	2465	206	70	2128	22	39
Eteone lactea	P	7	2	0	2	3	0
Euarche tubifex	P	1	0	0	0	0	1
Euceramus praelongus	O	65	12	2	35	5	11
Eudevenopus honduranus	A	204	17	123	12	17	35
Eulimidae	M	9	1	0	3	3	2
Eumida sanguinea	P	42	8	0	17	5	12
Eunicidae	P	38	17	0	11	9	1
Eupleura caudata	M	1	0	0	1	0	0
Eurydice personata	O	2	0	0	1	0	1
Euryplax nitida	O	1	0	0	1	0	0
Exogone arenosa	P	299	102	0	129	16	52
Exogone sp.	P	55	0	0	55	0	0
Fabricinae	P	3	0	0	3	0	0
Gaiathowenia oculata	P	288	81	1	100	72	34
Gastropods	M	40	12	11	6	4	7
Gibberosus myersi	A	25	4	1	13	1	6
Globosolembos smithi	A	13	1	0	5	7	0
Glottidia pyramidata	O	6	0	0	1	5	0
Glycera americana	P	4	2	0	0	2	0
Glycera dibranchiata	P	5	1	3	0	1	0
Glycera oxycephala	P	6	0	1	0	0	5
Glycera sp. G	P	13	9	1	2	1	0
Glyceridae	P	2	0	0	2	0	0
Glycinde solitaria	P	2	0	0	0	0	2
Goniada littorea	P	253	34	63	31	38	87
Goniadides carolinae	P	137	47	0	72	5	13
Gouldia cerina	M	1	1	0	0	0	0
					Zone		

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Species Name	Higher Taxa	Total Abundance	BE	BN	BS	BW	DS
Hemipholis elongata	O	1	0	0	0	1	0
Hemipodus roseus	P	28	11	0	9	0	8
Hesionura elongata	P	22	3	0	18	0	1
Heterocrypta granulata	O	5	1	0	4	0	0
Heteropodarke cf. heteromorpha	P	10	2	0	6	0	2
Holothuroidea	O	10	3	0	1	4	2
Horoloanthura irpex	O	8	3	0	4	0	1
Hydroides microtis	P	10	1	0	7	1	1
Isolda puchella	P	4	0	0	3	1	0
Kurtziella atrostyla	M	1	0	0	1	0	0
Kudziella limonitella	M	78	29	5	20	7	17
Laonice sp.	P	24	5	0	15	3	1
Latreutes parvulus	O	8	0	0	3	4	1
Leitoscoloplos robustus	P	7	0	1	0	1	5
Leitoscoloplos sp.	P	19	4	8	5	2	0
Lepidonotus sublevis	P	3	2	0	0	0	1
Leptochela serratorbita	O	25	5	12	1	3	4
Leptosynapta tenuis	O	3	2	0	0	0	1
Leucosiidae sp.	O	11	4	0	2	3	2
Levinsenia gracilis	P	1	0	0	1	0	0
Libinia sp.	O	1	0	0	1	0	0
Liljeborgia sp.	A	24	7	0	14	2	1
Listriella barnardi	A	82	13	32	1	35	1
Litocorsa antennata	P	365	75	0	257	3	30
Loimia medusa	P	31	22	0	3	2	4
Loimia viridis	P	1	1	0	0	0	0
Lucina nassula	M	7	4	0	2	0	1
Lucina radians	M	2	2	0	0	0	0
Luconacia incerta	O	14	0	1	0	12	1
Lumbrineddes sp.	P	1	1	0	0	0	0
Lumbrineris cruzensis	P	83	12	32	0	7	32
Lumbrineris sp.	P	114	10	0	36	67	1
					Zone		

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Species Name	Higher Taxa	Total Abundance	BE	BN	BS	BW	DS
Lyonsia hyalina	M	4	0	0	3	0	1
Lyonsia sp.	M	1	1	0	0	0	0
Macoma sp.	M	66	21	0	14	10	21
Macoma tenta	M	21	0	7	0	14	0
Mactridae	M	1	0	0	1	0	0
Maera caroliniana	A	3	0	0	3	0	0
Magelona sp.	P	48	5	16	2	20	5
Maldanidae	P	49	13	15	16	3	2
Marginellidae	M	3	2	0	1	0	0
Marphysa sp. B	P	3	0	0	0	0	3
Mediomastus ambiseta	P	13	0	4	0	1	8
Mediomastus californiensis	P	7	2	0	0	0	5
Mediomastus sp.	P	871	167	24	400	173	107
Megalomma bioculatum	P	2	1	0	1	0	0
Megalomma lobiferum	P	2	2	0	0	0	0
Melanella sp.	M	2	1	0	0	1	0
Melinna maculata	P	28	13	0	9	3	3
Melinna sp.	P	58	10	0	11	37	0
Mellita quinquiesperforata	O	3	0	2	0	1	0
Metharpinia floridana	A	116	42	0	52	13	9
Mexieulepis weberi	P	1	0	0	1	0	0
Microphthalmus fragilis	P	7	4	0	0	0	3
Microphthalmus sczelkowii	P	1	0	0	0	1	0
Microphthalmus sp.	P	3	3	0	0	0	0
Microprotopus raneyi	A	17	8	5	2	1	1
Microspio pigmentata	P	1	0	0	0	1	0
Modiolus s p.	M	20	4	0	11	2	3
Moira atropos	O	1	0	0	0	0	1
Monocorophium tuberculatum	A	2	0	0	0	2	0
Monticellina baptisteae	P	27	13	0	13	0	1
Monticellina dorsobranchialis	P	60	10	0	31	9	10
Mooreonuphis nebulosa	P	143	47	0	54	6	36
					Zone		

