

APPENDIX A - SECTION 404(B) EVALUATION

SECTION 404(b) EVALUATION
ENVIRONMENTAL IMPACT STATEMENT
ON
BROWARD COUNTY BEACH SHORE PROTECTION PROJECT
SEGMENTS II AND III
BROWARD COUNTY, FLORIDA

I. Project Description

a. Location. The proposed work will be performed along the Atlantic Ocean shoreline of Broward County, Florida. The Broward County Shore Protection Project involves two components: Segment II extending from Hillsboro Inlet to Port Everglades, and Segment III extending from Port Everglades to the Broward/Miami-Dade County line. The proposed work will be performed as part of the Broward County Shore Protection Project. Refer to the Location Map (Figure 1) in the Environmental Impact Statement.

b. General Description. The project fill area in Segment II is approximately 4.9 miles long and extends from FDEP monument R-36 (SE 6th Street in Pompano) to 1620 S. Ocean Blvd. (R-43), and from 300 feet south of Commercial Blvd. (R-51) to FDEP monument R-72 (Auramar Street in Ft. Lauderdale). A design protective beach width of 100 ft. and 20 ft. will be established in Pompano Beach and Fort Lauderdale, respectively. The new beach will have a berm elevation of 9.0 ft. (NGVD). Segment III involves sand placement on 6.9 miles of coastline, resulting in a design mean high water shoreline extension from the Erosion Control Line of 0 feet in John U. Lloyd State Park and 50 feet in Hollywood/Hallandale. An additional component of the Segment III project is the construction of three groin structures (two T-head and one spur) along approximately 700 feet of shoreline immediately downdrift of Port Everglades Inlet.

c. Authority and Purpose. Initial authorization for this project came with Public Law (PL), Public Works – River and Harbor (79 Stat. 1073), passed 27 October 1965 in accordance with recommendations of the Chief of Engineers in House Document 91, 89th Congress. The authorization combined beach erosion control, including periodic renourishment, for 8.9 miles of shoreline in Broward County and navigation improvements at Hillsboro Inlet. Three separate project segments were identified in the authorizing document. This project involves the second and third segments, Pompano Beach to Fort Lauderdale, and John U. Lloyd State Park to Hallandale, spanning 17.4 miles of coastline. Re-evaluation studies for Segments II and III were completed in April 1994, and April 1991, respectively, under the authority of Section 156 of Water Resources

Development Act (WRDA) of 1976 (PL 99-662), as amended by Section 934 of WRDA of 1986 (PL 99-662). Under this authority, the Assistant Secretary of the Army for Civil Works (ASA (CW)) was granted discretionary authority to extend Federal participation to the fiftieth year after initial construction of a project. Authorization for Segments II and III expires in 2020 and 2026, respectively.

The purpose of the project is to prevent or reduce loss of public beach front 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 beaches.

d. General Description of Dredged or Fill Material.

(1) General Characteristics of Material. The five borrow areas contain material ranging in mean grain size from 0.31 mm (Borrow Areas II and IV) to 0.43 mm (Borrow Area III). The composite silt content ranges from 1.9 percent in Borrow Area II to 4.4 percent in Borrow Area III. The sediment within the borrow areas contains an average of 2.6% silt and 6.4% rock. The medium to coarse grain size sand was found to be more calcareous than siliceous in composition. Small grains of coral and shell hash contribute towards the calcareous fraction. The silica content of the sediment decreases to the south of the study area (50.3% to 25.6%) as calcium carbonate content increases (48.1% to 72.0%) (CPE, 1997). The 2001 vibracores also showed an increase in calcareous content and decrease in silica from north to south. Borrow Area III exhibited the highest calcareous composition (90.4%) and Borrow Area I had the highest siliceous content (42.8%). The borrow sites were found to possess a quantity of rock and rubble larger than one-inch in diameter. The use of these borrow areas will require removal of the rock/rubble component before transferral to the fill site by screening on the hopper dredge. The rock rubble will be deposited in one of two approved offshore sand areas.

(2) Quantity of Material. The total project requirement for the remainder of the 50-year life of the Broward County Shore Protection program, including the proposed project, is estimated to be 5.4 million cubic yards.

(3) Source of Material. The five borrow areas proposed as the beach fill source are located from 0.25 to 1.0 mile offshore in water depths of 25.5 feet to 74 feet (NGVD).

e. Description of the Proposed Discharge Site.

(1) Location. The proposed fill area for Segment II is approximately 4.9 miles long and located between Hillsboro Inlet and Port Everglades. The fill location for Segment III is a 6.9 mile segment of beach between Port Everglades and the Broward/Miami-Dade County line. The proposed groin structures will be constructed along approximately 700 feet of shoreline immediately downdrift of the Port Everglades Entrance. The northern rock disposal area is located approximately 2 miles offshore of Hillsboro Beach in approximately 380 feet of water. The southern rock disposal area is located approximately 2 miles offshore of Hollywood in 200 to 350 feet of water.

