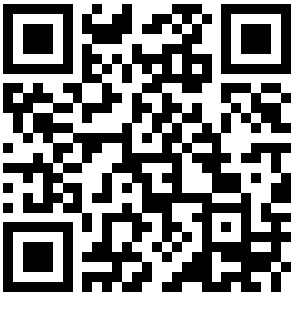
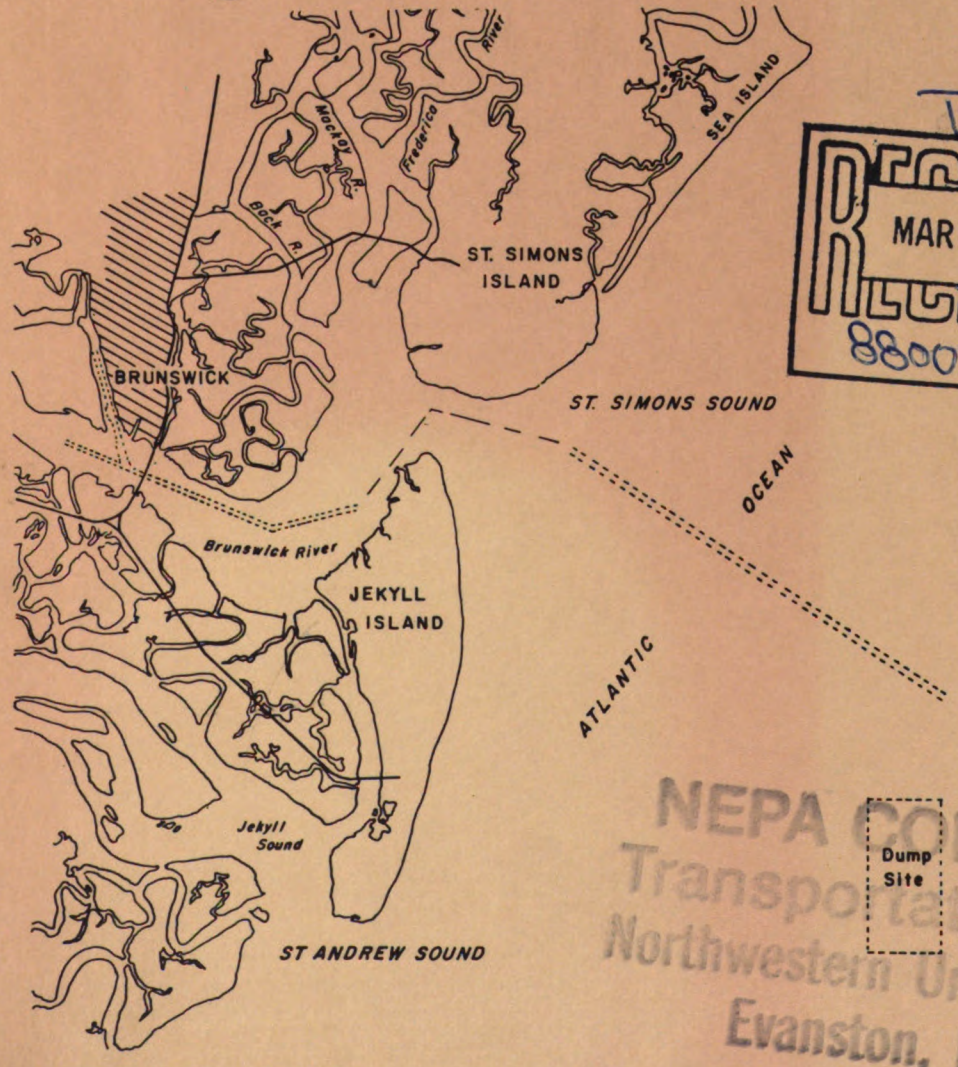


US Army Corps of Engineers
Savannah District

EPA United States Environmental Protection Agency
REGION IV

Final Environmental Impact Statement

Brunswick Harbor, Georgia Ocean Dredged Material Disposal Site Designation



MARCH 1988

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

345 COURTLAND STREET
ATLANTA, GEORGIA 30365

March 1988

Dear Reviewer(s):

Enclosed please find your copy of the Final Environmental Impact Statement (FEIS) for an Ocean Dredged Material Disposal Site (ODMDS) offshore Brunswick Harbor, Georgia. Please provide any review comments during the 30-day review period commencing sometime in March 1988. For the exact filing date, please see the Friday Federal Register announcements for March (Notice of Availability) or call the U.S. Environmental Protection Agency (EPA) in Washington D.C. (202/382-5075 or FTS 382-5075) or EPA/Region IV in Atlanta, Georgia (404/347-2126 or FTS 257-2126). Any written review comments should be sent to EPA/Region IV before the end of the review period at the following address:

Ms. Sally Turner, Chief
Marine Protection Section
Water Management Division
U.S. Environmental Protection Agency
Region IV
345 Courtland Street, NE
Atlanta, GA 30365

We look forward to your timely comments.

EPA/Region IV
Atlanta, Georgia

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

345 COURTLAND STREET
ATLANTA, GEORGIA 30365

FINAL
ENVIRONMENTAL IMPACT STATEMENT
BRUNSWICK HARBOR, GEORGIA
OCEAN DREDGED MATERIAL DISPOSAL
SITE DESIGNATION

Cooperating Agency

U.S. Army Corps of Engineers
Savannah District

Comments or inquiries should be directed to:

Sally Turner, Chief
Marine Protection Section
U.S. Environmental Protection Agency
Region IV
345 Courtland Street, NE
Atlanta, Georgia 30365
(404) 347-2126
(FTS) 257-2126

APPROVED BY:

Lee A. DeHihns, III
Acting Regional Administrator

March 1988
Date

SUMMARY SHEET

FINAL ENVIRONMENTAL IMPACT STATEMENT
FOR
BRUNSWICK, GEORGIA
OCEAN DREDGED MATERIAL DISPOSAL
SITE DESIGNATION

( ) Draft
(X) Final
( ) Supplement to Draft

ENVIRONMENTAL PROTECTION AGENCY
CRITERIA AND STANDARDS DIVISION

1. Type of action.

(X) Administrative/Regulatory action
( ) Legislative action

2. Description of the proposed action.

The proposed action is the designation of Brunswick, Georgia, Ocean Dredged Material Disposal Site (ODMDS), to be managed by the U.S. Environmental Protection Agency (EPA), Region IV. The EPA interim-approved site at Brunswick is rectangular shaped, and is approximately six nmi southeast of Brunswick, Georgia in 30 ft. of water. This site is proposed to receive final designation for continuing use for disposal of dredged material from the Brunswick Harbor area.

3. Environmental effects of the proposed action.

Adverse environmental effects of the proposed action include: 1) mounding, 2) smothering of the benthos, 3) temporary water column perturbations (turbidity plumes, release of chemicals, lowering of disolved oxygen concentration), and 4) possible habitat alteration of the site. These impacts are unavoidable, but not considered significant. The disposal operations will be regulated to prevent unacceptable environmental degradation outside site boundaries.

4. Alternatives to the proposed action.

Consideration of alternatives to the proposed action, pursuant to a joint directive (EPA & CE) entitled "Technical Guidance for the Designation of Ocean Dredged Material Disposal Sites," involves a three phase site selection process. While this process is primarily for new site designation, the directive indicates that it can apply to existing sites. The first phase consists of defining the geographic area of consideration. The disposal site must not be incompatible with other uses such as navigation, fisheries, or recreation. The second phase considers the 11 specific factors listed in 40CFR 228.6. Phase III, the final selection process considers all relevant data pertaining to the selection.
For the Brunswick disposal area, this three phase process has already occurred.

The site has been used for a number of years prior to and during interim site designation and is located at the south end of the channel. It is believed that the net sediment transport is to the south. For this reason the disposal area is located south of the channel. Its proximity to the channel aids in reducing economic costs of transportation. The water depth is sufficient to allow hopper dredges to operate. Because of continuous long term scour, the sediment build up is not a problem.

Any alternative location would incur either a greater cost for transportation and/or interfere with other marine uses. Therefore no other site locations were formally prepared for consideration. However, sites located further out to sea are considered as alternatives.

5. Federal, State, public, and private organizations from whom comments have been requested:

Federal Agencies and Offices

Council on Environmental Quality
U. S. Department of Commerce
Office of Coastal Zone Management
Maritime Administration
National Ocean Survey
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
U. S. Department of Defense
U. S. Department of the Navy
U. S. Department of Health and Human Services
U. S. Department of the Interior
Bureau of Land Management (now Minerals Management Service)
Bureau of Outdoor Recreation
U. S. Fish and Wildlife Service
U. S. Geological Survey
U. S. Department of State
U. S. Department of Transportation
U. S. Coast Guard
National Science Foundation
South Atlantic Fishery Management Council
U.S. Department of Agriculture
Soil Conservation Service
National Park Service
Pentagon
U.S. Army Corps of Engineers
Economic Development Administration
U.S. Department of Energy
Federal Power Commission
Housing and Urban Development
U.S. Air Force
Advisory Council on Historic Preservation
Environmental Government Affairs
Bureau of Mines
U.S. Food and Drug Administration
National Wildlife Refuge

South Atlantic Fishery Management Council
Federal Highway Administration
U.S. Environmental Protection Agency
Honorable Sam Nunn (U.S. Senate)
Honorable Wyche Fowler (U.S. Senate)
Honorable Lindsay Thomas (U.S. House of Representatives)

States and Municipalities

Georgia Department of Natural Resources
Georgia Ports Authority
Savannah Metropolitan Planning Commission
State of Georgia Clearinghouse
Jekyll Island Authority
Georgia Forestry Commission
Georgia Environmental Protection Division
Honorable Paul Warwick, Jr. (Mayor of Brunswick)
Honorable Joe Frank Harris (Governor of Georgia)

Private Organizations

American Littoral Society
Atlanta Audubon Society
Center for Law and Social Policy
Environmental Defense Fund, Inc.
National Wildlife Federation
Resources for the Future
Sierra Club
Water Pollution Control Federation
The Georgia Conservancy
Dames and Moore, Inc.
Claude Terry and Associates
Save
League of Conservation Voters
DeKalb County League of Women Voters
Georgia Natural Areas Council
Murphy and Argo Periodontists

Academic/Research Institutions

Skidaway Institute of Oceanography

6. The final EIS has been officially filed with the Director, Office of Environmental Review, EPA.

7. Comments on the final EIS are due within 30 days from the date of EPA's publication of Notice of Availability in the Federal Register.

Comments should be addressed to:

Sally Turner, Chief
Marine Protection Section
U. S. Environmental Protection Agency, Region IV
345 Courtland Street
Atlanta, Georgia 30365

Copies of the final EIS may be obtained from:

U. S. Environmental Protection Agency, Region IV
345 Courtland Street, N.E.
Atlanta, Georgia 30365

The final EIS may be reviewed at EPA Headquarters (Room 2404) or Region IV, Atlanta, Georgia.

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*To comply with the Council on Environmental Quality regulations for reducing paperwork, Appendix A, has been omitted from this Final. Both the Draft and Final are needed to constitute a complete document. Appendix A may be obtained by request from Savannah District CE.

CHAPTER 1

1.00 SUMMARY

1.01 Major Conclusions and Findings

This Final Environmental Impact Statement (EIS) considers final designation of the Brunswick Ocean Dredged Material Site (ODMDS).

This EIS is an integral part of the U. S. Environmental Protection Agency (EPA) procedure for designating the use of ocean sites for disposal of dredged materials. Evaluations of the suitability of the ODMDS are based on environmental data presented in the main body of this report. This summary describes the major conclusions and recommendations presented in this EIS.

Brunswick is one of two major ports of Georgia. Consequently, maintenance of this port for navigation is vital to the economy of the South Atlantic United States. Each year the entrance channel to Brunswick Harbor must be dredged because natural processes cause it to shoal. Approximately 0.6 million cu yds of sediments are dredged annually from the entrance channel and dumped in the Brunswick ocean disposal site. This existing ocean dredged material disposal site has been used since 1964 (Table 1). This material characteristically is fine to very fine-grained sand (as described in section 5.04, from Gillespie and Harding 1985).

Table 1

Year	Dredge	Cubic Yards	Type of Dredge
1964	GERIG	423,093	Hopper
1965	GERIG	554,221	Hopper
1966	HYDE	438,397	Hopper
1967	LYMAN	161,150	Hopper
1968	GERIG	691,970	Hopper
1969	GERIG	1,498,930	Hopper
1970	GERIG	415,723	Hopper
	HYDE	127,970	Hopper
1971	GERIG	865,514	Hopper
1972	GERIG	616,837	Hopper
1973	GERIG	545,496	Hopper
	GOETHALS	512,032	Hopper
1974	SCHWEIZER	27,720	Sidecaster
1975	DAVISON	158,579	Hopper
	SCHWEIZER	81,370	Sidecaster
1976	HYDE	291,737	Hopper
	ESSAYONS	1,630,594	Hopper
	SCHWEIZER	170,090	Sidecaster
1977	HYDE	928,451	Hopper
	ESSAYONS	617,840	Hopper
1978	MCFARLAND	239,129	Sidecaster
1979	HYDE	298,649	Hopper
1980	MANHATTEN ISLAND & SUGAR ISLAND	1,742,938	Hopper

Table 1 (cont.)

Year	Dredge	Cubic Yards	Type of Dredge
1982	MANHATTEN ISLAND	745,503	Contract
1983	DODGE ISLAND	695,902	Contract
1984	DODGE ISLAND	1,328,255	Contract
	MERMANTAU	286,929	Contract

1.02 CONSIDERATION OF ALTERNATIVE SITES

The U. S. Environmental Protection Agency (EPA) and U.S. Army Corps of Engineers (CE) evaluate the need for and alternatives to ocean dumping according to Ocean Dumping Regulations (40 CFR Part 227 Subpart C). When the need for ocean dumping has been established, potential sites for the disposal of dredged materials are evaluated. Criteria used for site selection are based on considerations of potential interferences by disposal operations with other marine activities and resources, potential perturbations of water quality, impacts on beaches or other amenity areas, previous use of an area for dredged material disposal, and geographic location.

The interim-approved Brunswick ODMDS has been used since 1964 as a primary disposal site for sediment dredged from the entrance channels of Brunswick Harbor. The Brunswick ODMDS is located about two miles south of the whistle buoy at mile 8 on the Brunswick bar channel. The area is currently approved by EPA on an interim basis. The area is described in Federal Register, Vol. 42, No. 7, dated 11 January 1977, as one nautical mile wide by two nautical miles long adjacent to the channel located on the south side of the entrance and being 6.6 nautical miles from the shore at a point of beginning at 31 02'35"N and 81 17'40"W, thence due east to 31 02'35"N and 81 16'30"W, thence due south to 31 00'30"N and 81 16'30"W thence due west to 31 00'30"N and 81 17'42"W, thence due north to the point of beginning (Figure 1).

1.03 OFFSHORE DISPOSAL

Mid-shelf or shelf-break locations, which would be much further offshore than the proposed site, have not been used for dredged material disposal from Brunswick Harbor. Potential interferences with several resources and activities in mid-shelf and shelf-break areas are possible. For example, hard-bottom reefs are scattered throughout the mid-shelf and shelf-break; reefs are unique habitats, support several species of commercially and recreationally important finfish, and are sensitive to the effects of dredged material disposal. Several proposed Bureau of Land Management (BLM: now Minerals Management Service) oil and gas lease sites exist in mid-shelf and shelf-break regions.