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Species Name	Higher Taxa	Total Abundance	BE	BN	BS	BW	DS
Musculus lateralis	M	16	8	0	3	4	1
Mysidae	0	2	0	0	1	1	0
Nannastacidae sp. A	O	27	8	1	4	3	11
Nannastacidae sp. B	O	10	4	0	1	4	1
Nannodiella melanitica	M	44	14	2	0	28	0
Nannosquillidae	O	1	0	0	1	0	0
Nassarina glypta	M	38	13	2	1	19	3
Natica canrena	M	53	12	12	6	8	15
Naticidae	M	8	4	0	2	2	0
Neanthes arenaceodentata	P	4	0	2	1	0	1
Neanthes micromma	P	59	11	0	44	1	3
Nemertinea	0	572	139	36	168	143	86
Neomegamphopus sp.	A	21	7	0	13	1	0
Nephtys bucera	P	1	0	0	0	0	1
Nephtys picta	P	136	31	38	12	25	30
Nephtys squamosa	P	2	2	0	0	0	0
Nereididae	P	1	0	0	0	0	1
Nereiphylla fragifis	P	3	1	0	0	1	1
Nereis lamellosa	P	9	1	0	4	3	1
Nereis sp.	P	3	0	0	0	3	0
Notomastus hemipodus	P	5	0	3	0	2	0
Notomastus sp. A	P	15	6	9	0	0	0
Notomastus sp.	P	18	11	1	0	3	3
Nucula sp.	M	10	5	0	2	3	0
Nudibranchia	M	1	0	0	0	0	1
Odontosyllis fulgurans	P	7	5	0	1	1	0
Odostomia sp. A	M	1	0	0	0	1	0
Odostomia sp.	M	4	0	0	0	0	4
Ogyrides alphaerostris	O	70	11	13	5	14	27
Oligochaeta	0	1535	430	18	723	96	268
Olivella sp.	M	23	11	1	0	2	9
Onuphidae	P	25	13	1	8	0	3
					Zone		

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Species Name	Higher Taxa	Total Abundance	BE	BN	BS	BW	DS
Onuphis eremita	P	6	1	2	0	2	1
Ophioderma brevispinum	O	1	0	0	1	0	0
Ophiolepis elegans	O	1	0	0	0	0	1
Ophiothrix angulata	O	1	0	0	0	1	0
Ophiuroidea	0	161	63	5	37	30	26
Orbiniidae	P	1	1	0	0	0	0
Ostreidae	M	2	0	0	2	0	0
Owenia collaris	P	277	85	11	87	54	40
Oxyurostylis smithi	O	123	39	8	22	18	36
Pagurus sp.	0	106	23	4	17	54	8
Pandora trilineata	M	1	0	0	0	1	0
Paradoneis sp. A	P	3	2	1	0	0	0
Paradoneis sp. B	P	16	9	0	7	0	0
Paranaitis poiynoides	P	1	0	1	0	0	0
Paraonis pygoenigmatica	P	8	0	2	3	3	0
Parapionosyllis longicirrata	P	65	14	0	33	4	14
Parapionosyllis sp. B	P	8	0	0	7	0	1
Parapionosyllis sp.	P	5	0	0	5	0	0
Paraprionospio pinnata	P	64	10	11	11	16	16
Parougia caeca	P	12	1	5	4	2	0
Parvilucina multilineata	M	373	71	105	78	57	62
Pectinaria gouldii	P	11	3	0	2	2	4
Pedicorophium laminosum	A	8	2	0	6	0	0
Petaloproctus sp.	P	16	2	0	4	2	8
Pettiboneae blakei	P	1	0	0	1	0	0
Pettiboneae duofurca	P	8	4	0	3	1	0
Phascolion strombi	O	38	24	1	12	1	0
Pholadidae	M	9	1	0	7	0	1
Pholoe minuta	P	3	1	0	0	0	2
Phoronis sp.	0	56	26	3	9	12	6
Photis sp. A	A	19	3	0	5	4	7
Photis sp. B	A	11	5	0	3	3	0
					Zone		

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Species Name	Higher Taxa	Total Abundance	BE	BN	BS	BW	DS
Phoxocephalidae	A	38	2	29	6	0	1
Phyllodoce arenae	P	22	0	5	6	10	1
Phyllodoce longipes	P	6	4	0	1	0	1
Phyllodoce sp.	P	25	24	0	0	1	0
Pinnixa sp.	0	138	32	39	25	20	22
Pionosyllis gesae	P	72	44	1	17	0	10
Piromis roberti	P	3	1	0	0	1	1
Pisione remota	P	13	5	0	6	0	2
Pitar sp.	M	11	1	1	1	6	2
Plakosyllis quadrioculata	P	4	3	0	0	0	1
Pleuromeris tridentata	M	99	36	0	56	0	7
Plicatula gibbosa	M	3	2	0	1	0	0
Podarke obscura	P	15	7	0	4	0	4
Podarkeopsis levifuscina	P	6	1	0	4	0	1
Poecilochaetus sp. B	P	1	0	0	0	0	1
Poecilochaetus sp. C	P	1	1	0	0	0	0
Politolana concharum	O	2	0	0	2	0	0
Polycirrus eximius	P	98	13	5	55	24	1
Polycirrus sp.	P	2	0	0	2	0	0
Polydora websted	P	18	9	0	1	8	0
Polygordius sp.	0	2902	672	146	769	766	549
Polynoidae	P	8	3	0	3	1	1
Polyodontes sp.	P	1	0	0	0	1	0
Polyplacophora	M	1	0	0	1	0	0
Prionospio (M.) multibranchiata	P	1	0	0	1	0	0
Prionospio (Minuspio) perkinsi	P	111	36	0	17	14	44
Prionospio (Prionospio) cristata	P	2271	645	81	1110	226	209
Proceraea comuta	P	12	4	0	7	1	0
Processa fimbriata	O	9	5	1	2	1	0
Promysis atlantica	O	11	4	2	0	1	4
Protodorvillea kefersteini	P	27	9	0	5	1	2
Protohaustorius cf. deichmannae	A	93	13	78	0	0	2
					Zone		

