MAY 2002

BEACH EROSION CONTROL AND HURRICANE PROTECTION PROJECT DADE COUNTY, FLORIDA

PROPOSED TEST FILL AT MIAMI BEACH USING A DOMESTIC UPLAND SAND SOURCE

DRAFT ENVIRONMENTAL ASSESSMENT

U. S. ARMY CORPS
OF ENGINEERS
Jacksonville District

DERM
DEPARTMENT OF ENVIRONMENTAL RESOURCES MANAGEMENT

PRELIMINARY
FINDING OF NO SIGNIFICANT IMPACT

PROPOSED TEST FILL AT MIAMI BEACH USING A DOMESTIC UPLAND SAND SOURCE

BEACH EROSION CONTROL AND HURRICANE PROTECTION PROJECT DADE COUNTY, FLORIDA

I have reviewed the Environmental Assessment (EA) for the proposed action. This Finding incorporates by reference all discussions and conclusions contained in the Environmental Assessment enclosed hereto. Based on information analyzed in the EA, reflecting pertinent information obtained from agencies having jurisdiction by law and/or special expertise, I conclude that the proposed action will not significantly impact the quality of the human environment and does not require an Environmental Impact Statement. Reasons for this conclusion are in summary:

a. The proposed action would restore a section of severely eroded beach at Miami Beach, Florida thus preventing or reducing loss of public beachfront to continuing erosional forces and preventing or reducing periodic damages and potential risk to life, health and property in the developed lands adjacent to the beach.

b. The Draft Fish and Wildlife Coordination Act Report of March 1, 2001 indicates no objection by the Department of the Interior and full compliance with the Endangered Species Act, the Coastal Barrier Resources Act, and the Fish and Wildlife Coordination Act.

c. Measures to prevent or minimize impacts to sea turtles in accordance with Biological Opinions from the U.S. Fish and Wildlife Service and the National Marine Fisheries Service will be implemented during and after project construction. To protect the manatee, all water-based activities would follow standard manatee protection measures. There would be no adverse impacts to other Federally listed endangered or threatened species.

d. Pending the State's concurrence with the Federal Coastal Zone Consistency Determination (Appendix C of the EA), the action is consistent with the State's Coastal Zone Management program.

e. Based on consultation with the State Historic Preservation Officer, no significant historical properties have been identified on the segment of beach proposed for renourishment.

f. Water Quality Certification, pursuant to Section 401 of the Clean Water Act, has been applied for.

g. Measures to eliminate, reduce, or avoid potential impacts to fish and wildlife resources include the following: (1) Extensive turbidity monitoring would be performed at the beach fill and dredging sites during construction to ensure turbidity levels do not exceed the State water quality standard, (2) Where the discharge pipeline crosses the nearshore hardbottom, collars would be placed along the pipe at 100' intervals to suspend it off the bottom to the greatest extent possible, (6) Any unavoidable impacts to the nearshore hardbottom from the pipeline would be appropriately mitigated as described in the Environmental Assessment.

_____ _____

James G. May
Colonel, U.S. Army
District Engineer

Date

DRAFT
ENVIRONMENTAL ASSESSMENT
ON
PROPOSED TEST FILL AT MIAMI BEACH
USING A DOMESTIC UPLAND SAND SOURCE
DADE COUNTY BEACH EROSION CONTROL
AND HURRICANE PROTECTION PROJECT
MIAMI-DADE COUNTY, FLORIDA

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1 PROJECT PURPOSE AND NEED

1.1 PROJECT AUTHORITY.

1.1.1 INITIAL AUTHORIZATION.
The Beach Erosion Control and Hurricane Protection (BEC & HP) Project for Dade County, Florida was authorized by the Flood Control Act of 1968 (see Figure 1, Location Map). In addition, Section 69 of the 1974 Water Resources Act (P.L. 93-251 dated 7 march 1974) included the initial construction by non-federal interests of the 0.85-mile segment along Bal Harbour Village, immediately south of Bakers Haulover Inlet. The authorized project, as described in HD 335/90/2, provided for the construction of a protective/recreational beach and a protective dune for 9.3 miles of shoreline between Government Cut and Baker's Haulover Inlet (encompassing Miami Beach, Surfside and Bal Harbour) and for the construction of a protective/recreational beach along the 1.2 miles of shoreline at Haulover Beach Park.

1.1.2 SUPPLEMENTAL APPROPRIATION.
The Supplemental Appropriations Act of 1985 and the Water Resources Development Act of 1986 (Public Law 99-662) provided authority for extending the northern limit of the authorized project to include the construction of a protective beach along the 2.5 mile reach of shoreline north of Haulover Beach Park (Sunny Isles) and for periodic nourishment of the new beach. This authority also provided for the extension of the period of Federal participation in the cost of nourishing the authorized 1968 BEC & HP Project for Dade County, which covered 10.5 miles of shoreline extending from Government Cut north to the northern boundary of Haulover Beach Park, from 10 years to the 50-year life of the project.

1.2 PROJECT LOCATION.

The project is located on the southeast Florida coast within Miami-Dade County. The proposed work would be performed as part of the Dade County BEC & HP Project and is located within the community of Miami Beach (see Figure 1, Location Map).

1.3 PROJECT NEED OR OPPORTUNITY.

The nourishment of Miami-Dade County Beaches has become a necessity to provide storm protection. The purpose of the Dade County Beach Erosion Control and Hurricane Protection (BEC&HP) Project is to reduce the loss of public beachfront to continuing erosional forces and to prevent or reduce periodic damages and potential risk to life, health and property in the developed lands adjacent to the beach.

Offshore borrow sources of beach quality sediment along the Miami-Dade County shoreline have been almost completely depleted, and alternative sources of material will be required in the near future to provide continued renourishment of the Dade County BEC&HP Project. Although carbonate sediment from offshore borrow sites has traditionally been used for project renourishment, sand from upland sources may provide an effective alternative for future renourishment requirements.

1.4 AGENCY GOAL OR OBJECTIVE.

1.4.1 OBJECTIVE
The purpose of the test fill, in addition to providing nourishment to an eroded portion of the Federal project along northern Miami Beach, is to evaluate the economic, engineering, and environmental performance of an upland source of sand on the beach erosion control project.

1.4.2 PROPOSED ACTION
The proposed test fill site would be located along northern Miami Beach, and would extend along approximately 1.5 miles of shoreline that has been an erosional area since the project was constructed. The proposed site is located far from adjacent inlets, and no significant structures exist in this vicinity to disrupt the "natural" coastal processes. The total volume of the test fill is expected to be approximately