Since 1972 dumping of dredged material in the ocean has been regulated by EPA. Section 102(a) of Title I of the Marine Protection, Research, and Sanctuaries Act (MPRSA) authorizes EPA to establish and apply criteria for reviewing and evaluating applications for permits for the dumping of

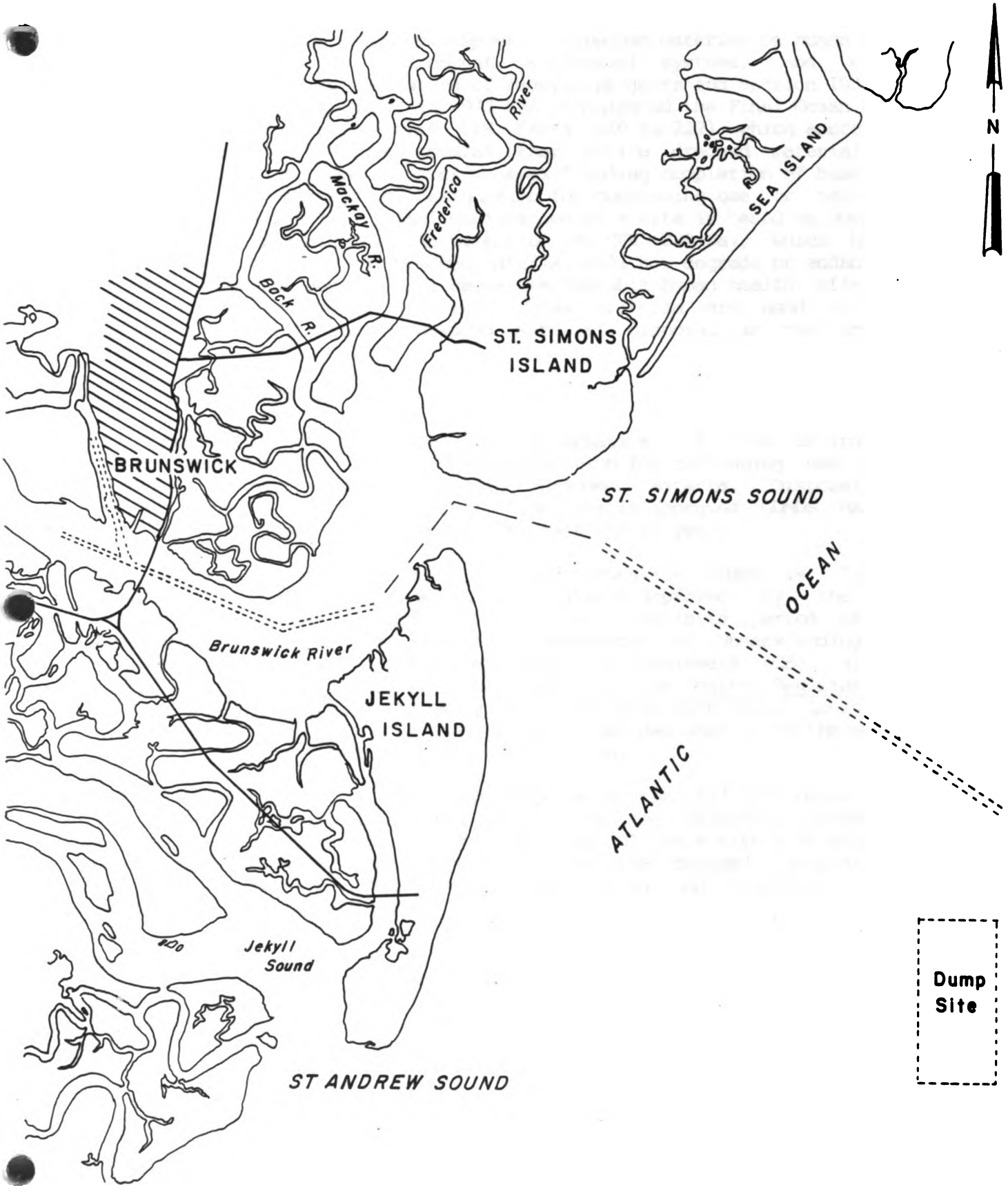


Figure 1

materials into ocean waters. Section 103 of Title I requires the CE to consider the effects of ocean disposal of dredged material on human health, amenities, the marine environment, ecological systems, and economic potentialities in its evaluation of Federal projects and Section 103 permit applications. Consequently, in 1977 EPA promulgated the Final Ocean Dumping Regulations and Criteria (40 CFR Parts 220 to 229), which approved the Existing Brunswick ODMDS and several other active dredged material ocean disposal sites for use on interim bases "Pending completion of baseline or trend assessment surveys and designation for continuing use or termination of use" (40 CFR 228.12). Final designation of a site is based on compliance with specific criteria for site selection (40 CFR 228.6a), which help to ensure that disposal of dredged material will not degrade or endanger the marine environment and will not cause unacceptable human health effects or other permanent adverse effects. These criteria are used to assess potential effects caused by dredged material disposal at the Brunswick ODMDS.

1.04 PROPOSED ACTION

The proposed action (preferred alternative) of this Environmental Impact Statement (EIS) is the final designation for continuing use of the existing, interim-approved Ocean Dredged Material Disposal Site (ODMDS) offshore Brunswick, Georgia. The interim-approved ODMDS has been used for ocean disposal of dredged materials for 24 years.

The current designation status of the Brunswick ODMDS is "interim-indefinite;" i.e., the site is interim-approved by the U. S. Environmental Protection Agency (EPA) for an indefinite period of time. However,, based on a national Memorandum of Understanding (MOU) between EPA and the U. S. Army Corps of Engineers (CE), all area ODMDS's presently listed for consideration in the Federal Register are to achieve final designation status by 1991. Although such final designations could be for new or interim ocean sites, final designation of the existing interim site is proposed for the Brunswick area.

The proposed action is in compliance with the 1977 EPA Ocean Dumping Regulations and Criteria for designation of the Brunswick ODMDS. The proposed action does not exampt the use of this site from additional environmental review, nor does it exempt the dredged materials from compliance with the Ocean Dumping Regulations and Criteria prior to disposal at a designated site.

1.05 AFFECTED ENVIRONMENT

Nearshore

The nearshore region of the ODMDS is affected by river and salt marsh discharges and seasonal weather patterns. Nearshore waters are partially to completely mixed, turbid, and typically well-oxygenated. Sediments consist of fine-grained sands with variable amounts of fines and shell hash. Sediment resuspension and transport are frequent during winter storms. Benthic communities are mostly composed of small-bodied invertebrate species with short generation times, characteristic of unstable sand substrates. Several commercially important finfish and shellfish species migrate through nearshore areas to the adjacent coastal estuaries.

Mid-shelf

The mid-Shelf environment is characteristically more stable than the nearshore region. Surface and bottom currents are generally sluggish, variable, and influenced by Gulf Stream intrusions and wind- and wave-induced currents. Surface and bottom waters are partially mixed, with high oxygen and low suspended sediment and nutrient concentrations. Episodic upwelling events occasionally supply nutrients to surface waters. Sediments consist of well-sorted, medium to coarse-grained sand; sediment movement is infrequent. Biotic assemblages are characterized by low biomass, high diversity, and large seasonal variability. Commercially important nekton species are typically restricted to scattered reef areas.

Shelf-break

Environmental characteristics at the Shelf-break are strongly influenced by the Gulf Stream. Surface waters are well-oxygenated with low suspended sediment and nutrient levels. Upwelling occasionally supplies dissolved nutrients to surface waters. Bottom sediments consist of poorly-sorted, fine sand and silt. Infaunal and epifaunal assemblages are heterogeneous, associated with specific substrate types, and are characterized by low biomass and diversity. Commercially important demersal fish are associated with reef outcrops, while pelagic species occur in the Gulf Stream.

1.06 ENVIRONMENTAL CONSEQUENCES

The interim-approved Brunswick ODMDS has been used since 1964. Dredged sediments are fine sands, with some silt and shell hash, which are chemically and texturally similar to disposal site sediments. Recent site surveys by the University of Georgia Marine Extension Service (Gillespie and Harding, 1985) detected no significant adverse effects to the water or

sediment quality, or cumulative changes in the biota, which would be attributed to previous dumping. Concentrations of suspended particulate matter, organics and trace metals in waters overlying the ODMDS were similar to those in adjacent control stations, and typical of levels in uncontaminated nearshore waters. Similarily, sediment texture and sediment concentrations of trace metals and organics were characteristic of uncontaminated nearshore sediments. The dominant macrofauna and epifauna collected during the surveys were both seasonally and spatially variable. Organisms collected during the surveys were characteristic of the variable, benthic communities present throughout the nearshore South Atlantic Bight (SAB).

Minor and temporary effects of dredged material disposal at the Brunswick ODMDS may be limited to increases in suspended sediment concentrations, mounding, and smothering of benthic infauna. Nearshore waters are characteristically turbid, therefore increases in suspended particulate concentrations are considered insignificant. Persistent mounding or accumulation of sediments is precluded by sediment dispersion during winter storms. Bioassay and bioaccumulation tests of Brunswick inner Harbor dredged sediments demonstrate that the sediments are, in most cases, nontoxic to marine organisms in liquid, suspended particulate, and solid phases. Smothering of infaunal organisms is probably restricted to within site boundaries. Recolonization rates are dependent on larval recruitment and settling patterns and the abilities of infaunal organisms to burrow upward through deposited dredged material.

No previous dumping has occurred in mid-shelf or shelf-break areas. Therefore, a projection of the effects of dredged material disposal in these areas would be speculative. No persistent changes in water quality would be expected; however, dredged material disposal may alter the existing sediment texture. No accumulation of toxic substances in bottom sediments would occur. Adverse impacts of dumping on biota would include smothering of infauna and alterations of the composition of benthic assemblages. No direct toxicity of dredged sediments to benthic organisms would be anticipated.

Using offshore disposal sites may increase the possibilty of emergency or erroneous dumping on the mid-shelf or outer shelf. Interferences of dumping with fishing or navigation would not be expected, and no significant adverse impacts on aesthetics or public health and safety would occur, although use of offshore sites would incur a significantly greater economic burden because of the greater transport distances.

1.07 Areas of Controversy - There are no known areas of controversy which affect the use of the site or its proposed final designation.

1.08 Unresolved Issues - There are no unresolved issues affecting the use of the site.

1.09 Relationship of Plans to Environmental Protection Statutes and Other Environmental Requirements - The relationship of each alternative to environmental protection statutes and other requirements are presented in Table A. The State of Georgia does not participate in the Federal Coastal Zone Management Program.

TABLE A
RELATIONSHIP OF PLANS TO ENVIRONMENTAL
PROTECTION STATUTES AND OTHER REQUIREMENTS

Federal Policies	Brunswick ODMDS	Alternatives Mid-Shelf	Alternatives Shelf-Break
Preservation of Historical Archaeological Data Act of 1974	Full	Undt	Undt
National Historical Preservation Act of 1966 as amended	Full	Undt	Undt
Clean Air Act, as amended	Full	Full	Full
Clean Water Act of 1977	N/A	N/A	N/A
Coastal Zone Management Act of 1972	N/A	N/A	N/A
Endangered Species Act of 1973, as amended	Full	Full	Full
Estuary Protection Act	N/A	N/A	N/A
Federal Water Project Recreation Act	N/A	N/A	N/A
Fish and Wildlife Coordination Act	Full	Full	Full
Land and Water Conservation Fund Act	N/A	N/A	N/A
Marine Protection, Research and Sanctuaries Act of 1972, as amended	Full	Full	Full
National Environmental Policy Act (NEPA) of 1969	Full	Full	Full
Rivers and Harbors Act	N/A	N/A	N/A

TABLE A (CONT)
RELATIONSHIP OF PLANS TO ENVIRONMENTAL
PROTECTION STATUTES AND OTHER REQUIREMENTS

Federal Policies	Brunswick ODMDS	Alternatives Mid-Shelf	Alternatives Shelf-Break
Watershed Protection and Flood Prevention Act	N/A	N/A	N/A
Wild and Scenic Rivers Act	N/A	N/A	N/A
Floodplain Management (E.O. 11988) 24 May 1977	N/A	N/A	N/A
Protection of Wetlands (E.O. 11990) 24 May 1977	N/A	N/A	N/A
Environmental Effects Abroad of Major Federal Actions (E.O. 12114) 4 January 1979	N/A	N/A	N/A
Executive Memorandum			
Analysis of Impacts on Prime and Unique Agricultural Lands in Implementing NEPA (CEO Memorandum, 11 August 1980)	N/A	N/A	N/A
Interagency Consultation to Avoid or Mitigate Adverse Effects on Rivers in the Nationwide Inventory (CEQ Memorandum, 10 August 1980)	N/A	N/A	N/A

TABLE A (CONT)
RELATIONSHIP OF PLANS TO ENVIRONMENTAL
PROTECTION STATUTES AND OTHER REQUIREMENTS

NOTE: Terms Defined

A. Full - Compliance. Having met all requirements of the statute, E.O. or other environmental requirements for the current stage of planning.

B. Partial - Partial Compliance. Not having met some of the requirements that normally are met in the current stage or planning. PArtial compliance entries are explained in appropriate places in the EIS.

C. Non - Non-Compliance. Violation of a requirement of the Statute, E.O., or other environmental requirement. Non-compliance entries are explained in appropriate places in the EIS.

D. Undt - Undetermined. Specific procedural steps to attain environmental compliance have not been pursued.

E. N/A - Not applicable.

1.10 CONCLUSIONS

Considerations for final site designation of the Brunswick ODMDS, based on EPA Ocean Dumping Regulation and Site Criteria, are summarized below. Final site designation is recommended for the following reasons:

Dredged material disposal has occurred at the Brunswick ODMDS for the past 23 years. Recent surveys have detected no persistent or cumulative changes in the water quality or ecology at the disposal sites.

Impacts resulting from dumping are temporary and restricted to site boundaries.

Dredged materials are similar to disposal site sediments, thus, changes in sediment texture and/or chemistry are unlikely.

Surveillance and monitoring are facilitated because the disposal site is near shore and in shallow waters.

Dredged material disposal at Brunswick ODMDS is significantly more cost effective.

Interference with fisheries, shipping, or other beneficial uses of the ocean is insignificant.

Dredged material disposal in either alternative mid-shelf and shelf-break areas is not recommended for the following reasons:

No dumping has occurred previously in either region of the South Atlantic Bight (SAB);

Baseline studies would be needed to provide data on water quality, ecology, and the presence or absence of exploitable, natural or cultural resources.

The additional costs of transporting materials further would be significant;

Dredged sediments are not physically similar to either mid-shelf or shelf-break sediments, thus the probability of altering sediment texture and adversely affecting benthic organisms is higher;

Monitoring and surveillance would be more difficult due to the greater depths and distances from shore; and

The probability of inadvertent dumping of dredged materials on sensitive hard-bottom areas during rough weather is higher.

1.11 ORGANIZATION OF THE EIS

1.12 This EIS is organized as follows:

- Chapter 1 provides a brief summary.

- Chapter 2 specifies the purpose and need for the proposed action, presents initial background information relevant to the dredging and disposal site, and discusses the legal framework guiding EPA's selection and designation of disposal sites and the CE's responsibilities in ocean disposal of dredged material.

- Chapter 3 discusses alternatives, including the proposed action.

- Chapter 4 describes the affected environment.

- Chapter 5 discusses environmental affects of using the interim approved ODMDS. It also describes the analysis used in evaluating site selection of the Brunswick ODMDS.

- Chapter 6 presents the list of prepares.

- Chapter 7 discusses public involvement, including comment letters received in response to the Draft EIS and responses from EPA.

CHAPTER 2

2.00 PURPOSE OF AND NEED FOR ACTION

The action proposed in this EIS is the final designation for continuing use of an environmentally acceptable, interim-approved ODMDS offshore Brunswick. The EIS presents the information needed to evaluate the suitability of an ocean disposal area for final designation for continuing use and is based on a series of disposal site environmental studies. The environmental studies and final designation process are being conducted in accordance with the requirements of the MArine Protection, Research, and Sanctuaries Act (MPRSA) of 1972, as amended (86 Stat. 1052, 33 USCA Part 1401 et seq.); the EPA implementation of the Ocean Dumping Regulations and Criteria (40 CFR 220-229); and other applicable Federal environmental legislation.

MPRSA authorizes the Administrator of the EPA (Section 102) and the Secretary of the Army, acting through the CE (Section 103), to establish ocean disposal permit programs for non-dredged and dredged materials, respectively. MPRSA requires EPA to establish criteria, based on those factors listed in Section 102(a), for the review and evaluation of permits under the EPA and CE permit program. It further authorizes EPA, considering criteria established pursuant to Section 102(a), to designate recommended ocean disposal sites or times for dumping of non-dredged material. The effects on the marine must be considered in peermitting the use of designated sites.