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Species Name	Higher Taxa	Total Abundance	BE	BN	BS	BW	DS
Pseudeurythoe ambigua	P	62	21	0	17	3	21
Pseudovermilia occidentalis	P	6	4	0	1	0	1
Pyramidella crenulata	M	15	0	0	1	6	8
Pyramidellidae	M	1	1	0	0	0	0
Questidae sp. A	P	2	2	0	0	0	0
Rhepoxynius epistomus	A	23	1	3	0	0	19
Rullierinereis sp. A	P	4	1	0	1	0	2
Sabellaria vulgaris	P	139	67	0	25	39	8
Sabellidae	P	2	0	0	1	0	1
Scolelepis (P.) bousfieldi	P	15	5	1	4	4	1
Scolelepis (Parascolelepis) texana	P	7	0	1	0	1	5
Scolelepis (Scolelepis) squamata	P	1	0	0	0	0	1
Scoletoma emesti	P	2	0	1	0	0	1
Scoletoma sp.	P	108	29	0	26	39	14
Scoloplos rubra	P	19	3	0	5	8	3
Semele nuculoides	M	2	2	0	0	0	0
Serpula sp.	P	6	1	0	4	0	1
Serpulidae	P	4	0	3	0	1	0
Serpulidae sp. A	P	638	409	0	191	0	38
Sicyonia typica	O	6	0	0	5	1	0
Sigambra bassi	P	2	1	0	0	1	0
Sigambra tentaculata	P	52	10	14	0	14	14
Sipuncula	0	40	6	4	11	10	9
Sphaerodoridae	P	2	2	0	0	0	0
Sphaerosyllis piriferopsis	P	8	4	0	3	0	1
Sphaerosyllis sp.	P	6	0	0	6	0	0
Sphaerosyllis taylod	P	47	25	0	18	0	4
Spio pettiboneae	P	14	12	0	2	0	0
Spio sp.	P	1	0	0	0	0	1
Spiochaetopterus costarum	P	8	1	1	4	1	1
Spiophanes bombyx	P	102	17	20	28	31	6
Spiophanes missionensis	P	122	44	7	28	32	11
					Zone		

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Species Name	Higher Taxa	Total Abundance	BE	BN	BS	BW	DS
Sthenelais boa	P	1	1	0	0	0	0
Sthenelais limicola	P	42	7	7	0	26	2
Sthenelais sp.	P	6	0	0	0	0	6
Streptosyllis pettiboneae	P	4	2	0	0	1	1
Streptosyllis sp.	P	6	1	0	4	1	0
Streptosyllis varians	P	3	0	0	2	1	0
Strigilla mirabilis	M	1	0	1	0	0	0
Strombiformis auricinctus	M	6	3	0	2	1	0
Strombiformis bilineatus	M	10	4	2	0	4	0
Strombiformis sp. A	M	2	0	0	0	2	0
Syllidae	P	1	0	0	0	1	0
Tanaidacea	O	3	2	0	1	0	0
Tanaissus psammophilus	O	21	11	0	10	0	0
Telling sp.	M	611	107	183	88	128	105
Terebra concava	M	1	0	1	0	0	0
Terebra dislocata	M	4	1	0	0	1	2
Thalassinidea	O	13	2	5	0	4	2
Tharyx sp. A	P	372	38	36	142	142	14
Thraciidae	M	5	4	0	1	0	0
Tiron tropakis	A	98	32	5	9	32	20
Trachypenaeus constrictus	O	18	0	3	4	5	6
Travisia parva	P	16	3	0	12	0	1
Trypanosyllis sp.	P	4	3	0	1	0	0
Turbonilla interrupts	M	27	0	5	4	5	13
Turbonilla sp.	M	52	4	11	4	24	9
Turbonilla stricta	M	3	1	0	1	1	0
Typosyllis alternata	P	2	0	0	2	0	0
Typosyllis regulata carolinae	P	5	0	0	5	0	0
Typosyllis sp.	P	1	1	0	0	0	0
Unciola serrata	A	4	2	0	0	2	0
Unciola sp.	A	48	27	0	11	4	6
Veneridae	M	4	3	1	0	0	0
					Zone		

Appendix C. Total abundance of each species sampled in the Port Royal ODMDS and surrounding area during August 1997.
(A = amphipod; M = mullosc; P = polychaete; O = other taxa).

Species Name	Higher Taxa	Total Abundance	BE	BN	BS	BW	DS
Vitrinella helicoidea	M	6	0	0	0	2	4
Xanthidae0	O	4	7	0	9	4	4

Appendix D

SUMMARY OF RESPONSES TO SCDNR SURVEY, LETTER TO INTERESTED PARTIES, MAILING LIST FROM SCOPING OF AN EIS FOR THE DESIGNATION OF THE OCEAN DREDGED MATERIAL DISPOSAL SITE, PORT ROYAL, SOUTH CAROLINA

**SUMMARY OF RESPONSES TO SCDNR SURVEY,
LETTER TO INTERESTED PARTIES,
MAILING LIST FROM SCOPING
OF AN EIS FOR THE DESIGNATION
OF THE OCEAN DREDGED MATERIAL DISPOSAL SITE
PORT ROYAL, SOUTH CAROLINA**

- Dredged material may have serious impact on the entire area with currents and storms

  - Artificial reef material should be added to aid the existing live bottom
  - DNR – myself and other members of the club do fish this area in sport fishing King Mackerel Tournament

- DNR – indicated recreational fishing areas on survey map

- DNR – no comments or fish area indicated – did provide name/address

- DNR – These offshore areas are where we catch hopper when there are not many brown shrimp.

  - completed survey map – commercial shipping
  - provided name/address

- Only DNR survey map – indicates commercial shrimping areas

- Does not fish these waters and have no knowledge of any sensitive fishing habitats

  - provided name/address (charter boat)

- I do not normally use this area. I use the Charleston Harbor area.

  - provided name/address

- Unaware of my expertise in the impact deposited spoils have in our coastal waters

  - from personal experience – the impact on seafood harvesting abilities is dramatic
  - suggest alternative – dumping all hydraulically dredged spoils be deposited past the 200' depth in an area that is (1) deep enough to support continuous dumpings and (2) where no seafood harvesting occurs
  - we have an abundance of area that fits this criteria well offshore where it would be more feasible to deposit such material

- Areas marked are sloping edges of Gaskin Banks. Fishing conducted here is not for bottom dwelling species but migratory species, i.e. king mackerel, Spanish mackerel, cobia in spring and summer months.

- DNR survey indicated recreational fin fishing areas
- provided name/address

- No comment – provided name/address

- No comment – provided name/address/organization

- No longer fish this area and have no comment

  - provided name/address

- I am unfamiliar with the area designated on this map. I primarily fish in GA waters south of this designated dumping area – no name

- None known areas that may represent sensitive bottom habitats that are productive as fishery habitats

  - provided name/address

- Been fishing, scuba since 1946 – has good feel for what's going on – knows these waters

  - just putting soil from one spot to another doesn't hurt the fishing
  - fish traps, long lines, etc. is killing our resources
  - one doesn't have to spend millions on research/studies to know what's happening
  - wish FEDS would move on Action – not worry about policies, etc.
  - Seawolf charters – commercial finfishing – charter boat
  - provided name/address

- The existing ODMDS looks like a good place for spoils. Why can't the existing location be utilized

  - DNR survey indicated areas of commercial shrimping
  - provided name/address

- No comment – provided name/address

- DNR survey indicated areas of commercial shrimping

  - provided name/address

- Guide/fish inshore, near the Charleston, South Carolina area. Have no knowledge of offshore benthic features in the Port Royal Sound area.