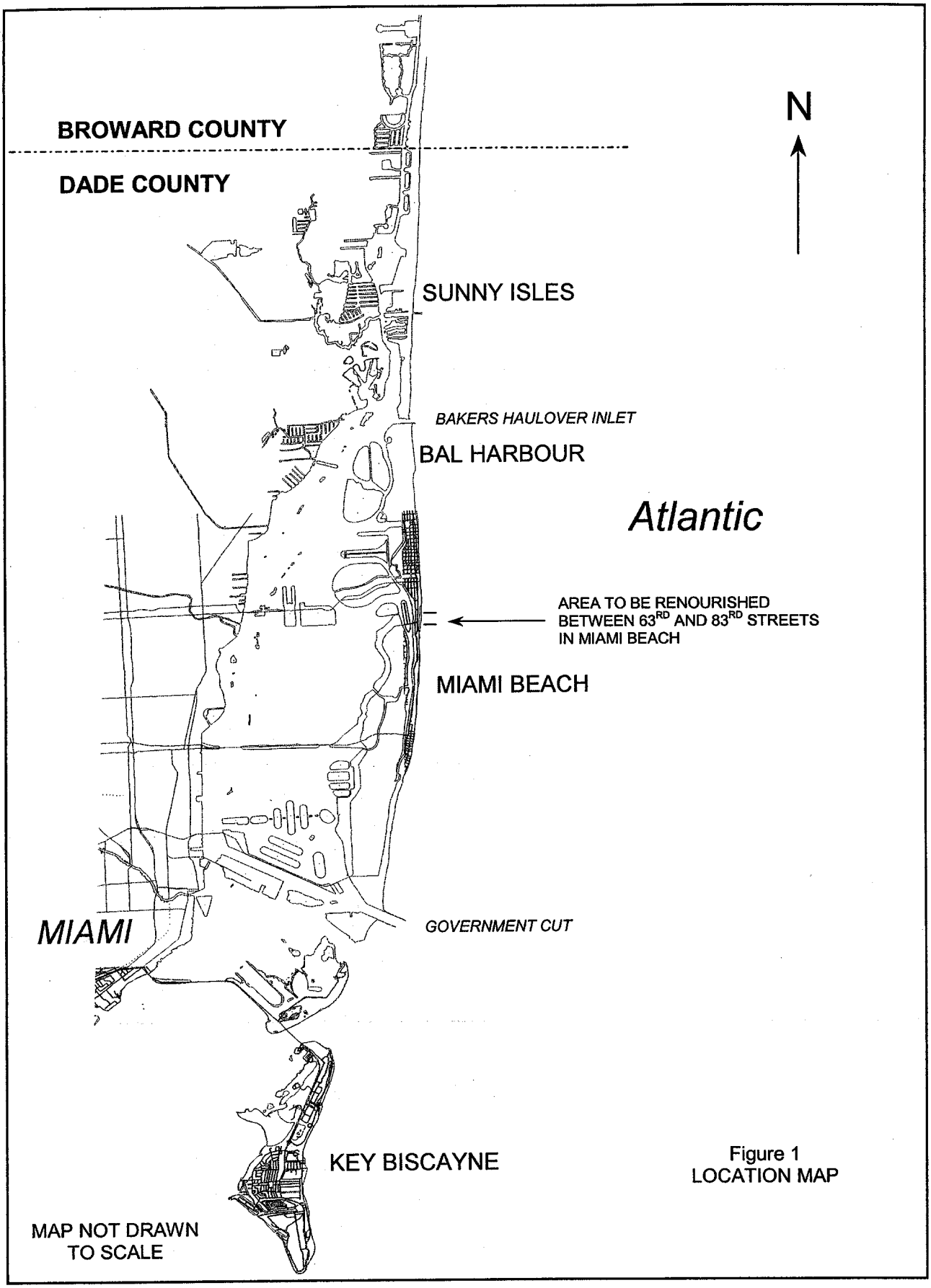


Figure 1
LOCATION MAP

600,000 cubic yards. The proposed location for the test fill is between 63rd and 83rd Streets in Miami Beach (DNR monuments R-36 to R-47). The exact source of upland sand for the test beach would be determined during the procurement process. Sand sources proposed by contractors would have to meet a set of generic sand specifications (see Appendix A) and pass a screening process for sand characteristics and potential environmental impacts. The beach fill would be constructed at the authorized +9.0-foot mean low water (MLW) elevation with a construction berm width of 205 feet from the erosion control line (ECL) (Figure 2). The front slope of the beach fill will be 1 vertical on 15 horizontal (Figure 3). This project has been previously nourished with the same design as proposed here.

Anticipated direct impacts to the hardbottom habitats are restricted to hardbottom habitats located in the pipeline corridor. This corridor will be the same corridor used for prior beach nourishment projects within the study area. The corridor identified is the one identified to produce the least amount of scarring to hardbottom resources within the area (Miami-Dade County 2000).

1.5 RELATED ENVIRONMENTAL DOCUMENTS.
The following is a list of related documents:

a. Dade County Beaches, Florida, Beach Erosion Control and Hurricane Surge Protection, General Design Memorandum, Phase I. U.S. Army Corps of Engineers, Jacksonville District, 1974.

b. Final Environmental Impact Statement, Beach Erosion Control and Hurricane Surge Protection Project, Dade County, Florida. U.S. Army Corps of Engineers, Jacksonville District, April 1975.

c. Beach Erosion Control and Hurricane Protection Study for Dade County, Florida, North of Haulover Beach Park, Survey Report and EIS Supplement. U.S. Army Corps of Engineers, Jacksonville District, June 1984.

d. Final Environmental Assessment, Second Periodic Nourishment, Sunny Isles and Miami Beach Segments, Beach Erosion Control and Hurricane Protection Project, Dade County, Florida. U.S. Army Corps of Engineers, Jacksonville District, May 1995.

e. Coast of Florida Erosion and Storm Effects Study, Region III, Feasibility Report with Final Environmental Impact Statement. U.S. Army Corps of Engineers, Jacksonville District, October 1996.

f. Final Environmental Assessment, Beach Erosion Control and Hurricane Protection Project Dade County, Florida, Second Periodic Nourishment, Surfside and South Miami Beach Segments. U.S. Army Corps of Engineers, Jacksonville District, April 1997.

g. Final Environmental Impact Statement, Beach Erosion Control and Hurricane Protection Project Dade County, Florida, Modifications at Sunny Isles. U.S. Army Corps of Engineers, Jacksonville District, July 1998.

h. Final Environmental Assessment, Beach Erosion Control and Hurricane Protection Project Dade County, Florida, Second Periodic Renourishment, at Bal Harbour. U.S. Army Corps of Engineers, Jacksonville District, May 1998.

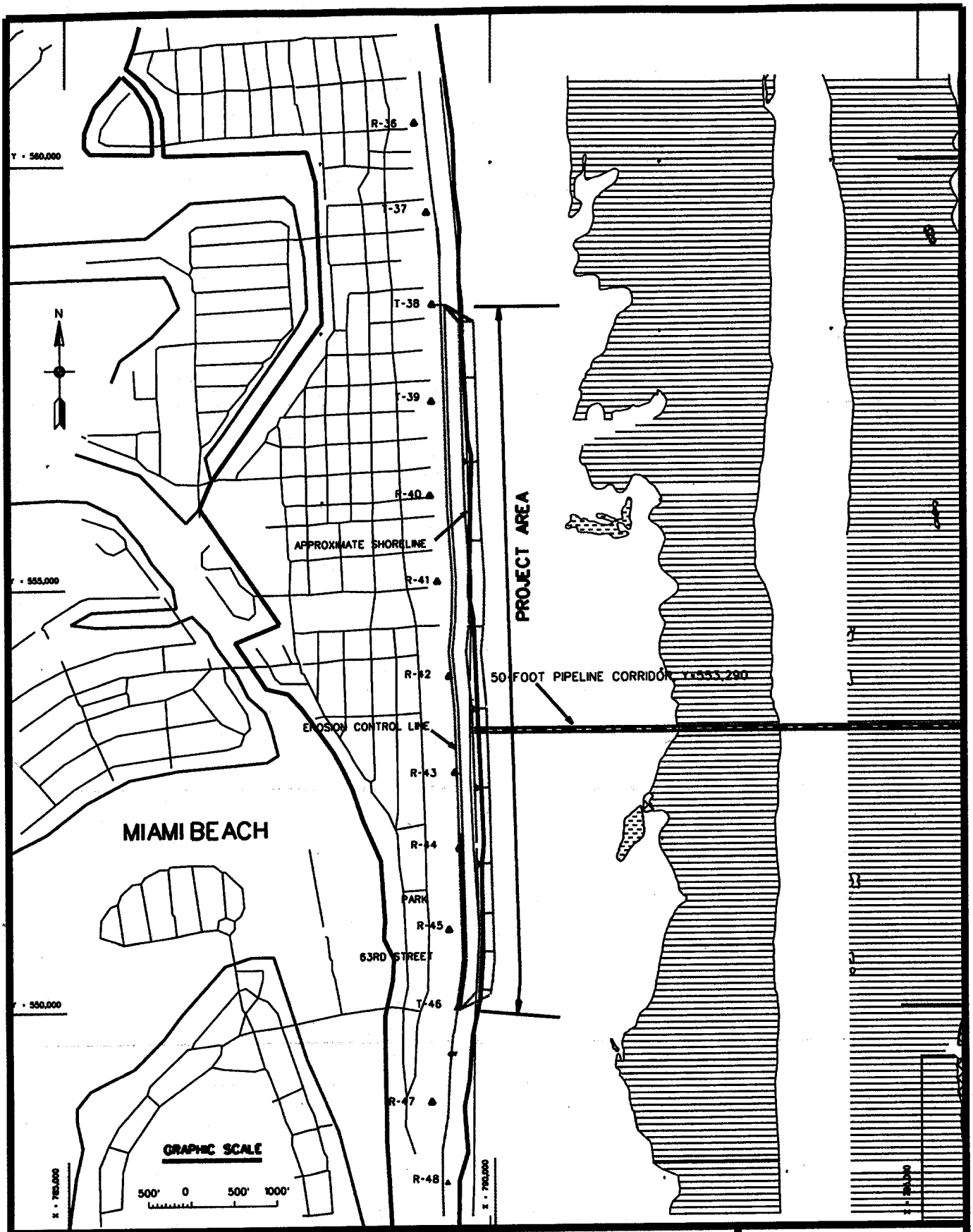
i. Final Environmental Assessment, Renourishment, at Miami Beach in the Vicinity of 63rd Street, Beach Erosion Control and Hurricane Protection Project, Dade County, Florida. U.S. Army Corps of Engineers, Jacksonville District, November 2000.