An ODMDS may be used for the disposal of dredged material only after evaluation of each Federal project or permit application has established that the disposal is within site capacity and that the dredged material and disposal procedures are in compliance with the criteria and requirements of EPA and the CE requlations. As such, designation of an ODMDS does not by itself authorize any dredging project or actual disposal of dredged materials at the ODMDS.

2.01 SITE DESIGNATION

In accordance with the EPA's Ocean Dumping Regulation and Criteria, site designations will be made by promulgation through formal rule making, The decision by EPA to designate one or more sites for continuing use will be based on appropriate Federal statutes, disposal site evaluation study, the EIS, supporting documentation, the public notice issued as part of the proposed rule making, and public comments on the EIS and proposed rule.

The EIS and supporting documents provide the necessary information to determine whether the proposed site is suitable for final designation. In the event that an interim-designated site is deemed unacceptable for continuing use, the site's interim designation will be terminated and either the No Action Alternative will be selected (no site being designated) or one or more alternative sites will be selected/designated. Furthermore, final site designation implies only EPA's determination that the proposed site is suitable for the disposal of drredged material. Approval for use of the site will be determined only after review of each project to ensure that the

proposed ocean disposal of dredged material is in compliance with the criteria and requirements of EPA Ocean Dumping Regulations (40 CFR 220-229) and appropriate CE regulations (33 CFR 209.145/33 CFR 324).

2.02 OCEAN DUMPING EVALUATION PROCEDURES

The Ocean Dumping Regulations specify the procedures for evaluating the effects of dredged material disposal. The EPA and CE evaluate Federal projects and permit applications for non-Federal projects to determine (1) whether there is a demonstrated need for ocean disposal and that other environmentally sound and economically reasonable alternatives do not exist (40 CFR 227 Subpart C) and (2) compliance with the environmental impact criteria (40 CFR 227 Subparts B, D, and E).

Under Section 103 of MPRSA, the Secretary of the Army is given the authority, with certain restrictions, to issue permits for the transportation of material dredged from non-CE projects for ocean disposal. For Federal projects involving dredged material disposal, Section 103(e) of MPRSA provides that "the Secretary [of the Army] may, in lieu of the permit procedure, issue regulations which will require the application to such projects of the same criteria, other factors to be evaluated, the same procedures, and the same requirements which apply to the issuance of permits..." for non-Federal dredging projects involving disposal of dredged material. These regulations are contained in 33 CFR 209.145. Consequently, both Federal and non-Federal dumping requests undergo identical regulatory reviews. The only difference is that, after the review and approval of the dumping request, non-Federal projects are issued an actual permit. The CE is responsible for evaluating disposal applications and granting permits to dumpers of dredged materials; however, dredged material disposal sites are designated and managed by the EPA Administrator or his designee. Consequently, dredged material generated by Federal and non-Federal projects must satisfy the requirements of the MPRSA (as detailed in the Ocean Dumping Regulations) to be acceptable for ocean disposal.

2.03 LOCAL PROJECTS

Applications for ocean dumping in the Brunswick area at the Brunswick ODMDS are expected to be made for specific projects associated with maintenance of the Brunswick port of Georgia. This port supports shipping commerce and maintenance is vital to the economy of the southeast Atlantic region of the U. S. For example, each year the entrance channel to Brunswick Harbor must be dredged because natural processes cause it to shoal. The CE is responsible for planning the maintenance dredging and conducting the necessary dredging and disposal operations. Approximately 0.6 million cu yds must be removed from the entrance channel on an annual basis. Final designation of an ODMDS in the Brunswick arrea would serve as one possible alternative for disposal of suitable dredged materials from various local approved projects.

Only dredged material suitable for ocean disposal can be dumped in an ODMDS. The environmental documents for specific dredging projects subject to the National Environmental Policy Act (NEPA) must also conclude (through the NEPA evaluation process) that ocean dumping is the preferred alternative for dredged material disposal. Other alternatives such as upland disposal (e.g., beach nourishment) would appropriately be considered in project-specific NEPA documents and not in ODMDS designation document.

CHAPTER 3

3.00 THE PROPOSED ACTION AND ALTERNATIVES

The proposed action is the final designation of the existing EPA interim-approved Brunswick ODMDS. Alternatives to the proposed action include no action and use of conceptual alternative ocean disposal sites. Conceptual ocean disposal areas in mid-shelf, and shelf-break regions are considered. Additional recommendations for use and monitoring of the ocean dredged materials disposal sites are discussed in this chapter.

3.01 NO ACTION ALTERNATIVE

The No Action alternative to the proposed action would be to refrain from designating an EPA-approved ocean site for the disposal of dredged material from the Brunswick area. The existing site is currently designated on an interim basis.

By taking no action, the present ocean site would not receive final designation, nor would alternative ocean disposal sites be designated. Consequently, the CE would not have an approved ocean disposal site available, thus precluding ocean dumping as a disposal method for dredged material. Therefore, the CE would be required to either: (1) justify an acceptable alternative disposal method (e.g., land based), or (2) develop information sufficient to select acceptable ocean sites for disposal, or (3) modify or cancel a proposed dredging project that depends on disposal in the ocean as the only feasible method for the disposal of dredged material.

As discussed below, results of CE studies indicated that land-based disposal is not feasible for bar channel sediments in Brunswick Harbor, and have demonstrated the need for ocean disposal. Based on these factors the "No-Action" alternative is not considered to be an acceptable alternative to the proposed action.

3.02 DISPOSAL IN THE OCEAN

Ocean disposal of sediments dredged from the Brunswick Bar Channel is the most practical alternative based on economic, technical, and environmental reasons. Selection of an appropriate ocean disposal site requires identification and evaluation of suitable areas for receiving the dredged sediments. Identification of these areas relies on available information obtained from previous site-specific and synoptic oceanographic studies. Specific alternative (or candidate) sites may be identified within these areas, based on historic and current use of the area, existence of previously used disposal sites, and recommendations from state and Federal resource agencies and the district and division offices of the CE.

General criteria used to select an ocean disposal site are:

The dumping of material 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.

Locations and boundaries of the disposal sites will be so chosen that temporary perturbations in water quality...can be...reduced to normal ambient seawater levels or to undetectable contaminant concentrations or effects before reaching any beach, shoreline, marine sanctuary, or known geographically limited fishery or shellfishery.

The sizes of ocean disposal sites will be listed in order to localize any immediate adverse impacts and permit the implementation of effective monitoring and surveillance programs to prevent adverse long range impacts.

Wherever feasible, designate ocean dumping site beyond the edge of the Continental Shelf and other such sites that have been historically used. (40 CFR 228.5)

The proposed Brunswick-ODMDS is within the nearshore region, but greater than 3 nmi from shore, and therefore seaward of areas used extensively for shrimping. No known hard-bottom areas occur within close proximity to ODMDS boundaries. Bottom sediments in the disposal sites are generally fine-grained sands, similar to the dredged materials. The associated benthic infauna are characteristic of seasonally variable sand communities with low abundances and high diversities.

3.03 MID-SHELF

Physical and biological characteristics of the mid-shelf region of the South Atlantic Bight (SAB) are influenced by seasonal oceanographic and climatic patterns, and episodic Gulf Stream intrusions. The mid-shelf is covered with medium-grained sands with scattered low to moderate relief, hard-bottom terrain. Rocky reefs support diverse and productive invertebrate assemblages, and demersal and pelagic finfish species. Consequently, reefs are important to commercial and recreational fisheries. Primary productivity in mid-Shelf waters is limited by nutrient inputs from Gulf Stream intrusions and upwelling. Soft-bottom, benthic communities have high biomass relative to nearshore areas, especially in areas contiguous with reefs (Tenore, 1979).

Major criteria for evaluating alternative mid-shelf areas are the location, density, and potential impact of dumping on hard-bottoms. However, since the locations of reefs are not known, identifying specific sites suitable for dredged material disposal is difficult. Relative to nearshore areas, the mid-shelf has a greater density of high-relief reefs (Henry and Giles, 1979). The biota associated with mid-shelf reefs are not generally subject to periodic burial by resuspended sediments (e.g., during storms). Therefore, dredged material disposal in the vicinity of mid-shelf hard-bottom areas could have greater adverse impacts on the macroinvertebrates and demersal fish. Pequegnat (1978) claims "these outcrops are considered to be unique or productive biotopes in the South Atlantic Bight, and as such

should be given prime consideration in selecting dredging material disposal sites" (p. 473). Another criteria for evaluating suitable mid-shelf areas is the location of oil and gas lease tracts (BLM, 1978 and 1980).

No mid-shelf sites have been used previously for dredged material disposal. A generalized mid-shelf area offshore Brunswick can be considered for dredged material disposal. Site-specific data for such locales are unavailable; however, the physical, chemical, and biological characteristics of the generalized mid-shelf region have been described by BLM (1978).

3.04 SHELF-BREAK

The physical and chemical characteristics (seawater temperatures, salinities, nutrients, and trace metal concentrations) of the shelf-break region of the SAB are strongly influenced by the Gulf Stream. Extensive but discontinuous Lithothamnion and Black Rock Reefs occur at depths of 100 to 200 m, and are productive areas for invertebrate and demersal finfish species (Pequegnat, 1978). Sandy-mud bottom regions are characterized by depauperate, but heterogeneous infaunal assemblages (Tenore, 1979).

Shelf-break reefs are considered unique and productive habitats and should be avoided for ocean dredged material disposal sites (Pequegnat, 1978). Another consideration for identifying alternative disposal sites is the dispersal capabilities of the Gulf Stream, since entrainment of fine grained sediment in Gulf Stream intrusions may result in shoreward transport of dumped sediments and subsequent sedimentation on the Shelf. "Since the [Gulf Stream] rings can concentrate and hold aloft fine sediments with adsorbed metals and organic toxins and move them over the slope and possibly deposit them on the Shelf, it is perhaps advisable to locate disposal sites outside of known southwesterly paths of these rings" (p. 557) (Pequegnat, 1978). Nevertheless, Pequegnat (1978) suggests that the shelf-break (seaward of the 200 m depth contour) offers an extensive region "favorable for deep-ocean disposal of dredged material."

Alternative sites in the vicinity of hard-bottom areas are not suitable for ocean dumping because of the potential adverse impact on the habitat and disturbances to reef fisheries. Several oil and gas lease tracts are located in the shelf-break region (BLM, 1978 and 1980). Dredged material disposal in the vicinity of lease tracts could result in interferences during the exploratory and extraction phases of oil and gas production.

Generalized shelf-break areas offshore Brunswick are considered as alternative ocean dredged material disposal sites. The areas should not overlie known hard-bottom areas or BLM oil and gas lease sites. No previous dredged material disposal has occurred in the shelf-break region. Specific data for these three areas are unavailable, although the biological and physical characteristics of this region have been described by BLM (1978).

3.05 SITES DROPPED FROM FURTHER CONSIDERATION

3.06 On the basis of the preceeding rationale, the following zones (regions of the SAB) are considered unsuitable for long term dredged material disposal:

- Fisheries within 3 nmi of shore

  Nearshore, mid-shelf, and shelf-break hard-bottom areas

  Active or proposed BLM (now Minerals Management Service) oil and gas lease tracts

  Areas upcurrent from the dredging sites

Dumping in these regions would either interfere with valuable marine resources or would be impracticable. Therefore, these locations are dropped from further consideration.

In general, nearshore areas which are greater than 3 nmi from shore and not adjacent to dredging sites or nearshore hard-bottom areas would provide suitable alternative sites. However, these regions are environmentally similar to the Brunswick-ODMDS. Therefore, other nearshore sites offer no significant benefits. Consequently, other nearshore areas will be dropped from further consideration in the evaluation for site designation.

The use of mid-shelf or shelf-break areas would result in a severe economic cost to the navigation project. The greater distances involved would increase transportation costs. Since the impacts to these areas would be unknown and since there are no discernable ecological impacts occurring at the interim-approved Brunswick site, the use of these areas could not be economically or environmentally justified. Therefore, these sites will not be considered further.

3.07 Other dredging techniques such as side casting or hydraulic pumping of channel material are either technically or economically infeasible and not considered further.

3.08 ALTERNATIVE ANALYSIS SUMMARY

The need for annual dredging in the Brunswick area has been demonstrated. The interim-approved Brunswick ODMDS has been used for more than 24 years. Such a need for the disposal of material from maintenance dredging is expected to continue. An approved ODMDS for the Brunswick area would serve as one possible alternative for disposal of suitable dredged materials from various local projects. Surveys of the disposal site by the University of Georgia Marine Extension Service (Gillespie and Harding, 1985) have not detected any substantial degradation of water or sediment quality or adverse impacts on the biota relative to adjacent control stations. Similarly, no adverse impacts to fishing, navigation, or other uses of the nearshore region have been reported.

In contrast, no previous dumping has occurred in mid-shelf or shelf-break areas. Consequently, the impacts of dumping in these regions are unknown. Few site specific data exist; pre-disposal data are needed so that subsequent site monitoring could detect environmental changes caused by

dredged material disposal. No perturbations of water quality would be expected, although changes in sediment texture would result because dredged materials are not similar in composition to either mid-shelf or shelf-break sediments. Dumping might cause slight changes in the benthic community by smothering or altering the infauna community. Monitoring and surveillance would be more difficult and expensive in mid-shelf and shelf-break areas because of deeper waters, higher frequency of rough weather, and paucity of site-specific data. Increased costs of disposal would also be appreciable because of the greater transport distances. Use of these areas during rough weather would be hazardous.

CHAPTER 4

4.00 AFFECTED ENVIRONMENT

Environmental characteristics which either will affect or be affected by the proposed dredged material disposal operations are described below. Characteristics potentially affected by dumping are generally categorized as either geological, chemical, or biological. Ancillary meteorological and oceanographic information is also presented in this chapter because natural physical processes influence the fate of released dredged material and the impacts of subsequent disposal.

4.01 ENVIRONMENTAL CHARACTERISTICS

4.02 CLIMATE

Climatic parameters of interest at an ODMDS are air temperature, rainfall, wind statistics, storm occurrences, and fog. Air temperature interacts with surface waters and, particularly during warm periods, influences the vertical stability of the water column. Rainfall increases coastal runoff, thereby decreasing surface salinity and intensifying vertical stratification of the water. Coastal runoff may contribute suspended sediments and various chemical pollutants. Winds and storms generate waves and currents that may resuspend and transport dredged material. High incidence of fog during various seasons may affect navigation safety and limit disposal operations.

The temperate to subtropical climate of the South Atlantic Bight (SAB) is influenced by the relative location of the Azores high-pressure system. In winter when the high pressure is located offshore at its southern extent, contact between polar and tropical air masses results in storms with strong, gusty winds. Predominant offshore winter winds are northwesterly, although southwesterly winds are also frequent. Along the coast, winds typically are from the west with average velocities of 8 to 15 kn. During spring the Azores High migrates north and west, reaching its northernmost extent in summer. Summer is characterized by frequent showers and thunderstorms. Predominant summer winds weaken and become southerly along the coast, and southwesterly over the Shelf, with an average velocity of 6 to 10 kn. The frequency of calms range from 15 to 20 percent throughout the year (BLM, 1978).

Precipitation along the coast ranges from 121 to 142 cm/yr. Much of the precipitation is associated with cyclonic activity, and maximum rainfall generally occurs from July through September. Minimum seasonal rainfall occurs from November to February (BLM, 1978).

Radiation fog is frequent along the coast, but diminishes with distance from shore. Heavy fog is frequent at Savannah, occurring an average 44 days per year, but decreases in frequency northward to Wilmington, where heavy fog occurs about 25 days per year (BLM, 1978).

Extratropical cyclones are formed offshore between 30 N and 40 N, from November to April and are associated with strong northeasterly winds (BLM, 1978). Tornados associated with tropical and extratropical cyclones generally travel in a southwest direction through SAB, and strike coastal areas with a frequency of approximately 12 per year. Hurricanes occurring in the SAB in late summer and early autumn travel east to west in a curved path, and have an 8 percent probability of impinging the southeastern U.S. Coast.

4.03 PHYSICAL OCEANOGRAPHY

Physical oceanographic parameters determine the extent of mixing zones, which influence sediment transport and the chemical environment at an ODMDS. Strong temperature or salinity gradients inhibit or prevent mixing of surface and bottom waters; waves aid such mixing, resuspend bottom sediments, and affect water turbidity. Currents, especially bottom currents, determine the direction and influence the extent of sediment transport into and out of the ODMDS. Tidal currents, which may contribute to the transport of dumped materials, do not usually add net directional effects.

