US Army Corps
of Engineers®
Galveston District

ENVIRONMENTAL ASSESSMENT

BENEFICIAL USE OF DREDGED MATERIAL FOR MARSH PRESERVATION IN THE VICINITY OF GREENS LAKE GALVESTON COUNTY, TEXAS

GULF INTRACOASTAL WATERWAY GALVESTON CAUSEWAY TO BASTROP BAYOU

U.S. ARMY ENGINEER DISTRICT, GALVESTON
GALVESTON, TEXAS

FEBRUARY 2007

FINDING OF NO SIGNIFICANT IMPACT

BENEFICIAL USE OF DREDGED MATERIAL FOR MARSH PRESERVATION

IN THE VICINITY OF GREENS LAKE

GALVESTON COUNTY, TEXAS

GULF INTRACOASTAL WATERWAY

GALVESTON CAUSEWAY TO BASTROP BAYOU

1. Purpose. This document addresses the proposed designation of a new dredged material discharge area for deposition of material from maintenance dredging of a section of the Gulf Intracoastal Waterway (GIWW) between the Galveston Causeway and Bastrop Bayou, Texas. It was prepared in accordance with the National Environmental Policy Act of 1969 (NEPA) and Council on Environmental Quality Regulations to document findings concerning the environmental aspects of the proposed action.

2. Proposed Action. The proposed Federal action is the construction of low berms along the GIWW. Dredged materials from routine periodic maintenance dredging are proposed to be used beneficially to preserve and enhance marsh habitats by restricting salt-water intrusion into historically fresh to intermediate marshes. This area will also provide some erosion protection by acting as sacrificial material to help replace lost material. Dredged material could also be used to raise elevations in drowned marsh of other low areas. The establishment of this area may benefit an estimated 250 acres of wetlands and will facilitate long-term maintenance of the GIWW in this region.

3. A draft Environmental Assessment (EA) was circulated on November 20, 2006. Three comments on the draft EA were received, and are included in the final EA.

4. The Galveston District has taken every reasonable measure to evaluate environmental, social, and economic impacts of the selected plan. These impacts are described in the EA. Based on the information presented in the EA and coordination with Federal, State, and local agencies, it has been determined that the selected action will have no significant impacts on the environment. There are no significant impacts to federally-listed threatened or endangered species, historic properties, land, water quality, wildlife, fisheries, and/or to the surrounding

human population. No hazardous, toxic, or radioactive wastes will be generated by proposed construction. A Section 404(b)(1) Evaluation (short form) of project impacts to water quality indicates the project will not adversely affect water quality. The project has the purpose of improving the quality of the environment in the public interest.

5. Texas Coastal Management Program Consistency. The project has been reviewed for consistency with the goals and policies of the Texas Coastal Management Program (TCMP). Coastal Natural Resource Areas in the project vicinity were identified and evaluated for potential impacts from project activities, with no adverse impacts expected. Based on this analysis, I find that the proposed beneficial use plan is consistent with the goals and policies of the TCMP to the maximum extent practicable. The Coastal Coordination Council also determined that the project is consistent with the Program.

6. Determinations. My analysis of the environmental aspects of the proposed action is based on the accompanying EA. Factors considered in the review were impacts on social resources, wildlife and fisheries, water quality, endangered and threatened species, and historic resources, as well as alternative courses of action and cumulative impacts.

7. Findings. Based on my analysis of the EA and other information pertaining to the proposed project, I find that the proposed action will not have a significant impact on the quality of the human environment. As a result, I have determined that an environmental impact statement is not required under the provisions of NEPA, Section 102, and other applicable regulations of the Corps of Engineers and Council on Environmental Quality.

9 FEB 2007
Date

David C. Weston
Colonel, Corps of Engineers,
District Engineer

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1.0 PROPOSED PLAN

1.1 PROJECT DESCRIPTION

The proposed action is to institute beneficial use (BU) of dredged material excavated during routine periodic maintenance dredging along part of the Galveston Causeway to Bastrop Bayou reach of the Gulf Intracoastal Waterway (GIWW), to protect and restore marsh habitat. The segment being addressed involves a two-mile reach of channel in Galveston County, Texas. The subject reach of the GIWW begins approximately seven miles west of the Galveston Causeway and includes the channel and the immediate environs. The proposed BU area is depicted in Figures 1 and 2.

The GIWW was constructed in the 1940s with an alignment through marshes and bayous in the region. Over the years, erosion and subsidence resulted in a transition of some historically fresh/intermediate marsh to a more saline condition. If no action is taken, salt-water intrusion will continue this transformation.

Dredged material from routine periodic maintenance dredging can be used beneficially to raise berms along the emergent, but low-lying channel banks to restrict the intrusion of saline channel water into adjacent fresh/intermediate marshes. An additional benefit is that the dredged material deposits can act as sacrificial sources of material to offset shoreline erosion. As the shore erodes to the point of impacting these berms, the material will slough and replace some of this lost shoreline material.

This Environmental Assessment (EA) only addresses changes in the authorized dredged material placement plan. The work described identifies an additional dredged material placement area to be used for routine maintenance of this federally-maintained navigation project.

Figure 1

Project Vicinity

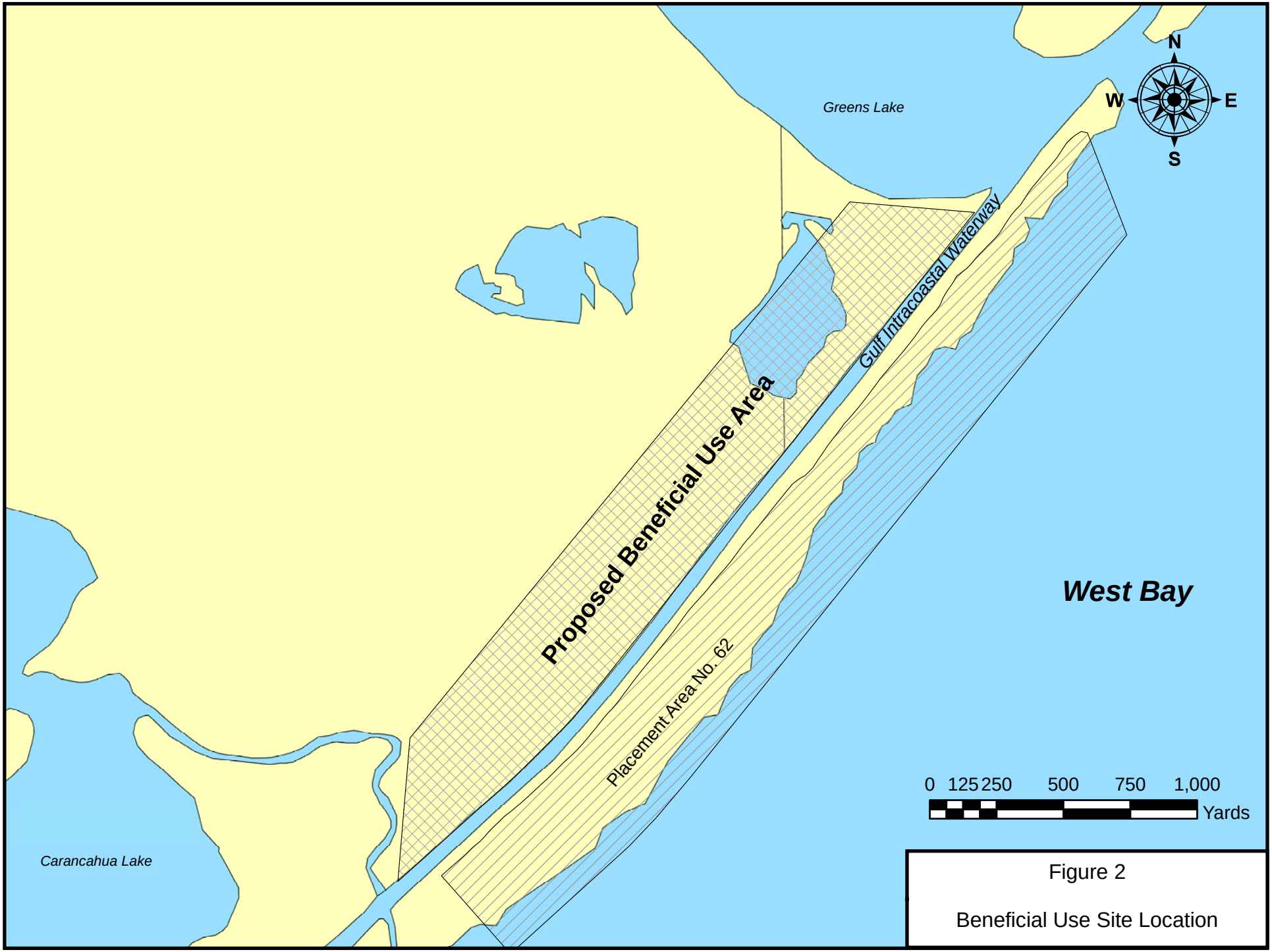


Figure 2

Beneficial Use Site Location

Maintenance dredging of the GIWW is addressed in the Final Environmental Statement (EIS) for Maintenance Dredging, Gulf Intracoastal Waterway, Texas Section -- Main Channel and Tributary Channels (USACE, 1975), which was completed and filed with the U.S. Environmental Protection Agency (EPA) in January 1976. In the EIS, impacts from dredging and dredged material discharge operations were described; designated areas for the placement of dredged material were also identified. Maintenance dredging of the project is required approximately every six years. The proposed action provides for continued periodic maintenance of the channel to its existing dimensions.

No operations by others are covered by this EA. The Department of the Army permit program regulates all Non-Federal activities.

1.2 NEED FOR PROJECT

The U.S. Army Corps of Engineers (USACE) is responsible for maintaining the GIWW to its authorized dimensions to insure navigability of the waterway. The addition of an alternative placement area will ensure that adequate long-term capacity is provided to accommodate the anticipated volume of material to be excavated from the channel over the life of the project. The proposed BU discharge area will also facilitate management of the adjacent marsh habitat and help reverse a transition from fresh/intermediate marsh to saline marsh, and prevent further transformation of marsh character. As a result of subsidence and erosion, the shoreline is at an elevation that permits saltwater from boat wakes and high tides to intrude into the marshes. The proposed placement plan is intended to result in an accumulation of dredged material to create a physical barrier that would halt or impede saltwater intrusion.

The proposed placement area, to be designated No. 62-A, consists of a discharge corridor immediately beyond the shoreline along the northwestern bank of the GIWW in West Bay, which is part of the Galveston Bay system. This discharge corridor will be situated as close to the shoreline as possible while ensuring that the material does not flow back into the channel. If a berm already exists, material will be discharged beyond it to prevent material from flowing back into the channel. If no berm is present, one will be created to the minimum size necessary to block material return. Discharge operations will be conducted so that accumulation of material along the channel is optimized to the extent possible via hydraulic dredging. In order to achieve this objective, the end of the discharge pipe will have an energy dissipater to reduce the discharge velocity. This helps spread the material and minimizes scour immediately beneath the discharge point. The buildup of material will be limited to two feet above existing ground elevations. Water entrained during the dredging process will be allowed to flow through the marsh where many of the fine-grained solids will be filtered by existing vegetation. Any water

not absorbed by the marshes will eventually return to the channel through streams, ditches, or bayous. Where possible, operations will be conducted so that material does not flow directly into any lakes, bayous, streams, or ditches.

Several discharge points will be established prior to maintenance dredging of this project. If anticipated favorable results are realized, material may be used in a similar manner during subsequent dredging events. Any such decisions for future beneficial use of material will be made from a consensus of appropriate agencies and landowners involved. Dredged material placement may take place anywhere along the proposed discharge area shown on Figure 2. Although placement along the entire length of the proposed discharge area is not anticipated, it remains a possibility. Conversely, if such placement is not needed, existing Placement Area No. 62 will continue to be available for use. Existing lakes, ponds or ditches may receive some deposit of material if ecologically desirable; therefore, these water bodies are included in the proposed discharge area in case future material is needed at these locations. Efforts will be made to prevent an overload of material at any particular location.

Most of the material is expected to settle out within about 250 feet of the discharge point, with the coarser-grained material settling within the first 100 feet. These distances depend on the grain-size distribution of the dredged material and density of vegetation near the discharge point.

1.3 WORK REQUIRED

Continued maintenance of the GIWW requires a dredge to excavate and deposit maintenance material into the placement areas. Historically, a hydraulic cutterhead dredge was, and continues to be used for this purpose. This type of equipment utilizes a rotating cutter and a centrifugal pump to excavate and entrain sediment in high velocity water and pumps the slurry through a floating or temporary land-based pipeline to the PA. Although dredging contractors have different sizes of dredges, it is expected that the dredge used for this project will be a 20-inch (pipeline diameter) or larger cutterhead dredge. Other types of equipment could also be used; however, cutterhead dredges are generally the most economical dredging equipment for this purpose.

Materials dredged from the adjacent reach of the GIWW consist of sands, silts, and clay. Historical data show average values of 37.9% sand, 41.7% silt and 20.4% clay. Shoaling in the channel is a result of alluvial deposits occurring during high water periods and redistribution of sediments from wind and tidal action. Dredging frequency along this channel segment is approximately six years. Historically, the average quantity of material excavated during each

dredging cycle is approximately 295,000 cubic yards (CY). This results from a shoaling rate of about 49,000 CY annually.

The total acreage proposed for BU discharge shown in Figure 2 occupies about 246 acres; however, not all of the area is expected to be used. If all of the material from a typical dredging job (295,000 CY) built up to an elevation of 2.0 feet, it would occupy about 91 acres. Since the material will be excavated hydraulically, all of the material will not mound; some will continue to flow. Although material may spread over an area larger than 91 acres, the 2-foot elevation increase will occur over a much smaller area. It is estimated that approximately 250 acres of marsh could benefit from the proposed action.

2.0 PROJECT ALTERNATIVES

2.1 PREFERRED ALTERNATIVE

The proposed action addressed in this EA is the preferred alternative. It involves the beneficial use of dredged material to preserve and nourish marsh.

2.2 NO ACTION ALTERNATIVE

The no action alternative is continued use of the existing emergent unconfined PA No. 62 (Figure 2). This alternative remains an available option; however, use of this alternative would result in continued discharge of dredged material into West Bay. Submerged aquatic vegetation (SAV) is colonizing the bay margin along this PA; however, continued use of PA 62 will occasionally be necessary to prevent the land from disappearing due to erosion. If all of the dredged material from the adjacent reach of channel was to be discharged into this area, as is the historical and current practice, adverse impacts to the SAV would not be minimized. More importantly, beneficial uses of the dredged material described in this EA would not be realized. The intrusion of saline water into the marshes would continue unabated unless action is taken to impede it. Implementation of other suitable measures would not be as cost-effective as the preferred alternative.

3.0 AFFECTED ENVIRONMENT

3.1 PHYSICAL DESCRIPTION

This area lies in the Texas Coastal plain, which varies from 30 to 60 miles in width along the entire Gulf shoreline of the State. Typified by a relatively flat, featureless terrain, the area

contains barrier islands and peninsulas, inland bays and bayous, and a mainland area of prairie grassland crossed by wooded streams and rivers.