1.6 DECISIONS TO BE MADE.
The alternatives to provide shore protection for the Miami-Dade County Beaches, from Government Cut north to Bakers Haulover Inlet were evaluated in references 1.5a and 1.5b above. The plan recommended and approved for implementation was beach restoration with periodic renourishment. This Environmental Assessment (EA) will not re-evaluate the alternatives to beach renourishment but will evaluate the use of upland sand as a potential source of beach quality material for the Miami-Dade County Project.

1.7 SCOPING AND ISSUES.
A Notice of Intent (NOI) to prepare a Draft Environmental Impact Statement (DEIS) for a Test Beach Fill using a foreign source of carbonate sand appeared in the Federal Register on August 21, 1998. In addition, the NOI was mailed to interested and affected parties on October 7, 1998. A correction to this NOI was published in the Federal Register on October 27, 1998. This NOI was cancelled in the Federal Register on February 19, 1999. A new NOI for to prepare a DEIS for a Test Beach using a domestic upland sand source appeared on May 6, 1999 and was mailed to interested parties on May 18, 1999. This NOI was cancelled on May 16, 2002 after it was determined that there were no new significant issues and that an Environmental Assessment would be adequate. Copies of the NOI's and the transmittal letters can be found in Appendix D as well as copies of any letters of comment/response received.

1.7.1 ISSUES EVALUATED IN DETAIL.
The following issues were identified during scoping and by the preparers of this Environmental Assessment to be relevant to the proposed action and appropriate for detailed evaluation:

a. Turbidity and sedimentation impacts to hardground/reef communities.
b. Monitoring of reefs for turbidity and sedimentation impacts.
c. Impacts to hardgrounds from pipeline placement.
d. Potential impacts on nesting sea turtles, nests, and hatchlings.



US ARMY CORPS
OF ENGINEERS

BEACH EROSION CONTROL AND HURRICANE PROTECTION
DADE COUNTY, FLORIDA

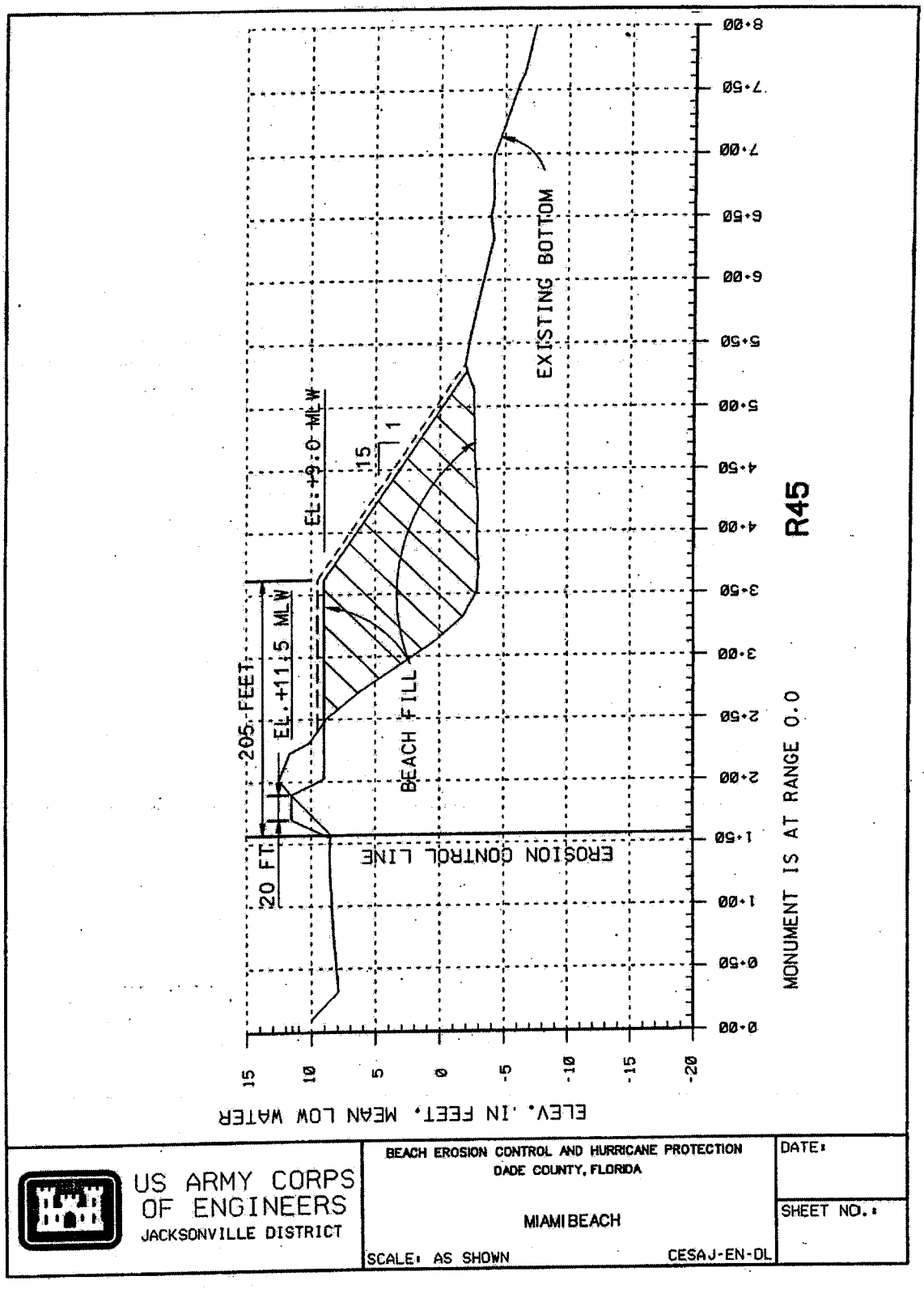
SUSTAINABILITY OF RENOURISHMENT
MIAMI BEACH
PROJECT PLAN VIEW

FIGURE 2

DATE:

OFFICE: CESAJ-EN-DL

SHT. NO.



TYPICAL BEACH PROFILE **FIGURE 3**

e. Potential effects on the beach benthic infaunal community.
f. Mitigation.
g. Impacts on historic properties (i.e. historic shipwrecks).
h. Water quality.
i. Recreation.
j. Endangered Species.
k. Essential Fish Habitat (EFH).

1.7.2 IMPACT MEASUREMENT.
The following provides the means and rationale for measurement and comparison of impacts of the proposed action and alternatives.

1.7.2.1 Hardground and Reef Impacts.
Based on extensive experience with beach renourishment in Miami-Dade County and other Florida beaches, impacts to hardground and reefs can be predicted based on proximity, currents, nature of borrow material, buffer zones and other factors. Our desire in selecting an alternative is to keep impacts to these resources to the minimum practicable in consideration of other project requirements. The only impacts to hardground and reef resources will be from placement of the pipeline to transport material to the beach fill area. Pipeline corridors that have been previously identified and utilized will be used to minimize impacts to these resources.

1.7.2.2 Sea Turtles.
Sea Turtle nesting is closely monitored along Miami-Dade County's public beaches. Detected nests are relocated to a safe hatchery. Impacts of compaction and scarps are fairly well established. In addition, continued beach erosion would reduce available nesting habitat. Corrective and mitigative protocols have been established. It is our goal to minimize impacts to sea turtles and to comply with the requirements of the Endangered Species Act.

1.7.2.3 Other Impacts.
Bases for impact measurement and comparison are stated more specifically in section 4.0 on ENVIRONMENTAL EFFECTS and other sections of this document and its appendices.