Shelf water of the SAB comprise two hydrographic zones: A nearshore regime and a Shelf regime. A Gulf Stream regime occurs seaward of the Shelf regime, along the Shelf break. Nearshore waters immediately adjacent to the coast are composed of river effluent and shelf water, and generally are delineated by lower temperatures and salinities and high suspended sediment concentration (National Oceanic and Atmospheric Administration, 1980; Jacobson, 1974; Blanton and Atkinson, 1978). Shelf waters characteristically have higher temperatures and salinities and low suspended sediment concentrations (National Oceanic and Atmospheric Administration, 1980). The Gulf Stream regime is characterized by seasonally constant temperature and salinity, and low suspended sediment concentrations. The Existing Brunswick ODMDS is within the nearshore zone; Alternative mid-shelf and shelf-break areas occur in the Shelf and Gulf Stream, respectively.

4.04 NEARSHORE WATERS

Several rivers and coastal marshes discharge low salinity water into the nearshore zone of the SAB. Maximum river discharge usually occurs in spring. Off the coasts of Georgia and South Carolina a zone of partially mixed, turbid, nearshore water extends 5 to 10 nmi offshore. Salinity and turbidity fronts produced by river discharge form a distinct boundary between coastal and Shelf waters. The degree of mixing between the two water masses is dependent on the intensity of horizontal and vertical density gradients and tidal and wind-generated currents (Blanton and Atkinson, 1978).

Nearshore surface water temperatures vary seasonally from 10 to 25 C under the influence of river runoff and air temperatures.

Surface salinities typically vary from about 32 /oo to 34 /oo with seasonally fluctuating river discharge volumes. The strengths of nearshore vertical salinity gradients are tidally dependent, reaching a maximum during ebb tide when low salinity water overlies more saline bottom water. The duration of vertical salinity gradient is related to the extent of tide, wind, and wave generated current mixing (NOAA, 1980; Blanton and Atkinson, 1978.)

Longshore currents are controlled largely by seasonal winds. A transient southwesterly current exists off the coasts of South Carolina and Georgia. Easterly or southerly nearshore currents occur off North Carolina capes (e.g., Cape Fear) (Bumpus, 1973). Reversals in longshore current directions are episodic, lasting for several days, and are associated with changes in the predominant wind direction (Blanton and Atkinson, 1978). Tidal currents are directed in onshore-offshore directions and are strongest near the mouths of coastal inlets (ibid).

4.05 SHELF WATERS

Shelf waters are influenced to a greater extent by periodic Gulf Stream intrusions than by coastal weather patterns or runoff. Consequently, water temperatures and salinities are less variable. Seasonal sea water temperatures typically increase with distance from shore during the winter, from an average 13 C nearshore to 24 C in the Gulf Stream; isotherms parallel the coast. During summer, surface seawater temperatures are uniform and average 27 C across the Shelf and Gulf Stream. Shelf waters generally are well mixed and isothermal throughout much of the year. Shelf-break waters may experience vertical stratification during intrusion of Gulf Stream waters or offshore movements of cold, inshore waters along the Continental Shelf (NOAA, 1980).

Surface salinities also tend to increase with distance from shore, ranging from 34 /oo to 37 /oo over the Shelf. Bottom salinities typically increase with depth and distance from shore. Vertical density gradients intensify during intrusions of Gulf Stream waters (NOAA, 1980).

Circulation over the Shelf is variable and controlled by cross-Shelf density differences, prevailing wind patterns, and the Gulf Stream (Jacobson, 1974; BLM, 1980). A predominant northerly flow exists in winter, spring, and early summer, resulting from a cross-shelf density gradient nearshore, and from frictional drag exerted by the northward flowing Gulf Stream offshore (Jacobson, 1974).

Bottom currents on the shelf are influenced by periodic intrusions of the Gulf Stream (Bumpus, 1973) and by cross-shelf semi-diurnal tidal currents. Off the Georgia and South Carolina coasts, the directions of bottom currents fluctuate frequently with little consistent pattern. Tidally induced current speeds range from 0.3 to 0.6 kn over the Shelf in onshore-offshore directions (ibid).

Periodic upwelling is coupled with Gulf Stream intrusions, and supply cold, nutrient-rich waters to the mid- and outer Shelf. Upwelling in the outer Shelf occurs throughout the year with an average frequency of one event within a two-week period; upwelling occurs sporadically during summer in the mid-Shelf region (Lee et al., 1981).

Maximum wave heights occur in winter and autumn, associated with wave fronts from the north and west. Minimum wave heights occur during summer and spring when the wave direction is primarily from the south and southwest. Seas of less than 4 ft.(1.2 m) occur 59 percent of the time, whereas seas greater than 12 ft (3.6 m) occur between two and 10 percent of the time (BLM, 1978).

4.06 GULF STREAM

The Gulf Stream, which forms the eastern boundary of the SAB, is a fast (2 to 4 kn), deep western boundary current flowing northerly along the edge of the Continental Shelf. The temperature and salinity of Gulf Stream water are seasonally constant at 20 to 25 C and 36 /oo, respectively. Intrusion of Gulf Stream eddies into Shelf waters have profound influences on surface and bottom currents, temperature, salinity, and nutrient concentrations (BLM, 1980); Tenore et al., 1978; Blanton, 1971).

4.07 GEOLOGY

Geological information relevant to an ODMDS included bathymetry, sediment characteristics, and dredged material characteristics. Bathymetric data provide information on bottom stability, persistence of sediment mounds and shoaling. The type of bottom sediments strongly influences the composition of resident benthic biota. Differences in sediment type between natural ODMDS sediments and dumped material may be used as tracers to determine areas of bottom influence due to dumping of dredged material. Changes in ODMDS sediment type by dumping may produce significant changes in chemical characteristics, and thus change the composition of benthic biota.

The South Atlantic Bight is bounded on the north by the Cape Fear Arch, on the south by the Florida Peninsula Arch, and on the east by the Gulf Stream. The coastline of the southern portion of the Atlantic Coastal Plain is characterized by low-lying barrier islands which front extensive salt marshes and lagoons. The broad, shallow Continental Shelf extends from a minimum distance of 15 nmi off the coast of Cape Hatteras, North Carolina, to a maximum distance off Jacksonville, Florida. The Shelf is an extension of the Atlantic Coastal Plain, which slopes eastward towards the Shelf break with an average gradient of 36 cm/km (Henry and Hoyt, 1968). The Shelf break occurs in water depths ranging from 50 to 70 m landward of the Blake Plateau, a broad plain in which water depths range from 600 to 1,000 m.

The surface of the SAB Shelf and Shelf break comprise three topographic regions or domains: (1) smooth, (2) undulating, and (3) rough. The smooth domain extends south from Cape Fear, from the surf zone to the 10 m bottom

contour, with the exception of an area southeast of Charleston, S.C., which is covered with ridges. An undulating domain extends from the 10 m contour to the Shelf break, and is characterized by sand swells 1 to 5 m in height and 100 to 4,200 m in width. These sand swells have an easterly trend with one to two slopes. The rough domain, extending south from Cape Lookout, consists of a 20-km-wide belt of rough topography at the base of the Florida-Hatteras Slope, with hills 20 to 80 m in height (Uchupi and Tagg, 1966).

Numerous reefs are scattered throughout the Shelf. The exact locations of all patch reefs and continuous hardbanks of the SAB are unknown, although they may cover an estimated 10 to 20 percent of the total Shelf area (NOAA, 1980). Hard-bottom areas were identified from side-scan sonar and seismic profile records by Henry and Giles (1979). Exposed hardbottom areas are less common nearshore because of frequent burial by recently deposited sediments. Seaward of this recent sediment deposition zone, the frequency of hard-bottom areas increases (Henry and Giles, 1979). Low relief rocky outcrops occur discontinuously in depths of 15 to 25 m from Jacksonville to Charleston. Reefs support large sessile invertebrate and fish communities and are used extensively by sportfishermen (BLM, 1978). Mid-Shelf reefs occur in depths of 30 to 40 m offshore Jacksonville to Frying Pan Shoals. The density of these reefs is not well known. Terraces and ridges (discontinuous reefs) also occur from Southern Florida to Cape Hatteras in water depths of 50 to 80 m. Shelf-break reefs are relict features of a lower sea level and have an algal origin (BLM, 1978).

4.08 NEARSHORE SEDIMENTS

The nearshore sedimentary regime is 5 to 10 nmi in width, and consists of modern (Holocene) sediments derived from coastal rivers, salt marshes, and areas north of Cape Hatteras. Nearshore surface sediments are primarily fine-grained sands (NOAA, 1980).

Sediments at the Savannah ODMDS consist of a mixture of modern fine-grained sediments with relict coarse-grained sands (Oertel, 1979). Finer-grained sediments are more frequent in deeper portions of the disposal site, whereas shallow sections of the site have higher concentrations of medium- to coarse-grained sand with abundant shell fragments (ibid). Sediments collected from the Brunswick ODMDS during the UGA surveys can be cataloged as fine to very fine-grained sand with some silt and almost no clay (Gillespie and Harding 1985).

The nearshore zone constitutes "an effective sediment trap, beyond which little sediment deposition occurs" (NOAA, 1980; p. 46). Sediment transport within the nearshore zone is complex due to interactions of wave surge and tidal currents. Net longshore sediment transport offshore Charleston and Savannah is southwesterly (Neiheisal, 1959; Oertel, 1979).

4.09 THREATENED AND ENDANGERED SPECIES

Threatened and endangered species occurring in SAB are listed in Table 2. Whales generally migrate northward during summer and southward during winter

through offshore waters of the SAB. Turtles migrate from the Carribean into the SAB and nest along the coast from May through late September, where they frequent shallow reefs and lagoons (NOAA, 1980).

The short-nosed sturgeon (Acipenser brevirostrum) occurs in estuaries and nearshore waters from central Florida to southeastern Canada. Although the sturgeon is protected, the populations continue to decline as a result of accidental capture by shad fishermen and loss of habitat.

Manatees (Trichechus manatus latirostrus) occur infrequently off the coasts of Georgia and the Carolinas.

TABLE 2
ENDANGERED AND THREATENED SPECIES

Common Name	Specific Names	Status
	WHALES	
Blue whale	Balaenoptera musculus	E
Bowhead	Balaena mysticetus	E
Finback	Balaenoptera physalus	E
Humpback	Megaptera novaeangliae	E
Right	Eubalaena glacialis	
Sei	Balaenoptera borealis	E
Sperm	Physeter catodon	E
	TURTLES	
Green sea	Chelonia mydas	E
Hawksbill	Eretmochelys imbricata	E*
Kemps ridley	Lepidochelys kempi	E*
Loggerhead	Caretta caretta	T**
Leatherback	Dermochelys Coriacea	E
	FISHES	
Shortnose sturgeon	Acipenser brevirostrum	E
	SIRENIANS	
West Indian manatee	Trichechus manatus latirostrus	E
	BIRDS	
Bald eagle	Haliaetus leucocephalus	E
Peregrine falcon	Falco perigrinus	E

E - Endangered
T - Threatened
* Rare north of Florida
Range unknown
** South Carolina and Georgia; nest along North Carolina coast

Source: NOAA, 1980

Chapter 5

5.00 ENVIRONMENTAL EFFECTS

Site specific surveys were conducted by the Marine Extension Service, University of Georgia (UGA), at the Brunswick ODMDS in October 1984 and April 1985. This time interval was scheduled to detect any seasonal differences. Sample stations, as indicated on Figure 2, were set along north, south and east transects through the disposal area. This sample regime was established to distinguish within-versus-without differences. Trawl stations were also patterned after the same sampling regime. Trawls were 15 minutes in duration at a tow speed of about two kn.

A box corer was used to obtain sediment and organism samples. Six box cores were obtained at each sample station during each sample period, for a total of 108 cores.

Transmissometer, water quality and bathymetric surveys were also conducted.

5.01 RESULTS

5.02 Bathymetry

During both survey periods, all bathymetric measurements were made using a Raytheon DE-719C Survey Fathometer. Bathymetric profiles surveyed in April 1985 were used for correlation purposes with soundings done by the Corps of Engineers in May 1984 (drawing no. DBH 232/227, Sheet 3).

Soundings of several lines obtained in the Corps survey were plotted on cross-section paper, as were corresponding lines done by the Marine Extension Service in the April 1985 survey. The latter soundings were corrected to MLW, the same datum that the Corps employed. Figure 3 displays the cross-sectional plot and spatial distribution on the two sets of data.

As can be noted on Figure 3, close correlation exists between all line numbers. Considering that two different horizontal positioning systems were employed, all lines are felt to be a representative match.

The close correlation between the soundings taken approximately one year apart illustrates the overall stability of the material within the disposal area. No evidence of wave-base induced scour was noted. This is especially important as during the interval of time between the two surveys the area was subjected to numerous northeasters which were capable of producing scour.

5.03 Transmissometer Profiles

The water clarity in the disposal area was determined using a Hydro Products transmissometer. The water was much more turbid during the October 1984 survey than it was in April 1985. In October (see Table 3) the percentage of light transmission at the sea surface ranged from 72 to 80 percent, and

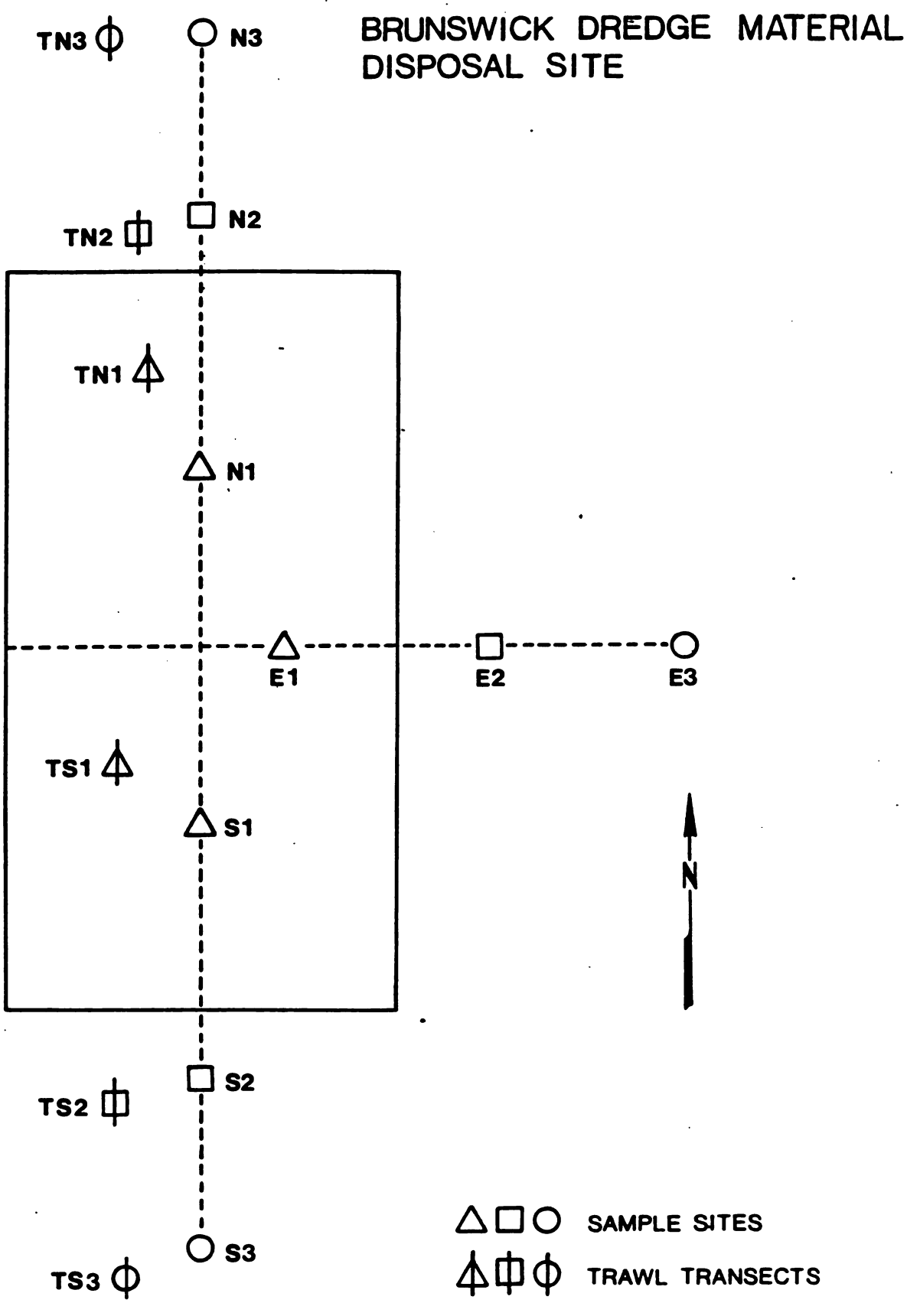
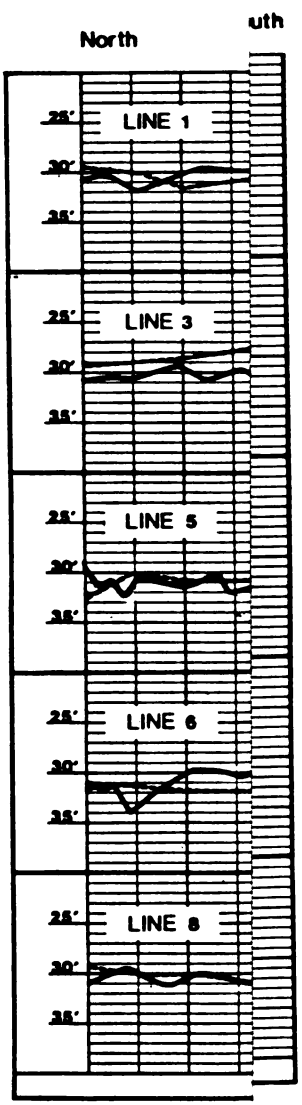