  - provided name/address

- This is an area that whelk are fished for.

  - indicated commercial shrimping and other commercial fishing activity

- no survey map
- provided name/address

- No comment – U.S. Department of Commerce

  - cannot attend public meeting

- Hilton Head Consultant (Olsen and Associates)

  - opposes continued offshore disposal of beach compatible material

    - ♦ no opposition to permitting of ODMDS solely for the disposal of non-beach compatible maintenance dredging

  - all maintenance material shoaling the navigation channel associated with the outer cut (Hilton Head seaward) is beach compatible

    - ♦ opposes offshore disposal of this material
    - ♦ historic transfer of sand resources to offshore waters and Port Royal serves to exacerbate erosion of both the shoreline of Hilton Head Island and its associated ebb tidal shoals
    - ♦ the continued loss of beach compatible material to the local sand sharing system must be addressed in the EIS

  - numerous non-impactive uses of beach compatible materials excavated from navigation projects which are public interest, can provide environmental benefits rather than impacts – serve to protect sea turtle habitat, protect wetlands including large areas of endangered estuarine marsh reduce regiment to construct borrows areas seaward of Hilton Head for beach restoration.

  - EIS should account for: Town of Hilton Head obtained all permits necessary for Charleston District to perform beach disposal on north end of Hilton Head Island in August 2000. Town has requested that District perform technical investigations necessary to justify beach disposal along entirety of Port Royal Sound Shoreline – from the Atlantic shoreline westward to Pine Island – all future beach or in-shore disposal should be at Federal expense.

  - SCDNR determined that there appears to be a continued loss state-wide, of emergent shoal features conductive to foraging and breeding of sea bird populations. Accordingly, additional benefits associated with the in-shore disposal of channel maintenance material could include the reinforcement of emergent ebb-tidal shoal features bordering Port Royal Sound.

  - Comment on past dredging operations at Port Royal seem to have been singularly narrow in scope not necessarily keeping with "public interest" requirement to re-permit an "appropriate ODMDS". It submitted that alternative actions which provide public benefits, both shore protection and environmental, need to be taken into consideration…the justification of an action solely on the basis of it being "least cost" alternative – no longer acceptable.

GOVERNMENT AGENCIES AND SPECIAL INTEREST GROUPS

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Planning Commission
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State Conservationist
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Columbia, SC

Charleston Development
Alliance
Charleston, SC

South Carolina Department
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Ph.D., Executive Director
Columbia, SC

Center for Marine &
Wetland Studies
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Conway, SC

U.S. Fish and Wildlife
Service
Atlantic Coast Joint Venture
New Corner, MA

Beaufort County Planning
Board
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Beaufort, SC

U.S. Environmental
Protection Agency
Region IV – Ecological
Review/Wetlands

U.S. Coast Guard
Safety Office
Charleston, SC

Division of Boating, Chief
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Atlantic Coast Conservation
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Mt. Pleasant, SC

NRCS
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South Carolina Waterfowl
Association
Charleston, SC

South Carolina Shrimps
Association
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Isle of Palms, SC

Beaufort County Chamber
of Commerce
Beaufort, SC

U.S. Coast Guard – Office
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Aids to Navigation
Tybee, GA

Charleston Branch Pilots
Association
Captain R. F. Bennett
Charleston, SC

Department of Commerce,
USFCS
Columbia, SC

Berk-Chas-Dor Regional
Development Corp.
Charleston, SC

South Carolina Nature
Conservancy
Columbia, SC

Marine Resources Research
Institute
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University of South
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Department of Biological
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Columbia, SC

Beaufort City Manager
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Beaufort, SC

Lowcountry Regional
Planning Commission
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Yamessee, SC

National Marine Fisheries
Habitat Conservation
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St. Petersburg, FL

U.S. Fish and Wildlife
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Fish & Wildlife Service
Washington, DC

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National Marine Fisheries

Service

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Beaufort, NC

Association of Island Marinas/Hilton Head
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Town Manager, Hilton Head
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Hilton Head, SC

South Carolina Audubon Council
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Ocean & Coastal Resource Management
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Grant Services – Office of the Governor
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U.S. Forest Service
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Georgetown, SC
Town Manager, Edisto Beach
Mr. Linda Flatten
Edisto Beach, SC

Ducks Unlimited
Mr. Coy Johnson
Summerville, SC

Coastal Planning and Engineering
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Boca Raton, FL

South Carolina Sea Grant Consortium
Charleston, SC

American Rivers
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Washington, DC

South Carolina Coastal Conservation League
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Beaufort-Jasper Water & Sewer Authority
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Beaufort, SC

National Park Service
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Atlanta, GA

Sierra Club South Carolina Chapter
Columbia, SC

Wildlife Society – South Carolina Chapter
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Yamessee, SC

South Carolina DHEC
Division of Water Quality & Shellfish Sanitation
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South Carolina Water Resources Commission
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South Carolina Wildlife & Marine Resources Dept.
Santee Coastal Reserve
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U.S. Fish and Wildlife Service
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Ocean & Coastal Resource Management
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South Carolina Department of Parks Recreation & Tourism
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Columbia, SC

South Carolina Water Resources Commission
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South Carolina Department of Natural Resources
Water Resources Division
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South Carolina Department Natural Resources
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South Carolina Wildlife Federation
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South Carolina Department Natural Resources
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South Carolina Department Natural Resources
Chief, Hydrologist
Mr. Rod Cherry
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SHPO, Department of Archives
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Land Resources Conservation Commission
Administrative and Regulatory Service
Mr. Cary D. Chamblee, Deputy Director
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Charleston World Trade Center
Charleston, SC

Marine Contracting and Towing
Georgetown, SC

NAA/NOS Nautical Data Unit
Rockville, MD
Ber-Chas-Dor Council of Governments
Charleston, SC

South Carolina State Development Board
Columbia, SC

Beaufort County Development Commission
Beaufort, SC

Port of Port Royal, Inc.
Port Royal, SC

NOAA NOS Mapping and Charts
Source Data Unit N/CG221 Sta. 7350
Silver Springs, MD

South Carolina State Ports Authority
Mr. Larry Setzler
Charleston, SC

Charleston Trident Chamber of Commerce
Charleston, SC

Georgetown County Chamber of Commerce
Georgetown, SC

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Skipper & Wayne, Inc.
Mt. Pleasant, SC