1.7.3 ISSUES ELIMINATED FROM DETAIL ANALYSIS.
No issues were specifically identified for elimination.

1.8 PERMITS, LICENSES, AND ENTITLEMENTS.

The proposed beach renourishment is subject to the Coastal Zone Management Act. Consultation with the State Historic Preservation Officer (SHPO) is also required. Since there would be a discharge of dredged or fill material into waters of the United States, the proposed Action is subject to Section 404 of the Clean Water Act. In addition the proposed action is subject to Section 401 of the Act for certification of water quality by the state. The U.S. Army Corps of Engineers, Jacksonville District, has submitted an application for a Section 401 Water Quality Certificate (WQC) from Florida Department of Environmental Protection (FDEP).

If conducted during the sea turtle nesting and hatching season, the proposed action will require daily sea turtle nest surveys and nest relocations. A permit from Florida Fish and Wildlife Conservation Commission (FWC) to handle sea turtles and relocate nests will be required for the person(s) performing the surveys and nest relocations associated with the proposed action. For the proposed renourishment at Miami Beach, personnel from the Miami-Dade County Department of Parks and Recreation will be conducting the surveys and nest relocations.

The project sponsor, Miami-Dade County Department of Environmental Resources Management, is responsible for obtaining any real estate easements and rights of way required for this project.

2 ALTERNATIVES

This section describes in detail the no-action alternative, the proposed action, and other reasonable alternatives that were studied in detail. Then based on the information and analysis presented in the sections on the Affected Environment and the Probable Impacts, this section presents the beneficial and adverse environmental effects of all alternatives in comparative form, providing a clear basis for choice among the options for the decision maker and the public.

As previously mentioned in Section 1.6 the alternatives to provide shore protection for Miami-Dade County beaches were evaluated in prior reports. This EA will not re-evaluate the alternatives to beach renourishment but will address the potential impacts associated with constructing a test beach using a domestic upland sand source. This will be compared to the no action alternative.

2.1 DESCRIPTION OF ALTERNATIVES

2.1.1 CONSTRUCT A TEST BEACH USING A DOMESTIC UPLAND SAND SOURCE

Offshore borrow sources of beach quality sediment along the Miami-Dade County shoreline have been almost completely depleted, and alternative sources of material will be required in the near future to provide continued renourishment of the Dade County BEC&HP Project. Although carbonate sediment from offshore borrow sites has traditionally been used for project renourishment, sand from upland sources may provide an effective alternative for future renourishment requirements.

The total volume of the test fill is expected to be approximately 600,000 cubic yards. The proposed location for the test fill is between 63rd and 83rd Streets in Miami Beach (DNR monuments R-36 to R-47). The exact source of upland sand for the test beach would be determined during the procurement process. Sand sources proposed by contractors would have to meet a set of generic sand specifications and pass a screening process for sand characteristics and potential environmental impacts.

Characteristics of the Material.
For the proposed test fill, the sand must come from a domestic upland source and meet the following physical specifications:

- Composed of quartz and/or carbonate with no more than 20 percent other constituents.
- Average mean grain size greater than or equal to 0.30 mm and less than 0.55 mm.
- Silt content (passing #200 sieve (.074mm)) of less than 5 percent.
- 99 percent of the material must pass 3/8 inch sieve and sand shall contain no material larger than the 3/4 inch sieve.
- Phi Standard Deviation values from 0.50 phi to 2.00 phi.
- Free of debris, sharp rocks and pebbles, concrete rubble, clay and organic material.
- Sand color will be similar to the existing beach. Based on the Munsell Soil Color Chart, color must be within the following range: HUE of 2.5 YR, 5 YR, 7.5 YR, 10 YR, 2.5 Y, 5 Y with a CHROMA of 1, 2, or 3 and a VALUE of 6, 7, or 8. This color specification eliminates strongly colored or dark sand.

Refer to Appendix A for the complete sand specification to be used for this project.

The contractor will determine the best method for material placement. However, material from the upland sand source will most likely be loaded onto barges for placement onto the beach. Barges will be anchored in offshore staging areas previously used for beach nourishment projects. Material for placement will then be pumped via pipeline to the beach. Pipeline corridors utilized will be a corridor previously used to minimize new impacts to benthic communities (Figure 2).

Since the objective of the proposed action is to evaluate the economic, engineering, and environmental performance of upland sand as a source of beach fill material, the only alternative other than no-action, is to construct a test beach.

The proposed test fill site would be located along northern Miami Beach, between 63rd and 83rd Streets in Miami Beach (DNR monuments R-36 to R-47), and would extend along approximately 1.5 miles of shoreline that has been an erosional area since the initial project was constructed. The proposed site is located far from adjacent inlets, and no significant structures exist in this vicinity to disrupt the "natural" coastal processes. The total volume of the test fill is expected to be approximately 600,000 cubic yards.

2.1.2 NO-ACTION ALTERNATIVE (STATUS QUO)

With the no-action alternative, the use of upland sand would not be evaluated as an alternative sand source for renourishing the project. The present condition of erosion would continue along Miami Beach at its present rate. The no-action alternative does not provide the benefits needed to protect the coast from the effects of erosion and storm damage.

2.2 PREFERRED ALTERNATIVE

The test beach would consist of constructing a berm 205 feet from the erosion control line at an elevation of + 9 feet MLW (Figure 3). To accomplish this, approximately 600,000 cubic yards of material must be placed on the beach along the 2,800 foot project area (Figure 1). This material is proposed to come from an upland sand source to be determined by the contractor and meeting the criteria set in the sand specifications (Appendix A).

2.3 ALTERNATIVES ELIMINATED FROM DETAILED EVALUATION

No other alternatives were considered.

2.4 ALTERNATIVES NOT WITHIN JURISDICTION OF LEAD AGENCY

To the Corps' knowledge, there are no alternatives that are not within the jurisdiction of the lead agency.

2.5 COMPARISON OF ALTERNATIVES

See section 4.0 Environmental Effects for a discussion on the impacts of alternatives.

2.6 MITIGATION

Mitigation for hardbottom impact due to the placement of the discharge pipeline across the nearshore reef would be performed as part of this proposed project. Mitigation would be accomplished by constructing an artificial reef utilizing limestone boulders or prefabricated reef modules, similar to what was conducted for the 1997 renourishment at Sunny Isles and Miami Beach and the 1999 renourishment at Surfside. Section 5.0 Environmental Commitments, discusses other procedures that will be implemented to avoid or minimize potentially adverse environmental impacts.

3 AFFECTED ENVIRONMENT

This section describes only those environmental resources that are relevant to the decision to be made. It does not describe the entire existing environment, but only those environmental resources that would affect or that would be affected by the alternatives if they were implemented. This section, in conjunction with the description of the "no-action" alternative forms the base line conditions for determining the environmental impacts of the proposed action and reasonable alternatives.

3.1 GENERAL ENVIRONMENTAL SETTING

The shoreline along Miami Beach is lined with hotels, condominiums, and other commercial establishments. The area is used extensively for recreation.

3.2 VEGETATION

The dune system in Miami-Dade County between Government Cut and Bakers Haulover Inlet is largely artificial and was built as part of the Dade County BEC & HP Project. Dominant plant species in the dune communities include sea grapes, *Coccoloba uvifera*; the beach morning glory, *Ipomoea pes-caprea*; beach bean, *Canavalia rosea*; sea oats, *Uniola paniculata*; dune panic grass, *Panicum amarulum*; bay bean, *Canavalia maritima.* The beach berry or inkberry, *Scaevola plumieri;* sea lavender, *Mallotonia gnaphalodes*; spider lily, *Hymenocalis latifolia*; beach star, *Remirea maritima*; and coconut palm, *Coco nucifera* are also present.

Algal coverage on the offshore hardground areas fluctuates seasonally. The most common algal species observed within southeast Florida offshore hardground areas are *Caulerpa prolifera*, *Codium isthmocladum*, *Gracillaria* sp., *Udotea* sp., *Halimeda* sp., and various members of the crustose coralline algae of the family Corallinaceae. Algal growth is most luxuriant from late July through late October or early November. There seems to be a particular burst or bloom in the macroalgal population in conjunction with the seasonal upwelling that occurs in late July or early August (Smith, 1981, 1983; Florida Atlantic University and Continental Shelf Associates, Inc., 1994).