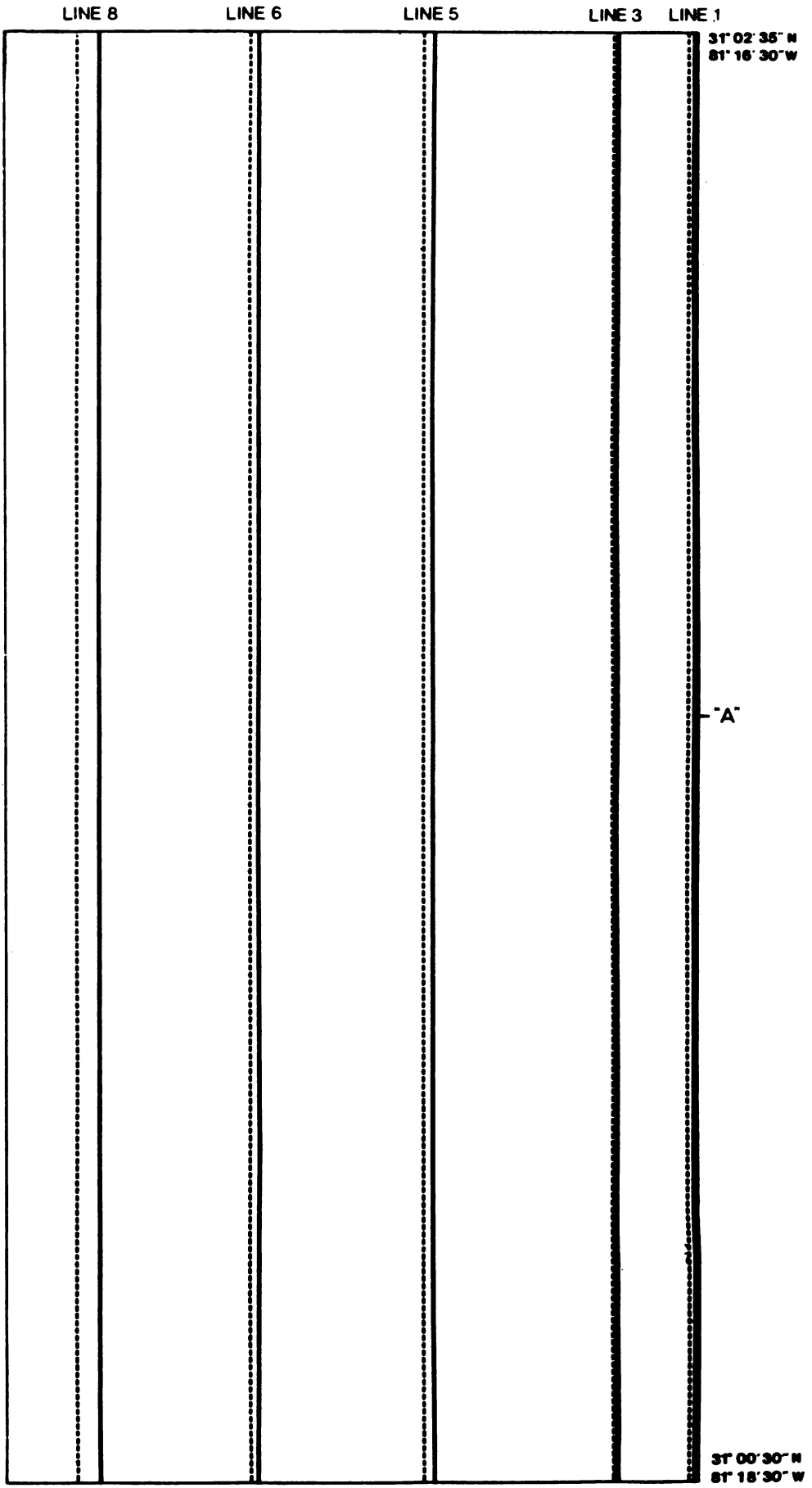
Figure 2. Sample locations in the Brunswick, Georgia dredge material ocean disposal site. Locations are approximate.

FIGURE 3

BATHYMET

BRUNSWIC
OFFSHORE





at the bottom from 69 to 87 percent. The measurements made in April (Table 4) showed a greater degree of consistency within the entire water column, with light transmission ranging from 93 to 97 percent on the surface and from 92 to 97 percent at the seafloor. The differences between the two sets of measurements reflect prevailing sea states, freshwater runoff volumes and other factors more than seasonal changes.

5.04 Sediment Characteristics

The bottom sediments in and adjacent to the disposal area were sampled by box coring at all nine sample stations during each of the two survey periods. Samples for sediment size analysis were taken with a 2-inch O.D. coring tube from the center of each box core. Upon return to the laboratory, the samples were extruded, washed with distilled water to remove the salts, dried in a convection oven and then split with a mechanical splitter, reconstituted into a representative bulk sample, weighed and placed in a ro-tap for grain size analysis.

The statistical breakdown of the coarse fraction size analysis for each is given in Tables 3 and 4. The contents of the pan (+230 mesh for the silt plus the clay fractions) were then added to 1,000-milliliter volumetric cylinders for pipette analysis.

The majority of the bottom sediments both within and without the disposal area can be described as unimodal, meaning that the majority of a given sample is in one size class. The only exception to this trend was the material at sample Station N-2, just outside the northern boundary of the disposal area. At this site, the bottom material exhibits a bimodal distribution, wherein over 50 percent of the sediments occur in two size classes. This apparent anomaly may be explained in part by the high concentration of shell debris in the samples taken at this site.

The bottom sediments of the entire surveyed area can be cataloged as fine-to very fine-grained sand with some silt and almost no clay. The sand fraction consists of shell fragments, most of which are recognizable portions of molluscs, lithic fragments, quartz and feldspar grains, mica and unidentified opaque mineral grains. No evidence of human debris was seen in any of the sediments analyzed. There is no discernable difference between the bottom material within the disposal area and that sampled outside the boundaries of the prescribed area.

5.05 Water Analyses

5.06 Total Suspended Solids

The highest content of suspended solids was 50 mg/l at sample Station S-2 taken in the April survey (Table 5). Although somewhat anomalous when compared to the other samples, it should be pointed out that even this concentration is very low (50 parts per million).

No definite trends can be seen in the amounts of suspended material, and there is no significant difference between the suspended solids in the water column samples within the disposal area versus those taken outside its boundaries.

5.07 High Molecular Weight Hydrocarbons

The concentration of high molecular weight hydrocarbons was at or below detection limits in all samples. Trace amounts of C-25 (pentacosane) and C-26 (hexacosane) were present in the samples taken at Station S-3 (outside the disposal area) during both surveys. However, even these were less than 0.10 parts per billion. The amounts of aliphatic and aromatic hydrocarbons in the water samples are extremely minute both inside and outside the boundaries of the disposal area, with no detectable differences other than that discussed above (Tables 6 and 7).

5.08 Sediment Analyses

5.09 Oil and Grease

Sediment oil and grease were found in low but detectable levels in all sediment samples analyzed (Table 8). No detectable trends were found with regard to location of samples relative to the disposal site. Oil and grease levels were slightly higher in October 1984 than in April 1985, but the data are not adequate to show a significant seasonal trend.

5.10 High Molecular Weight Hydrocarbons

Sediment high molecular weight hydrocarbons were below detection limits (0.1 parts per billion for aliphatic compounds; 0.50 parts per billion for aromatic compounds) on both sample dates for all samples at all sites (Table 9).

5.11 Chlorinated Hydrocarbons and Related Compounds

Sediment chlorinated hydrocarbons for both sample dates were all below limits of detectability (Tables 10 and 11). In addition to the samples shown in Tables 10 and 11, all samples were analyzed for PCBs (Aroclor 1254 standard) and were found to be below limits of detectability. Samples were also tested for the following related compounds; all were below detectable limits: Carbophenolthion, Diazinon, Ethion, Malathion, Methyoxychlor, Parathion, Methyl Parathion, Mirex and Rabon.

5.12 Total Organic Carbon and Heavy Metals

Organic carbon was present in all samples from all sites on both surveys. In the October survey, the highest concentration was in the sediments at Station S-1, which is inside the disposal area, whereas in the April 1985 survey, the highest concentration was at Station S-3, outside the disposal area. No significant trends and/or differences with respect to sample location can be delineated from the analyses presented in Table 9.

Mercury was detected in all samples from all sites on both surveys, and ranged from 37 to 85 parts per billion (Tables 12 and 13).

The other heavy metals (lead, copper and cadmium) which were present in all samples showed no discernable trend with respect to sample location or season, either inside or outside of the disposal area (Table 12 and 13).

5.13 Tissue Analyses

Due to the sparsity of faunal samples, both vertebrate and invertebrate, in some of the trawl hauls, insufficient biomass precluded the analysis of tissue material from all of the trawl sets.

5.14 High Molecular Weight Hydrocarbons

In the majority of the trawl samples, the aliphatic compounds were below detectable limits. In the October samples, the striped drum from Trawl S2 had trace amounts of C-21 and C-22, whereas the same species from Trawl N2 contained trace amounts of C-19, C-20, and C-21. The aromatic compounds in the October samples were all below limits of detectability, with the exception of the lizard fish from Trawl N2, which contained 1.00 part per billion pyrene.

In the April samples, all tissues analyzed were below detectable limits for the aliphatic compounds, as were the aromatics with the exception of the squid in Trawl N3, which contained 1.21 parts per billion phenanthrene.

5.15 Chlorinated Hydrocarbons and Related Compounds

Chlorinated hydrocarbons were below limits of detectability in all faunal tissue samples collected on both dates. In addition to the data presented in Tables 14 and 15, all samples were also analyzed for PCBs (Aroclor 1254 standard) and were found to be below detectable limits. Similar results were obtained on all samples analyzed for the same related compounds listed above under the sediment analyses.

5.16 Heavy Metals - Macrofauna

Heavy metals (mercury, lead, copper and cadmium) were detected in all of the tissue samples from the macrofauna on both sample dates. In the October samples, mercury was rather high in the croaker from Trawl S2, and copper was high in the blue crab from Trawl N1 and the portunid crab from Trawl S3 (99 and 165 parts per million, respectively). In the April samples, mercury was again high in the anchovies (242 parts per billion) and the flounder (701 parts per billion) from Trawl N2.

5.17 Faunal Distribution and Analyses

5.18 Trawl Macroepifauna

Beam trawl samples included 25 species in samples taken 16 October 1984, and 15 species in samples taken 17 April 1985 (Tables 16 and 17). Although

species richness was fairly high, numbers and biomass were very low. More than one-third of the species was represented in single samples and several by single individuals. The resulting data matrices are very sparse (with mostly zero entries) and therefore somewhat difficult to interpret.

Multivariate analysis of variance (MANOVA) was performed on the samples for both dates using three treatment levels. Levels were on site (samples TS-1 and TB-1), adjacent (samples TS-2 and TN-2) and off site (samples TS-3 and TN-3). Box's test for equality of dispersions and Rao's test for equality of population centroids were calculated; neither showed any overall treatment effect, although the hypotheses of common means and variances for all species were rejected. The univariate F-Ratios for all species were calculated (Tables 18 and 19) and the probabilities of calculated ratios relating to treatment effects were determined, with two +3 degrees of freedom and significance level of 1-p=0.90. The data for October 1984 show only one species (of 25) with significant treatment response while the April 1985 data show two species (of 15) responding significantly. In both cases, the number of species showing treatment effects is less than that expected as a result of random sampling effects (Harris, 1985), and is interpreted as showing no significant impacts from dredge spoil disposal.

The among-station correlations were calculated for each sample date (Tables 20 and 21). If significant treatment effects due to dredge spoil disposal occur, correlations are expected to be highest between pairs of stations receiving similar treatments (those with common numerical indices). This does not appear in either correlation matrix. The October 1984 results show apparently random dispersal while those for April 1985 show highly significant correlation among all stations except Station TS-2, which is poorly correlated with other stations. Examination of Table 17 shows that this result is due to the effects of a single species (Mnemiopsis leidyi). If M. leidyi is dropped from the data, the results are approximately random.

In order to examine the correlation matrices for additional, possibly hidden, patterns, they were subjected to principal components analysis (PCA) using a varimax rotation procedure to emphasize existing differences. The resulting factor tables and PCA plots (Tables 22 and 23, Figures 4 and 5) show no additional significant patterns. The April 1985 plot shows the expected clustering of all stations except TS-2 (#4). The October 1984 plot shows apparently random scatter with no particular gradient.

As an additional test, independent of the correlation matrix, hierarchial cluster analysis (HCA), based on the raw numerical data by station was applied to the data (Tables 24 and 25; Figures 6 and 7). Here again, if treatment effects due to location were evident in the species distribution data, the samples would be expected to cluster first in pairs from similarly treated location (i.e., with the same numerical index) before forming larger clusters. No such effects were found in the tables or dendrograms.

5.19 Box Core Macroinfauna

Macroinfauna sampling was accomplished on 15 October 1984 and 16 April 1985. Forty-four species were found in the first set of samples and 62 species in

the second set (Tables 26 and 27). Most of the taxonomic work, sorting, and counting was done by Ms. Amy L. Edwards, who is associated with the University of Georgia Museum of Natural History in Athens. As with the trawl samples, species richness was fairly high but numbers and biomass very low. The data matrices are very sparse with many species represented in single samples.

Three-level MANOVA was performed on the samples for both dates. Levels corresponded to station location, and as stated before, are indicated by numerical indices (1 for on site; 2 for immediately adjacent to the site; 3 for farthest off site). The results (Tables 28 and 29) showed no significant treatment effects due to location relative to the dredge spoil disposal site. Box's test for equality of dispersions and Rao's test for equality of population centroids were calculated. The hypotheses of common means and common variances were rejected, but no overall treatment effects were found. Calculation of F-ratios and associated probabilities for each species resulted in three species (of 44) from the October 1984 sampling and three (of 62) from the April 1985 sampling showing significant treatment effects (1-p=0.90, with two + 42 degrees of freedom). These are fewer than would be expected from chance alone in sampling a randomly distributed set of species. The overall conclusion is that one cannot reject the null hypothesis of no treatment effect due to dredge spoil disposal.

Samples were grouped by station for among-station correlation analyses. The resulting matrices (Tables 30 and 31) show no obvious pattern for either sampling date. Only one pairwise correlation (N-1 versus E-2, Table 20b) came very close to the critical value for significance (approximately 0.75 in this case) and no evidence of association by location appeared.