Miss Alva, Inc.
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Folley Beach Seafood
Folly Beach, SC

Miss Marie, Inc.
Folly Beach, SC

Salvavida USA, Inc.
Folly Beach, SC

B&B Seafood
Green Pond, SC

Research & Marketing, Inc.
Isle of Palms, SC

Sea Shadow, Inc.
Edisto, SC

L&L Seafood
Brunswick, GA

Bay Street Seafood, Inc.
St. Simons Island, GA

C&H Industries
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Station Creek Co., Inc.
Frogmore, SC

Steadfast Marine Services
Frogmore, SC

Captain Ben Jones Corp.
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MacDonald Brothers ENT, Inc.
Hilton Head, SC

Drifters Excursions, Inc.
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Sea Trawlers, Inc.
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Mr. Magoo, Inc.
Townsend, GA

Gore Enterprises, Inc.
Valona, GA

W. O. Sasser Seafood, Inc.
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Gulf Stream Seafood, Inc.
Savannah, GA

Bay Street Seafood, Inc.
St. Simons Island, GA

C&H Industries
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M-Operating Company, Inc.
Jacksonville, SC

White Stack Towing and Transportation Co., Inc.
Charleston, SC

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Chesapeake, VA

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American Tugboat Co., Inc.
McClellanville, SC

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Norfolk Dredging Company
Chesapeake, VA

Coastal Science & Engineering
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Mr. Herbert Guerry
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Southern Dredging Co., Inc.
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Metal Traders, Inc.
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Salmons Dredging Corp.
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Inc.
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Beaufort, SC

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Inc.

SOUTH CAROLINA SALTWATER SPORTFISHING CLUBS
JANUARY 1997

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Taylors, SC

Beaufort Sportfishing & Diving Club
Beaufort, SC

Boca Morriss Pass Fly Fishing Club
Mt. Pleasant, SC

Bohicket Sportfishing Club
John's Island, SC

Carolina Lady Anglers
Charleston, SC

Central Savannah River Area Offshore Sportfishing Club
Martinez, GA

Charleston Coastal Anglers
Charleston, SC

Citadel Club of Charleston
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Columbia Offshore Fishing Association
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Edisto Beach Sportfishing Club
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Georgetown Sportfishing Association
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Greenville Saltwater Sportfishing Club
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Hilton Head Island Sportfishing Club
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Lowcountry Anglers
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The Saltwater Sports Club
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Saltwater Coalition of Recreational Anglers
Hilton Head Island, SC

South Carolina Saltwater Sportfishing Association
N. Charleston

Surfside Float Fishing Association
Surfside Beach, SC

Springmaid Kingfishing Club
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Sumter Saltwater Fishing Club
Sumter, SC

Grand Strand Saltwater Anglers Association
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Isle of Palms, SC

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William S. Fralin
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Francis Major
Beaufort, SC

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Troy Dewilde
Beaufort, SC

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Josie Mae S. Webb
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Kenneth N. Gibson
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David D. Coleman
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Charlie Washington
Burton, SC

David Godley
Beaufort, SC

Isaac Atkins
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Harry L. Taylor
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Loretta S. Jenkins
Burton, SC

Rondall W. Lanier
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Trae G. Everett
Beaufort, SC

Joseph A. Shipman
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Robert D. O'Quinn III
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Robert N. Graves
Beaufort, SC

Odell R. Wynn, Jr.
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Stephen R. Wells
Burton, SC