This reach of the GIWW was constructed through low-lying lands comprising principally tidal and fresh marshes, streams, and lakes. This navigation channel acts as a direct conduit for introduction of saline water into adjacent marshes. Subsidence and erosion have progressed to such a degree that this saline water frequently intrudes into the historically fresh and intermediate marshes, thereby altering the character of these marshes.

Tidal streams and adjacent marshes provide high quality habitat used by many species of fish and crustaceans for feeding, breeding, and nursery areas. The tidal marshes also contribute important organic materials to the waters. Some of the water areas with low salinities provide feeding, nursery, and breeding habitat for many species of freshwater fish.

One of the objectives of the proposed beneficial use is to provide an opportunity to manage the marshes to restore and retain historical characteristics.

3.2 TIDES

Tidal interchange between this segment of the GIWW and the Gulf of Mexico occurs primarily through Bolivar Roads and San Luis Pass. The tidal range has a mean diurnal variation from 1.0 to 2.0 feet during ordinary conditions. The water level is often affected by winds. Prolonged north winds in the winter season have depressed the water surface as much as 4 feet below mean low tide. Storm surges associated with tropical storms or hurricanes can raise water levels as much as 15 feet above mean low tide.

3.3 WETLANDS

The wetlands along this reach of GIWW in the vicinity of the proposed BU site can be classified as typically fresh to brackish high marsh with some low marsh components. These high marsh areas are infrequently inundated. Some of the area within the proposed BU discharge corridor can be characterized as transitional between wetland and upland. These areas are occasionally flooded but to a lesser frequency than the high marsh areas. Vegetation in these areas is mixed and some of the same species occur in each of these wetland types because they are adapted to a broad variety of environmental factors such as salinity and hydrology. Representative species include gulf cordgrass (*Spartina spartinae*), saltmeadow cordgrass (*S. patens*), common reed (*Phragmites australis*), groundsel tree (*Baccharis halimifolia*), bulrush (*Scirpus* spp.), spikerush (*Eleocharis* spp.), and umbrella sedge (*Cyperus* spp.).

3.4 WILDLIFE

The project vicinity is situated within the Gulf prairies and marshes region of Texas (Gould, 1975). The West Bay area provides feeding and nesting habitat for numerous species of waterfowl and shore birds. The Texas coast is a terminus or stopover for many migratory waterfowl and other birds traversing the Mississippi or Central Flyways. Migratory waterfowl such as ducks and other species visit the West Bay area regularly, stopping to use ponded water for resting areas rather than as permanent feeding or nesting habitat. Among species of ducks and geese commonly observed in the area are Canada goose (*Branta canadensis*), white-fronted goose (*Anser albifrons*), snow goose (*Chen hyperborea*), blue goose (*C. caerulescens),* pintail (*Anas acuta*), gadwall (*A. strepera*), green-winged teal (*A. carolinensis*), mallard (*A. platyrhynchos*), mottled ducks (*A. fulvigula),*scaup (*Aythya* spp.), and American wigeon (*Mareca americana*). Clapper rail (*Rallus longirostris*), seaside sparrow (*Ammospiza maritima*), and red-winged blackbird (*Agelaius phoeniceus*) are typical residents of the salt marshes. Other shore and wading birds that nest and feed along the bay shore include long-billed curlew (*Numenius phaeopus*), herons, egrets, black skimmer (*Rynchops niger),* ibis, roseate spoonbill (*Ajaia ajaja*), double-crested cormorant (*Phalacrocorax auritus*), sandpipers, and plovers (*Charadrius* spp.). Pelicans (*Pelecanus* spp.) and gulls (*Larus* spp.) are also common in this area.

There are 46 species of mammals known to frequent the West Bay area. Nearby mainland terrestrial and aquatic habitats support a variety of wildlife species, including the opossum (*Didelphis virginiana*), raccoon (*Procyon lotor*), northern rice rat (*Oryzomys palustris*), hispid cotton rat (*Sigmodon hispidus*), roof rat (*Rattus rattus*), nutria (*Myocaster coypus*), and eastern cottontail (*Sylvilagus floridanus*) (Blair, 1950; Mueller, 1982).

Species of herptiles common to the region include 62 different species of reptiles and 22 species of amphibians. Of the amphibians, there are 16 species of toads and frogs, 5 salamanders, and 1 newt. In the reptilian group, there are 16 turtles, 10 lizards, and 35 snake species.

3.5 FISHERIES

Large portions of adjacent marshes are tidally influenced, creating estuarine environments important to a variety of fish, shrimp and crabs, as well as other life forms higher on the food chain that feed on such organisms. These estuaries are very productive communities and are vital to the life cycle of many marine species. Principal marine species in West Bay include blue crab (*Callinectes sapidus*), penaeid shrimp, spotted seatrout (*Cynoscion nebulosus*), sand seatrout (*C. arenarius*), spot (*Leiostomus xanthurus*), Atlantic croaker (*Micropogonias*

undulatus), black drum (*Pogonias cromis*), red drum (*Sciaenops ocellatus*), southern flounder (*Paralichthys lethostigma*), striped mullet (*Mugil cephalus*), Gulf menhaden (*Brevoortia patronus*), bay anchovy (*Anchoa mitchilli*), and sheepshead (*Archosargus probatocephalus*). The shoreline, shallow water, and marshes are used primarily as nursery areas for early life stages of fishes and crustaceans, as feeding areas for the above-mentioned species, and as breeding areas, primarily for spotted seatrout.

The West Bay area supports a diverse population of benthic organisms. Benthic organisms occupy an intermediate role in the food chain. The benthic community nearest the project site is a Bay Margin assemblage characterized by such species as: Mollusca: *Acteocina canaliculata, Acteon punctostriatus, Mulinia lateralis, Ensis minor, Lyonsia hyalina floridana*; Polychaeta: *Mediomastus californiensis*; Crustacea: *Ampelisca abdita, A. brevisimulata, Oxyurostylis salinoi* (White, et al. 1985).

Benthic organisms are also important to the estuarine food web because: (1) they mineralize organic matter, releasing important nutrients to be reused by primary producers; (2) they act as trophic links between primary producers and primary consumers; and (3) they can also aggregate dissolved organics within estuarine waters, which are another source of particulate matter for consumers (Peterson and Peterson, 1979).

3.5.1 Essential Fish Habitat

Essential fish habitat (EFH) consists of those habitats necessary for spawning, breeding, feeding, or growth to maturity of species managed by Regional Fishery Management Councils, as described in a series of Fishery Management Plans, pursuant to the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA). The Gulf of Mexico Fishery Management Council (GMFMC) has identified habitats in the project region as EFH for Gulf stone crab (*Menippe adina*), brown shrimp (*Farfantepenaeus aztecus*), white shrimp (*Litopenaeus setiferus*), and red drum.

In addition to EFH designated for several species, the project area wetlands provide nursery and foraging habitats that support various forage species and recreationally important marine fishery species such as spotted seatrout, flounder, Atlantic croaker, black drum, Gulf menhaden, striped mullet, and blue crab. These estuarine-dependent organisms also serve as prey for other fisheries managed under the MSFCMA by the GMFMC (e.g., red drum, mackerels, snappers, and groupers) and highly migratory species managed by the National Marine Fisheries Service (NMFS) (e.g., billfishes and sharks).

Essential fish habitats for those species that may occur in the project area and may be affected by the proposed action include estuarine emergent wetlands. The wetlands that are of highest importance to these species are associated with the tidally-influenced lakes and ponds that are situated in the vicinity. The wetlands that would be affected by the proposed beneficial use are relatively isolated from the regular tidal cycle.

This EA continues EFH consultation under the MSFCMA that was initiated in the Public Notice issued for this action. The result of this consultation is provided in Appendix A.

3.6 THREATENED AND ENDANGERED SPECIES

3.6.1 Federally Listed Species

The project area is in the coastal vicinity of Galveston County, Texas. The U.S. Fish and Wildlife Service (USFWS) and NMFS consider the endangered or threatened species contained in Table 1 as possibly occurring in this county. No designated or proposed critical habitat, or other species under their jurisdictions were identified as possibly occurring in the project vicinity. These endangered species are discussed in detail in the Biological Assessment located at Appendix B.

TABLE 1
Federally-Listed Threatened, Endangered, and Species of Concern
for Galveston County, Texas

Common Name	Scientific Name	Listing Status
BIRDS		
Brown Pelican	*Pelecanus occidentalis*	Endangered
Piping plover	*Charadrius melodus*	Threatened
FISH		
Gulf Sturgeon	*Acipenser oxyrinchus desotoi*	Threatened
Dusky Shark	*Carcharhinus obscurus*	Species of Concern
Sand Tiger Shark	*Odontaspis taurus*	Species of Concern
Night Shark	*Carcharhinus signatus*	Species of Concern
Speckled Hind	*Epinephelus drummondhayi*	Species of Concern
Saltmarsh Topminnow	*Fundulus jenkensi*	Species of Concern
Goliath Grouper	*Epinephelus itajara*	Species of Concern

Common Name	Scientific Name	Listing Status
Warsaw Grouper	*Epinephelus nigritus*	Species of Concern
Largetooth sawfish	*Pristis pristis*	Species of Concern
White Marlin	*Tetrapturus albidus*	Species of Concern
INVERTEBRATES		
Elkhorn Coral	*Acropora palmata*	Proposed for Listing
Staghorn Coral	*Acropora cervicornis*	Proposed for Listing
Ivory Bush Coral	*Oculina varicosa*	Species of Concern
MARINE MAMMALS		
Blue Whale	*Balaenoptera musculus*	Endangered
Finback Whale	*Balaenoptera physalus*	Endangered
Humpback Whale	*Megaptera novaeangliae*	Endangered
Sei Whale	*Balaenoptera borealis*	Endangered
Sperm Whale	*Physeter catodon*	Endangered
REPTILES		
Green Sea Turtle	*Chelonia mydas*	Threatened
Kemp's Ridley Sea Turtle	*Lepidochelys kempii*	Endangered
Loggerhead Sea Turtle	*Caretta caretta*	Threatened
Hawksbill Sea Turtle	*Eretmochelys imbricata*	Endangered
Leatherback Sea Turtle	*Dermochelys coriacea*	Endangered

Source: US Fish & Wildlife Service, letter dated December 13, 2005 and National Marine Fisheries Service, letter dated November 1, 2005

3.6.2 State Listed Species

Table 2 is a list of additional species considered threatened or endangered by the Texas Parks and Wildlife Department (TPWD) as potentially occurring in Galveston County. This list also includes other State species of concern.

The Arctic peregrine falcon has been federally delisted, but maintain the State listing status. This falcon is a possible migrant to the area.

Attwater's prairie chicken, once abundant on the Texas coastal prairies, now exists in only a few small, disjunct populations. The major cause for its decline is the loss of its optimum habitat of upland open prairies of mostly thick grass one to three feet tall. The USFWS currently has a captive propagation program designed to increase the range of the bird by

reintroducing the prairie chicken into a few of its former locations with optimum habitat. The release site closest to the study area is Hoskins Mound, which is located about 15 miles southwest of the proposed BU area. The Nature Conservancy of Texas operates the Texas City Preserve, a 2,303-acre parcel of land near Texas City that features rare coastal prairie habitat that is one of the last remaining sites supporting wild Attwater's prairie chickens. This preserve is located about 13 miles from the project site.

TABLE 2
Texas Annotated County List of Rare Species for Galveston County

Common Name	Scientific Name	Listing Status
BIRDS		
Arctic Peregrine Falcon	*Falco peregrinus tundrius*	Threatened
Attwater's Greater Prairie-Chicken	*Tympanuchus cupido attwateri*	Endangered
Bald Eagle	*Haliaeetus leucocephalus*	Threatened
Black Rail	*Laterallus jamaicensis*	Species of Concern
Black Tern	*Chlidonias niger*	Species of Concern
Brown Pelican	*Pelecanus occidentalis*	Endangered
Eskimo Curlew	*Numenius borealis*	Endangered
Henslow's Sparrow	*Ammodramus henslowi*)	Species of Concern
Mountain Plover	*Charadrius montanus*	Species of Concern
Piping Plover	*Charadrius melodus*	Threatened
Reddish Egret	*Egretta rufescens*	Threatened
Snowy Plover	*Charadrius alexandrinus*	Species of Concern
Southeastern Snowy Plover	*Charadrius alexandrinus tenuirostris*	Species of Concern
White-faced Ibis	*Plegadis chihi*	Threatened
White-tailed Hawk	*Buteo albicaudatus*	Threatened
Whooping Crane	*Grus americana*	Endangered
Wood Stork	*Mycteria americana*	Threatened

TABLE 2 (Cont'd.)
Texas Annotated County List of Rare Species for Galveston County

Common Name	Scientific Name	Listing Status
FISH		
American Eel	*Anguilla rostrata*	Species of Concern
MAMMALS		
Louisiana Black Bear	*Ursus americanus luteolus*	Threatened
Plains Spotted Skunk	*Spilogale putorius interrupta*	Species of Concern
West Indian Manatee	*Trichechus manatus*	Endangered
	MOLLUSKS	
Pistolgrip	*Tritogonia verrucosa*	Species of Concern
REPTILES		
Alligator Snapping Turtle	*Macrochelys temminckii*	Threatened
Atlantic Hawksbill Sea Turtle	*Eretmochelys imbricata*	Endangered
Green Sea Turtle	*Chelonia mydas*	Threatened
Gulf Saltmarsh Snake	*Nerodia clarkii*	Species of Concern
Kemp's Ridley Sea Turtle	*Lepidochelys kempii*	Endangered
Leatherback Sea Turtle	*Dermochelys coriacea*	Endangered
Loggerhead Sea Turtle	*Caretta caretta*	Threatened
Texas Diamondback Terrapin	*Malaclemys terrapin littoralis*	Species of Concern
Texas Horned Lizard	*Phrynosoma cornutum*	Threatened
Timber/Canebrake Rattlesnake	*Crotalus horridus*	Threatened
VASCULAR PLANTS		
Coastal Gay-Feather	*Liatris bracteata*	Species of Concern
Correll's False Dragon-Head	*Physostegia correllii*	Species of Concern

TABLE 2 (Cont'd.)
Texas Annotated County List of Rare Species for Galveston County

Common Name	Scientific Name	Listing Status
Grand Prairie Evening Primrose	*Oenothera pilosella* ssp. *sessilis*	Species of Concern
Houston Daisy	*Rayjacksonia aurea*	Species of Concern
Texas Windmill-Grass	*Chloris texensis*	Species of Concern
Threeflower Broomweed	*Thurovia triflora*	Species of Concern

Source: TPWD (2006)

The bald eagle is found primarily near seacoasts, rivers, and large lakes. This species nests in tall trees or on cliffs near water and communally roosts, especially in winter. This bird hunts live prey, scavenges, and pirates food from other birds. This species may use the project vicinity for feeding but is not likely to nest in the area.

The black rail can usually be found in salt, brackish, and freshwater marshes, pond borders, wet meadows, & grassy swamp. It nests in or along edges of marsh, sometimes on damp ground, but usually on mat of previous year's dead grasses. The nests are usually hidden in marsh grass or at base of *Salicornia spp.* It is possible that this species occurs in the project area.