Seasonally, there is extensive macroalgal growth in the offshore soft bottom areas, with species of green algae (*Caulerpa* sp., *Halimeda* sp., and *Codium* sp.) being particularly abundant in the summer and the brown algal species (*Dictyota* sp. and *Sargassum* sp.) being more abundant in the winter (Courtenay *et al.*, 1974; Florida Atlantic University and Continental Shelf Associates, Inc., 1994). The sea grass *Halophila decipiens* has been observed offshore of Miami-Dade County, but is considered seasonal (April through November) in these offshore soft bottom areas.

3.3 THREATENED AND ENDANGERED SPECIES

3.3.1 SEA TURTLES

Sea turtles are present in the open ocean year-round offshore of Miami-Dade County because of warm water temperatures and hardbottom habitat used for both foraging and shelter. The predominant species is the loggerhead sea turtle, *Caretta caretta*, although green turtles, *Chelonia mydas*; leatherback turtles, *Dermochelys coriacea*; hawksbill turtles, *Eretmochelys imbricata*; and Kemp's ridleys, *Lepidochelys kempii* are also known to exist in the area. All the sea turtles except for the loggerhead are listed as endangered. The loggerhead is listed as threatened.

On the 37.8 miles of beach surveyed within the Miami-Dade County, a total of 505 nests were found in 2001 (FMRI, 2002a,b, & c). Loggerhead nesting in Miami-Dade County occurs from late April through September (Meylan et. al., 1995). The density of nesting along the Miami-Dade County shoreline north of Government Cut is relatively low. The frequency of nesting along the beach at Sunny Isles has ranged from 9 nests in 1989 to 24 nests in 1997 with the highest occurring in 1995 at 35 nests (DERM 1997, unpublished nesting data). The number of false crawls ranged from 44 in 1989 to 24 in 1997. The lowest number of false crawls occurred in 1993 at 7 with the highest occurring in 1989. For Golden Beach nesting ranged from 45 nests in 1987 to 28 nests in 1992 (Meylan et. al., 1995). The highest number of nests for Golden beach occurred in 1991 with 80 nests. The number of false crawls in Golden Beach ranged from 11 in 1987 to 9 in 1992. The highest number of false crawls occurred in 1990 with 17 and the lowest occurred in 1992 with 9. The loggerhead accounts for the majority of the nesting in the county with occasional nesting by green and leatherback turtles. Leatherback turtles may start nesting earlier than loggerheads. In Miami-Dade County the earliest nest documented by Meylan et. al., 1995, was on April 11, 1992. During the sea turtle nesting season, the Miami-Dade County Park and Recreation Department conducts daily surveys (commence on April 1) and relocates nests found along the beach from Sunny Isles south to Government Cut. This is done to prevent poaching or nest destruction due to beach maintenance, emergency vehicles which access the beach and other human related causes (Flynn 1992). All nests found during the surveys are relocated to a central hatchery on Miami Beach (pers.

comm., B. Flynn, Miami-Dade Co. Dept. of Env. Res. Mgmt., 1993). Turtle nests laid on the beach within the Town of Golden Beach are not surveyed by the county and are not routinely relocated, but are allowed to remain on the beach.

3.3.2 WEST INDIAN MANATEE

The estuarine waters around the inlets and bays within Miami-Dade County provide year-round habitat for the West Indian manatee, *Trichecus manatus*. Although manatees have been observed in the open ocean, they feed and reside mainly in the estuarine areas and around inlets. No significant foraging habitat is known to exist in the areas around the project sites, nor have manatees been known to congregate in the nearshore environment within the project area.

3.3.3 OTHER THREATENED ENDANGERED SPECIES

Other threatened or endangered species that may be found in the in the coastal waters off of Miami-Dade County during certain times of the year are the finback whale, *Balaenoptera physalus*; humpback whale, *Megaptera novaeangliae*; right whale *Eubalaena glacialis*; sei whale, *Balaenoptera borealis*; and the sperm whale *Physeter macrocephalus catodon*. These are infrequent visitors to the area and are not likely to be impacted by project activities.

3.4 FISH AND WILDLIFE RESOURCES

3.4.1 BEACH AND OFFSHORE SAND BOTTOM COMMUNITIES

The beaches of southeast Florida are exposed beaches and receive the full impact of wind and wave action. Intertidal beaches usually have low species richness, but the species that can survive in this high energy environment are abundant. The upper portion of the beach, or subterrestrial fringe, is dominated by various talitrid amphipods and the ghost crab *Ocypode quadrata*. In the midlittoral zone (beach face of the foreshore), polychaetes, isopods, and haustoriid amphipods become dominant forms. In the swash or surf zone, coquina clams of the genus Donax and the mole crab Emerita talpoida typically dominate the beach fauna. All these invertebrates are highly specialized for life in this type of environment (Spring, 1981; Nelson, 1985; and U.S. Fish and Wildlife Service [USFWS], 1997).

Shallow subtidal soft bottom habitats (0 to 1 meters [0 to 3 feet] depth) show an increasing species richness and are dominated by a relatively even mix of polychaetes (primarily spionids), gastropods (*Oliva* sp., *Terebra* sp.), portunid crabs (*Arenaeus* sp., *Callinectes* sp., *Ovalipes* sp.), and burrowing shrimp (*Callianassa* sp.). In slightly deeper water (1 to 3 meters [3 to 10 feet] depth) the fauna is dominated by polychaetes, haustoid and other amphipod groups, bivalves such as *Donax* sp. and *Tellina* sp. (Marsh *et al.*, 1980; Goldberg *et al.*, 1985; Gorzelany and Nelson, 1987; Nelson, 1985; Dodge *et al.*, 1991.

Surf zone fish communities are typically dominated by relatively few species (Modde and Ross, 1981; Peters and Nelson, 1987). Fish species that can be found in the surf zone include, Atlantic threadfin herring, *Opisthonema oglinum*; blue runner, *Caranx crysos*; spotfin mojarra, *Eucinostomus argenteus*; southern stingray, *Dasyatis americana*; greater barracuda, *Sphyraena barracuda*; yellow jack, *Caranx bartholomaei*; and the ocean triggerfish, *Canthidermis sufflamen*, none of which are of local commercial value. Most of the fish making up the inshore surf community tend to be either small species or juveniles (Modde, 1980).

3.4.2 REEF/HARDGROUND COMMUNITIES

The classic reef distribution pattern described for southeast Florida reefs north of Key Biscayne consists of an inner reef in approximately 15 to 25 feet (5 to 8 meters) of water, a middle patch reef zone in about 30 to 50 foot (9 to 15 meters) of water, and an outer reef in approximately 60 to 100 foot (18 to 30 meters) of water. This general description was first published by Duane and Meisburger (1969) and has been the basis for most descriptions of hardground areas north of Government Cut, Miami since that time (Goldberg, 1973; Courtenay *et al.*, 1974; Lighty *et al.*, 1978; Jaap, 1984). Development of these three reef terraces into their present form is thought to be related to fluctuations in sea level stands associated with the Holocene sea level transgression that began about 10,000 years ago.

Lighty *et al.* (1978) showed that active barrier reef development took place as far north as the Fort Lauderdale area as late as 8,000 years ago. It is possible that the reefs and hardground areas seen from Delray Beach southward are the result of active coral reef growth in the relatively recent past, whereas the hard bottom features seen north of Palm Beach Inlet may represent the outcropping of older, weathered portions on the Anastasia Formation. The reefs north of Palm Beach Inlet (Lake Worth Inlet) do not show the same orientation to shore as those to the south and the classical "three reef" hardgrounds description begins to differ north of that inlet (Continental Shelf Associates, Inc., 1993).