(2) Size. The total project fill area is 11.8 miles of shoreline.

(3) Type of Site. The sites for disposal of the sand material are segments of eroded, sandy, recreational beach. The two rock disposal sites are areas of sandy, offshore seabed located approximately two miles offshore.

(4) Type of Habitat. The disposal site is a supratidal dry beach and high energy intertidal environment.

(5) Timing and Duration of Discharge. The exact timing of nourishment is not known at the time of submittal of the Draft Environmental Impact Statement. It is anticipated that construction will begin in April 2003 and will take approximately eight months to complete.

f. Description of Disposal Method. It is anticipated that the material will be obtained from the offshore borrow areas using a hopper dredge with pumpout capability. Once the material is pumped onto the beach, grading will be done to achieve the desired construction profile.

II. Factual Determinations

a. Physical Substrate Determinations.

(1) Substrate Elevation and Slope. Details will available with the final design proposals.

(2) Sediment Type. Sand from the borrow areas is fine to coarse grained quartz sand with varying amounts of shell.

(3) Dredge/Fill Material Movement. The fill material will be subject to erosion by waves with the net movement of fill material to the south.

(4) Physical Effects on Benthos. The placement of sand on the beach will result in the burial and subsequent loss of most of the beach infauna. Sandy beaches are generally populated by small, short-lived organisms with high reproductive potential. Beach and surf zone infaunal populations should recover to pre-nourishment levels within one year after completion of nourishment. Likewise, the benthic infaunal communities within the five proposed borrow areas will be destroyed during dredging. Recolonization of the borrow areas by benthic macroinfaunal species will occur within one to two years after completion of dredging. Changes in infaunal community structure may persist for two to more than three years. No long-term (greater than five years) adverse impacts are expected.

b. Water Circulation, Fluctuation and Salinity Determination.

(1) Water Column Effects. Fill placement will not have long-term or significant impacts, if any, on salinity, water chemistry, clarity, color, odor, taste, dissolved gas levels, nutrients or eutrophication.

(2) Current Patterns and Circulation. Currents in the project area are both tidal and longshore. Net movement of water due to the longshore current is from the north to the south.

(3) Normal Water Level Fluctuations and Salinity Gradients. Tides in the project area are semi-diurnal. Elevations of mean high water and mean low water tidal datum in Broward County were reported to be +1.64 feet (NGVD) and -0.89 feet (NGVD) (USACE, 1994).

c. Suspended Particulate/Turbidity Determinations.

(1) Expected Changes in Suspended Particulates and Turbidity Levels in the Vicinity of the Disposal Site. There will be a temporary increase in turbidity levels in the project area during discharge. Turbidity will be short-term and localized and no significant adverse impacts are expected. State standards for turbidity should not be exceeded during construction.

(2) Effects on the Chemical and Physical Properties of the Water Column.

(a) Light Penetration. The placement of fill on the beach will increase turbidity in the nearshore area during construction. Because the immediate nearshore area is a high wave energy system and subject to naturally occurring elevated turbidity and sediment, increases due to project construction should not be significant. A nearshore turbidity monitoring program with a plume mixing zone of 150 meters from the discharge site will be implemented during construction. Turbidity and sedimentation at the offshore sand borrow sites is likely due to the filling/washing of the material on the hopper dredge. Turbidity will be monitored during construction, and State standards for turbidity should not be exceeded. A sedimentation monitoring program will be implemented to assess the relationship between sedimentation and stress upon stony and soft corals adjacent to the borrow areas. Preventative measures will minimize impacts upon adjacent reef communities based upon biological stress indicators for stony and soft coral species. Borrow areas will be utilized in an alternating pattern, limiting turbidity/sedimentation impacts during dredging operations. Light penetration will decrease during discharge in the immediate area where sand is being deposited on the beach. This effect will be short-term and have limited adverse impacts on the nearshore environment during construction activities. A long-term nearshore monitoring program will be implemented to assess the potential secondary impacts of sedimentation and turbidity to nearshore hardbottom communities adjacent to the equilibrium toe of fill.

(b) Dissolved Oxygen. Dissolved oxygen levels will not be altered by this project.

(c) Toxic Metals, Organics, and Pathogens. No toxic metals, organics, or pathogens will be released by the project.

(d) Aesthetics. Aesthetic quality will be reduced during that period when work is occurring. There will be a long term increase in aesthetic quality of the beach once the work is completed.

(3) Effects on Biota.