John E. O'Quinn
Coosaw, SC

Stephen D. Dempsey
Beaufort, SC

Randy A. Higgins
Burton, SC

Sokpun Hoffman
Beaufort, SC

Norman J. Singleton
Beaufort, SC

Albert J. Wallace
Beaufort, SC

Billy E. Dilsaver
Beaufort, SC

David G. Diehl
Beaufort, SC

Mark E. Bonds
Beaufort, SC

Alan R. McCartha
Beaufort, SC

Dennis Hoffman
Beaufort, SC

James M. Cook
Beaufort, SC

Marvin D. Braden
Burton, SC

Travis G. Hollingsworth
Burton, SC

Michael A. Gibson
Beaufort, SC

Tina L. Holder
Beaufort, SC

Richard J. Rubiolo
Beaufort, SC

Robert J. Witter
Burton,SC

Patrick V. Hoffman
Beaufort, SC

Charles L. Smith, Jr.
Beaufort, SC

Stephen G. Preul
Okatie, SC

Fred D. Crouse
Okatie, SC

Robert P. Kieffer
Bluffton, SC

Kenneth M. Deaver
Okatie, SC

Melvin Alston
Bluffton, SC

Deborah T. Hubbard
Bluffton, SC

Charles L. Criddle
Bluffton, SC

Michael R. Saturday
Bluffton, SC

Perry Hubbard III
Okatie, SC

Acie C. Baker
Bluffton, SC

Clayton C. Lowther
Okatie, SC

Mark K. Wise
Bluffton, SC

Matthew Stoney
Bluffton, SC

William A. Rooker
Bluffton, SC

Benjamin Miller
Bluffton, SC

Willis F. Hill
Bluffton, SC

John D. Todd
Bluffton, SC

Robert B. Boulineau
Okatie, SC

Frank T. Parrott
Bluffton, SC

Joe Spencer, Jr.
Bluffton, SC

Keith T. Hubbard
Bluffton, SC

Frank G. Toomer, Jr.
Bluffton, SC

Richard G. Toomer, Jr.
Bluffton, SC

Richard M. Inglis
Bluffton, SC

Larry C. Toomer
Bluffton, SC

David B. Nettles
Bluffton, SC

Ronald L. Leach
Bluffton, SC

Toniette F. Farmer
Okatie, Sc

Glen M. Burkart
Bluffton, SC

Jacquelin P. Flick
Bluffton, SC

Kevin L. flick
Bluffton, SC

Charles J. Heyward
Lobeco, SC

Pedro A. Albany
Dale, SC

Joe L. Albany
Dale, SC

Dawn R. Girdina
Seabrook, SC

Franklin D. Wiley
Daufuskie Island, SC

Ervin Simmons
Daufuskie Island, SC

Claudia S. Gay
St. Helena, SC

Edward B. Rynecki
St. Helena Island, SC

Michael H. Finnen
St. Helena, SC

Stephen P. Kerchner
Frogmore, SC

Arthur L. Ford
St. Helena, SC

Frank D. Mullins
Frogmore, SC

George T. Golden
St. Helena, SC

Bruce P. Fowler
St. Helena, SC

Bruce W. Fowler
St. Helena, Sc

Jeffery S. Gunther
St. Helena, SC

Bruce C. Golden
Frogmore, SC

Joey L. Chaplin
St. Helena, SC

Andrew Kidd, Jr.
St. Helena, SC

James D. Smith
St. Helena, SC

Willie A. Williams, Jr.
St. Helena, SC

Marion D. Jenkins
St. Helena, SC

William D. Stevenson II
Fripp Island, SC

Wild B. Green
St. Helena, SC

William R. Hunt, Jr.
St. Helena, SC

Thomas Capers
St. Helena, SC

Dale J. Ackerman
St. Helena, SC

Grail A. Reaves
St. Helena, SC

Charles Brisbane
St. Helena, SC

Howard Holmes
St. Helena, SC

Bernard Doctor
St. Helena, SC

Harold I. Moultrie
St. Helena, SC

Robert Pope, Jr.
St. Helena, SC

Tamer Middleton
St. Helena, SC

Bobby D. Knight
St. Helena, SC

Norman F. Gay
Frogmore, SC

Arthur Singleton
St. Helena, SC

William M. Chaplin
St. Helena, SC

Ernest Coleman
St. Helena, SC

Ezekiel Johnson
St. Helena, SC

John M. Carson
St. Helena, SC

Steven K. Abraham
St. Helena, SC

Michael A. Yoakum
St. Helena, SC

Arthur M. Chisholm
St. Helena, SC

Cleophus Wareen
St. Helena, Sc

William L. Golden
Frogmore, SC

Jesse Holmes, Jr.
St. Helena, SC

James Bradley
St. Helena, SC

Marvin H. Ladson
St. Helena, SC

Henry Chisholm, Jr.
St. Helena, SC

Jonathan Holmes
St. Helena, SC

Barrett T. Boulware
Frogmore, SC

John Singleton
St. Helena, SC

Barrett T. Boulware
Frogmore, SC

John Singleton
St. Helena, SC

Leisha M. Golden
St. Helena, SC

Julius Moultrie
St. Helena, SC

James D. Berry III
St. Helena Island, SC

Robert Pope
St. Helena, SC

John F. Martin III
St. Helena Island, SC

Colling O. Cleveland
St. Helena, SC

Robert K. Upton
Frogmore, SC

George Coleman
St. Helena, SC

John Mattis, Jr.
St. Helena, SC

Jimmy L. Stanley
St. Helena, SC

Saxby S. Chaplin
St. Helena, SC

Terry R. Golden
Frogmore, SC

Bobby N. Webb
St. Helena, SC

Mildred B. Varn
Frogmore, SC

George White
St. Helena, SC

Randall M. McCoy
St. Helena, SC

John J. Hall
St. Helena, SC

William P.Treloar
Frogmore, SC

Bartley W. Hughes
Furman, SC

Frank G. Toomer, Sr.
Hilton Head, SC

William Green
Hilton Head, SC

John F. Carter, Jr.
Hilton Head, SC

Martin Govan III
Hilton Head, SC

Ronald Stewart
Hilton Head, SC

Daniel Driessen
Hilton Head, SC

Richard Mitchell, Sr.
Hilton Head, SC

Eugene Orage
Hilton Head, SC

Clarence M. McMillan, Jr.
Hilton Head, SC

Brantley E. Toomer
Hilton Head, SC

Earl R. Hubbard
Hardeeville, SC

Joseph R. Bright
Hardeeville, SC

E.C. Hubbard
Hardeeville, SC

Carl L. Rogers
Hardeeville, SC

Penny T. Orrel
Hardeeville, SC

Clyde F. Scott
Hardeeville, SC

Isaiah G. Brown, Jr.
Hardeeville, SC

John M. Sanders, Jr.
Hardeeville, SC

Marvin Orrel
Hardeeville, SC

Glenn M. Scott
Hardeeville, SC

Phillip R. Horton
Hardeeville, SC

Richard T. Willdigg
Hilton Head, SC

Ronald W. Alley
Hilton Head, SC

Frank Gadson
Hilton Head, SC

Woodrow W. Collins
Hilton Head, SC

Larry C. Butler
Port Royal, SC

Robert T. Lewis
Port Royal, SC

Robert W. Potter
Port Royal, SC

Robert G. Chapin, Sr.
Port Royal, SC

George Ford
Port Royal, SC

Ogden C. Lazenby
Port Royal, SC

Roy D. Gray
Port Royal, SC

David K. Bogan
Port Royal, SC

Larry C. Butler
Port Royal, SC

Robert W. Potter
Port Royal, SC

J.C. Washington
Port Royal, SC

David S. Jones
Ridgeland, SC

Bill F. Cashion
Ridgeland, SC

Troy E. Altman
Ridgeland, SC

Harold H. Washington
Ridgeland, SC

George T. Pepper
Ridgeland, SC

Wilbur Gardner
Ridgeland, SC

David M. Plewes
Ridgeland, SC

William J. Rowell, Jr.
Ridgeland, SC

Thomas C. Lowther
Ridgeland, SC

Darrell T. Johnson
Ridgeland,SC

Ernest Jackson
Ridgeland, SC

Leon D. Wilson
Ridgeland, Sc

Oliver J. Bright
Ridgeland, SC

William C. North
Hilton Head, SC

James N. Lloyd
Hilton Head, SC

Jackie E. Woody
Seabrook, SC

Roger A. Walker
Seabrook, SC

George Albany
Seabrook, SC

Benjamin Capers