As an additional test, PCAs were performed (Tables 32 and 33; Figures 8, 9) on the correlation matrices to emphasize any obscure patterns. Five significant factors axes were found for the October 1984 samples and four for the April 1985 samples. In each case only the two most significant axes are plotted, although all significant axes were considered in the analyses. No significant treatment-related trends appeared in either set of data. The apparent association of the off-site stations for October 1984 (points 7, 8 and 9 in Figure 8) is an artifact, and disappears as other axes are examined.

Hierarchial cluster analysis (HCA) was also applied to the data matrices. The results of HCA by station are presented here (Tables 34 and 35; Figures 10, 11). HCA was also done on a sample-by-sample basis, but no additional information was revealed except for a slight tendency to cluster by station. The clustering sequences and resulting dendograms show no significant patterns related to sample location. Clusters and distance coefficient relationships appear essentially random.

5.20 SITE SPECIFIC STUDIES (Conclusions)

Aside from expected differences in faunal makeup and distribution between the two sampling dates, with the spring survey resulting in a greater number of species, no significant differences were detected in the parameters studied.

The data were analyzed statistically based on the null hypothesis that no significant differences would be ascertainable that could be attributed to the effects of dredge spoil disposal. The sampling permitted a three-level analysis consisting of coded samples within the site, immediately adjacent to the site and further from the site. With this approach, any consistent gradient relative to sample location would have resulted in the rejection of the null hypothesis. In fact, no such gradients occurred in any of the data with the result that the null hypothesis could not be rejected. The overall conclusion must be that no effects attributed to dredge spoil disposal were identified in these studies.

On the basis of heavy metal analysis in sediments the material would be considered clean and relatively unpolluted. On the basis of heavy metal analysis in tissue samples it is evident that bioconcentration is occurring. However, it is unclear if there is any correlation to disposal, uptake may be directly from water contact or from food. The spring sample seems to show higher concentrations except for copper which seems higher in the fall (Tables 12, 13). It cannot be stated whether the values reported are related to disposal nor for that matter even whether there is an anthropogenic relation. The values reported are not exceptional.

Bathymetric surveys should be continued to monitor the site in the future, and a winter/summer schedule should be selected. In view of the lack of detectable effects, every other year should suffice for monitoring to maintain the quality of the site.

5.21 IMPACTS

In a comprehensive 1981 report to the President and Congress, the National Advisory Committee on Oceans and Atmosphere (NACOA) made significant policy recommendations to the Environmental Protection Agency (EPA) regarding the ocean disposal of dredged materials. Their recommendations were based on a preponderance of data compiled from foreign as well as domestic research. Their study, was entitled " The Role of the Ocean in a Waste Management Strategy", evaluated the dumping of industrial wastes as well as dredged sediments.

In the case of dredged materials, it was generally found that the sediments act as a sink and repository for most toxic substances. Much of the early concern regarding ocean disposal was fostered by a lack of specific knowledge. Now, however, more is known about the effects of ocean dumping. With this information, NACOA specifically recommends that "The EPA policy that no ocean dumping permit will be issued when any land-based alternative exists should be reversed." NACOA contends that adverse effects of land disposal can outweigh the effects of ocean dumping.

The Corps' Waterways Experiment Station has been active in researching the effects of ocean dumping. In an extensive literature review entitled Potential for Biomagnification of Contaminants within Marine and Freshwater Food Webs, the author concludes that "the biomagnification of contaminants in marine and freshwater food webs is not a dramatic phenomenon" (Kay 1984). Furthermore, the Corps' extensive Dredge Material Research Programs provided some definitive information regarding the impacts of ocean dumping.

Site specific studies at the Brunswick ODMDS indicate a lack of long-term adverse environmental effects. These study results are in accord with findings reported elsewhere. In cases where like material is deposited on like material over time, little consequence is evident. While bathymetric survey showed little evidence of scour over the one-year time period, it is intuitively evident that dispersion has occurred over the 23-year use period of the site. Considering the long-term use of the site, it is encouraging to know that the site is physically, chemically and ecologically, indistinguishable from the surrounding area.

5.22 Site Criteria

EPA established 11 criteria to be used in assessing suitability of a site for dredged material disposal (40 CFR S 228.6). As part of the environmental review of a proposed site designation at Brunswick, EPA, Region IV has applied the criteria which are presented below.

1. Geographic position, depth of water, bottom topography, and distance from coast.

The site area is approximately 6 nmi offshore southeast of Brunswick Georgia in about 30 ft. of water. Its corner coordinates are given in Section 1.02 of the FEIS. There are no distinct features in the bottom topography of the site and no evidence of any mounding of sediments from past disposal activities.

2. Location in relation to breeding, spawning, nursery, feeding, or passage areas of living resources in adult or juvenile phases.

The nearshore coastal area off Brunswick Harbor is utilized for breeding, spawning and nursery by many important marine organisms. The ODMDS site is about six miles offshore. Shrimp and numerous finfish migrate seasonally through the area. However, its use as a disposal site for more than 20 years has not had any apparent effect on any living resources within or migrating through the area. The environmental studies at the site indicate no detectable effects to living species within or around the site (Gillespie and Harding 1985). In fact there is no discernable difference. Considering the 20 plus years use of the site this indicates no long-term effects.

Being about six miles offshore, the site is not close enough to block movement of shrimp up into the esturary or hinder the female loggerhead turtle from nesting on the beaches.

3. Location in relation to beaches and other amenity areas.

The major bathing beaches are just north and south of the channel entrance at St. Simons Island and Jeykll Island, respectively. Sport fishing occurs in the area of the site, but typically waters further offshore are fished for open ocean species. EPA has determined that continued disposal at the proposed site will not significantly affect recreational uses of the area waters. There are no reefs near the proposed site. The nearest artificial reefs that enhance sportfishing are further offshore. No impacts to these reefs are expected by use of the proposed site.

4. Types and quantities of wastes proposed to be disposed of, and proposed methods of release, including methods of packing the waste, if any.

The material expected to be dumped at an offshore disposal site will result from dredging the entrance channel to Brunswick Harbor although the ODMDS will not necessarily be limited to such maintenance dredging (Table 1). An annual average (based on the years 1964 through 1984) of 0.6 million cubic yards of dredged material has been dumped at the proposed site (Table 1).

Sediments dredged from the entrance channel are predominantly sand(Gillespie and Harding 1985), also see Section 5.04.

Hopper dredge is the type of vehicle for dredging and transport of the dredged material.

Dredged material may not be approved for ocean dumping unless it meets the criteria in 40 CFR Part 227. These criteria were also applied to inner harbor sediments (bioassay testing) and these sediments were determined suitable for ocean disposal, however, because of economic considerations, land disposal is presently the best means of disposal for these inner harbor sediments.

5. Feasibility of surveillance and monitoring.

The United States Coast Guard is not currently conducting surveillance at the existing site; however, surveillance would be relatively easy because the site is only about six miles offshore. Either shore-based observers or day-use boats could be used for surveillance. Monitoring is feasible at the proposed site.

A monitoring plan for the site will consist of the same type of sampling used to establish baseline surveys.

6. Dispersal, horizontal transport and vertical mixing characteristics of the area, including prevailing current direction and velocity, if any.

Predominant nearshore currents move southerly during summer months and northerly in winter months. The area of the proposed ODMDS is under

tidal influence. Tidal currents appear to have a stronger influence on waters in the vicinity of the proposed ODMDS site than nearshore ocean currents. Both hydrologic forces will cause the dumped sediments to spread in most any direction. Sea-bed drifters* release and return data seem to indicate that currents and presumbably sediment dispersal are strongly influenced by prevailing wind patterns in addition to tidal influences.

Significant long-term accumulation or mounding of dredged material has not been detected by high-resolution profiling conducted before and after disposal operations. Storms producing wave action affecting the entire water column are believed to cause spreading of the sandy sediments dumped previously at the site.

7. Existence and effects of current and previous discharges and dumping in the area (including cumulative effects).

Annual dredged material disposal has produced no significant adverse effects on the water quality at the proposed site. Changes in water quality as a result of disposal operations have been of short duration (minutes) and have been confined to relatively small areas. No major differences in finfish and shellfish species or numbers were found in the recent UGA survey within and adjacent to the existing site.

Past use of the existing site has created no persistent mounding or other disturbances of benthic infauna and demersal fish assemblages. Diversity and density of benthic communities within the disposal site are indistinguishable from control sites that were surveyed. No adverse, cumulative effects are evident from previous disposal operations.

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.

Shipping, fishing, and recreational activities occur in the vicinity of the existing site. Previous dredged material disposal operations are not known to have interfered with these activities. No resource development occurs in the immediate vicinity of the existing site, such as mineral extraction. Although the waters and considerable land area surrounding Brunswick Harbor are used for environmental study, the existing site and immediate coastal waters are not of special scientific importance. Aquaculture activities presently do not occur in the vicinity of the disposal site. There is a marine sanctuary "Gray's Reef National Marine Sanctuary" located 37 miles northeast of Brunswick marked by a fish haven buoy GRS at 31 24.5' N, 80 52.6'W. No effects to the sanctuary from the ODMDS are expected.

* (unpublished CE sea-bed drifter data on file Savannah Harbor Comprenhensive Study).

9. The existing water quality and ecology of the site as determined by available data or by trend assessment or baseline surveys.

Investigations of the dredged material disposal site have indicated that previous disposal has had no significant adverse effects on water quality (e.g., dissolved nutrients, trace metals, dissolved oxygen, or pH). Freshwater runoff from several of Georgia's large coastal rivers result in varied salinity and high turbidity near the site. Trace contaminants in the water were shown to be within or below ranges noted elsewhere along the coast. Most metal concentrations were low or below detection limits as were PCBs and pesticides tested.

Fish and shrimp dominated the nekton community adjacent to the existing site, and species are typical of those reported from the coastal waters all along the South Atlantic Bight. Several of these species are commercially and recreationally important, including the brown and white shrimp and various fishes.

Bottom sediments were fine-to medium-grained sands at the site. Comparison of pollutant content of these sediments with other data near the site and elsewhere along the coast indicated that the site's sediments cannot be considered polluted.

The benthic infauna community is characteristic of coastal medium to coarse sands in the vicinity of the proposed site. Species diversities are variable from season to season, with diversities high but low in biomass. Results of the study suggest that there have been no long-term effects on the benthic infauna at the proposed site resulting from past disposal activity.

10. Potentiality for the development or recruitment of nuisance species in the disposal site.

Sediments likely to be disposed at the site are low in organic and nutrient concentrations. Algal stimulation is not likely. Surveys there did not detect the development or recruitment of nuisance species.

11. Existence at or in close proximity to the site of any significant natural or cultural features of historical importance.

No historical features are known to exist within the proposed site.

The existing site is believed to be compatible with the criteria used for site evaluation, at reasonable costs. EPA considered whether it would be preferable to designate a deep-water site. For the following reasons, EPA believes that the existing site is the preferable site for the disposal of dredged material. These factors are discussed in greater detail in the EIS.

The existing site is six nautical miles offshore whereas a mid-shelf deep-water site would be more than 25 nautical miles from shore (Criterion 1). Disposal costs and energy consumption involved in the use of a deep-water site would be significantly greater than for the proposed site due to greater transportation demands.

Dredged material has been dumped at the proposed site, and the effects of disposal have been insignificant. The bottom is sand, and the site is not located near sensitive hard-bottom marine habitats.

Deep-water sites have not been used for dredged material disposal, and the environmental impact is uncertain.

5.23 SITE MANAGEMENT MEASURES TO MINIMIZE IMPACTS

5.24 PERMISSIBLE MATERIAL LOADINGS

Approximately 23 years of dredged material disposal has occurred at the existing site, with volumes of approximately 0.6 million cu yd per year creating no discernable adverse impacts. Therefore, it is difficult to assign an upper loading limit, beyond which significant adverse impacts will occur. It is anticipated that continuation of historic annual dredging volumes of approximately 0.6 million cu yd would have few, if any, significant adverse impacts. If dredged material volumes were significantly increased, the CE monitoring effort should be intensified to identify and mitigate potential adverse effects.

5.25 DISPOSAL METHODS

Present disposal methods practices by the CE at the Brunswick-ODMDS are acceptable for future dumping. Material is dredged, transported by hopper dredge, and discharged from underwater ports while the hopper dredge is underway and within the boundaries of the disposal site.

5.26 MONITORING THE DISPOSAL SITES

Section 228.9 of the Ocean Dumping Regulations established that the impacts of dumping on a disposal site and surrounding marine environment will be evaluated periodically. The information used in making the disposal impact evaluation may include data from monitoring surveys. Thus, if necessary, the CE District Engineer (DE) and EPA Regional Administrator (RA) may establish a monitoring program to supplement the historical site data. The DE and RA can develop the monitoring plan by determining the appropriate monitoring parameters, the frequency of sampling, and the areal extent of the survey. Factors considered in making determinations include the frequency and volumes of disposal, the physical and chemical nature of the dredged material, the dynamics of the site's physical processes, and the life histories of the species monitored. The framework for ODMDS management and monitoring plans will be provided in a Memorandum of Understanding (MOU) between the EPA (Region IV) and the CE (South Atlantic Division).

The primary purpose of the monitoring program is to determine whether disposal at the site is significantly affecting areas outside the site, and

to detect long-term adverse effects. Consequently, the monitoring study must survey the site and surrounding areas, including control sites and areas likely to be affected, as indicated by environmental factors (e.g., prevailing currents and sediment transport). Knowledge of density and concentration gradients facilitates prediction of future impacts on areas surrounding the disposal sites, and provides direction for management of future disposal activities.

5.27 GUIDELINES FOR THE MONITORING PLAN

No significant adverse effects from previous disposal activities at Brunswick ODMDS have been detected. Monitoring requirements for the site are minimized by the similarity of the dredged materials (fine to very fine sand with some silt and shell hash) to sediments at the disposal site and surrounding areas. Many physical parameters will not be significantly affected by disposal (e.g., temperature and salinity). Physical parameters showing variation during disposal (e.g. turbidity) rapidly return to ambient levels due to the high-energy environment of the Brunswick-ODMDS and the nature of the dredged material. However, the DE and RA may choose to monitor selected parameters which experience wide natural variability (e.g., sediment characteristic during high river runoff) in order to separate natural environmental fluctuations from those caused by dredged material disposal. At present, no known environmental impacts are occurring at the Brunswick-ODMDS and therefore no additional mitigation practices are required.

CHAPTER 6

6.00 PREPARATION OF THE EIS

6.01 PREPARATION OF THE DRAFT EIS

6.02 The preparation of the draft EIS was a cooperative effort between the Region IV EPA and the Army Corps of Engineers (Savannah District & South Atlantic Division). In addition, environmental studies were conducted by the University of Georgia, Marine Extension Service. Personnel involved in this effort are listed below.

Mr. Dennis Barnett	-	South Atlantic Division CE
Mr. Reginald Rogers	-	Region IV EPA
Mr. Tom Yourk	-	Savannah District CE
Dr. David M. Gillespie	-	UGA Marine Extension Service
Dr. James L. Harding	-	UGA Marine Extension Service

6.03 PREPARATION OF THE FINAL EIS

6.04 Comments received on the draft EIS and EPA's responses to those comments are incorporated in the Final EIS. Where appropriate, revisions were made to the draft EIS and are included in this final EIS along with comment letters. The principal preparers of the final EIS are:

Mr. Chris Provost	-	EPA, Region IV
Mr. Tom Yourk	-	CE, Savannah District

CHAPTER 7

7.00 PUBLIC INVOLVEMENT

7.01 Section 7 Coordination

7.02 Contacts were made between EPA, CE, with the U.S. Fish and Wildlife Service (FWS) and the National Marine Fisheries Service (NMFS) regarding any possible effects of this site designation to threatened or to endangered species pursuant to Section 7 of the Endangered Species Act. The FWS and NMFS concurred with the site designation indicating there would be no effect to endangered species under their respective jurisdictions.