(a) Primary Productivity and Photosynthesis. A temporary increased level of suspended particles will occur in the surf zone during construction. However, since primary productivity is not a recognized significant phenomenon in the surf zone, there will be limited effects on nearshore productivity as a result of the proposed beach disposal. Potential secondary impacts of chronic turbidity and sedimentation will be assessed for the nearshore hardbottom communities seaward of the equilibrium toe of fill during the four-year post-construction period.

(b) Suspension/Filter Feeders. There will be no long-term adverse impact to suspension/filter feeders.

(c) Sight Feeders. There will be no long-term adverse impact to sight feeders.

(d) Contaminant Determinations. Deposited fill material will not introduce, relocate, or increase contaminants.

(e) Aquatic Ecosystem and Organism Determinations. The grain size characteristics and composition exhibited by the proposed fill material are similar to those of the existing beach sediments. Therefore, no sediment related impacts are expected. The proposed fill material meets the exclusion criteria, therefore, no additional chemical-biological testing will be required.

(1) Effects on Plankton. No adverse long-term impacts to planktonic organisms are anticipated.

- (2) Effects on Benthos. No adverse long-term impacts to non-motile or motile benthic invertebrates are anticipated.
- (3) Effects on Nekton. No adverse long-term impacts to nektonic species are anticipated.
- (4) Effects on the Aquatic Food Web. No adverse long-term impacts to any trophic group in the food web are anticipated.
- (5) Effects on Special Aquatic Sites.
- (a) Hardground and Coral Reef Communities. Beach nourishment activities within the study area will cover 13.6 acres of nearshore hardbottom habitat. Approximately 2.0 acres of nearshore hardbottom will be directly buried during construction, and the remaining 11.6 acres will be gradually impacted by beach fill equilibration. Overall, the nearshore hardbottom communities do not represent irreplaceable resources and with proper mitigation, suitable replacement habitat can be created for epibenthic and fish species. Approximately six acres of limestone boulder mitigative reef will be constructed prior to beach project construction to compensate for the temporal lag in habitat functionality. Offshore reefs adjacent to the borrow areas will be protected by buffer distances determined by the habitat quality of the adjacent reef. The average buffer on the inshore edge ranges from 235 feet for Borrow area VI to 375 feet for Borrow Area III. The average buffer on the offshore edge ranges from 512 feet for Borrow Area IV to 718 feet for Borrow Area II. Construction turbidity and sedimentation monitoring will avoid and minimize impacts to adjacent reef communities. Alternating use of the borrow areas will limit sedimentation impacts upon adjacent habitats and allow epibenthic species time to recover from short-term sedimentation stress.
- (b) Sanctuaries and Refuges. There are no sanctuaries or wildlife refuges located within the proposed dredge and disposal areas.
- (c) Wetlands. There are no wetlands located within the proposed dredge and disposal areas.

(d) Mud Flats. There are no mud flats located within the proposed dredge and disposal areas.

(e) Vegetated Shallows. There are no known seagrass beds located with the proposed dredge and disposal areas. Seagrass beds consisting of *Halophila decipiens* have been observed in the Port Everglades Inlet Channel and Intracoastal Waterway adjacent to Port Everglades. Secondary impacts of turbidity should not be a major concern due to tidal flushing. Two of the originally proposed offshore borrow areas, Borrow Areas VI and VII, contained contiguous areas of *H. decipiens*. The southern half of Borrow Area VI, and all of Borrow Area VII, were deleted from the proposed project design. The remaining five borrow areas do not contain significant areas of seagrass coverage. A buffer of approximately 400 feet will protect the *H. decipiens* bed south of Borrow Area VI, alleviating potential secondary impacts associated with turbidity during dredging.

(6) Endangered and Threatened Species. There will be no significant impacts on any threatened or endangered species or on designated Critical Habitat of any threatened or endangered species. Sea turtle nesting may occur in the project area during the time that dredging and beach disposal takes place. If construction occurs during the nesting season, a nest relocation program will be implemented as recommended by the USFWS. Manatee protection measures as specified by the USFWS will be followed to minimize the potential for harm.

(7) Other Wildlife. No adverse impacts to small foraging mammals, reptiles, wading birds, or wildlife in general are expected.

(8) Actions to Minimize Impacts. All practical safeguards will be taken during construction to preserve and enhance environmental, aesthetic, recreational, and economic values in the project area. Specific precautions that will be implemented in conjunction with the proposed project are discussed elsewhere in this 404(b) evaluation and in the Draft Environmental Impact Statement for the project.

f. Proposed Disposal Site Determinations.

(1) Mixing Zone Determination. The fill material will not cause unacceptable changes in the mixing zone specified in the Water Quality Certification in relation to: depth, current velocity, direction and variability, degree of turbulence, stratification, or ambient concentrations of constituents.