Seabrook, SC

John E. Smalls, Jr.
Seabrook, SC

David P. Brennan
Seabrook, SC

Rufus H. Pinckney
Sheldon, SC

Tyrone Powell
Sheldon, SC

James F. Log, Jr.
Varnville, SC

Craig B. Dopson
Yemassee, SC

John L. Simmons
Yemassee, SC

Dennis R. Ulmer, Jr.
Bloomingdale, GA

Donald E. Miller, Jr.
Brooklet, GA

Frederick W. Dennis, Jr.
Lyons, GA

Alvin G. Hilton III
Bloomingdale, GA

Mary F. Sheffield
Clyo, GA

Calvin R. Morris
Clyo, GA

Ralph McIver
Crescent, GA

Richard L. Skinner
Crescent, GA

Dubbie R. Kehle
Crescent, GA

Billy J. Nelson, Sr.
Crescent, GA

Rodney C. Sawyer
Crescent, GA

Max B. Yednak
Darien, GA

Ted W. Smithwick
Darien, GA

John H. Miller
Darien, GA

Roy O. Parks
Darien, GA

Walter H. Boone
Darien, GA

Gregory T. Boone
Darien, GA

George C. Everson
Darien, GA

Dave L. Gale, Sr.
Darien, GA

Marcus H. McCall
Darien, GA

Henry A. Skipper, Jr.
Darien, GA

Fred N. Todd
Darien, GA

Tommy H. Poppell
Darien, GA

Tracy T. Neesmith
Darien, GA

William P. Brannan
Darien, GA

Darnell F. Boone
Darien, GA

Chris B. Colson
Darien, GA

George W. Trutt
Darien, GA

Francis R. Keahig
Darien, GA

Douglas M. Boone
Darien, GA

James D. Herrington
Guyton, GA

David B. Bailey
Guyton, GA

Elbert Thompson, Sr.
Guyton, GA

Elbert Thompson, SR.
Guyton, GA

John A. Wallace
Meridian, GA

Robert C. Todd
Valona, GA

Hunter W. Forsyth
Meridian, GA

Martha H. Wadsworth
Richmond Hill, GA

Larry W. Perkins
Rincon, GA

Billy F. Watson
Tybee Island, GA

James M. Robertson
Tybee Island, GA

Frank Schuman
Tybee Island, GA

Michael O. White
Tybee Island, GA

Charles E. Bunting
Tybee Island, GA

Josiah B. Riffle
Tybee Island, GA

Albert D. Clark
Tybee Island, GA

John M. Fleming
Townsend, GA

Lawrence A. Jacobs
Valona, GA

Lawrence F. Jacobs
Valona, GA

Jules A. Hagan
Valona, GA

Paul T. Gregory
Savannah, GA

John F. Hayden
Savannah, GA

Robert F. Patterson
Savannah, GA

S. L. Shores
Savannah, GA

Henry H. Groover
Savannah, GA

Valgie McLemore
Savannah, GA

Gerald R. Smith
Savannah, GA

Thoas Stafford, Jr.
Savannah, GA

Reuben E. Smith
Savannah, GA

John D. McPhail
Savannah, GA

David Vongsaona
Savannah, GA

Kirk P. Davis
Savannah, GA

Dewey M. Bashlor
Savannah, GA

John C. McCarthy
Savannah, GA

Angie Woodward
Savannah, GA

George B. McKenzie
Savannah, GA

Elijah Wafford
Savannah, GA

Andrew G. Griner
Savannah, GA

Ricky D. Miles
Savannah, GA

Edward H. Bumgardner
Savannah, GA

James H. Woods
Port Wentworth, GA

David L. Sanders
Port Wentworth, GA

Darren A. Jackson
Savannah, GA

Keith J. Kramer
Savannah, GA

Ronald W. Martin
Savannah, GA

Robert F. Lowery
Savannah, GA

Betty G. Hall
Savannah, GA

Michael P. Sullivan
Savannah, GA

Christopher R. Gore
Savannah, GA

John B. Anderson
Savannah, GA

R.D. Watson, Sr.
Savannah, GA

Willie J. Holmes, Sr.
Savannah, GA

Allan F. McDonald
Savannah, GA

Dennis Ulmer
Savannah, GA

James F. Dubbely
Savannah, GA

Robert M. McCall
Brunswick, GA

Susan C. Teston
St. Simons Island, GA

Wesley F. Dickey
Jekyll Island, GA

James A. Carter
Woodvine, GA

James Gabrish
Charleston, SC

Joan Klippel
Hilton Head, SC

Marsha Hass
Charleston, SC

Charles Raley, Jr.
Charleston, SC

Jerry Olman
Hilton Head, SC

Atlee Compher
Hilton Head, SC

William Whitner
Johns Island, SC

Stephen Brinson
Hollywood, SC

Bradley Webb
Isle of Palms, SC

William Schilling
Hilton Head, SC

George Van Cott
Isle of Palms, SC

Michael Larrow
Ridgeland, SC

Robert Besok
Kiawah Island, SC

Samuel Lyon III
Hilton Head, SC

Marc Pincus
Hilton Head, SC

Thomas Bronsky
Hilton Head, SC

Erich Von Ahn
Hilton Head, SC

Craig Reda
Mt. Pleasant, SC

Gail Strusbaugh
Murrells Inlet, SC

John Cox
Mt. Pleasant, SC

Andrew Belk
Mt. Pleasant, SC

Edward Surgeon
Fripp Island, SC

Manley Eubank
Charleston, SC

Trevor Strever
Beaufort, SC

Waldo Phinney, Jr.
Beaufort, SC

Jerry Ciandella
Mt. Pleasant, SC

Ralph Howey, Jr.
Hilton Head, SC

James Watts
Wando, SC

Gregory Clark
Hilton Head, SC

Peter Brown
Charleston, SC

Charles Raley
Hilton Head, SC

Jay Johnson, Jr.
Charleston, SC

Edwin Toporek
Sullivans Island, SC

Dennis Lee
Mt. Pleasant, SC

Benjamin McInnes
North Charleston, SC

E.Byrd, Jr.
Isle of Palms, SC

Richard Stuhr
Charleston SC

Michael Able
Mt. Pleasant, Sc

Larry Branham
Johns Island, SC

George Campsen III
Charleston, SC

Richard Vance
Charleston, SC

William Parker, Ir.
Bluffton, SC

James Lockwood III
Mt. Pleasant, SC

Howard Costa
Hilton Head, SC

Robert Bennett, Jr.
Charleston, SC

Randolph Scott
Mt. Pleasant, SC

Kenneth Cannon
Ravenel, SC

Douglas Heaton
Charleston, SC

Alton McAbee
Johns Island, SC

William Pollitzer
Hilton Head, SC

Harry Kennerty
Mt. Pleasant, SC

Rodney Hughes
Hilton Head, SC

Michael Glaesner
Charleston, SC

Marvin Copeland
Burton, SC

Robert Johnson, Jr.
Mt. Pleasant, SC

William Stuhr
Mt. Pleasant, SC

John Sheppard
Folly Beach, SC

Charles Griffin, Jr.
Mt. Pleasant, SC

George Gallager, Jr.
Awendaw, Sc

John Carter, Jr.
Hilton Head, SC

Richard Smith
Mt. Pleasant, SC

Robert Jones
Bluffton, SC

Cecil Lachicotte
Edisto Island, SC

Jill Merritt
Charleston, SC

Thomas Young
Edisto Island, SC

A. Swygert
Johns Island, SC

David Thomas
Edisto Island, Sc

Richard Brackett
Charleston, SC

Augustus Blalock
Charleston, SC

George Webb
Charleston, SC

William Tuten III
Jacksonboro, SC

George West, Jr.
Charleston, SC

Jack Schultz
Charleston, SC

Charles Getsinger
Bluffton, SC

Robert Gilbert
Fripp Island, SC

Jerome Baldwin, Jr.
Green Pond, Sc

Charles Gertis
Beaufort, Sc

Ocie Welch III
Ridgeland, SC

Serge Claire
Charleston, SC

Michael Pendleton
Charleston, SC

Albert Martin III
Okatie, SC

Lawrence Wells
Hilton Head, SC

Michael Kitchen
Charleston, SC

Kevin Ragsdale
Beaufort, SC

Steven Gale
Bluffton, SC

Mark Maurer
Hilton Head, Sc

Ronald Wallschlager
Kiawah Island, SC

Mark Brown