The Black Tern is mainly an insect predator, hovering just above the water as it picks its prey off the surface. This bird breeds across Canada and northern United States, from Northwest Territories to New Brunswick, and central California to southern Indiana, also in Eurasia. This species builds floating nests in loose colonies in shallow marshes, especially in cattails. It winters at sea and along shore of both coasts of Central and South America, also along African coasts. Threats include wetland drainage and alteration, water pollution and human disturbance at nesting colonies (particularly boat traffic which can swamp the floating nests). Only transient individuals would be expected to occur in the project vicinity.

The Eskimo curlew nests in treeless tundra in Alaska and the Northwest Territories, Canada and overwinter in Argentina, South America, 15,000 miles from their breeding grounds. The range of the Eskimo curlew in the United States is Alaska, Montana, North Dakota, South Dakota, Kansas, Nebraska, Oklahoma, and Texas. Outside the United States, its range includes Canada and Central and South America. Historical observations on Galveston Island suggest

that Eskimo curlews fed over wide areas of sand flats, shallow ponds, and grassy patches, as well as well-drained, gently rolling grazed pastures, with grass about 3 to 4 inches high.

The Eskimo curlew's decline is mainly attributed to excessive hunting. Other factors included conversion of native grasslands to cropland in the main wintering area in South America, and along the migration route through the tall grass prairie of the United States. Although the Arctic tundra may still provide enough food for energy storage for fall migration, the South American and North American grasslands, now largely cultivated, may not provide enough suitable insect foods during winter and early spring to allow the curlews to travel their long traditional migration routes and then breed successfully. This species is now nearly extinct or perhaps extinct. There have been no reliable sightings since 1987 (NatureServe, 2006) Due to the rarity of this species, it is unlikely that transient individuals would be found in the project area.

Henslow's sparrow winter in Texas and individuals are found in weedy fields or cut-over areas where bunch grasses occur along with vines and brambles. A key component is bare ground for running and walking. This species is not likely to occur in the project area.

Mountain plover are winter residents in this area. When present, they can be found shortgrass plains and plowed fields (bare, dirt fields). This species is not likely to occur in the project area.

The reddish egret is a resident of the Texas Gulf Coast, favors brackish marshes, shallow salt ponds, and tidal flats. It nests on the ground or in trees or bushes, generally on dry coastal islands in brushy thickets of yucca and prickly pear. It is possible that this species occurs in the project area.

The snowy plover is a wintering migrant generally found along the Texas Gulf Coast beaches and bayside mud or salt flats. Only transient individuals may occur in the project vicinity.

The white-faced ibis prefers fresh marshes, sloughs, and irrigated rice fields, but will attend brackish and saltwater habitats. It nests in marshes, in low trees, on the ground in bulrushes or reeds, or on floating mats. It is possible that this species may be found in the project vicinity.

The white-tailed hawk can be found on prairies, cordgrass flats, and scrub-live oak near coasts. Further inland it prefers prairies, mesquite and oak savannas, and mixed savanna-chaparral. It is possible that this species may be found in the project vicinity.

The whooping crane is potential migrant in the vicinity. It winters in and around Aransas National Wildlife Refuge and migrates to Canada for breeding. Although blue crab, which is a preferred food item, can be found in the project vicinity, this species is not likely to occur in the project area.

The wood stork forages in prairie ponds, flooded pastures or fields, ditches, and other shallow standing water, including salt water. It usually roosts communally in tall snags, sometimes in association with other wading birds (e.g., in active heronries). It breeds in Mexico, and birds move into the Gulf states in search of mud flats and other wetlands, even those associated with forested areas. The wood stork formerly nested in Texas, but no breeding has been noted since 1960. This species could possibly be found in the project vicinity.

American eels can be found in most aquatic habitats with access to ocean. This species spawns January-February in the ocean, the larvae move to coastal waters to metamorphose. The females then move into freshwater; muddy bottoms, still waters, large streams, or lake sand. These eels have the ability to travel overland in wet areas. The males move into brackish estuaries. This species could possibly be found in the project vicinity.

The Louisiana black bear is a possible transient in the region, living in bottomland hardwoods and large tracts of inaccessible forested areas. This species is not likely to be found in the project vicinity. Habitat for this species does not exist in the project vicinity.

The plains spotted skunk is a generalist in habitat preference and may be found in open fields, prairies, croplands, fence rows, farmyards, forest edges, and woodlands. However, it prefers wooded, brushy areas and tallgrass prairie. This species is not likely to be found in the project vicinity. Preferred habitat for this species does not exist in the project vicinity.

West Indian Manatees can occasionally wander into waters along the Texas Gulf coast and bay systems. When observed, the number is usually limited to a single individual. These are opportunistic, aquatic herbivores. This species is not likely to occur in the project area.

The pistolgrip prefers stable substrate, such as rock or hard mud, but also can be found in soft bottoms, where it is often deeply buried. Habitat ranges from east and central Texas, Red through San Antonio River basins. This species is not likely to occur in the project area.

The alligator snapping turtle resides in deep water of rivers, canals, lakes, and oxbows, as well as swamps, bayous, and ponds near deep running water and abundant aquatic vegetation. It may migrate several miles along a river, and is most active in March-October. It breeds April-October. It is possible that this species may occur within freshwater lakes in the project vicinity.

The gulf saltmarsh snake resides in saline flats, coastal bays, and brackish river mouths. This species could possibly be found in the project vicinity.

The Texas diamondback terrapin prefers coastal marshes, tidal flats, coves, estuaries, and lagoons behind barrier beaches. It is also found in brackish and salt water. It burrows into mud when inactive and may venture into lowlands at high tide. This species may possibly occur within the project vicinity.

The Texas horned lizard is generally found in open arid, and semi-arid regions with sparse vegetation, including grass, cactus, scattered brush or scrubby trees. Preferred soils may vary in texture from sandy to rocky. The horned lizard burrows into soil, enters rodent burrows, or hides under rock when inactive. It breeds between March and September. Habitat for this species does not exist in the project vicinity.

The timber/canebrake rattlesnake favors swamps, floodplains, upland pine, and deciduous woodlands, riparian zones, abandoned farmland, limestone bluffs, and sandy soil or black clay. It prefers dense ground cover such as grapevines or palmetto. This species may possibly occur within the project vicinity.

The coastal gay-feather is found in black clay soils of prairie remnants. Flowering occurs in fall. This species is not likely to occur in the project area.

Correll’s false dragon-head grows in wet soils including roadside ditches and irrigation channels. Flowering takes place in the months of June and July. This species is not likely to occur in the project area.

The Grand Prairie evening primrose is known in Texas from a single collection made in the 1850's from Galveston Island. Elsewhere it is known to occur in sandy soils in low rises in Mississippi Delta. Flowering takes place in May and June. This species is not likely to occur in the project area.

Houston daisy can be found in seasonally wet, saline barren areas, around the base of mima mounds in coastal prairies, or in barren to somewhat vegetated openings in grasslands,

including pastures and roadsides. It prefers loamy to sandy loam soils. Flowering occurs in October-November. This species is not likely to occur in the project area.

Texas windmill-grass occurs in sandy to sandy loam soils in open to sometimes barren areas in prairies and grasslands, including ditches and roadsides. Flowering takes place in autumn. This species is not likely to occur in the project area.

Threeflower broomweed is endemic to black clay soils of remnant grasslands. It can also be found in tidal flats. Flowering occurs from July through November. This species is not likely to occur in the project area.

3.7 HISTORIC RESOURCES

A reconnaissance survey of the proposed discharge area was performed on July 19, 2006 by a staff archeologist with the Galveston District. Much of the area appears to be low-lying wetlands with no existing or subsided natural levee landforms; thus, there having a low potential to contain historic properties that may be eligible for inclusion in the National Register of Historic Places (NRHP). According to records at the Galveston District and the Texas Sites Atlas, no previously recorded prehistoric sites are located in or near the proposed placement area.

3.8 AIR QUALITY AND NOISE

3.8.1 Air Quality

To comply with the 1970 Clean Air Act (CAA) and the 1990 Amendments, the U.S. Environmental Protection Agency (EPA) has promulgated National Ambient Air Quality Standards (NAAQS) for the protection of the public health and welfare with the allowance of an adequate margin of safety. The EPA has set NAAQS for six criteria pollutants: lead; sulfur dioxide; nitrogen dioxide; carbon monoxide; ozone; and particulates. The project area is located within the Houston-Galveston Air Quality Control Region District, also referred to as the Houston-Galveston Area (HGA). Air quality data for the five-year period from 1988-1992 indicate that the HGA counties in the study area are safely within the air quality standards set by the EPA for five of the six criteria pollutants. However, all eight counties of the Gulf Coast State Planning Region (which includes Harris, Montgomery, Chambers, Brazoria, Liberty, Galveston, Fort Bend and Waller Counties) exceeded the standards for ozone for all five years and are designated by the EPA as nonattainment for ozone (United States Department of Justice, 1994). According to the Houston-Galveston Area Council (H-GAC), this status of nonattainment

for ozone remains (H-GAC, 2000). The HGA remains in moderate nonattainment status under current EPA regulations with the 8-hour NAAQS for ozone, and has until 2010 to meet an attainment mandate (TCEQ, 2006). The TCEQ has submitted a State Implementation Plan (SIP) to the EPA, which describes how air quality standards for ozone will be attained in the HGA. The subsequent approval of the SIP by the EPA, initiated increased restrictions on construction project air emissions in the HGA. In accordance with regulatory requirements, Section 176 of the CAA, known as the General Conformity Rule and Texas Rule, 30 TAC 101.30, respectively, criteria were established for air quality preservation that apply to Federal actions in areas that are designated as being in non-attainment for any of the criteria pollutants. Estimates indicate that emissions generated directly or indirectly by this Federal action will be below the *de minimis* threshold that initiates Section 176 (c) of the CAA requirement for a formal General Conformity determination.

3.8.2 Noise

Pursuant to the Noise Control Act of 1972 as amended by the Quiet Communities Act of 1978, the EPA has developed appropriate noise-level guidelines. The EPA generally recognizes an average day-night noise level (Ldn) of less than 50 decibels a-weighting (dBA) (USEPA, 1978) for rural areas and between 55 and 60 dBA for urban areas. Hearing loss could result if the average outdoor noise level is in excess of 70 dBA or more for 24 hours over a 40-year period (USEPA, 1974). Several factors affect response to noise levels, including background level, noise composition, level fluctuation, time of year, time of day, history of exposure, community tolerance, and individual emotional factors. In general, people are more tolerant of a given noise if the background level is closer to the level of the new noise source. Also, people are more tolerant of noises during daytime than at night when background noise normally diminishes, increasing sound awareness. Residents are more tolerant of an activity if it is considered to benefit the economic or social wellbeing of the community or them individually. Noise levels also have a much greater affect on outdoor than indoor activities. The immediate activities in the study area with the potential of affecting noise levels could include waterborne transportation (commercial vessels and recreation boats), dredging, and related construction activities. The Houston-Galveston vicinity is highly urbanized and has the highest ambient noise levels from concentrations of residential areas, industry, and traffic (highway, railroad, and shipping). The GIWW in the project vicinity is bounded by undeveloped marsh, but is nevertheless subjected to noise from consistent barge and boat traffic, and from oil and gas well activity, which is scattered along the study area.

The primary source of noise from the proposed activities would be from the equipment required to transport and deposit the material. Typical noise levels generated by this equipment

range from 80 to 88 decibels at 50 feet from the source (USDOT, 1995). Noise from this equipment will be intermittent and of short-term duration. Assuming that noise from the equipment radiates equally in all directions, sound intensity will diminish inversely as the square of the distance from the source. Therefore, in a free field (no reflections of sound), the sound pressure level decreases 6 decibels with each doubling of the distance from the source. Under most conditions, reflected sound will reduce in attenuation because of distance (American National Standards Institute, 1983). The area surrounding the project site is composed of undeveloped marsh and grasslands. There are no sensitive receptors located in the project vicinity.

3.9 WATER AND SEDIMENT QUALITY

3.9.1 Water Quality

This segment of the GIWW is situated within West Bay which is a classified water body designated Segment 2424 of the Bays and Estuaries category. There are no direct industrial or municipal discharges in the vicinity that could degrade water quality. Water body uses of this segment are: Aquatic Life Use; Contact Recreation Use; General Use; Fish Consumption Use, and Oyster Waters Use. Based on the most recent data, the TCEQ determined that all uses are fully supported near the project location in the western part of West Bay. Oyster Waters Use in the eastern part of the bay is not supported because of bacteria (TCEQ, 2005). However, the GIWW, Greens Lake and Carancahua Lake are restricted by the Texas Department of Health and are closed to shellfish harvesting.

The most recent water quality data were obtained on samples collected from the GIWW on December 17, 2002. Chemical analyses were conducted for several metals, pesticides, polycyclic aromatic hydrocarbons, and other organic compounds. These data are located at Appendix C, and indicate that the water quality is good. The data presented represents segments of the GIWW much broader than proposed for the this beneficial use site. The dredged material likely to be used will be taken from the channel approximately between stations 50+000 and 65+000. Samples collected from this reach of channel are labeled GIF-GCCB-02-07 to GIF-GCCB-02-10. Along with data on detected analytes, Appendix C also includes the complete list of contaminants analyzed, and data sheets containing field-collected data and sample locations. The data show that detected contaminant levels in all water samples were below applicable EPA Water Quality Criteria, and Texas Surface Water Quality Standards.

A review of the National Response Center web page was also conducted (NRC, 2006). Records for the past three years did not reveal any reports of chemical or petroleum spills in the project vicinity.

Elutriate data are also included in Appendix C. The elutriate test was designed to simulate the process of hydraulic dredging and is used to predict any potential for resuspension of contaminants into the water column during dredging. The elutriate is prepared by creating a slurry which is then agitated to determine if contaminants associated with the sediment particles are resuspended into the water column. These data show that detected contaminant levels in elutriate samples were below all applicable Texas Surface Water Quality Standards and EPA Water Quality Criteria.

3.9.2 Sediment Quality

Sediment quality data on channel sediments are also located at Appendix C. The sediment quality data are based on analyses of composite samples comprised of subsamples collected perpendicular to the centerline of the channel. There are no EPA quality criteria for sediments, so comparisons with sediment quality screening guidelines (Buchman, 1999) were made. Based on these comparisons, the channel sediments proposed to be used for beneficial use in the marsh areas are considered to be non-hazardous, and are therefore suitable for this purpose.

Sediments that collect in the GIWW between dredging cycles have been regularly sampled for size characteristics since the 1980s. The average historical sediment grain size distribution for the reach of the GIWW proposed for beneficial use is given in Table 3. The sediments in this reach are primarily sands and silts with a relatively small clay fraction. The D_{50}, which represents the median particle size, indicates an overall size characteristic of very fine sand. The sand composition ranges from 5.5% to 74.8%.

TABLE 3
Sediment And Grain Size Analysis

Project Segment	Average Composition (%)*			D_{50} (mm)
	Sand	Silt	Clay	
GIWW – Adjacent to Proposed BU Area	39.8	41.4	18.8	0.069

3.10 HAZARDOUS, TOXIC, AND RADIOACTIVE WASTE (HTRW)

For this assessment, information was utilized from the Hazardous, Toxic, and Radioactive Waste investigation conducted in 1999 for the Greens Lake area of the GIWW in conjunction with the Environmental Assessment for the Gulf Intracoastal Waterway, High Island To Brazos River, Section 216 Feasibility Study, Chambers, Galveston, And Brazoria Counties, Texas (PBS&J, 1999). The investigations were initiated to determine if any HTRW sites are currently located within the study area and, if so, to determine the probability and severity of an HTRW site to the project, as well as potential impacts of the project on a particular HTRW site. This investigation was conducted in general accordance with procedures described in the USACE document ER 1165-2-132, "Water Resource Policies and Authorities--Hazardous, Toxic and Radioactive Waste (HTRW) Guidance for Civil Works Projects. The findings and recommendations presented in the HTRW assessment are based on a site visit, characterization of the physical setting, a review of historical land use, and a review of regulatory agency records. This information was updated with a scan of the EPA online databases.