7.03 Coastal Zone Management Consistency

7.04 The State of Georgia has no approved Coastal Zone Management Plan.

7.05 Comments and Responses

7.06 Introduction

7.07 Some of the comments on the draft EIS indicated a concern about EPA's proposed final designation of the interim approved Brunswick Harbor ocean dredged material disposal site (ODMDS). These concerns do not appear to be questioning the environmental suitability of the site proposed for final designation. Rather, those concerned are objecting to the site designation as it would provide a feasible ocean alternative to land disposal for beach-compatible sand.

7.08 EPA believes that these concerns should be addressed during the Corps of Engineers evaluation of the particular dredging project(s) to which they apply, and not in the context of EPA's ocean disposal site designation, which itself neither authorizes any dredging project nor permits disposal of any dredged material. While such matters may be highly relevant to determinations about the need for ocean dumping in relation to a specific dredging project, EPA does not regard them as being relevant to the issue now before this Agency: whether or not to designate an ocean disposal site to serve those dredging projects for which ocean disposal may, in the future, be approved.

7.09 Although EPA is authorized by the Marine Protection, Research, and Sanctuaries Act of 1972 (MPRSA) to designate sites for ocean dumping, EPA has no authority to impose, either directly or indirectly, a blanket prohibition on ocean disposal of dredged materials. Decisions about whether to permit ocean disposal of any dredged materials must be made on a case-by-case basis through the application of permitting criteria (40 CFR Part 227) to individual projects. These permitting criteria, applied in the course of the Corps of Engineers' review of projects involving ocean disposal of dredged materials, are different from the criteria applicable to site designations (40 CFR Part 228). Among these differences is the inclusion in the permitting regulations of criteria for evaluating the need for ocean

dumping in light of alternative methods of disposal (40 CFR Part 227, Subpart C). EPA views the need for ocean dumping with respect to any particular dredging project as being a different issue from the need to have an EPA-designated ocean dumping site available for consideration as a disposal option for dredging projects generally. Therefore, EPA believes that concerns related to adverse effects on a sand sharing system of possible ocean disposal of beach-compatible sand should be addressed during the Corps' project review process, which provides for public notice and opportunity to comment.

7.10 This interpretation of the scope of concerns to be studied within the site designation Environmental Impact Statement is, in cur opinion, consistent with Congress' expressed desire that ocean sites designated by EPA should be used for ocean disposal of dredged materials whenever feasible. If EPA were to refuse to designate any ocean disposal site in an area because of opposition to aspects of a dredging project proposed there, the lack of an EPA designated site would not preclude ocean disposal in the area, but rather would abrogate to the Corps of Engineers the duty of selecting a site whenever ocean dumping was found to be the preferred disposal method. EPA believes that the environment is better served when disposal site designation is performed by EPA after a thorough environmental assessment and scientific analysis, and that matters relevant only to specific project evaluation should not impede or delay the site designation process.

7.11 The Corps of Engineers is involved in a multi-year feasability study to determine the best operational configuration of Brunswick Harbor. As part of this study, the Corps is looking at possible disposal sites for the new work dredged material, as well as sites for maintenance material. The effect of deepening the harbor on shoaling patterns in the harbor and the nearshore area will be a part of this study. EPA suggests that concerns for the impacts of dredging and disposal site selection be directed to those preparing this report.

7.12 In summary, the comments submitted concerning the objections to the site designation based on the proposed use of the site for beach-compatible sand disposal not germane to this EIS. Issues relevant to this site designation and the site's relationship to marine resources, coastal amenities, historical resources and other factors included in the eleven criteria given in the Ocean Dumping Regulations.

7.13 Specific Comments

The following are copies of the comment letters received on the draft EIS. Following these letters are EPA's responses. Specific comments and corresponding responses are numbered accordingly.

OFFICE OF PLANNING AND BUDGET

JOE FRANK HARRIS
GOVERNOR

CLARK T. STEVENS
DIRECTOR

GEORGIA STATE CLEARINGHOUSE MEMORANDUM

TO: Ms. Sally S. Turner
U. S. Environmental Protection Agency
Marine Protection Section
345 Courtland Street, N.E.
Atlanta, Georgia 30365

FROM: Charles H. Badger, Administrator
Georgia State Clearinghouse
Office of Planning and Budget

DATE: December 17, 1986

SUBJECT: RESULTS OF STATE-LEVEL REVIEW

Applicant: Corps of Engineers

Project: DEIS Brunswick Ocean Dredged Material Site Designation

State Application Identifier: GA 861112-002

The State-level review of the above-referenced document has been completed. As a result of the environmental review process, the activity this document was prepared for is recommended for further development with the following recommendations for strengthening the project:

1. The disposal area is located within the spawning habitat for commercially important shrimp. Suspended sediments as a result of dredge and disposal of material at this site may adversely impact shrimp spawning activity.

2. The area of dredging and the spoil disposal site is also located in the habitat of several species of sea turtles. To date, we have not found any adverse impacts from this dredge/spoil activity on sea turtles. Should it be determined that these animals are being adversely impacted by either activity, we would recommend that the Corps of Engineers consult immediately with the Department of Natural Resources to develop a plan to minimize this impact.

SC-EIS-4m
9/85

3. The North Atlantic right whale (Eubaleana glacialis), an endangered species and the official State Marine Mammal, occurs along the Georgia coast between the months of November and March. We request that the dredge operators be advised of the possible presence of this animal in the vicinity of the dredge and spoil disposal site. Should any of these animals be sighted, they should be given wide berth and their presence reported to our office as soon as possible. This will enable us to gather additional data regarding this species.

4. The draft E. I. S. incompletely details the impacts of the proposed final designation of the ocean disposal site which is located 6 nautical miles southeast of Jekyll Island beaches in 30 feet of water. The site selected is downstream of the St. Simons Sound Entrance bar beaches. The site is designated to receive an average of 600,000 cubic yards of sand annually, which is dredged from the bar channel. In 1980, 1.74 million cubic yards were dredged from the channel and placed off-shore, and again in 1984, 1.33 million cubic yards were placed off-shore according to the E. I. S., Table I, p. 4. During this time frame and through 1985-1986, severe erosion has occurred on St. Simons and Sea Island beaches, and on the north end of Jekyll Island (the north picnic area at Jekyll has been abandoned for rehabilitation).

   Environmental issues in the draft E. I. S. were limited to disucssion of water quality, fisheries, shipping, and economic efficiency. No mention was made of the environmental impact of offshore ocean disposal on beach erosion. Sand deficits on St. Simons/Sea Islands and Jekyll Island beaches are aggravated and exacerbated by removal of the nearshore materials from the sand sharing system. We strongly recommend that suitable dredged material from the bar channel be placed in a nearshore environment or on the beaches of Jekyll and St. Simons Islands.

CHB/slm

cc: Paul Metz, Corps of Engineers ✓

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December 18, 1986

Col. Stanley G. Genega, Dist. Eng.
U.S. Army Corps of Engineers
Savannah District
P. O. Box 889
Savannah, GA 31402-0889

Re: Draft E.I.S., Final Designation Brunswick Ocean Dredged Material Disposal Site, prepared by E.P.A. and Corps of Engineers, 11/3/86.

Dear Col. Genega:

Reference the above cited document in which you propose to designate an off-shore ocean disposal site (ODMDS) for dumping of dredged material removed from the St. Simons Bar Ship-Channel between St. Simons and Jekyll Islands. The area being designated is located six (6) nautical miles southeast of Jekyll Island, south-southeast of the ship channel, and it is to be utilized for the disposal of 600,000 cubic yards annually of predominantly sand and shell materials.

Adverse environmental effects of the proposed action are stated as: "1) mounding, 2) smothering of the benthos, and 3) possible habitat alteration of the site. - - - operations will be regulated to prevent unacceptable environmental degradation outside site boundaries."

The document does not sufficiently address unacceptable environmental degradation outside site boundaries. Specifically, the document does not address the adverse impacts of dredging materials from the nearshore ebb delta bars and sand-sharing system and the placement of this material outside of the system.

The actual disposal of materials in the site proposed for designation will adversely impact and accelerate the beach erosion on St. Simons, Sea, and Jekyll Islands. These beaches are undergoing severe erosion, i.e., 30 feet of dunes was lost in the past week at the St. Simons Beach Club as a result of the Thanksgiving northeaster. Similar erosion took place last year along this stretch of beach.

As a property owner and concerned citizen I request that the E.P.A. and the Corps of Engineers address the impacts of ship channel maintenance dredging on the adjacent beaches and investigate the placement of this dredged material on the beaches and/or nearshore environment. I am opposed to the designation as propsed, unless these issues are properly addressed; firstly, in a public

hearing, and secondly, by additional amendments to the D.E.I.S., which are in turn circulated to the public. The D.E.I.S., in its present form, is inadequate and fails to address the impacts on the human and physical environment.

Sincerely,

Terrell K. Murphy, D.D.S.

cc: Senator Sam Nunn
Senator Mack Mattingly

United States Department of the Interior

OFFICE OF ENVIRONMENTAL PROJECT REVIEW
RICHARD B. RUSSELL FEDERAL BUILDING, SUITE 1034
75 SPRING STREET, S.W.
ATLANTA, GEORGIA 30303

TAKE PRIDE IN AMERICA

December 31, 1986

ER-86/1391

Mr. Jack E. Ravan,
Regional Administrator
Environmental Protection Agency
345 Courtland Street, N. E.
Atlanta, Georgia 30365

Dear Mr. Ravan:

The Department of the Interior has reviewed the draft environmental statement for Brunswick Harbor, Georgia, Ocean Dredged Material Disposal Site Designation, and offers the following comments.

(1) The potential for interference with recovery of minerals other than oil and gas should have been mentioned, even though the potential for recovery of minerals at this site is low.

(2) References to the Bureau of Land Management (BLM) concerning offshore matters, such as on pages 2 and 22, should be replaced with the Minerals Management Service (MMS). BLM offshore functions were transferred to the Minerals Management Service several years ago.

Other resources of concern to this Department have been adequately addressed.

Thank you for the opportunity to comment on this report.

Sincerely,

James H. Lee
Regional Environmental Officer

Georgia Department of Natural Resources
205 Butler Street, S.E., Floyd Towers East, Atlanta, Georgia 30334
J. Leonard Ledbetter, Commissioner
Harold F. Reheis, Assistant Director
Environmental Protection Division
(404) 656-3214

Reply To:
Room 400
1 [redacted]rtin Luther King, Jr., Dr., S.W.
Atlanta, Georgia 30334

November 26, 1986

Ms. Sally S. Turner
U. S. Environmental Protection Agency
Marine Protection Section
345 Courtland Street, NE
Atlanta, Georgia 30365

Dear Ms. Turner:

This is regarding your request for a floodplain management review for the Brunswick Harbor, Georgia Ocean Dredged Material Disposal
(1) Site Designation. Since the proposed disposal site is not located landward of the Georgia coast it does not affect the floodplains within the State of Georgia.

If you should have any questions concerning this review, please do not hesitate to contact my office at (404) 656-3214.

Sincerely,

Donna M. Mack
for State Floodplain Management Coordinator

AMM:ah

DEPARTMENT OF THE AIR FORCE
REGIONAL CIVIL ENGINEER, EASTERN REGION (HQ AFESC)
526 TITLE BUILDING, 30 PRYOR STREET, S.W.
ATLANTA, GEORGIA 30303-6801

REPLY TO ATTN OF: ROV2

SUBJECT: Draft Environmental Impact Statement (DEIS) for Brunswick, Georgia, Ocean Dredged Material Site Designation

TO: U.S. Environmental Protection Agency
Region IV
Marine Protection Section
ATTN: Ms Sally S. Turner
345 Courtland St. NE
Atlanta, GA 30365

(1) We have reviewed the subject DEIS and find that implementation of the proposed action will have no impact on Air Force operations in the area. Thank you for the opportunity to review this document.

THOMAS D. SIMS
Chief
Environmental Planning Division

DEPARTMENT OF THE ARMY
SOUTH ATLANTIC DIVISION, CORPS OF ENGINEERS
510 TITLE BUILDING, 30 PRYOR STREET, S.W.
ATLANTA, GEORGIA 30335-6801

REPLY TO
ATTENTION OF:

SADPD-R

9 December 1986

SUBJECT: DEIS for Brunswick, Georgia, Ocean Dredged Material Site Designation

Commander, Savannah District
ATTN: SASPD-E

(1) We have reviewed the subject document and have no comments.

FOR THE COMMANDER:

for DAN M. MAULDIN
Chief, Planning Division

Encl
Subj DEIS

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
WASHINGTON, D.C. 20314-1000

REPLY TO ATTENTION OF:

10 DEC 1986

WRSC-D

Mr. Reginald Rogers
Water Management Division, MPS
EPA Region IV
345 Courtland Street
Atlanta, Georgia 30365

Dear Mr. Rogers:

This responds to your November 3, 1986, Draft EIS entitled "Final Designation of the Brunswick Harbor Ocean Dredged Material Disposal Site." The site is aproximately six nautical miles offshore from Brunswick Harbor.

We offer the following comments on this document:

a. Alternatives (Chapter 3) - The specific purpose of the document is to locate an environmentally
(1) acceptable and economically feasible ocean disposal option for dredged material originating from the Brunswick Harbor area. Thus, land-based disposal, including beach nourishment should not be addressed as an alternative in this EIS. Rather, such discussion should be confined to the section dealing with Purpose and Need.

b. Beach Nourishment (page 23) - Recommend that
(2) all specific references to local cost sharing be deleted. We have not as yet developed programmatic guidance to the field for implementing new provisions of law which address this issue.

c. The discussion of the No Action alternative (page 19) may be misleading to the general public for several reasons. First, this site has an indefinite
(3) interim designation and "no action" may not necessarily result in cessation of ocean disposal. Rather, the immediate result would be the need to continue ocean disposal at a site which has not been fully studied and approved by EPA. Second, the Corps does have an optional ocean site designation/specification authority should an EPA designated site not be feasible for use. Thus, ocean disposal would not necessarily be precluded as an alternative for dredged material.

d. Purpose of Action (page 1) - We request that the document clearly indicate that the proposed action
(4) is final designation for continuing use and for disposal of acceptable dredged materials derived from Brunswick Harbor.

e. Monitoring - From the several different discussions of monitoring (Section 5.20; Section 5.22(5) and Section 5.27) within the document, it is unclear as
(5) to what the monitoring recommendation is to be. Based on historic use and lack of observed adverse impacts, the similarity of sediment types of the site and dredged material, and absence of critical resources or incompatible use areas within close proximity of the site, periodic bathymetric surveys seem to be the only justifiable monitoring requirement at this time.

We appreciate the opportunity to review the document. Please contact Mr. David Mathis (FTS 385-3099) of our Water Resources Support Center, Ft. Belvoir, Virginia, should you require any clarification of our review comments.

Sincerely,

Joseph T. Larremore
Colonel, Corps of Engineers
Assistant Director of Civil Works,
Atlantic

DE
OP

Jekyll Island Authority
375 RIVERVIEW DRIVE
JEKYLL ISLAND, GEORGIA 31520
TELEPHONE 912-635-2236

cy: DD-C, DE

OCP
PAO
PDBR
2 DD-E
DD-E1

December 15, 1986

Mr. Jack E. Ravan
Regional Administrator, Region IV
U. S. Environmental Protection Agency
345 Courtland Street, N.E.
Atlanta, Georgia 30354

RE: U.S. E.P.A. & Corps of Engineers, Draft E.I.S., Final Designation Brunswick Ocean Dredged Material Disposal Site, Atlantic Ocean - Jekyll Island, GA Dated 11/3/86

Dear Mr. Ravan:

This letter is in response to the D.E.I.S. cited above which proposes to make a final designation of the interim-approved site located 6 n. miles southeast of Jekyll Island in 30 feet of water. My agency, the Jekyll Island-State Park Authority, is not listed among those organizations requested to comment on the designation although our beaches are located downstream of the ship channel and are directly impacted by the dredge and disposal operations associated with maintenance of the channel. Nevertheless, we submit our review in good faith.

Jekyll Island has a high year-around visitation rate; however, the peak visitation is in the summer months when beach use is the greatest single activity. By survey, we have established that 82% of our spring visitors and 86% of our summer visitors utilize the beaches of Jekyll Island.