Mt. Pleasant, SC

Edward Roberts
Hilton Head, SC

Mark Davis
Hilton Head, SC

Scott Condie
Bluffton, SC

James Maples
Hilton Head, Sc

Robert Nissly
Mt. Pleasant, SC

Albert Harvey III
Kiawah Island, Sc

George Bach
Beaufort, SC

John Williams
Folly Beach, SC

Victor Mills
Seabrook Island, SC

Larry Rhodes
Johns Island, SC

William Coleman
Johns Island, SC

James Crocker
Mt. Pleasant, SC

Levon Reeves
Mt. Pleasant, SC

Ralph Netherland, Jr.
St. Helena Island, SC

William Pinkston
Hilton Head, Sc

Billy Grooms
Charleston SC

David Murray
Beaufort, SC

David Fleming
Hilton Head, SC

Charles Monzel
Bluffton, SC

Richard Moore
Isle of Palms, SC

Patricia Broad
Ravenel, SC

Philip Smith
Hilton Head, SC

Richard Fleming
Hilton Head, SC

Stephen Wagner
Edisto Beach, SC

Appendix E

RESPONSES TO COMMENTS RECEIVED ON THE DRAFT EIS

NOAA Fisheries: Letter dated October 23, 2003. NMFS, Habitat Conservation Division concurred with the Federal determination that the proposed action would not have a substantial individual or cumulative adverse impact on essential fish habitat, or fishery resources under NOAA management responsibility. Also recommended coordination with NMFS, Protective Resources Division.

Response: We appreciate the concurrence on Essential Fish Habitat and will contact the Protected Resources Division, as recommended.

NOAA Fisheries: Letter dated December 10, 2003, NMFS, Protected Species Division concurred with the Federal determination that the project will have no effect on listed species or critical habitat protected by the ESA under NOAA Fisheries' purview. Also recommended coordination with NMFS, Habitat Conservation Division.

Response: We appreciate the concurrence on the Endangered Species Act.

Office of Ocean and Coastal Resource Management, SC DHEC: Letter dated October 20, 2003. OCRM identified some editorial changes to be addressed. Also expressed concerns regarding disposal of material from the Federal Navigation Project at the proposed ODMDS as opposed to beneficial uses of the material by placement on Hilton Head Island or at Joiner Bank. The letter also identified the confusion regarding the definition of private beaches versus publicly owned beaches.

Response: We have made editorial changes as requested and have made changes to the language concerning the beaches being privately owned. All comments concerning use of sand for beach nourishment are appreciated. EPA continues to support the beneficial use of dredged material on all projects. However, this document is focused on the environmental acceptability of the proposed ODMDS for its intended use. Extensive discussion on other uses of dredged material from projects is inappropriate within the scope of this document.

S.C. Department of Natural Resources: Letter dated October 21, 2003. SCDNR identified four editorial changes regarding the data presented in Section 4.2.5 and Section 4.7.3. Two changes in Section 4.2.5 have been made. The correct Appendix for the complete list of all taxa has been noted in Section 4.7.3. Lastly, the mailing list for the draft EIS is consistent with the addressees in Appendix D. However, the current mailing list has been updated to reflect personnel changes.

Response: Thank you for the editorial comments. The changes have been made.

Town of Hilton Head Island: Letter dated October 9, 2003. Expressed concern regarding the disposal of sediments from the Federal Navigation Channel at the proposed ODMDS and identified confusion regarding the definition of public versus private beaches.

Response: We appreciate the comments, and have made changes to the language concerning the beaches being privately owned. We also appreciate your comments related to beneficial uses of appropriate dredged material. EPA continues to support the beneficial use of dredged material on all projects. However, this document is focused on the environmental acceptability of the proposed ODMDS for its intended use. Extensive discussion on other uses of dredged material from projects is inappropriate

within the scope of this document.

South Beach Marina of Hilton Head: Letter dated October 17, 2003. The marina discussed the need for an ODMDS near the south end of Hilton Head instead of at the proposed location. Requested that the proposed ODMDS be moved to a location at the mouth of Calibogue Sound.

Response: We disagree with the comment that there is little need for the ODMDS in its current location. The need for this ODMDS is the reason for the proposed action. We have also heard of the Governor's idea of shutting down the State Port Authority's (SPA) facility at Port Royal, however, no such action has been initiated. The need for the ODMDS is driven by the Congressional authorization of the federal project, as determined by studies showing a federal interest in maintaining the navigational waterways within the project scope. Even closure of the SPA facility does not automatically mean the federal project would be deauthorized, particularly within a timely manner. The idea of relocating the ODMDS as suggested is not practical. As described within the Draft EIS, the process of designating an ODMDS starts with determination of need, followed by extensive field studies, which characterize the environs of the proposed ODMDS, and completed by the EIS development and rulemaking process. The entire process would have to be reinitiated in order to relocate the ODMDS several miles to the south. Such an action is doable, but cannot be shortened by "altering" the current proposal.

Sea Pines South Beach Owners Association: Letter (no date). The Owners Association reiterated the concerns and requests of the Town of Hilton Head and South Beach Marina letters.

Response: See responses to previous comments.