A review of aerial photos reveals the area is basically unchanged from 1969 to 1995 with the exception of some dredged material placement on a small island. Regulatory databases searched indicate there are no known HTRW sites, pipelines or petroleum wells in the project area. A visual survey of the area confirmed there are no apparent HTRW sites in the project area. Additional HTRW investigations are not warranted at this time.

3.11 SOCIOECONOMICS AND AESTHETICS

The project vicinity is an area of transit for barge traffic along the GIWW, which is also used by recreational and commercial boaters. The proposed beneficial use will be implemented as part of routine maintenance dredging in the channel. The nourished marshes will resemble the natural marshes along other fringes of the bay.

No unique or significant economic activity is generated at the project sites, nor are other areas dependent on economic activity at the project sites for sustained economic activity.

3.12 PUBLIC SAFETY AND AWARENESS

Dredging and dredged material discharge operations entail the use of equipment that would present a safety hazard to recreational boaters and fishermen. This equipment includes barges, utility boats, dredge anchor floats, and dredge pipeline. This pipeline could be floating or submerged.

3.13 ENVIRONMENTAL JUSTICE

In compliance with Executive Order (EO) 12898, Federal Action to Address Environmental Justice in Minority and Low-Income Populations, an analysis was performed to determine whether the proposed project will have a disproportionate adverse impact on minority or low-income population groups in the vicinity of the project area. This analysis consisted of determining characteristics of residential populations in the project area.

The proposed project location is relatively isolated and is bounded by the GIWW and uninhabited marshlands. There are no residential areas in the immediate project vicinity.

The project vicinity is Galveston County, which has a population of 250,158 living in 94,782 households, based on the 2000 Census. A breakdown of the population is reported as 74.5 percent white, 15.8 percent African American, 0.9 percent Native American, 2.5 percent Asian, 0.1 Pacific Islander, and 8.4 percent other; within these groups, approximately 18.0 percent of the population is of Hispanic origin (USCB, 2006). The median household income is $42,419, with about 10.1 percent of families living below the poverty level (USCB, 2006).

The project area is located within census tract 7236, and adjacent to census tract 7261. The total population of tract 7236 is 4,131 living in 1,473 households. The households in this tract are concentrated mainly in Hitchcock, and parts of Texas City and Alvin, located several miles from the GIWW. A breakdown of the population is reported as 74.2 percent white, 19.4 percent African American, 0.9 percent Native American, 0.5 percent Asian, and 7.1 percent other; within these groups, approximately 15.0 percent of the population is of Hispanic origin (USCB, 2006). The median household income is $33,097, with about 11.3 percent of families living below the poverty level (USCB, 2006).

The total population of tract 7261 is 2,727 living in 1,265 households. The households in this tract are concentrated on the western part of Galveston Island, located across West Bay several miles from the GIWW. A breakdown of the population is reported as 97.2 percent white, 0.6 percent African American, 1.2 percent Native American, 0.7 percent Asian, and 1.8 percent other; within these groups, approximately 6.6 percent of the population is of Hispanic origin (USCB, 2006). The median household income is $55,110, with about 6.6 percent of families living below the poverty level (USCB, 2006). Table 4 summarizes these population data.

TABLE 4
Population Characteristics

Geographic Unit	White		Non-White		Families Below Poverty Level	
	Percent	Percent of Galveston Co.	Percent	Percent of Galveston Co.	Percent	Percent of Galveston Co.
Galveston County	74.5	----	25.5	----	10.1	----
Census Tract 7236	74.2	1.6	25.8	1.7	11.3	0.2
Census Tract 7261	97.2	1.4	2.8	0.2	6.6	0.08

4.0 ENVIRONMENTAL IMPACTS OF THE PROPOSED ACTION

4.1 IMPACTS ON WETLANDS

The discharge of dredged material will bury existing vegetation near the discharge point. The elevation of the substrate in some areas will be increased such that the vegetative community structure would be converted from wetland to transitional or upland. Since there is a relatively high sand fraction in the material to be dredged, it is anticipated that much of this material will build up within about 100 feet of the discharge point. The fine-grained fraction will continue to flow through the existing vegetation, but is not expected to result in a perceptible increase in marsh elevation.

The salinity of the water entrained in the dredged slurry may have a temporary adverse impact on the existing vegetation. If the dredging occurs during a dry period the salinity may burn some of the plants that are less salt-tolerant. This effect is considered to be minor and similar to impacts already experienced by salt-water intrusion. This would be a temporary condition, lasting until dilution by rainfall.

These impacts are considered to be minor when weighed against the overall objective of maintaining habitat diversity by preserving and restoring these marshes to their historical character. The additional benefit of the material as a sacrificial source of material to replace erosion losses will prevent erosion from extending farther into the marshes.

4.2 IMPACTS ON WILDLIFE

The proposed BU areas will not have long-term adverse impacts on wildlife in the area. Some short-term disturbance to wildlife will be experienced during dredged material discharge operations. Small mammals, reptiles, and amphibians will be forced by dredged material placement to migrate to unaffected areas or seek suitable habitat elsewhere. However, this disturbance will be very localized and of short duration, lasting only during the material discharge period, which is expected to last for several days at any particular discharge point. Recolonization is expected to occur shortly after the dredged material dries. Timing of the proposed action is not expected to result in any appreciable reduction of these impacts. The added benefit of the material as a sacrificial source of material to replace erosion losses will prevent additional loss of habitat by retarding erosion farther into the marshes.

4.3 IMPACTS ON FISHERIES

The proposed BU is expected to have negligible direct impacts to fisheries. The discharge corridors are generally located in areas of dense vegetation that are relatively isolated from standing water bodies or tidally-influenced marsh. By preserving habitat diversity, some species of freshwater fish may benefit from the action.

4.3.1 Impacts on Essential Fish Habitat

The proposed action is not expected to affect EFH. The discharge corridors will be generally located in areas of dense vegetation that are relatively isolated from standing water bodies or tidally-influenced marsh. Therefore, the proposed BU will not adversely impact EFH or associated managed fishery species.

4.4 IMPACTS ON THREATENED AND ENDANGERED SPECIES

Although several threatened or endangered species could occur in the project vicinity, there is no regularly used habitat known to exist in the immediate project site. Therefore, the conclusion of the Biological Assessment determined that there would be no effect on federally-listed or proposed species, or critical habitat (Appendix B).

Some State listed species could benefit from the preservation of habitat. The added benefit of erosion protection would also help prevent the loss of existing habitat.

4.5 IMPACTS ON HISTORIC RESOURCES

The proposed work was coordinated with the State Historic Preservation Officer (SHPO), there is no indication that the proposed project will have any effect on historic properties eligible for inclusion in the NRHP. Therefore, the proposed project is not expected to effect historic properties.

4.6 IMPACTS ON AIR QUALITY AND NOISE

4.6.1 Impacts on Air Quality

It has been estimated that increased emissions from the maintenance dredging activities will only produce minimal short-term impacts to the air quality in the immediate vicinity of the project site. However, dredging and related material placement activities will not be concentrated in one area for long durations. The dredging operation extends through a two-mile project area and will be performed over an extended period. Dredging over an extended period should reduce daily impacts, versus dredging over a short period, but should have no effect on overall quantity of emissions. Additionally, maintenance dredging and material placement will not produce any indirect increase in emissions from increased vessel traffic other than those resulting from normal growth of commercial activity in the area.

The scope of the project is to return the channel to its original authorized depth and width, which will reduce vessel and barge maneuverings. Although, difficult to quantify, these channel improvements will improve traffic flow and reduce vessel exhaust emissions. Because the proposed Federal action is designated as maintenance dredging, the regulations cited in Section 3.8.1 do not apply. However, because the project is within an area classified as a moderate non-attainment for ozone, an applicability analysis (Appendix D) was conducted based on the established criteria to estimate what the air quality impact would be, and indicate whether a formal conformity determination would be required. The analysis focused on both immediate dredging requirements and long-term emission impacts from cyclic maintenance dredging activities, which will produce minor amounts of emissions and are also not restricted Federal actions under the General Conformity Rule. The analysis was based on material quantities documented in the project description and established dredge equipment emission data. The results of the analysis indicated that short-term construction emissions of volatile organic compound (VOC) and nitrogen oxide (NO_x), which are ozone precursors, would amount to 3.87 and 36.54 tons per year, respectively, and would be below their applicable *de minimis* threshold levels to require a General Conformity determination. These emissions would also be well below the 10 percent of the HGA SIP emission inventories for these pollutants. Therefore,

further conformity analysis is not required, and the resulting emissions would conform to the most recent approved SIP, as required by Section 176 of the CAA.

Performance of the proposed maintenance dredging and BU discharge operations would result in short-term increases in air emissions. However, these emissions would be less than the conformity *de minimis* thresholds, and 10 percent of the VOC and NO_x emissions for the HGA. Long term operational and maintenance emissions from the project alternative would remain well below those thresholds. Therefore, by definition the proposed project would not (1) cause or contribute to any new violation of any of NAAQS impacts to air quality in the project area, (2) increase the frequency or severity of any existing violation of NAAQS, or (3) delay attainment of the NAAQS or any interim emissions reduction in the project area. Therefore, direct and indirect emissions from this project are not considered regionally significant.

Exhaust from the dredge and other equipment during channel maintenance operations would compare in degree to that of several diesel trucks. The dredge's contribution to the volume of hydrocarbons, carbon monoxide, and other by-products from fuel combustion would be negligible compared to emissions resulting from industry and regular truck and ship traffic already in the Texas City/Galveston complex, and from steady barge traffic now plying the GIWW. Project activities would be expected to introduce additional particulates. Therefore, some short-duration, minor air quality impacts are anticipated in the immediate vicinity of the dredging sites and from future maintenance activities. These activities would be conducted regardless of whether the proposed BU is implemented.

4.6.2 Impacts of Noise

Noise from the operation of heavy-duty dredging, equipment and support boats will be generated from implementation of the proposed action. These impacts are expected to be minor in nature and will be temporary, occurring only during the dredging period, which is expected to be about one month for the entire two-mile reach. These dredging activities would be conducted regardless of whether the proposed BU is implemented.

4.7 IMPACTS ON WATER AND SEDIMENT QUALITY

4.7.1 Water Quality

The dredged material will be deposited behind a berm to prevent return to the channel. The berms will either already exist or small ones will be pushed up by a bulldozer other suitable equipment. This berm will also prevent any water entrained in the dredged slurry from flowing

directly to the channel. The end of the discharge pipe will have an energy dissipater to slow the discharge velocity and prevent scour immediately beneath the discharge point. The existing vegetation will also retard the flow of material and facilitate settling of fine-grained material. It is expected that most, if not all, of the entrained water will be absorbed by the marsh. Any water returning to the channel will be clarified by the vegetation.

Elutriate data can be found at Appendix C. These data indicate that little or no resuspension of contaminants would occur during maintenance dredging of this project.

The proposed dredged material discharges should have no adverse impacts on water quality. Adverse impacts, if any, are expected to be minor and will be temporary, occurring only during the dredging periods, which is expected to be approximately one month for this entire reach of the GIWW, but only a few days at any particular discharge point.

4.7.2 Sediment Quality

A comparison of sediment quality data (Appendix C) with sediment quality screening guidelines indicate that the GIWW sediments in the region are suitable for beneficial use. Therefore, unacceptable adverse impacts on sediment quality are not expected to result from dredging and discharge operations.

4.8 IMPACTS FROM HAZARDOUS, TOXIC AND RADIOACTIVE WASTE

Research conducted to determine whether HTRW sites are located in or near the proposed project and the potential for discovery of a site, indicates there are no sites of concern in or adjacent to the area proposed for beneficial use of dredged material. The area is remote and undeveloped with the exception of petroleum exploration, and maritime traffic. Based on the findings of the HTRW survey and regulatory file data, no other HTRW investigations are warranted at this time, and the chances of encountering contaminated material in this area are low.

4.9 IMPACTS ON SOCIOECONOMICS AND AESTHETICS

The proposed beneficial use will have no significant effect on maritime traffic along this reach of the GIWW. The BU will be implemented as part of routine maintenance dredging in the channel. During such operations, the dredge swings out of the way to allow passage of barge or other traffic.

There will be minor, temporary impacts to localized aesthetics during the dredging period because of the presence and activity of equipment and the deposition of material, which is expected to last approximately one month, and occurs approximately once every six years.

The material to be deposited at the proposed sites has a high sand content that is expected to accumulate near the discharge point. This sand will create the desired berm and is expected to be barren for a period of several months. Vegetation will eventually establish so that this berm will resemble the nearby landscape. There will be no long-term significant impacts to aesthetics as a result of project implementation.

4.10 IMPACTS ON PUBLIC SAFETY AND AWARENESS

During dredging, the area immediately around the dredge and pipeline may be hazardous due to the presence of equipment. Service boat traffic will also be increased. These conditions necessitate a higher level of vigilance on the part of the boating public. These impacts are expected to be minor in nature and will be temporary, occurring only during the dredging period, which is expected to take about one month.

4.11 ENVIRONMENTAL JUSTICE

The population data presented in Table 4 indicate that in the project vicinity, there are no disproportionate concentrations of minority populations or families living below the poverty level. Furthermore, the project area is situated several miles from the nearest concentrated human habitation. Therefore, the proposed action will not create adverse environmental impacts on any person or group of people, nor will there be any disproportionate share of adverse environmental impacts on any minority, low income, disadvantaged, or Native American tribal population within the area.

4.12 CUMULATIVE IMPACTS

Cumulative impacts is defined by the Council on Environmental Quality's (CEQ) regulations for implementing the National Environmental Policy Act (NEPA) as the effects on the environment which result from the incremental effect of the action when added to other past, present, and reasonably foreseeable future actions. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time. Ecological effects refer to effects on natural resources and on the components, structures, and functioning of affected ecosystems, whether direct, indirect, or cumulative.

Similar marsh preservation projects have not been undertaken in the project vicinity. The proposed BU is similar to discharge methods that were practiced during initial construction of the GIWW. The mounds of dredged material will help to offset the impacts of the channel on the adjacent marshes by impeding intrusion of salt-water from the channel into the historically fresh to intermediate marshes through which the channel now runs.

Several marsh restoration projects, using dredged material, in the region have been implemented or are under construction. These are located in West Bay and Chocolate Bay, at distances greater than eight miles from the proposed project site. Other marsh restoration projects have been undertaken at Galveston Island State Park, along the northern margin of western Galveston Island. All of these projects were designed to provide positive effects to the region.

A search of Department of the Army permit records indicated that, for the immediate vicinity of the project, only three permits were issued. All of these permits were for construction of oilfield drilling structures. No wetland impacts were expected to occur and no mitigation was required.