- (2) Determination of Compliance with Applicable Water Quality Standards. Because of the inert nature of the fill material, State water quality standards will not be violated.
- (3) Potential Effects on Human Use Characteristics.
- (a) Municipal and Private Water Supplies. No municipal or private water supplies will be impacted by the implementation of the project.
 - (b) Recreational and Commercial Fisheries. Recreational and commercial fisheries will not be permanently impacted by the disposal of dredged material on the beach. Recreational fishing would be temporarily curtailed near the dredging sites, and recreational boating may be detoured during construction and restricted from the dredging areas.
 - (c) Water Related Recreation. Beach recreation will be enhanced by the nourishment of the beach. Nearshore snorkeling and offshore SCUBA activities will be temporarily affected by increased turbidity in the vicinity of dredge and disposal sites. The presence of the dredge and construction related equipment will create public safety risks at the beach and offshore borrow area sites. The creation of 13.6 acres of nearshore mitigative reef should provide alternate snorkeling/SCUBA habitat accessible from the beach.
 - (d) Aesthetics. The stabilization of an eroding beach will improve aesthetics of the beach.
 - (e) Parks, National and Historic Monuments, National Seashores, Wilderness Areas, Research Sites, and Similar Preserves. A 1.5 mile section of beach between R-86 and R-94 at John U. Lloyd State Park has already been restored through nourishment with a periodic renourishment interval of 6 years. Biological monitoring of the J. U. Lloyd Beach Renourishment of 1989 revealed that although major faunal shifts occurred in the softbottom communities within the toe of fill site of the beach nourishment area, no pattern of hardground organism abundance relative to dredge or fill activities was observed (Dodge et al., 1991). Coordination with the Ranger of the John U. Lloyd State Park revealed that beach nourishment was needed to combat erosion near the parking areas (Leve, 1995).

Approximately 0.9 acres of low-profile hardbottom dominated by macroalgae and blue-green algae will be directly buried at the time of construction in John U. Lloyd State Park. This habitat exhibits a high level of nutrification, evidenced by the extensive coverage of macroalgae and blue-green algae and depauperate faunal communities. Anthropogenic influences upon this habitat are likely the result of Port Everglades Inlet output of nutrient and freshwater flow, creating turbidity and sudden temperature and salinity fluctuations. Given the natural and anthropogenic influences upon this habitat, alternative replacement habitat can be created which provides higher faunal utilization. Therefore, no adverse impacts to irreplaceable hardbottom biological resources are expected. No other State Park or aquatic preserves would be directly or indirectly impacted by the proposed Broward County Shore Protection Project.

- (f). Determination of Cumulative Effects on the Aquatic Ecosystem. There will be no significant cumulative impacts that result in a major impairment of water quality of the existing aquatic ecosystem as a result of placement of fill at the project site. If determined feasible, sand bypassing activities at Port Everglades would create ongoing, local turbidity in the vicinity of the port. This habitat is subjected to apparent Port Everglades Inlet related influences of nutrient and freshwater output and is dominated by macroalgal/blue-green algae communities with low faunal utilization. The impacts of disposing material on the beach during these dredging cycles would be minor. Sand bypassing at Port Everglades could potentially eliminate the need for larger scale renourishment projects on the beaches downdrift of the port, thereby avoiding impacts associated with these projects.

- (g). Determination of Secondary Effects on the Aquatic Ecosystem. No adverse secondary effects of the placement of the fill material are anticipated. Long-term monitoring will document potential secondary impacts of turbidity and sedimentation upon adjacent hardbottom habitats.

III. Findings of Compliance or Non-compliance with the Restrictions on Discharge.

- a. No significant adaptations of the guidelines were made relative to this evaluation.
- b. No practicable alternative exists which meets the study objectives that does not involve discharge of fill into waters of the United States.
- c. After consideration of disposal site dilution and dispersion, the discharge of fill materials will not cause or contribute to, violations of any applicable State water quality standards for Class III waters. The discharge operation will not violate the Toxic Effluent Standards of Section 307 of the Clean Water Act.
- d. The Broward County Shore Protection Project will not jeopardize the continued existence of any species listed as threatened or endangered or result in the likelihood of destruction or adverse modification of any critical habitat as specified by the Endangered Species Act of 1973, as amended.
- e. The placement of fill material will not result in significant adverse effects on human health and welfare, including municipal and private water supplies, recreational and commercial fishing, plankton, fish, shellfish, wildlife, and special aquatic sites. The life stages of aquatic species and other wildlife will not be adversely affected. Significant adverse effects on aquatic ecosystem diversity, productivity and stability, and recreational, aesthetic, and economic values will not occur.
- f. On the basis of the guidelines, the proposed disposal site for the discharge of dredged material is specified as complying with the requirements of these guidelines.