We have on Jekyll severe beach erosion occurring at certain seasons and tides and during hurricane events. The fact that we are located "downstream" of St. Simons ship channel makes for a greater deficit of sand on our beaches than would

normally be the case. The disposal of sand, i.e., the precise location and method, dredged from the channel has a direct impact, either positive or negative, on the quality of our beaches. It is our conclusion that the continued placement of sand offshore beyond the sand-sharing system as defined in GA Laws (Shore Act 21-5-232) and as proposed in the D.E.I.S. is determental to the long-term environmental quality of Jekyll Island.

We, therefore, request that E.P.A. and the Corps of Engineers address this concern in the E.I.S. by evaluating the impacts of dredging and disposal on the adjacent beaches; and further, that both agencies give consideration to the alternative of placing the dredged materials onto the beaches of Jekyll and St. Simons Island. This agency objects to the designation as proposed and requests further study of alternatives.

Sincerely,

George Chambliss
Executive Director

GC:ms
cc: Col. Stanley G. Genga, District Engineer
Honorable Lindsay Thomas, U.S. Congress, 1st Dist.

7.14 Georgia Office of Planning and Budget

(1) EPA believes that the location of the site will not result in adverse impacts to shrimp spawning activity in the area (see the discussion in Section 5.22 on pages 40 and 41 of the draft EIS and page 36 of this final EIS).

(2) Comment noted. EPA has received a letter dated May 1, 1987, from the National Oceanic and Atmospheric Administration (NOAA) (see page 62 of this final EIS) stating that "[w]e have reviewed the EIS (DEIS) and concur with your determination that populations of endangered/threatened species under our purview would not be adversely affected by the proposed action". Concurrence from the U. S. Fish and Wildlife Service was received by the CE (see page 59 of this final EIS). However, regarding your sea turtles concern, EPA believes that consulation with the National Marine Fisheries Service (NMFS)/NOAA, the Georgia Department of Natural Resources (GDNR), and EPA would be appropriate for each project involving dredged material disposal at the ODMDS on a project-by-project basis.

(3) Comment noted. Similar to the above Response #2, EPA believes consulation with NMFS/NOAA, GDNR, and EPA would also be appropriate for the North Atlantic right whale on a project-by-project basis.

(4) Refer to the "Introduction" section of the comment/response section (Section 7.06 of this final EIS). Upland alternatives such as beach erosion should be addressed in project-specific EIS's and not in a ODMDS designation, which by itself neither authorizes any dredging project nor permits disposal of any dredged material.

(5) Same as above.

7.15 Murphy and Argo Periodontists

(1) It is not the purpose of this document to address the environmental impacts of dredging operations in the Brunswick area. Refer to the "Introduction" portion of the comment/response section (Section 7.06).

(2) Refer to introduction. The disposal of materials at the candidate site will not accelerate beach erosion on any of the nearby beaches.

(3) This proposed site designation in no way authorizes any dredging project or the actual disposal of dredged materials at the site (see the "Introduction" portion of the comment/response section and Response #4 Paragraph 7.14 above). The comments received on the draft EIS did not surface any new information which would indicate the need for a public hearing. EPA believes that the EIS addresses the impacts of the proposed site designation on the human and physical environment.

7.16 U.S. Department of Interior-Office of Environment Project Review

(1) Accumulation or mounding of dredged material could potentially interfere with the recovery of minerals other than oil and gas. Since the mid-shelf and shelf-break current regimes have not been well studied, the potential for mounding in these areas is unknown. However, no long-term mounding or accumulation of dredged material has been detected from historical use of the candidate site so that it is not likely that continued use of the site would interfere with any mineral extraction in the area.

(2) Comment noted. Changes have been made.

7.17 Georgia Department of Natural Resources

(1) Thank you for your review of the draft EIS.

7.18 Department of the Air Force

(1) Thank you for your review of the draft EIS.

7.19 Department of the Army - South Atlantic Division Corps of Engineers

(1) Thank you for your review of the draft EIS.

7.20 Department of the Army - Office of the Chief of Engineers

(1) Agree. See the "Introduction" portion of the comment/response section (Section 7.06). The discussion of land-base disposal was eliminated since only ocean disposal alternatives and the no action alternative should be considered in an ODMDS EIS.

(2) Comment noted. We have removed the reference to local cost sharing on page 23 of the draft EIS.

(3) Comment noted. However, the second paragraph in Section 3.01 of the draft and final EIS does states that, if the no action alternative were selected, the Corps of Engineers would be required to"_ ...develop information sufficient to select acceptable ocean sites for disposal.." among other options.

(4) Comment noted. The change has been made (see page ii of this final EIS).

(5) At a minimum, periodic bathymetric surveys will be made at the site. Further monitoring efforts will involve tracking significant movement of the material, if any, and any associated impacts beyond the site boundaries. This may include video photography, surficial sediment grain size and chemical analyses, and analysis of the benthic communities.

7.21 Jekyll Island Authority

(1) See response to Georgia Office of Planning and Budget Section # 7.14.

7.21 SECTION 7 COORDINATION CORRESPONDENCE

Ocean Dump PD-EI

Yourk/pt/5793

JUN 2 6 1986

Planning Division

Mr. David J. Wesley
Endangered Species Field Office
United States Fish and Wildlife Service
2747 Art Museum Drive
Jacksonville, Florida 32207

Dear Mr. Wesley:

The Region IV Environmental Protection Agency in cooperation with the Savannah District, U.S. Army Corps of Engineers, is preparing a Draft Environmental Impact Statement (DEIS) for the permanent designation of the Brunswick Ocean Disposal Site. We are submitting for your review the text and species list which will appear in the DEIS. We do not anticipate any adverse effects to the species listed as a result of the disposal operations at the Brunswick site. A copy of this letter is being furnished to the National Marine Fisheries Service.

If you have any concerns or comments regarding this material, please feel free to contact Mr. Tom Yourk at FTS 248-5793 or Commercial (912) 944-5793.

Sincerely,

JOHN W. SEIBERT III
LTC, Corps of Engineers
Deputy Commander

Stanley G. Genega
Colonel, Corps of Engineers
Commander

Enclosure

~~YOURK~~ - PD-EI
COLEMAN - PD-EI
METZ - ~~PD-E~~
~~DOWNING~~ - OP
~~LANIER~~ - ~~PD~~
~~SEIBERT~~ - ~~DD-C~~
~~GENEGA~~ - DE
~~DISPATCH~~ - ~~AS-M~~
FILE - PD-EI

6/20/86 IC 6/18

Ocean Dump

United States Department of the Interior

FISH AND WILDLIFE SERVICE
ENDANGERED SPECIES FIELD STATION
2747 ART MUSEUM DRIVE
JACKSONVILLE, FLORIDA 32207

July 2, 1986

4: DDC, DE
DX

Colonel Stanley G. Genega
Corps of Engineers
Savannah District
P.O. Box 889
Savannah, Georgia 31402-0889

FWS Log No. 4-1-86-252

Dear Colonel Genega:

This responds to your letter of June 20, 1986, in accordance with Section 7 of the Endangered Species Act of 1973, as amended, on the permanent designation of the Brunswick Ocean Disposal Site located off Jekyll Island.

The Corps evaluated the impact this disposal site would have on the following endangered species which are under the jurisdiction of the Service; manatee and brown pelican. The brown pelican has been removed from the endangered species list for Georgia and Florida. Based on our review of the project, we concur with the Corps' determination of no effect.

Although this does not constitute a biological opinion described under Section 7 of the Endangered Species Act, it does fulfill the requirements of the Act and no further action is required. If modifications are made in the project or if additional information involving potential impacts on listed species becomes available, please notify our office.

Sincerely yours,

David J. Wesley
Field Supervisor

JAN 29 1987

REF: 4WMD-ME/CP

Mr. Charles A. Oravetz, Chief
Protected Species Management Branch
National Marine Fisheries Service
9450 Koger Boulevard
St. Petersburg, FL 33702

Dear Mr. Oravetz:

The U.S. Environmental Protection Agency (EPA) and the U.S. Army Corps of Engineers (COE) have prepared a draft Environmental Impact Statement (EIS) for the designation of a dredged material disposal site offshore Brunswick, Georgia. A copy of the draft EIS is enclosed for your review. EPA is now finalizing that EIS and preparing a proposed rulemaking to designate the existing interim site about six nautical miles offshore Brunswick Harbor, Georgia. Pursuant to Section 7 of the Endangered Species Act, EPA would like to coordinate with your agency to ensure that designation of this site will not jeopardize the continued existence of threatened or endangered species under the jurisdiction of the National Marine Fisheries Service (NMFS).

The proposed site is six nautical miles southeast of Brunswick Harbor, Georgia. The site is rectangular containing an area of about two square nautical miles in water depths averaging 9 meters. Prior to usage of the site each Federal project or permit application must establish that the disposal would occur within the site boundaries and would comply with the regulations and criteria of EPA (40 CFR Part 227) and any state requirements. Section 4.09 of the draft EIS lists the endangered species that may occur in the area of the site. Please ensure that this list is complete.

Available information indicates that use of this site would not likely affect any of these species since the site does not encompass any known unique breeding, spawning, nursery, or passage area and is small in relation to their total ranging areas. Comments on the draft EIS have raised a concern for the endangered right whale whose calving/wintering periods occur in the South Atlantic waters. We have previously coordinated with your office concerning the Fernandina site designation and its effect on the right whale on November 7, 1986. It is our belief that similar measures should be applied to this site designation (i.e. specific disposal projects utilizing the site be evaluated on a case-by-case basis for impacts on the right whale) as were applied to the Fernandina site.

Under Section 7 of the Endangered Species Act of 1973, EPA is requesting your comments on the conclusion that the proposed designation of this site will have no effect on threatened or endangered species under the purview of the National Marine Fisheries Service. If there are any questions, please contact me or Mr. Chris Provost at FTS 257-2126.

Sincerely yours,

Sally S. Turner, Chief
Marine Protection Section

Enclosure

CPROVOST:jb:1-16-87
2nd Draft:jb:1-27-87
Final:1-28-87

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE

Southeast Regional Office
9450 Koger Boulevard
St. Petersburg, FL 33702

May 1, 1987 F/SER23:TAH:DCP

Dr. Sally S. Turner
Chief, Marine Protection Section
U.S. Environmental Protection Agency
Region IV
345 Courtland Street
Atlanta, Georgia 30365

Dear Dr. Turner:

This responds to your February 2, 1987, letter regarding the proposed designation of a dredged material disposal site (ODMDS) offshore Brunswick, Georgia. The proposed site has been used as an interim-approved ODMDS since 1964, and no adverse impacts on threatened/endangered species have been observed. A draft Environmental Impact Statement (EIS) was transmitted pursuant to Section 7 of the Endangered Species Act of 1973 (ESA).

We have reviewed the EIS and concur with your determination that populations of endangered/threatened species under our purview would not be adversely affected by the proposed action.

This concludes consultation responsibilities under Section 7 of the ESA. However, consultation should be reinitiated if new information reveals impacts of the identified activity that may affect listed species or their critical habitat, a new species is listed, the identified activity is subsequently modified or critical habitat determined that may be affected by the proposed activity. If you have any questions, please contact Dr. Terry Henwood, Fishery Biologist at FTS 826-3366.

Sincerely yours,

Charles A. Oravetz (cer)

Charles A. Oravetz, Chief
Protected Species Management Branch

cc: F/M412
F/SER11

REFERENCES

Atkinson, L.P., J.O. Blanton and E.B. Haines. 1978. Shelf flushing rates based on the distribution of salinity and freshwater in the Georgia Bight. Estuarine and Coastal Marine Science. 7:465-472.

Blanton, J.O. 1971. Exchange of Gulf Stream Water with North Carolina Shelf Water in Onslow Bay during stratified conditions. Deep-sea Research. 18(2):167-178.

Blanton, J.O. and L.P. Atkinson. 1978. Physical transfer processes between Georgia tidal inlets and nearshore waters. pp. 515-532 In: M.L. Wiley [ed.] Estuarine Interactions. Academic Press, Inc.

Bumpus, D.F. 1973. A description of the circulation on the Continental Shelf of the East Coast of the United States. Progress in Oceanography. 6:111-157.

Bureau of Land Management. 1978. Final environmental impact statement, proposed 1978 Outer Continental Shelf Oil and Gas Lease Sale, South Atlantic, OCS Sale No. 43. U.S. Department of the Interior, New Orleans OCS, Louisiana. Volumes I-III.

____1980. Draft environmental impact statement. Proposed 1981 Outer Continental Shelf Oil and Gas Lease Sale No. 56. New Orleans, LA.

Buusan, B. and S. Pfirman. 1979. Observations of bottom current and bottom sediment movement in the Southeast Georgia Embayment, 1977. pp. 104-37 In: South Atlantic Outer Continental Shelf Geological Studies, Fiscal Year 1976: Geology. U.S. Geological Survey Final Report prepared for Bureau of Land Management, Washington, DC.

Gillespie D.M. and J.L. Harding. 1985. An environmental study to support permanent designation of the Brunswick Ocean Disposal Site. Report submitted to the Savannah District COE. Contract #DACW 21-84-C-005.

Gillespie, D.M. and J.C. Hodges, Jr. 1982. Production of Invertebrates in the Tidewater Zone of a Coastal River and Adjacent Estuary. ERC 0482, Georgia Institute of Technology, Atlanta, Georgia. pp. 57.

Henry, V.J., Jr. and J.H. Hoyt. 1968. Quaternary paralic and shelf sediments of Georgia. Southeastern Geology. 9:195-214.

Henry, V.J., Jr. and R.T. Giles. 1979. Distribution and occurrence of reefs and hardgrounds in the Georgia Bight. pp. 324-381 In: South Atlantic Outer Continental Shelf Geological Studies, Fiscal Year 1976: Geology. U.S. Geological Survey Final Report prepared for Bureau of Land Management, Washington, DC.

Jacobson, J.P. 1974. A socio-economic environmental baseline summary for the South Atlantic Region between Cape Hatteras, North Carolina and Cape Canaveral, Florida. Vol. 1 Physical Oceanography. Virginia Institute of Marine Science, Gloucester Point, VA.

Kay, S.H. 1984. Potential for biomagnification of contaminants within marine and freshwater food webs. Technical report D-84-7, U.S. Army Engineer Waterways Experiment Station, Vicksburg, Miss.

Lee, T.N., L.P. Atkinson and R. Legeckis. 1981. Observations of a Gulf Stream frontal eddy on the Georgia Continental Shelf, April, 1977. Deep Sea Research. 28:347-378.

National Oceanic and Atmospheric Administration. 1980. Draft environmental impact statement on the proposed Gray's Reef Marine Sanctuary. U.S. Dept. of Commerce, Office of Coastal Zone Management, Washington, DC.

Neiheisel, J. 1959. Littoral drift in vicinity of Charleston Harbor. Jour. of Waterways and Harbors Division, Proceedings of the American Society of Civil Engineers. WW2: 99-113.

Oertel, G.F. 1979. Depositional characteristics of sediments at a low energy ocean disposal site, Savannah, Georgia. pp. 97-107. In: Palmer, H.D. and M.G. Gross [eds.]. Ocean Dumping and Marine Pollution. Dowden, Hutchinson and Ross Inc. 268 pp.

Pequegnat, W.E. 1978. An assessment of the potential impact of dredged material disposal in the open ocean. Dredged Material Research Program, Tech. Rep. D-78-2. Waterways Experiment Station, Vicksburg, MS.

Tenore, K.R. 1979. Macroinfaunal benthos of South Atlantic/Georgia Bight. pp. 281-308. In: South Atlantic Benchmark Program. Volume 3: Results of Studies of Georgia Bight of South Atlantic Ocean. Prepared by Texas Instruments Incorporated for Bureau of Land Management, Washington, DC.

Tenore, K.R., C.F. Chamberlain, W.M.Dunstan, R.B. Hanson, B. Sherr, and J.H. Tietjen. 1978. Possible effects of Gulf Stream intrusions and coastal runoff on the benthos of the Continental Shelf of the Georgia Bight. pp. 577-598. In: M.L. Wiley [ed.]. Estuarine Interactions. Academic Press, Inc.

Uchupi, E. and A.R. Tagg. 1966. Microrelief of the Continental Margin south of Cape Lookout, North Carolina. Geol. Soc. America Bull. 77:427-430.