No other projects are foreseen in the immediate project area. Any future projects would likely resemble past projects, i.e., marsh restoration and petroleum exploration. Therefore, this action together with previous and future similar projects should have a cumulative beneficial effect on biological resources in the region.

5.0 RELATIONSHIP TO OTHER FEDERAL PROJECTS

This plan is part of the Gulf Intracoastal Waterway, which is a federally-maintained navigation channel. There are no other Federal projects directly affected by this plan.

6.0 RELATIONSHIP OF PLAN TO ENVIRONMENTAL REQUIREMENTS

This assessment has been prepared to satisfy the requirements of all applicable environmental laws and regulations and has been prepared using Corps of Engineers Regulation ER 200-2-2, Environmental Quality: Policy and Procedures for Implementing NEPA and the CEQ National Environmental Policy Act regulations (40 CFR Part 1500). The following is a list of applicable environmental laws and regulations that were considered in the planning of this project and the status of compliance with each.

National Environmental Policy Act - This environmental assessment was prepared in accordance with CEQ regulations to aid in complying with NEPA. The environmental and social consequences of the recommended plan have been analyzed in accordance with the Act and presented in the assessment.

Fish And Wildlife Coordination Act Of 1958, as amended - The proposed plan has been coordinated with the USFWS, NMFS, TPWD, and other appropriate State and Federal resource agencies. During the coordination process, the agencies provided information on fish and wildlife resources and planning input that was considered in the development of the project. No significant concerns were identified by the resource agencies (Appendices A and G).

Endangered Species Act of 1973, as amended - The USFWS and NMFS were contacted regarding threatened, endangered or proposed species and their critical habitats in the project area (Appendix B). Available information, investigations, and informal consultation with USFWS and NMFS have determined that the proposed project will have no effect on any federally-listed threatened or endangered species, or critical habitat (Section 4.4).

Magnuson-Stevens Fishery Conservation and Management Act (Public Law 104 - 297) - Congress enacted amendments to the Magnuson-Stevens Fishery Conservation and Management Act (Public Law 94-265) in 1996 that established procedures for identifying essential fish habitat and required interagency coordination to further the conservation of federally managed fisheries. Rules published by the National Marine Fisheries Service (50 CFR 600.805 through 600.930) specify that any Federal agency that authorizes, funds, or undertakes or proposes to authorize, fund, or undertake an activity that could adversely affect EFH is subject to the consultation provisions of the Act. No significant impacts to living marine resources or EFH will occur as a result of the project (Section 4.3.1, Appendix A).

Clean Water Act of 1977 - A CWA Section 404(b)(1) evaluation of the proposed action was conducted and is included in Appendix C. A Joint Public Notice has been issued with the TCEQ (Appendix A). The §401 State Water Quality Certification for this action is also included in Appendix C.

Marine Protection, Research, and Sanctuaries Act of 1972 - This Act requires a determination that dredged material discharge in the ocean will not unreasonably degrade or endanger human health, welfare or amenities, or the marine environment, ecological system, or economic potentialities (shellfish beds, fisheries, or recreational areas). There will be no offshore placement sites for deposition of material excavated from this project.

National Historic Preservation Act of 1966, as amended - Coordination of the proposed project has been completed with the Texas State Historic Preservation Officer (Appendices A and F). It was determined that no further historic resources investigations are necessary and that no historic properties eligible for the National Register of Historic Places will be impacted by this project (Section 4.5).

Coastal Zone Management Act (CZMA) of 1972 - This Act requires that all land-use changes in the project area be conducted in accordance with approved State coastal zone management programs. Any project that is located in or that may affect land and water resources in the Texas coastal zone and that requires a Federal license or permit, or is a direct activity of a Federal agency, or is federally funded must be reviewed for consistency with the Texas Coastal Management Program (TCMP). The proposed action is within the coastal boundary defined by the TCMP and is consistent to the maximum extent practicable with the goals and policies of the TCMP (Appendix E). A letter from the Coastal Coordination Council (CCC) indicating their agreement that the proposed action is in compliance with the TCMP is included in Appendix E.

Clean Air Act of 1977 - The EPA established nationwide air quality standards to protect public health and welfare. The State of Texas has adopted the National Ambient Air Quality Standards [40 CFR Part 50] as the State's air quality criteria. This project is in Galveston County, which is a nonattainment area for air quality (ozone). Direct and indirect emissions of ozone precursors from construction activities meet USEPA Final General Conformity Rule *de minimis* requirements and are not considered regionally significant (Sections 3.8.1 and 4.6.1, and Appendix D).

Executive Order (EO) 11990, Protection of Wetlands - The proposed action has been analyzed for compliance with EO 11990. Impacts to wetlands from the proposed action have been identified in the EA and Section 404(b)(1) analysis. The proposed project is in compliance with this EO (Sections 3.3 and 4.1). Furthermore, wetlands in the area will be enhanced through this BU.

EO 11988, Floodplain Management - This EO directs Federal agencies to evaluate the potential effects of proposed actions in floodplains. The proposed project is situated in a floodplain. In accordance with this EO, a public notice has been circulated to acquaint the public and all interested Federal, State and local agencies, and organizations with details of the proposed action and provide an opportunity for public hearing. The recommended plan will not induce increased flooding in developed areas and will not contribute to increased future flood damages.

CEQ Memorandum dated August 11, 1980, Prime or Unique Farmlands - Prime farmland is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is also available for these uses. Unique farmland is land other than prime farmland that is used for the production of specific high-value food and fiber crops. The proposed project will not impact any lands considered prime or unique farmlands.

EO 12898, Environmental Justice - This EO directs Federal agencies to the greatest extent practicable and permitted by law, and consistent with the principles set forth in the report on the National Performance Review, to achieve environmental justice by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations in the United States and its territories and possessions, the District of Columbia, the Commonwealth of Puerto Rico, and the Commonwealth of the Mariana Islands.

The project will not have a disproportionate adverse impact on minority or low-income population groups within the project area (Sections 3.13 and 4.11).

7.0 CONCLUSIONS

The following specific conclusions summarize the findings of the EA, as detailed in the environmental analyses in Section 4.0:

- The proposed action will be beneficial to the overall environment by preserving and restoring habitat diversity while providing a means to help offset shoreline erosion and prevent erosion loss in more interior areas of the wetlands. An estimated 250 acres of wetlands may benefit from this action.

- Aquatic habitat will not be affected by the proposed BU discharge of dredged material. Discharge operations will be undertaken so that material will not flow into the channel.

- Other than for some transitional areas between wetland and upland, no terrestrial habitats will be adversely affected by this proposed action. The area directly beneath and near the discharge points will be buried, but will recover to the previous state. Benefits will accrue through habitat preservation and erosion control.

- There will be no impacts to seagrasses due to the project.

- Threatened or endangered species will be unaffected by this action.

- Historic properties or recorded archeological sites will not be affected by the proposed action.

- Direct and indirect emissions of the ozone precursors, and other compounds, meet USEPA Final General Conformity Rule *de minimis* requirements and are not considered regionally significant.

- Implementation of the proposed action will not exceed any Federal or local noise guidelines and regulations, and there are no sensitive receptors in the project vicinity.

- There will be no long-term impacts to water quality from the proposed activities.

- There will be no hazardous and/or toxic waste impacts from the proposed action.

- There will be minor, temporary impacts to localized aesthetics during the dredging period, but no long-term impacts. Impacts to barge traffic or other local commercial and recreational boating along the GIWW will be identical to those occurring during normal maintenance dredging operations.

- No significant impacts to environmental resources are expected to occur as a result of implementation of the proposed BU project. No adverse cumulative impacts to environmental resources are expected as a result of project implementation.

- The U.S. Army Corps of Engineers finds that the proposed action is not a major Federal action and is in compliance with the Texas Coastal Management Program.

- It is recommended that a Finding of No Significant Impact (FONSI) be prepared and signed for this action.

8.0 LITERATURE CITED

American National Standards Institute. 1983. American National Standard Specification for Sound Level Meters, April 1983.

Buchman, M. F. 1999. NOAA Screening Quick Reference Tables, NOAA HAXMAT Report 99-1. Coastal Protection and Restoration Division, National Oceanic and Atmospheric Administration, Seattle WA. 12pp.

Gould, F.W. 1975. Texas Plants - A Checklist and Ecological Summary. Texas A&M University, Texas Agricultural Experiment Station. MP-585/Rev., College Station, Texas.

H-GAC (Houston-Galveston Area Council). 2000. Air Quality Reference Guide for the Houston-Galveston Area, Regional Air Quality Planning Committee, Houston, Texas.

Mueller, A.J. 1982. The nontidal wetlands of Galveston Island. U.S. Fish and Wildlife Service. Galveston, Texas.

NatureServe. 2006. http://www.natureserve.org/explorer/servlet/NatureServe?searchName=Numenius+borealis. Accessed July 11, 2006.

NRC. 2006. http://www.nrc.uscg.mil. Accessed February 2, 2006.

PBS&J. 1999. Hazardous, Toxic and Radioactive Waste Study, Gulf Intracoastal Waterway, High Island to Brazos River, Prepared for U.S. Army Engineer District, Galveston, Texas.

Peterson, C.H., and N.M. Peterson. 1979. The ecology of intertidal flats of North Carolina: a community profile. U.S. Fish and Wildlife Service, Biological Service Program. FWS/OBS-79/39. 73 pp.

TCEQ (Texas Commission on Environmental Quality). 2005. Draft 2004 Texas Water Quality Inventory. May 13, 2005.

TCEQ. 2006. Fact Sheet, Houston-Galveston Brazoria SIP Revision. http://www.tceq.state.tx.us/assets/public/implementation/air/sip/miscdocs/HGB_fact_sheet011906.pdf

TPWD (Texas Parks and Wildlife Department). 2006. Wildlife Division, Diversity and Habitat Assessment Programs. County Lists of Texas' Special Species. Galveston County, July 6, 2005.

USACE. 1975. Final Environmental Impact Statement: Maintenance Dredging, Gulf Intracoastal Waterway, Texas Section – Main Channel and Tributary Channels. Prepared by the U.S. Army Corps of Engineers, Galveston District. January.

USCB (U.S. Census Bureau), 2006. http://factfinder.census.gov/servlet/BasicFactsServlet http://factfinder.census.gov/servlet/DatasetMainPageServlet?_program=DEC&_submenuId=datasets_0&_lang=en&_ts=

USDOT (U.S. Department of Transportation). 1995. Transit noise and vibration impact assessment. Final Report. Washington, D.C. April.

USEPA (U.S. Environmental Protection Agency). 1974. Information on levels of environmental noise requisite to protect public health and welfare with an adequate margin of safety. Publication No. 550/9-74-004. Washington, D.C. March 1974.

USEPA. 1978. Protective Noise Levels, Condensed Version of EPA Levels Document, Office of Noise Abatement and Control.

White, W. A., T. R. Calnan, R. A. Morton, R. S. Kimble, T. G. Littleton, J. H. McGowen, and H. S. Nance, K.E. Schmedes. 1987. Submerged Lands of Texas, Galveston-Houston Area: Sediments, Geochemistry, Benthic Macroinvertebrates, and Associated Wetlands. The University of Texas, Bureau of Economic Geology Special Publication, Austin.

APPENDIX A

Public Notice and Responses

DEPARTMENT OF THE ARMY
GALVESTON DISTRICT, CORPS OF ENGINEERS
P. O. BOX 1229
GALVESTON, TEXAS 77553-1229

REPLY TO
ATTENTION OF

Environmental Section

December 19, 2005

JOINT PUBLIC NOTICE
U.S. ARMY CORPS OF ENGINEERS, GALVESTON DISTRICT
AND
TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

PUBLIC NOTICE NO. IWW-M-3-S-8
(Supplements Public Notice No. IWW-M-3)

GULF INTRACOASTAL WATERWAY - GALVESTON CAUSEWAY TO BASTROP BAYOU

BENEFICIAL USE OF DREDGED MATERIAL FOR MARSH PRESERVATION IN THE VICINITY OF GREENS LAKE GALVESTON COUNTY, TEXAS

PURPOSE

This public notice is issued in accordance with the provisions of Federal regulations, Title 33 CFR 337.1 and Title 40 CFR 230, concerning the policy, practice, and procedures to be followed by the U.S. Army Corps of Engineers (USACE) in connection with disposition of dredged or fill material in navigable waters.

This notice is being distributed to interested State, Federal, and local agencies, private organizations, news media, and individuals in order to assist in collecting facts and recommendations concerning the dredging and dredged material disposition for the Gulf Intracoastal Waterway (GIWW) - Galveston Causeway to Bastrop Bayou, Texas.

This public notice supplements PUBLIC NOTICE NO. IWW-M-3 dated October 8, 1974, which described maintenance dredging of the GIWW (Main Channel) - Galveston Causeway to Matagorda Bay, Texas.

The purpose of this notice is to inform the public that alternate areas are proposed for deposition of material from maintenance dredging of this segment of the GIWW. Dredged materials from routine periodic maintenance dredging are proposed to be used beneficially to help create a berm along the channel to restrict the intrusion of saline channel water into adjacent fresh- to brackish-water marshes. The dredged material will also provide some erosion protection for numerous inland lakes and ponds that are in peril from potential breaching that would create direct connections with the GIWW.

This public notice only addresses changes in the existing dredged material placement plan; specifically, an additional dredged material placement area is proposed for incorporation into the plan as presented originally by IWW- M-3.

PROJECT LOCATION

The proposed alternative beneficial use site is located along a two-mile reach of channel between Greens Lake and Carancahua Lake in Galveston County, Texas. The subject reach of GIWW begins approximately seven channel miles west of the Galveston Causeway.

PROJECT DESCRIPTION

Maintenance dredging of the GIWW was addressed in the Final Environmental Statement (FES) for Maintenance Dredging, Gulf Intracoastal Waterway, Texas Section – Main Channel and Tributary Channels, that was completed and filed with the U.S. Environmental Protection Agency (EPA) in January 1976. In the FES, designated areas for the placement of dredged materials were identified. Maintenance dredging of the project is required approximately every six years. The proposed action provides for continued periodic maintenance of the channel to its existing dimensions.

The work described in this public notice identifies an additional dredged material placement area to be used for routine maintenance of the this federally-maintained navigation project. (Enclosed Figures).

NEED FOR WORK

The USACE is responsible for maintaining the GIWW to its authorized dimensions to insure navigability of the waterway. The addition of an alternative placement area will ensure that adequate long-term capacity is provided to accommodate the anticipated volume of material to be excavated from the channel over the life of the project. The proposed placement area will also facilitate management of the adjacent marsh habitat and help prevent a transition from fresh-

/brackish-water marsh to saline marsh. As a result of subsidence and erosion, the shoreline is at an elevation that permits saltwater from boat wakes and high tides to intrude into the marshes. Additionally, narrow strips of land that presently isolate several lakes and ponds from the GIWW are vulnerable to erosion. The proposed placement plan is intended to result in an accumulation of dredged material to create a physical barrier that would halt or impede saltwater intrusion and bolster the barrier protecting the lakes and ponds.