The composition of hardground biological assemblages along Florida's east coast has been detailed by Goldberg (1970, 1973), Marszalek and Taylor (1977), Raymond and Antonius (1977), Marszalek (1978), Continental Shelf Associates, Inc. (1984; 1985; 1987; 1993), and Blair and Flynn (1989). Although there are a large variety of hard coral species growing on the reefs north of Government Cut, these corals are no longer actively producing the reef features seen there. The reef features seen north of Government Cut have been termed "gorgonid reefs" (Goldberg, 1970; Raymond and Antonius, 1977) because they support such an extensive and healthy assemblage of octocorals. Goldberg (1973) identified 39 species of octocorals from Palm Beach County waters. The U.S. Environmental Protection

Agency (1992) lists 46 species of shallow water gorgonids as occurring along southeast Florida. Surveys by Continental Shelf Associates, Inc. (1984; 1985) identified 33 sponge, 21 octocoral, and 5 hard coral species on offshore reefs off Ocean Ridge and 40 sponge, 18 octocoral, and 14 hard coral species on the offshore reefs off Boca Raton. Blair and Flynn (1989) described the reefs and hard bottom communities off Miami-Dade County and compared them to the offshore reef communities from Broward and Palm Beach counties. They documented a decrease in the hard coral species density moving northward from Miami-Dade County to Palm Beach County. Despite this gradual decrease in the density of hard coral species present, the overall hardground assemblage of hard corals, soft corals, and sponges seen along southeast Florida's offshore reefs remains remarkably consistent throughout the counties of Miami-Dade, Broward, and Palm Beach. Commercially, the most important invertebrate species directly associated with these hardground areas is the Florida lobster, *Panulirus argus*.

Common fish species identified with the reef/hardground communities include grunts (Haemulidae), angelfish (Pomacanthidae), butterflyfish (Chaetodontidae), damselfish (Pomacentridae), wrasses (Labridae), drum (Sciaenidae), sea basses (Serranidae) snapper (Lutjanidae) and parrotfish (Scaridae). Important commercial and sport fish such as black margate (*Ansiotremus surinamensis*), gag (*Mycteroperca microlepis*), red grouper (*Epinephelus morio*), red snapper (*Lutjanus campechanus*), gray snapper (*L. griseus*) Hogfish (*Lachnolaimus maximus*) and snook (*Centropomus undecimalis*) are also associated with these reefs. The precise composition of the fish assemblage associated with any given location along these hardground areas is dependent upon the structural complexity of the reef at that location.

Herrema (1974) reported over 300 fish species as occurring off southeast Florida. Approximately 20 percent of these species were designated as "secondary" reef fish. Secondary reef fish are fish species that, although occurring on or near reefs, are equally likely to occur over open sand bottoms. Many of these species, such as the sharks, jacks, mullet, bluefish, sailfish, and marlin (none of which have significant local commercial value), are pelagic or open water species and are transient through all areas of their range.

3.4.3 ESSENTIAL FISH HABITAT

Habitats within the project area have been designated as Essential Fish Habitat (EFH) as defined in 1996 by amendment to the Magnuson-Stevens Fishery Conservation and Management Act (SAFMC, 1998). EFH for species within the project area include shrimp, snapper-grouper complex (73 species), Spanish and king mackerel, coral and coral communities, and spiny lobster. Various life stages of some of the managed species found in the project area include larvae, post larvae, juvenile, and adult stages of red, gray, lane, schoolmaster, mutton and yellowtail snappers, scamp, speckled hind, red, yellowedge and gag groupers, white grunt and spiny lobster. Categories of EFH that occur within the project area include water column, hardbottom, coral, artificial reef, and open sand habitat. Habitat Areas of Partilcular Concern (HAPC) have also been identified for south Florida. These include hardbottom, coral and coral reef habitats.

3.5 COASTAL BARRIER RESOURCES

There are no designated Coastal Barrier Resource Act Units located in the project area that would be affected by this project.

3.6 WATER QUALITY

Waters off the coast of Miami-Dade County are classified as Class III waters by the State of Florida. Class III category waters are suitable for recreation and the propagation of fish and wildlife. Turbidity is the major limiting factor in coastal water quality in South Florida. Turbidity is measured in Nephelometric Turbidity Units (NTU), which quantitatively measure light-scattering characteristics of the water. However, this measurement does not address the characteristics of the suspended material that creates turbid conditions. According to Dompe and Haynes (1993), the two major sources of turbidity in coastal areas are very fine organic particulate matter and sediments and sand-sized sediments that become resuspended around the seabed from local waves and currents. Florida state guidelines set to minimize turbidity impacts from beach restoration activities confine turbidity values to under 29 NTU above ambient levels outside the turbidity mixing zone for Class III waters.

Turbidity values are generally lowest in the summer months and highest in the winter months, corresponding with winter storm events and the rainy season (Dompe and Haynes, 1993; Coastal Planning & Engineering [CPE], 1989). Moreover, higher turbidity levels can generally be expected around inlet areas, and especially in estuarine areas, where nutrient and entrained sediment levels are higher. Although some colloidal material will remain suspended in the water column upon disturbance, high turbidity episodes usually return to background conditions within several days to several weeks, depending on the duration of the perturbation (storm event or other) and on the amount of suspended fines.

3.7 HAZARDOUS, TOXIC AND RADIOACTIVE WASTE

The coastline within the project area is located adjacent to predominantly residential, commercial and recreational areas. The areas within the project are high energy littoral zones and the material used for nourishment are composed of particles with large grain sizes that do not normally have contaminants adsorbing to them. The nature of the work involved with the renourishment of beaches is such that

contamination by hazardous and toxic wastes is very unlikely. Beach fill materials obtained from upland sources will be screened according to the requirements set forth in the Sand Specifications for Beach Fill (Appendix A). No contamination due to hazardous and toxic waste spills is known to be in the study area.

3.8 AIR QUALITY

Air quality within the project area is good due to the presence of either on or offshore breezes. Miami-Dade County is in attainment with the Florida State Air Quality Implementation Plan for all parameters except for the air pollutant ozone. The county is designated as a moderate non-attainment area for ozone.

3.9 NOISE

Ambient noise around the project area is typical to that experienced in recreational environments. Noise levels range from low to moderate based on the density of development and recreational usage. The major noise producing sources include breaking surf, beach and nearshore water activities, adjacent residential and commercial areas, and boat and vehicular traffic. These sources are expected to remain at their present noise levels.

3.10 AESTHETIC RESOURCES

The project area consists of light sandy beige beaches that contrast strikingly with the deep hues of the panoramic Atlantic Ocean. The eastern foreground consisting of dune vegetation is backdropped by condominium and hotel tropical landscape plantings in many areas. Coconut, sabal, and date palm trees provide vertical human scale transition between the structures and the beachfront. Beachfront plantings of sea oats, dune sunflower, seagrapes, morning glory vines and many other tropical beach plantings provide an aesthetic transition between the remaining dunes and the beach. The project segments consist of moderate to good aesthetic values with few exceptions throughout the entire project.

3.11 RECREATION RESOURCES

Miami-Dade County is a heavily populated county on Florida's Atlantic Coast, which receives a tremendous volume of tourists, particularly during the winter months. Those beaches that can be accessed by the general public are heavily used year round. Those beaches which are associated with condominiums, apartments and hotels have more restricted access for the general public, but receive use from the many visitors who frequent these facilities as well as those members of the general public who walk or jog along the beachfront.

Miami Beach has public access and receives heavy use by swimmers and sunbathers. Adjacent to these beaches are many condominiums and hotels used by long term and short-term visitors and residents of the area. Other water related activities within the project area include on-shore and offshore fishing, snorkeling, SCUBA diving, windsurfing and recreational boating. Most of the boating activity in the area originates from either Bakers Haulover Inlet or Government Cut. Both offshore fishing and diving utilize the natural and artificial reefs located within and adjacent to the project area. Commercial enterprises along the beach rent beach chairs, cushions, umbrellas, and jet skis. Food vendors can also be found along the beach areas. The revenue generated by beachgoers supports a resurgent Miami Beach business district in the project vicinity.

3.12 HISTORIC PROPERTIES

The current project will not impact any cultural resources within the project area. No offshore borrow areas are being utilized for the project. Material placed on the beach may help to preserve cultural resources in danger of being lost due to erosion. It is not believed any cultural resources are present within the fill area, however.

It is assumed that the fill material to be obtained by the contractor will have been obtained from an upland source with no cultural significance.

4 ENVIRONMENTAL EFFECTS

This section is the scientific and analytic basis for the comparisons of the alternatives. The following includes anticipated changes to the existing environment including direct, indirect, and cumulative effects.

4.1 GENERAL ENVIRONMENTAL EFFECTS

The placement of sand on the beach and within the transition fill area would restore some of the beach's ability to provide protection against storms and flooding. It would also enhance the appearance and suitability for recreation along the beach and would provide additional habitat for threatened an endangered species of sea turtles. Placement of the discharge pipeline across the first reef would impact the associated benthic community including soft and hard corals. Any adverse impacts to the first reef would be appropriately mitigated. If no action is taken, the project beach would continue to erode and shoreline recession would continue.