PLACEMENT AREA

The proposed placement area, to be designated No. 62-A, consists of a discharge corridor along the northwestern bank of the GIWW. Material will be discharged beyond the existing berm to prevent material from flowing back into the channel. Discharge operations will be conducted so that accumulation of material along the channel is optimized to the extent possible via hydraulic dredging. The buildup of material will be limited to about two feet above existing ground elevations. Water entrained during the dredging process will be allowed to flow through the marsh where many of the fine-grained solids will be filtered by existing vegetation. Any water not absorbed by the marshes will eventually return to the channel through streams, ditches, or bayous. Where possible, operations will be conducted so that material does not flow directly into any lakes, bayous, streams, or ditches.

Several discharge points will be established prior to maintenance dredging of this project. If anticipated favorable results are realized, material may be used in a similar manner during subsequent dredging events. Dredged material placement may take place anywhere along the proposed discharge area shown on Figure 2. Although placement along the entire length of the proposed discharge area is not anticipated, it remains a possibility. Conversely, if such placement is not needed, existing placement areas will continue to be available for use. Existing lakes, ponds or ditches may receive some deposit of material if ecologically desirable; therefore, these water bodies are included in the proposed discharge areas in case future material is needed at these locations. Efforts will be made to prevent an overload of material at any particular location.

Most of the material is expected to settle out within about 250 feet of the discharge point, with the coarser-grained material settling within the first 100 feet. These distances depend on the grain-size distribution of the dredged material and density of vegetation near the discharge point.

COMPOSITION AND QUANTITY OF MATERIALS

Materials dredged from the adjacent reach of the GIWW consist of sands, silts, and clay. Historical data show average values of 37.9% sand, 41.7% silt and 20.4% clay. Shoaling in the

channel is a result of alluvial deposits occurring during high water periods and redistribution of sediments from wind and tidal action. Dredging frequency along this channel segment is approximately six years. Material excavated during each dredging cycle is approximately 295,000 cubic yards (CY). This results from a shoaling rate of 49,000 CY annually.

Shoal material from the GIWW has undergone chemical and grain-size analyses prior to dredging events. Chemical data obtained in conjunction with previous dredging in this channel indicate that no unacceptable environmental impacts due to chemical composition of sediments are expected to occur from the proposed dredged material beneficial use plan.

DREDGING EQUIPMENT

Maintenance dredging of this project is generally performed by a hydraulic cutterhead dredge. This type of equipment utilizes a rotating cutter and a centrifugal pump to excavate and entrain sediment in high velocity water and pumps the slurry through a floating or temporary land-based pipeline to the placement area. Although dredging contractors have different sizes of dredges, it is expected that future dredging for this project would be conducted by a 20-inch (pipeline diameter) or larger cutterhead dredge.

Other types of equipment expected to be used during routine channel maintenance include bulldozers or low-ground pressure marsh vehicles for earthwork and pipeline handling, and barges and tow boats to transport pipelines and equipment.

DREDGING BY OTHERS

There is no dredging or deposition of materials by others covered by this notice. The Department of the Army permit program regulates non-Federal dredging activities.

COMPLIANCE WITH LAWS AND REGULATIONS

This dredged material placement plan is being coordinated with the U.S. Fish and Wildlife Service (USFWS), National Marine Fisheries Service (NMFS), and other Federal, State, and local agencies. Informal consultation procedures also have begun with the USFWS and NMFS in compliance with the Endangered Species Act, as amended. Our initial determination is that the proposed action will not have any adverse impacts on threatened or endangered species.

This notice initiates Essential Fish Habitat consultation requirements of the Magnuson-Stevens Fishery Conservation and Management Act. Our initial determination is that the proposed action will not have a substantial adverse impact on Essential Fish Habitat or federally-managed

fisheries in the Gulf of Mexico. Our final determination relative to project impacts and the need for mitigation measures is subject to review by and coordination with the NMFS.

The proposed dredged material placement plan will also be evaluated with regard to the requirements of Section 404(b)(1) of the Clean Water Act. Water quality certification will be requested from the Texas Commission on Environmental Quality (TCEQ).

It is also our preliminary determination that the proposed action is consistent with the Texas Coastal Management Program (TCMP) to the maximum extent practicable.

The proposed activity will be coordinated with the State Historic Preservation Officer (SHPO). Our initial determination is that the proposed action will not have any adverse impacts on historic or cultural resources.

The following is a partial list of Federal, State, and local agencies with which these activities are being coordinated:

U.S. Environmental Protection Agency, Region 6
U.S. Department of Commerce
U.S. Department of the Interior
U.S. Department of Energy
Eighth Coast Guard District
Budget and Planning Office, Office of the Governor of Texas
Texas Historical Commission
Texas Parks and Wildlife Department
Texas Commission on Environmental Quality
Texas General Land Office
Coastal Coordination Council
The Texas Office of State-Federal Relations
Texas Department of Transportation
Texas Water Development Board
Commissioners' Court of Galveston County

STATE WATER QUALITY CERTIFICATION

Texas Commission on Environmental Quality certification is required. The TCEQ is reviewing the proposed project under Section 401 of the Clean Water Act and in accordance with Title 31, Texas Administrative Code Section 279.1-13 to determine if the work would comply with State water quality standards. By virtue of an agreement between the U.S. Army Corps of Engineers

and the TCEQ, this public notice is also issued for the purpose of advising all known interested persons that there is pending before the TCEQ a decision on water quality certification under such act. Any comments concerning this work may be submitted to the Texas Commission on Environmental Quality, Attention: 401 Coordinator, MC-150, P.O. Box 13087, Capitol Station, Austin, Texas 78711-13087. The public comment period extends 30 days from the date of publication of this notice. A copy of the public notice with a description of work is made available for review in the TCEQ's Austin office.

The TCEQ may conduct a public meeting to consider all comments concerning water quality if requested in writing. A request for a public meeting must contain the following information: the name, mailing address, and telephone number of the person making the request; a brief description of the interest of the requester, or of persons represented by the requester; and a brief description of how the project would adversely affect such interest.

EVALUATION FACTORS

The decision whether to proceed with the proposed dredged material placement plan will be based on an evaluation of the probable impact of the proposed activity on the public interest. That decision will reflect the national concern for both protection and utilization of important resources as well as public and environmental safety and economic concerns.

ENVIRONMENTAL DOCUMENTATION

The work described in this notice represents a change to the previous dredged material placement plan. A preliminary review of this proposed dredged material placement plan indicates that an Environmental Impact Statement (EIS) is not required. This preliminary determination of EIS requirement will be changed if information brought forth in the coordination process is of a significant nature. It is anticipated that an Environmental Assessment (EA) and Finding of No Significant Impact (FONSI) will fulfill the requirements of the National Environmental Policy Act (NEPA). Single copies of these documents will be available by written request to the address below. The draft EA will also be available online for review in the “Hot Topics” section at: http://www.swg.usace.army.mil/.

Designation of the proposed placement plan associated with this Federal project shall be made through the application of guidelines promulgated by the Administrator of the EPA in conjunction with the Secretary of the Army. If these guidelines alone prohibit the designation of this proposed plan, any potential impairment to the maintenance of navigation, including any economic impact on navigation and anchorage which would result from the failure to use this plan, will also be considered.

PUBLIC COMMENT

Persons desiring to express their views or provide information to be considered in evaluating the impact of this work and the future maintenance and operations are requested to mail their comments within 30 days of the date of this notice to:

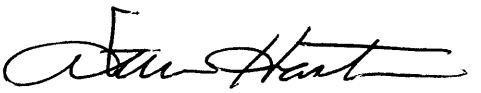
District Engineer
U.S. Army Engineer District, Galveston
ATTN: CESWG-PE-PR
P.O. Box 1229
Galveston, Texas 77553-1229

or email at: robert.g.hauch@usace.army.mil

The comments should make specific reference to Public Notice No. IWW-M-3-S-8.

Any person who has an interest, which may be affected by this action, may request a public hearing. The request must be submitted in writing within 30 days of the date of this notice and must clearly set forth the interest which may be affected and the manner in which the interest may be affected by this activity.

Any questions concerning the proposed action may be directed to Mr. Rob Hauch at (409) 766-3913, or the email address above.



Steven P. Haustein
Colonel, Corps of Engineers
District Engineer

Enclosure

Figure 1

Project Vicinity

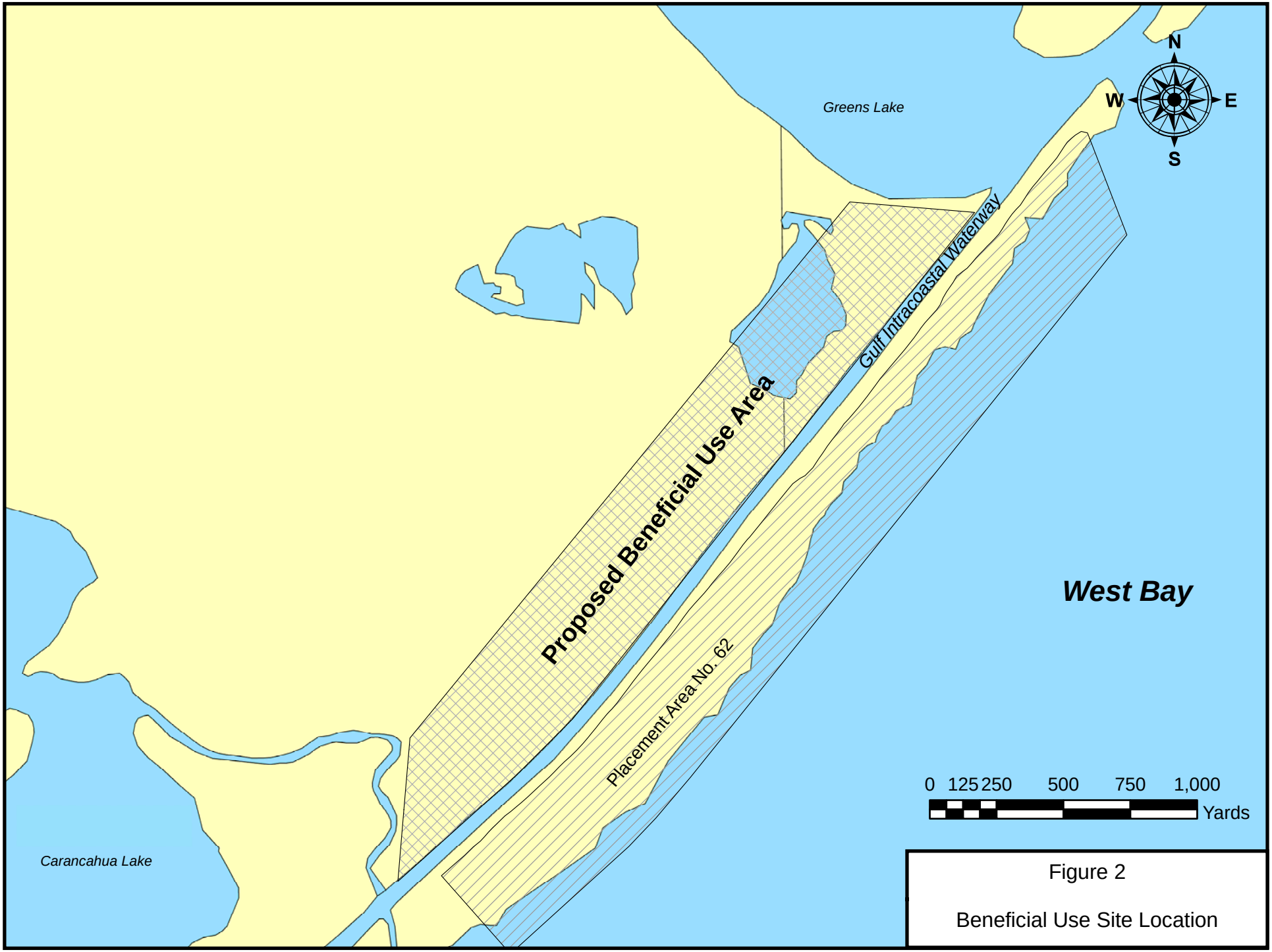


Figure 2

Beneficial Use Site Location

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

Southeast Regional Office
263 13th Avenue S
St. Petersburg, Florida 33701-5511

December 29, 2005

Colonel Steven P. Haustein
District Engineer
Department of the Army, Corps of Engineers
P.O. Box 1229
Galveston, Texas 77553-1229

Dear Colonel Haustein:

The NOAA National Marine Fisheries Service (NMFS) has reviewed Public Notice No. IWW-M-3-S-8 dated December 19, 2005, concerning the beneficial use (BU) of dredged material for marsh preservation in the vicinity of Greens Lake, Galveston County, Texas. The Corps of Engineers (COE) proposes to create a new placement area to be designated "PA 62-A" on the northwest side of the Gulf Intracoastal Waterway (GIWW). The proposed BU of dredged material project is designed to offset historic marsh loss caused by subsidence and erosion within the project area by creating elevations suitable for the establishment of coastal marsh. Approximately 295,000 cubic yards of material will be available for BU on an average dredging cycle of every six years. Prior to each dredging cycle, an assessment will be made to determine if the material is needed for BU in PA 62-A or if it will be disposed of in the traditional placement areas.

Based upon the information received in the public notice, our coordination with the COE and other Federal agencies, we have determined that the proposed BU of dredged material project will have the potential to restore significant areas that have been designated as essential fish habitat (EFH) for Federally managed fisheries and will provide positive benefits to living marine resources. Therefore, NMFS has no comments to provide regarding the currently proposed plans and no further EFH consultation with NMFS is required. We look forward to assisting the COE in the development of BU plans and specifications for each dredging cycle in this reach of the GIWW.

If we may be of further assistance, please contact or Mr. Rusty Swafford of our Galveston Facility at (409) 766-3699.

Sincerely,

Miles M. Croom
Assistant Regional Administrator
Habitat Conservation Division

Miles M. Croom
Assistant Regional Administrator
Habitat Conservation Division
National Marine Fisheries Service
263 13th Avenue South
St. Petersburg, FL 33701-5511

COMMENT NO.	RESPONSE

Thank you for your letter.

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

January 17, 2006

Mr. Rob Hauch
U.S. Army Corps of Engineers
Galveston District CESWG-PE-RE
P.O. Box 1229
Galveston, Texas 77553-1229

Re: USACE Permit Application No. IWW-M-3-S-8

Dear Mr. Hauch:

As stated in the Joint Public Notice, dated December 19, 2005, the United States Army Corps of Engineers (Corps), proposes an alternative placement site for the beneficial use of dredge material from maintenance dredging of the Gulf Intracoastal Waterway (GIWW) from the Galveston Causeway to Bastrop Bayou, Texas. The proposed alternate placement area designated as 62-A is located along a two mile reach of channel between Greens Lake and Carancahua Lake in Galveston County, Texas.

The Corps is responsible for maintaining the GIWW to its authorized dimensions to ensure navigability of the waterway. The addition of an alternate placement area will ensure that adequate long-term capacity is provided to accommodate the anticipated volume of material to be excavated from the channel over the life of the project. The proposed placement area will also facilitate management of the adjacent marsh habitat and help prevent a transition from fresh-water/brackish-water marsh to saline marsh. As a result of subsidence and erosion, the shoreline is at an elevation that permits saltwater from boat wakes and high tides to intrude into marshes. Additionally, narrow strips of land that presently isolate several lakes from the GIWW are vulnerable to erosion. The proposed placement plan is intended to result in an accumulation of dredged material to create a physical barrier that would halt or impede saltwater intrusion and bolster the barrier protecting the lakes and ponds.

In addition to the information contained in the public notice, the following information is needed for review and certification of the proposed project. Responses to this letter may raise other questions that will need to be addressed before a water quality certification determination can be made.

1. The public notice states: "Existing lakes, ponds or ditches may receive some deposit of material if ecologically desirable; therefore, these water bodies are included in the proposed discharge areas in case future material is needed at these locations." Please clarify this statement and explain the conditions under which it may be ecologically desirable to deposit dredge material in lakes, ponds, or ditches.

2. The public notice also states that shoal material from the GIWW has undergone chemical and grain-size analyses prior to dredging events and that no unacceptable environmental impacts due to chemical composition of sediments are expected to occur from the proposed dredged material beneficial use plan. Will the shoal material be analyzed for chemical composition prior to the next GIWW dredging event associated with this beneficial use project? If so, please submit a copy of the results to the Texas Commission on Environmental Quality (TCEQ) 401 coordinator.

3. Are any secondary impacts to water quality in the freshwater marsh areas expected from the discharge of saltwater associated with the dredge material, and if so, what will be done to minimize those impacts?

The TCEQ looks forward to receiving and evaluating other agency or public comments. Please provide any agency comments, public comments, as well as the applicant's comments, to Mr. Peter Schaefer of the Water Quality Division MC-150, P.O. Box 13087, Austin, Texas 78711-3087. Mr. Schaefer may also be contacted by e-mail at *pschaefe@tceq.state.tx.us,* or by telephone at (512) 239-4372.

Sincerely,

L Stepney

L'Oreal W. Stepney, Director
Water Quality Division
Texas Commission on Environmental Quality

LWS/PS/ms

DEPARTMENT OF THE ARMY
GALVESTON DISTRICT, CORPS OF ENGINEERS
P. O. BOX 1229
GALVESTON, TEXAS 77553-1229

REPLY TO
ATTENTION OF

Environmental Section

February 1, 2006

Ms. L'Oreal W. Stepney, Director
Water Quality Division
Texas Commission on Environmental Quality
MC-150 ATTN: Mr. Peter Schaefer
P.O. Box 13087
Capitol Station
Austin, Texas 78711-3087

Dear Ms. Stepney:

Please reference your letter of January 17, 2006 concerning Public Notice IWW-M-S-3-S-8 that pertains to our proposed beneficial use of dredged material in the vicinity of Greens Lake in Galveston County. Your letter contained several questions on this project. The numbered responses below correspond with each of your questions.

1. Ordinarily, operations will be conducted so that material would not flow directly into any lakes, bayous, streams, or ditches. These features were not excluded from consideration in order to maximize flexibility for the beneficial uses of the dredged material. There may be future situations where it might become desirable to raise the bottom elevations of ponds or lakes, perhaps to facilitate growth of vegetation, or alter drainage to achieve more desirable hydrologic conditions in the marsh. These are conditions that may warrant discharge of dredged material into these features. Such discharge would only occur under close coordination with natural resource agencies.

2. We plan to test sediment and water quality prior to dredging and dredged material placement operations. The data will be furnished to TCEQ, as is the current practice.

3. Presently, there is no freshwater marsh in the immediate area of the placement area. Inundation of saline bay water has converted freshwater marsh to tidal saltmarsh. One of the goals of the proposed beneficial use is to hinder this inundation and restore the freshwater marsh characteristics. Any freshwater marshes in the vicinity are far enough away so that they will not be adversely impacted by discharge operations.

One other letter of comment was received in response to Public Notice IWW-M-3-S-8. A copy of this letter, together with our response, is enclosed.

If you have any questions regarding this project, please contact Mr. Rob Hauch at (409)766-3913.

Sincerely,

for Carolyn Murphy
Chief, Environmental Section

Enclosures

DEPARTMENT OF THE ARMY
GALVESTON DISTRICT, CORPS OF ENGINEERS
P. O. BOX 1229
GALVESTON, TEXAS 77553-1229

REPLY TO
ATTENTION OF

Environmental Section

December 19, 2005

NO HISTORIC
PROPERTIES AFFECTED
PROJECT MAY PROCEED
By
for F. Lawerence Oaks
State Historic Preservation Officer
Date 1/20/07
Track#

JOINT PUBLIC NOTICE
U.S. ARMY CORPS OF ENGINEERS, GALVESTON DISTRICT
AND
TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

PUBLIC NOTICE NO. IWW-M-3-S-8
(Supplements Public Notice No. IWW-M-3)

GULF INTRACOASTAL WATERWAY - GALVESTON CAUSEWAY TO BASTROP BAYOU

BENEFICIAL USE OF DREDGED MATERIAL FOR MARSH PRESERVATION IN THE VICINITY OF GREENS LAKE GALVESTON COUNTY, TEXAS

PURPOSE

This public notice is issued in accordance with the provisions of Federal regulations, Title 33 CFR 337.1 and Title 40 CFR 230, concerning the policy, practice, and procedures to be followed by the U.S. Army Corps of Engineers (USACE) in connection with disposition of dredged or fill material in navigable waters.

This notice is being distributed to interested State, Federal, and local agencies, private organizations, news media, and individuals in order to assist in collecting facts and recommendations concerning the dredging and dredged material disposition for the Gulf Intracoastal Waterway (GIWW) - Galveston Causeway to Bastrop Bayou, Texas.

This public notice supplements PUBLIC NOTICE NO. IWW-M-3 dated October 8, 1974, which described maintenance dredging of the GIWW (Main Channel) - Galveston Causeway to Matagorda Bay, Texas.

APPENDIX B

Compliance with the Endangered Species Act

DEPARTMENT OF THE ARMY
GALVESTON DISTRICT, CORPS OF ENGINEERS
P. O. BOX 1229
GALVESTON, TEXAS 77553-1229

REPLY TO
ATTENTION OF

October 21, 2005

Environmental Section

Mr. David M. Bernhart
Assistant RA for Protected Resources
Southeast Regional Office
National Marine Fisheries Service
263 13th Avenue South
St. Petersburg, Florida 33701

Dear Mr. Bernhart:

This letter is in regard to the maintenance dredging and placement of dredged material from the Gulf Intracoastal Waterway (GIWW) – Galveston Causeway to Bastrop Bayou Project, in Galveston County, Texas (Enclosed Figure). The Galveston District is currently developing an alternative dredged material placement plan to use the material beneficially to nourish marsh habitat northwest of the GIWW between Greens Lake and Carancahua Lake.

To ensure compliance with the requirements of Section 7, subsection (a)(2) of the Endangered Species Act, a list is requested of any species which is listed or proposed to be listed, as well as any critical habitat that may be present in the area of the proposed action.

If you or your staff have any questions regarding this activity, please contact Rob Hauch at (409) 766-3913.

Sincerely,

Carolyn Murphy
Chief, Environmental Section

Enclosure

CF:

Mr. Rusty Swafford
National Marine Fisheries Service
Habitat Conservation Division
4700 Avenue U
Galveston, Texas 77551

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

Southeast Regional Office
263 13th Avenue South
St. Petersburg, FL 33701
(727) 824-5312, Fax 824-5309
http://sero.nmfs.noaa.gov

Dear Colleague:

NOV 1 - 2005

Pursuant to section 7(a)(2) of the Endangered Species Act (ESA), the Protected Resources Division of NOAA's National Marine Fisheries Service (NMFS) has reviewed your letter requesting information on threatened and endangered species that may be affected by maintenance dredging and placement of dredged material from the Gulf Intracoastal Waterway - Galveston Causeway to Bastrop Bayou Project in Galveston County, Texas. Species lists and species information may also be obtained directly from our Protected Resources Division website at http://sero.nmfs.noaa.gov/pr/protres.htm.

__**There are no ESA-listed species** or designated critical habitat under our purview in the action area.

___**We cannot determine** impacts to threatened or endangered species, or designated critical habitat, under NOAA Fisheries purview because the letter lacks sufficient information to evaluate the project. **Enclosed are guidelines** to conduct a proper biological evaluation.

___**Please provide a letter** from the lead federal action agency designating you to conduct ESA section 7 consultation with this office.

_X_**Enclosed is a list** of federally-protected species under the jurisdiction of NMFS for the state of **Texas.** Biological information on federally-protected species and candidate species can be found at the following website addresses: http://www.nmfs.noaa.gov/prot_res/prot_res.html; http://www.cccturtle.org;. http://noflorida.fws.gov/SeaTurtles/seaturtle-info.htm); http://endangered.fws.gov/wildlife.html#Species; http://www.cmc-ocean.org/main.php3; http://floridaconservation.org/psm/turtles/turtle.htm; http://obis.env.duke.edu/data/sp_profiles.php; www.mote.org/~colins/Sawfish/SawfishHomePage.html; www.floridasawfish.com; www.flmnh.ufl.edu/fish/sharks/InNews/sawprop.htm;.Gulf sturgeon critical habitat rule and maps (http://alabama.fws.gov/gs/).

__ **It is NMFS' opinion that the project will have no effect** on listed species or critical habitat protected by the ESA under NOAA Fisheries purview. No further consultation with NOAA Fisheries pursuant to section 7(a)(2) of the ESA is required unless the project description changes.

Consultation with NMFS' Habitat Conservation Division (HCD), pursuant to the Magnuson-Stevens Fishery Conservation and Management Acts requirements for essential fish habitat consultation, may be required. Please contact HCD at (727) 824-5317. **If you have any ESA questions, please contact the consulting biologist, _____ at (727) 824-5312, or by e-mail at _____**; or our ESA section 7 coordinator, Eric Hawk, at the same number or by e-mail at eric.hawk@noaa.gov.

____**Other:**_____.

Sincerely,

Teletha Mincey
Administrative Support Assistant
Protected Resources Division

Enclosure

File: 1514-22.f.1 TX
specieslistltr53wpd.wpd

Endangered and Threatened Species and Critical Habitats
under the Jurisdiction of the NOAA Fisheries

Texas

Listed Species	Scientific Name	Status	Date Listed
Marine Mammals			
blue whale	*Balaenoptera musculus*	Endangered	12/02/70
finback whale	*Balaenoptera physalus*	Endangered	12/02/70
humpback whale	*Megaptera novaengliae*	Endangered	12/02/70
sei whale	*Balaenoptera borealis*	Endangered	12/02/70
sperm whale	*Physeter macrocephalus*	Endangered	12/02/70
Turtles			
green sea turtle	*Chelonia mydas*	Threatened[1]	07/28/78
hawksbill sea turtle	*Eretmochelys imbricata*	Endangered	06/02/70
Kemp's ridley sea turtle	*Lepidochelys kempii*	Endangered	12/02/70
leatherback sea turtle	*Dermochelys coriacea*	Endangered	06/02/70
loggerhead sea turtle	*Caretta caretta*	Threatened	07/28/78
Fish			
Gulf sturgeon	*Acipenser oxyrinchus desotoi*	Threatened	09/30/91

Designated Critical Habitat
None

Species Proposed for Listing
Acropora palmata (elkhorn coral)
Acropora cervicornis (staghorn coral)

Proposed Critical Habitat
None

[1] Green turtles are listed as threatened, except for breeding populations of green turtles in Florida and on the Pacific Coast of Mexico, which are listed as endangered

Texas

Candidate Species[2]	Scientific Name
none	

Species of Concern[3]	Scientific Name
Fish	
dusky shark	*Carcharhinus obscurus*
goliath grouper	*Epinephelus itajara*
largetooth sawfish	*Pristis pristis*
night shark	*Carcharhinus signatus*
saltmarsh topminnow	*Fundulus jenkinsi*
sand tiger shark	*Odontaspis taurus*
speckled hind	*Epinephelus drummondhayi*
Warsaw grouper	*Epinephelus nigritus*
white marlin	*Tetrapturus albidus*
Invertebrates	
ivory bush coral	*Oculina varicosa*

[2] The Candidate Species List has been renamed the Species of Concern List. The term "candidate species" is limited to species that are the subject of a petition to list and for which NOAA Fisheries has determined that listing may be warranted (69 FR 19975).

[3] Species of Concern are not protected under the Endangered Species Act, but concerns about their status indicate that they may warrant listing in the future. Federal agencies and the public are encouraged to consider these species during project planning so that future listings may be avoided.

DEPARTMENT OF THE ARMY
GALVESTON DISTRICT, CORPS OF ENGINEERS
P. O. BOX 1229
GALVESTON, TEXAS 77553-1229

REPLY TO
ATTENTION OF

October 21, 2005

Environmental Section

Mr. Carlos Mendoza
Field Supervisor
U.S. Fish and Wildlife Service
17629 El Camino Real, Suite 211
Houston, Texas 77058

Dear Mr. Mendoza:

This letter is in regard to the maintenance dredging and placement of dredged material from the Gulf Intracoastal Waterway (GIWW) – Galveston Causeway to Bastrop Bayou Project, in Galveston County, Texas (Enclosed Figure). The Galveston District is currently developing an alternative dredged material placement plan to use the material beneficially to nourish marsh habitat northwest of the GIWW between Greens Lake and Carancahua Lake.

To ensure compliance with the requirements of Section 7, subsection (a)(2) of the Endangered Species Act, a list is requested of any species which is listed or proposed to be listed, as well as any critical habitat that may be present in the area of the proposed action.

If you or your staff have any questions regarding this activity, please contact Rob Hauch at (409) 766-3913.

Sincerely,

Carolyn Murphy

Carolyn Murphy
Chief, Environmental Section

Enclosure

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Division of Ecological Services
17629 El Camino Real #211
Houston, Texas 77058-3051
281/286-8282 / (FAX) 281/488-5882

December 13, 2005

Carolyn Murphy
Chief, Environmental Section
Department of the Army
Galveston District, Corps of Engineers
P.O. Box 1229
Galveston, Texas 77553-1229

Dear Ms. Murphy:

This responds to your letter dated October 21, 2005, requesting information on federally listed species that may occur in the vicinity of the Corps of Engineers' Gulf Intracoastal Waterway (GIWW) Galveston Causeway to Bastrop Bayou Project in Galveston County, Texas. Specifically, the Corps has requested information on any species that may occur in their proposed beneficial use area, marsh habitat northwest of the GIWW between Greens Lake and Carancahua Lake in Galveston Bay.

A review of Service files indicates that the following species and critical habitat may occur in your project area:

Brown pelican (*Pelecanus occidentalis*) - Endangered

Piping plover (*Charadrius melodus*) - Threatened, with critical habitat

Kemp's ridley sea turtle (*Lepidochelys kempii*) - Endangered

Loggerhead sea turtle (*Caretta caretta*) - Threatened

Green sea turtle (*Chelonia mydas*) - Threatened

You should evaluate your project for potential effects to these species. The Service's Consultation Handbook is available online to assist you with further information on definitions, process, and fulfilling Endangered Species Act requirements at http://endangered.fws.gov/consultations/s7hndbk/s7hndbk.htm. In addition, the NOAA Fisheries Protected Resource Branch (David Bernhart, 727/551-5767) should be contacted for additional information on listed species under their jurisdiction.

If you have any questions, please contact Catherine Yeargan or Moni Belton at 281/286-8282.