4.2 VEGETATION

4.2.1 BEACH RENOURISHMENT USING DOMESTIC UPLAND SAND (TEST BEACH)

There are no sea grasses or algal communities present in the footprint of the beach fill or the adjacent nearshore areas. No work would be performed on vegetated upland or dune areas. Potential impacts to upland vegetation at the upland borrow site proposed by the contractor may occur. These impacts will not be discussed in this evaluation since upland sand sources will be identified by the contractor. No adverse impacts to either marine or terrestrial vegetation are expected.

4.2.2 NO ACTION ALTERNATIVE (STATUS QUO)

This alternative would have no effect on marine vegetation. However, continued erosion could eventually result in the loss upland vegetation adjacent to the beach.

4.3 THREATENED AND ENDANGERED SPECIES

4.3.1 BEACH RENOURISHMENT USING DOMESTIC UPLAND SAND (TEST BEACH)

Beach nourishment and associated activities have the potential to impact sea turtles and may have the following effects.

a. Scarp development leading to hindrance or blockage of accessibility to nesting habitat.

b. Adverse alteration of moisture levels or temperature in beach due to modified nesting material.

c. Compaction and cementation of beach sediments that cause reduced nesting success and aberrant nest cavity construction resulting in reduced nesting and/or hatching success.

d. If carried out during the nesting season, there is a potential for the destruction of nests that are not identified during the daily nest survey and relocation program.

e. Disruption of nesting activities that could lead to poor nest site selection and energetic cost diminishing egg production.

f. Disorientation or misorientation of hatchlings from adjacent beaches by artificial lights on dredge equipment or construction equipment on the beach.

Important physical characteristics of beaches include sand grain size, grain shape, silt-clay content, sand color, beach hardness, moisture content, mineral content, substrate water potential, and porosity/gas diffusion. By using proper management techniques such as nest relocation, tilling of compacted beaches, use of compatible sand, and smoothing of scarp formations, most of the negative effects can be avoided or corrected (Nelson and Dickerson, 1989a). Use of upland sand as beach fill material is not expected to have any long-term effects on sea turtle nesting in the project area. Studies by Nelson et. al, (1999) and Blair et al. (2000) have shown no differences in nest success parameters between sand types.

Artificial lighting along the beach is known to effect the orientation of hatchlings (Dickerson and Nelson, 1989; Witherington, 1991) and to effect the emergence of nesting females onto the beach (Witherington, 1992). If beach nourishment occurs during the sea turtle nesting season, lighting associated with construction activities on the beach may effect hatchlings and nesting females. Research has shown that low pressure sodium (LPS) lights that emit only yellow wavelengths do not attract hatchlings (Dickerson and Nelson 1988 and 1989; Nelson and Dickerson, 1989b). Witherington (1992) demonstrated that LPS lights on the beach did not significantly effect the nesting behavior of green or loggerhead sea turtles. The use of LPS lighting at the beach nourishment site and on the dredge can reduce the potential for lighting effects on sea turtles. However, the Corps is concerned about the appropriateness of using LPS lights in a marine environment for safety reasons. In a letter dated January 29, 1998, the USFWS revised their

requirement for using LPS lights to a recommendation.

4.3.2 NO ACTION ALTERNATIVE (STATUS QUO)

If no action is taken, the beach would continue to erode. If left to erode, this could ultimately result in the loss of sea turtle nesting habitat and/or poor nest site selection. No adverse impacts are expected on other listed species.

4.4 FISH AND WILDLIFE RESOURCES

4.4.1 BEACH RENOURISHMENT USING DOMESTIC UPLAND SAND (TEST BEACH)

During the placement of sand on the beach there may be some interruption of foraging and resting activities for shorebirds that utilize the project area. This impact would be short-term and limited to the immediate area of disposal and time of construction. There would be sufficient beach area north and south of the renourishment sites that can be used by displaced birds while construction takes place. Increased foraging opportunities for some species, such as sea gulls, can also occur as a result of the discharge activity. Elevated turbidity levels within the immediate vicinity of the discharge site may interfere with foraging by sight feeders such as the brown pelican (*Pelecanus occidentalis*). However, increased turbidity levels would be limited to a small portion of the shoreline and should not result in significant impacts to foraging activities.

Nelson (1989c) reviewed the literature on the effects of beach renourishment projects on sand beach fauna and concluded that minimal biological effects resulted from beach nourishment. In addition, some mortality of organisms may occur where grain size is a poor match to existing sediments; however, recovery of the beach system appears to be rapid. Nelson reviewed several studies on the most common beach invertebrates of the southeastern U.S., including the mole crab, *Emerita talpoida*, the surf clam, *Donax sp.*, and the ghost crab *Ocypode quadrata*. None of the studies cited by Nelson showed significant or lasting impacts to any of the above species resulting from beach nourishment. Hackney et al. (1996) provide a more recent review of the effects of beach restoration projects on beach infauna in the southeastern U.S. They also reviewed studies on the above species and agree with the conclusions set forth by Nelson (1989c), with the suggestion that construction should take place in winter months to minimize impacts, and that the sand used should be a close match to native beach sand. In review of past studies, there was a considerable short-term reduction in the abundances of mole crabs, surf clams, and ghost crabs attributable to direct burial. Recruitment and immigration were generally sufficient to re-establish populations within one year of construction. No long-term adverse effects are anticipated to the intertidal macroinfaunal community due to nourishment activities (Deis, et al. 1992, Nelson 1985, Gorzelany & Nelson 1987, USFWS 1997).

Minimal impacts to nearshore hardbottom communities are expected by sand placement (i.e., disposal) on the beach due to the distance of the reefs to the shore. In conjunction with the Coast of Florida Erosion and Storm Effects Study, the hardbottom areas offshore of Miami-Dade County were mapped using side scan sonar. Subsequent aerial photography flown in July 1997 and April 2000 has also been used to map the nearshore hardbottom The closest hardbottom community in the vicinity of the proposed beach fill in Miami Beach is in excess of 1,800 feet offshore.

The communities found offshore of Miami-Dade County out to one-half mile from shore are described in Dodge et al. (1987). Dodge characterizes four community types within this area. (1) non-vegetated sand flats occurring; (2) soft coral communities in sand deposits of 3" to 6" or greater depth; (3) soft coral and attached algae on sand bottom; (4) hard coral community hardground "reefs". Of these community types, only the last one is characteristic of hardbottom reef areas (i.e., continuous rocky substrate with epibiotic growth). The other community types noted by Dodge et al. (1987) have developed and grown in these highly dynamic areas of sand movement, characterized by sporadic, episodic sand inundation and removal. The organisms that colonize these areas are more tolerant of the dynamic conditions that exist in these areas, and comprise a stable community adapted to sand movement of the nearshore system. The community types (2) and (3) above correlate to the hardbottom areas located closest to shore as interpreted by side scan sonar. The hardbottom areas ((4) above) noted by Dodge et al. (1987) were reported as being "never closer than 1500 feet and generally greater than 1800 feet from shore", and that "the hard coral coverage and diversity is greatest on the seaward portions of the transects" (greater than 3000 feet from shore). Because the communities nearest the shore (within 1500 feet) are adapted for periodic sand movement within the zone it is not expected that these communities will be effected by the placement of sand on the beach or the subsequent periodic offshore-onshore movement of that sand. The shoreward edge of the hard coral community described above is at least 1000 seaward of the anticipated equilibrium toe of the beach fill and would not be directly impacted by the sand.

A potential method of placing the sand onto the beach would be to pump it from barges offshore. It may therefore be necessary to place a discharge pipeline across the reef from an offshore pump-out platform to the beach fill site. The placement of the pipeline across the reef would have an impact on the benthic community. Potential impacts included: physical crushing, abrasion and shading of benthos

(algae, sponges, soft coral and hard coral). It is expected that the major impact would occur to sponges, algae and soft corals, with some loss to hard corals. The actual extent of impact would be determined through post-construction surveys.

The substrate located within the footprint of the pipeline will be temporarily impacted by the placement of the pipeline. However, when the pipeline is removed the area will be re-exposed and new benthic populations will begin to quickly establish. Past observations during previous renourishments (Miami Beach 1994; Sunny Isles and Miami Beach 1997; Surfside and South Miami Beach 1999; Sunny Isles and Miami Beach 2001/2002) have shown the pipeline made only occasional contact with the bottom, minimizing the impact by reducing the amount of substrate and number of benthic organisms contacting the pipeline. Post-placement inspection of the pipe found it to be in contact with the reef only sporadically. Irregularities of the reef and the connector collars (or rings) used to connect the pipe segments, held the pipeline off the reef surface for considerable distances. In general, impacts to the bottom were much less than expected. The most severe impacts noted were to large hard coral heads having a colony diameter up to 2.0 m. The most common impact was to erect, dendroid soft corals that bordered the pipeline. These corals were abraded by the constant wave surge moving their branches against the pipeline. The actual impact was considerably less than the pre-project estimated impact. This was the result of several factors. The pre-project evaluation of the reef area over which the pipeline was to be placed provided a 'minimal impact" path for the corridor. In addition, the connector rings for the pipeline segments raised substantial lengths of the pipe off the bottom (between 50 and 100 feet, dependent on localized relief). Finally, the irregularities of the reef itself served as point supports for the pipe, allowing substantial lengths of the pipeline (up to 150 to 200 feet) to remain off the bottom. Although organisms in contact with the pipe (soft corals, sponges and hard corals) were impacted, many of these were saved by the "suspended" pipeline. For the 1999 Surfside and South Miami Beach renourishment, and the 2001/2002 renourishment at Sunny Isles and Miami Beach, the Corps included a requirement in the contract plans and specifications for "collars" to be placed along the pipeline at 100-foot intervals. The contractor elected to use large tractor tires which where slid over the pipeline and secured in place by pieces of chain that were passed through the side-wall of the tire and attached to "eyes" welded to the exterior of the pipe. Underwater surveys of the pipeline indicated that the tires were successful in holding the pipe off the bottom to a much greater extent than seen in previous projects. The same requirement for collars will be included in the contract plans and specifications for this project.

The pipeline corridor that would be used for this project has already been established and was used for the renourishment of Miami Beach in the vicinity of 63rd Street during 2001. The pipeline corridor is permanently marked underwater with concrete blocks cemented to the substrate with the location of the markers determined by differential GPS. This pipeline corridor would be used for future renourishments of Miami Beach. Surface and subsurface buoys can be attached to the blocks that would allow a contractor to place a pipeline along or very near the previous impact path. This would greatly reduce future impacts to the reef because many hard corals in the impact path would have previously relocated and repaired.

Miami-Dade County DERM will implement protection measures prior to and during placement of the pipeline to reduce hard coral and benthic impact associated with placing the pipeline. Any impacts to the first reef from placing the pipeline will be appropriately mitigated. The mitigation would be similar to what was performed for the 1997 Sunny Isles and Miami Beach renourishment and the 1999 renourishment at Surfside and South Miami Beach. Prefabricated modules composed of pre-cast concrete culvert, with limerock grouted to the exterior surface would be placed with a corresponding artificial reef habitat creation-to-impact ratio of 1:1. The area of credit for the artificial reef modules will be the footprint of the module. Similar prefabricated modules were used to mitigate pipeline impacts for the Sunny Isles and Miami Beach and the Surfside renourishments. The actual level of impact to be mitigated will be determined through the evaluation conducted during the post construction pipeline survey. A mitigation plan specific to this project will be developed in coordination with FDEP, DERM, and the Corps.

4.4.2 NO ACTION ALTERNATIVE (STATUS QUO)

The No-Action Alternative would have no impact on fish and wildlife resources within the project area. Continued erosion of the County's beaches could result in continued loss of habitat and eventual loss of vegetated dune habitat. Also, the armoring measures that may be taken by residents along the beaches in these areas would result in impact to the plant and animal communities within these areas.

4.5 ESSENTIAL FISH HABITAT

Implementation of the preferred alternative would not significantly impact EFH resources within the project area. Placement of material on the beach would temporarily impact fishes within the nearshore habitats. Increased turbidity and disturbance during construction may hinder feeding and migration of fishes within these habitats. Due to the relatively small habitat being impacted at one time during the project, and the available adjacent habitats, fishes should be able to utilize these adjacent habitats.

Other impacts include physical damage to the nearshore live/hardbottom and coral habitat within the footprint of the discharge pipeline. Pre and post-construction surveys of the pipeline corridor will be conducted to assess the actual impact. Any impact to the nearshore reef associated with the placement of the pipeline will be mitigated as previously described in the EA. Impacts associated with the beach fill for this project will not result in any long-term significant adverse impacts to EFH within the area.

4.6 COASTAL BARRIER RESOURCES

The purpose of the Coastal Barrier Resources Act is to minimize the loss of human life, wasteful expenditure of Federal moneys; and the damage to fish, wildlife, and other resources associated with the coastal barriers along the Atlantic coast by restricting future Federal expenditures and financial assistance, which have the effect of encouraging development of these coastal barriers. There are no designated Coastal Barrier Resource Act Units located within or adjacent to the project area.

4.7 WATER QUALITY

The proposed action would cause temporary increases in turbidity along and adjacent to the beach disposal site. The State of Florida water quality regulations require that water quality standards not be violated during dredging operations. The standards state that turbidity outside the mixing zone shall not exceed 29 NTU's above background. Results from turbidity monitoring at previous beach nourishment projects have shown that the turbidity did not exceed the standard. Various protective measures and monitoring programs would be conducted during construction to ensure compliance with state water quality criteria. Should turbidity exceed State water quality standards as determined by monitoring, the contractor would be required to cease work until conditions returned to normal. The proposed action has been evaluated in accordance with Section 404 of the Clean Water Act and a 404(b) evaluation report has been included as Appendix B to this EA.

4.8 HAZARDOUS, TOXIC, AND RADIOACTIVE WASTE

There are no hazardous, toxic, or radioactive waste sites or producers in the project area that would be affected as a result of the preferred alternative. No impacts associated with the disturbance of such sites are anticipated from either the recommended or no-action alternatives. However, use of upland borrow sources would require examination for potential problems with harmful substances. This will involve the screening protocols outlined in the Sand Specification (Appendix A). If these indicate a potential for contamination, we would either try to avoid the potential contamination, look for another site, or consider remediation.

With the use of construction equipment in the in the areas around the borrow and beach fill sites, there is the potential for hydrocarbon spills or other effluent releases. However, the likelihood of significant accidents and releases of this sort is very remote. The contract specifications will require the contractor to develop accident and spill prevention plans. The no-action alternative should not allow conditions to develop that would increase accidents or releases of this sort.

4.9 AIR QUALITY

Direct emissions from the proposed action would be confined to exhaust emissions of labor transport equipment (land and water vehicles), and construction equipment (dredge, barges, tugs, etc.). These emissions would likely be well under the *de minimus* levels for ozone non-attainment areas as cited in 40 CFR 91.853; that is, projects implemented cannot produce total emissions greater or equal to 100 tons per year of Volatile Organic Compounds (VOCs). Any indirect increase in emissions (indirect emissions), as a result of the proposed action is beyond the control and maintenance of the USACE. Consequently, a conformity determination with the Florida State Implementation Plan is inappropriate for increases of indirect emissions from the proposed action. As with the proposed action and alternatives, the no-action alternative will see continued development, which may cause marginal adverse impacts to air quality. The extent of these impacts, however, is difficult to predict.

4.10 NOISE

With the implementation of the proposed action there would be a temporary increase in the noise level during construction. The principle noise would stem from the vicinity of the discharge point on the beach. Construction equipment would be properly maintained to minimize the effects of noise. Increases from the current noise levels as a result of the proposed action would be localized and minor, and limited to the time of construction. There would be no noise related impacts associated with the no-action alternative.

4.11 AESTHETICS

There would be a temporary increase in the noise level during construction, as mentioned above. Engine exhaust fumes would be rapidly carried away by breezes. Any temporary decrease in air quality caused by this work would be corrected once work is completed. Hundreds of feet of dredge pipe lying on the beach or just offshore would have a negative visual impact on the aesthetics of the area. This impact would only be temporary and would be removed along with the pipe at the completion of the work. The negative visual impacts of the equipment and pipe would be offset to an extent by the natural curiosity of some individuals to see what is going on and how work is progressing. There would also be a