Sincerely,

Carlos H. Mendoza
Field Supervisor, Clear Lake ES Field Office

cc
David Bernhart, NOAA Fisheries Protected Resources Division, St. Petersburg, Florida

TAKE PRIDE IN AMERICA

BIOLOGICAL ASSESSMENT FOR FEDERALLY-LISTED THREATENED AND ENDANGERED SPECIES

BENEFICIAL USE OF DREDGED MATERIAL FOR MARSH PRESERVATION IN THE VICINITY OF GREENS LAKE GALVESTON COUNTY, TEXAS

GULF INTRACOASTAL WATERWAY GALVESTON CAUSEWAY TO BASTROP BAYOU

1.0 INTRODUCTION

1.1 PURPOSE OF THE BIOLOGICAL ASSESSMENT

This Biological Assessment (BA) is being prepared for the purpose of fulfilling the U.S. Army Corps of Engineers (USACE) requirements as outlined under Section 7(c) of the Endangered Species Act (ESA) of 1973, as amended. The proposed Federal action is establishment of an alternate area for deposition of material from maintenance dredging in a segment of the Gulf Intracoastal Waterway (GIWW) - Galveston Causeway to Bastrop Bayou in Galveston County, Texas (Figure 1). Dredged materials from routine periodic maintenance dredging are proposed to be used beneficially to help create a berm along the channel to restrict the intrusion of saline channel water into adjacent historically fresh- to brackish-water marshes. The dredged material will also provide some erosion protection for numerous inland lakes and ponds that are in peril from potential breaching that would create direct connections with the GIWW.

This BA is being prepared to assist the U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS) personnel in fulfilling their obligations under the ESA.

1.2 DESCRIPTION OF THE PROPOSED PROJECT

The proposed alternative beneficial use site is located along a two-mile reach of channel between Greens Lake and Carancahua Lake in Galveston County, Texas. The subject reach of GIWW begins approximately seven channel miles west of the Galveston Causeway.

The proposed placement area consists of a discharge corridor along the northwestern bank of the GIWW. Material will be discharged beyond the existing berm to prevent material from flowing back into the channel. Discharge operations will be conducted so that accumulation of material along the channel is optimized to the extent possible using hydraulic cutterhead dredges. The buildup of material will be limited to about two feet above existing ground elevations. Water entrained during the dredging process will be allowed to flow through the marsh where many of the fine-grained solids will be filtered by existing vegetation. Any water not absorbed by the marshes will eventually return to the channel through streams, ditches, or bayous. Where possible, operations will be conducted so that material does not flow directly into any lakes, bayous, streams, or ditches.

Several discharge points will be established prior to maintenance dredging of this project. Dredged material placement may take place anywhere along the proposed discharge area shown on Figure 2. Although placement along the entire length of the proposed discharge area is not anticipated, it remains a possibility. Existing lakes, ponds or ditches may receive some deposit of material if ecologically desirable; therefore, these water bodies are included in the proposed discharge areas in case future material is needed at these locations. Efforts will be made to prevent an overload of material at any particular location.

Most of the material is expected to settle out within about 250 feet of the discharge point, with the coarser-grained material settling within the first 100 feet. These distances depend on the grain-size distribution of the dredged material and density of vegetation near the discharge point.

2.0 FEDERALLY-LISTED THREATENED AND ENDANGERED SPECIES

The project area is in the coastal vicinity of Galveston County, Texas. The USFWS and NMFS consider the endangered or threatened species contained in Table 1 as possibly occurring in this county. No other species, and no designated or proposed critical habitat under their jurisdictions were identified as possibly occurring in the project vicinity.

TABLE 1
Federally-Listed Threatened, Endangered, and Species of Concern
for Galveston County, Texas

Common Name	Scientific Name	Listing Status
BIRDS		
Brown Pelican	*Pelecanus occidentalis*	Endangered

TABLE 1 (Cont'd.)
Federally-Listed Threatened, Endangered, and Species of Concern
for Galveston County, Texas

Common Name	Scientific Name	Listing Status
Piping plover	*Charadrius melodus*	Threatened
FISH		
Gulf Sturgeon	*Acipenser oxyrinchus desotoi*	Threatened
Dusky Shark	*Carcharhinus obscurus*	Species of Concern
Sand Tiger Shark	*Odontaspis taurus*	Species of Concern
Night Shark	*Carcharhinus signatus*	Species of Concern
Speckled Hind	*Epinephelus drummondhayi*	Species of Concern
Saltmarsh Topminnow	*Fundulus jenkensi*	Species of Concern
Goliath Grouper	*Epinephelus itajara*	Species of Concern
Warsaw Grouper	*Epinephelus nigritus*	Species of Concern
Largetooth sawfish	*Pristis pristis*	Species of Concern
White Marlin	*Tetrapturus albidus*	Species of Concern
INVERTEBRATES		
Elkhorn Coral	*Acropora palmata*	Proposed for Listing
Staghorn Coral	*Acropora cervicornis*	Proposed for Listing
Ivory Bush Coral	*Oculina varicosa*	Species of Concern
MARINE MAMMALS		
Blue Whale	*Balaenoptera musculus*	Endangered
Finback Whale	*Balaenoptera physalus*	Endangered
Humpback Whale	*Megaptera novaeangliae*	Endangered
Sei Whale	*Balaenoptera borealis*	Endangered
Sperm Whale	*Physeter catodon*	Endangered
REPTILES		
Green Sea Turtle	*Chelonia mydas*	Threatened
Kemp's Ridley Sea Turtle	*Lepidochelys kempii*	Endangered
Loggerhead Sea Turtle	*Caretta caretta*	Threatened
Hawksbill Sea Turtle	*Eretmochelys imbricata*	Endangered
Leatherback Sea Turtle	*Dermochelys coriacea*	Endangered

Source: US Fish & Wildlife Service, letter dated December 13, 2005 and National Marine Fisheries Service, letter dated November 1, 2005

2.1 BROWN PELICAN

The brown pelican is largely found in coastal and near-shore areas. The brown pelican almost completely disappeared from the coast of Texas by the 1960s, largely due to the use of agricultural pesticides which bioaccumulate in the marine food chain and cause reproductive failure (King et al., 1977; Schreiber, 1980; USFWS, 1980, 1985). Since then, the use of chlorinated hydrocarbons for pest control has declined and the brown pelican has recovered and spread through its original range. It is now common along the Texas coast and nests on several isolated islands where they are safe from predators such as raccoons and coyotes. Foraging pelicans are common along the Texas Coasts and may be found in the project area.

2.2 PIPING PLOVER

The northern Great Plains and Great Lakes populations of the piping plover migrate along the Texas coast from fall through spring, and feed in moist sand along beaches and sand-mud flats around inlets and estuaries (Chapman, 1984; Haig, 1987). The major portion of the two populations now winters along North and South Padre Island and Bolivar Flats in Texas (Federal Register, 1985; Haig and Oring, 1985). Loss of wintering habitat is a significant threat to the bird since so much of its population winters in Texas. Critical habitat was designated for this species; the nearest critical habitat unit is TX-34 located on west Galveston Island, about 10 miles from the project site. The next closest unit is TX-36, located on Bolivar Beach, about 17.5 mile from the project.

Piping plovers can occasionally be seen in the general vicinity of the proposed beneficial use areas. However, these species are transitory and the chances of them occurring at one particular site is very low.

2.3 GULF STURGEON

The Gulf sturgeon, also known as the Gulf of Mexico sturgeon, is a subspecies of the Atlantic sturgeon. Gulf sturgeon are anadromous, but most adult feeding takes place in the Gulf of Mexico and its estuaries. The fish return to breed in the river system in which they hatched. Spawning occurs in areas of deeper water with clean (rock and rubble) bottoms.

Historically, the Gulf sturgeon occurred from the Mississippi River to Charlotte Harbor, Florida. It still occurs, at least occasionally, throughout this range, but in greatly reduced numbers. The fish is essentially confined to the Gulf of Mexico. River systems where the Gulf sturgeon are known to be viable today include the Mississippi, Pearl, Escambia, Yellow, Choctawhatchee, Apalachicola, and Suwannee Rivers, and possibly others.

As with sturgeon worldwide, dams have been a significant factor in the decline of the Gulf sturgeon. The Gulf sturgeon are unable to pass through dam and lock systems, preventing use of upstream areas for spawning (NMFS, 2006A). The proposed project is not located within the historical range for this species, nor does suitable spawning habitat exist in the vicinity.

2.4 DUSKY SHARK

The dusky shark is a large shark with a wide-ranging distribution in warm-temperate and tropical continental waters. It is coastal and pelagic in its distribution, where it occurs from the surf zone to well offshore. Currently, the principal threat to this species is from commercial and recreational shark fisheries (NMFS, 2004A). Habitat for this species does not exist in the project vicinity.

2.5 SAND TIGER SHARK

The sand tiger shark has a broad inshore distribution. In the Western Atlantic, this shark occurs from the Gulf of Maine to Florida, in the northern Gulf of Mexico, in the Bahamas and in Bermuda. They are generally coastal, usually being found from the surf zone down to depths around 75 feet. They may also be found in shallow bays. They usually live near the bottom, but may be found throughout the water column. The biggest threat is from over fishing. These sharks are very susceptible to fisheries because they aggregate in large numbers at particular coastal spots at certain times of year. These aggregations have been targeted in the past by fisheries. In addition, the juveniles are most common and dependent on some of the most polluted estuaries of the eastern U.S., such as Chesapeake, Delaware, and Narragansett Bays, and the Pamlico and Long Island Sounds (NMFS, 2004B). Habitat for this species does not exist in the project vicinity.

2.6 NIGHT SHARK

The night shark is a deep-water shark reported in waters from Delaware south to Brazil, including the Gulf of Mexico. This shark is usually found at depths greater than 150-200 fathoms during the day and 100 fathoms at night. The main threat to this shark has been mortality associated with fishing. The shark is caught mainly on longlines in about 100 fathoms, usually at night (NMFS, 2004C). Habitat for this species does not exist in the project vicinity.

2.7 SPECKLED HIND

The speckled hind inhabits warm, moderately deep waters from North Carolina to Cuba, including Bermuda, the Bahamas and the Gulf of Mexico. The preferred habitat is hard bottom reefs

in depths ranging from 150 to 300 feet. The major threat to this species is mortality as a result of fishing (NMFS, 2004D). Habitat for this species does not exist in the project vicinity.

2.8 SALTMARSH TOPMINNOW

The saltmarsh topminnow is endemic to the north-central coast of the Gulf of Mexico of the southern United States from Galveston Bay Texas eastward through Louisiana, Mississippi, Alabama and parts of western Florida. They tend to live in salt marshes and brackish water. This species requires shallow flooded marsh surfaces for breeding and feeding. Coastal erosion and man-made conversions of marsh habitat to other uses is thought to be the greatest threat to the continued existence of this species (NMFS, 2004E). It is possible that this species occurs in the project area.

2.9 GOLIATH GROUPER

The goliath grouper was historically found in tropical and subtropical waters of the Atlantic Ocean, both coasts of Florida, and from the Gulf of Mexico down to the coasts of Brazil and the Caribbean. Most adults are found in shallow waters, the deepest being about 150 feet. Historically, they were abundant in very shallow water, often associated with piers and jetties along the Florida Keys and the southwest coast of Florida. This fish spawns offshore, and when not spawning is dispersed along shallow reefs. The most likely threat to this species is heavy fishing pressure during spawning, when large numbers of normally dispersed fish are concentrated at predictable areas and times, making them highly vulnerable to overexploitation (NMFS, 2004F). Habitat for this species does not exist in the project vicinity.

2.10 WARSAW GROUPER

The warsaw grouper is a very large fish found on the deep-water reefs of the southeastern United States. This fish ranges from North Carolina to the Florida Keys and throughout much of the Caribbean and Gulf of Mexico to the northern coast of South America. This species inhabits deepwater reefs on the continental shelf break in waters 350 to 650 feet deep. The major threat is mortality as a result of fishing (NMFS, 2004G). Habitat for this species does not exist in the project vicinity.

2.11 LARGETOOTH SAWFISH

Largetooth sawfish are generally long lived (30 years), slow growing, and late-maturing, and they produce a small number of young, resulting in a very low intrinsic rate of population growth for

these species. Sawfish are sluggish bottom-dwellers living in coastal, estuarine and marine waters. Prey items include benthic invertebrates and fish .

Historical occurrences of largetooth sawfish in North America were strictly confined to shallow (<10 m), near-shore, warm-temperate and tropical waters (>18-30ºC), estuarine localities, partly enclosed lagoons, and similar situations. In the United States, largetooth sawfish were reported mainly along the Texas coast and east into Florida waters, but reported occurrences of this species in U.S. waters are rare. It has been noted that all specimens reported from the coast of Texas have been large, in contrast with the abundance of smaller individuals farther south – suggesting that young are confined to southern regions where water temperature is warmer. It is likely that U.S. waters represent the northernmost limit of the largetooth sawfish's historic range.

Incidental commercial catch was likely the most significant factor in the decline of sawfish populations in U.S. waters. Sawfish are extremely vulnerable to overexploitation due to their exceptional propensity for entanglement in net gear, their restricted habitat, and their low intrinsic rate of increase. Habitat degradation likely impacts the species given their inshore distribution (NMFS, 2006B). It is possible that this species occurs in the project area.

2.12 WHITE MARLIN

White marlin are found in offshore waters throughout the tropical and temperate Atlantic Ocean and adjacent seas. White marlin preferred habitat is deep blue water over 100 m with salinity around 35 ppt and a surface temperature of about 22ºC. Prey items include a variety of fishes, crustaceans, and cephalopods. White marlin are mostly caught as bycatch in international longline fisheries (NMFS, 2004H). Preferred habitat for this species does not exist in the project vicinity.

2.13 ELKHORN CORAL

Elkhorn coral is found on coral reefs in southern Florida and the Bahamas, and throughout the Caribbean. Its northern limit is Biscayne National Park, Florida. This species is particularly susceptible to damage from sedimentation (NMFS, 2006C). The proposed project is not located within the historical range for this species, nor does suitable habitat exist in the vicinity.

2.14 STAGHORN CORAL

Staghorn coral is found throughout the Florida Keys, the Bahamas, and the Caribbean islands. This coral occurs in the western Gulf of Mexico, but is absent from U.S. waters in the Gulf of Mexico. This species is particularly susceptible to damage from sedimentation and sensitive to

temperature and salinity variation (NMFS, 2006D). The proposed project is not located within the historical range for this species, nor does suitable spawning habitat exist in the vicinity.

2.15 IVORY BUSH CORAL

Colonies of Ivory Bush Coral are found to depths of 152 m depth on substrates of limestone rubble, low-relief limestone outcrops, and high-relief, steeply sloping prominences. The primary threat is habitat alteration from trawl damage that yields a rubble substrate which is not conducive to coral recruitment (NMFS, 2004I). The proposed project is not located within the historical range for this species, nor does suitable spawning habitat exist in the vicinity.

2.16 WHALE SPECIES

The five species of whales listed by the NMFS are known to occur in waters off the Texas coast. Only eight whale strandings were reported through 1992 (USEPA, 1992). Of the eight stranded whales, seven were identified by the NMFS. Five were sperm whales, one was a right whale, and one was a fin whale. Whales are open-ocean species and would not be expected to enter the shallow waters of the project site. Historical records indicate that it is unlikely that any of these species will appear within the project area.

2.17 SEA TURTLES

Of the five species of endangered and threatened sea turtles known to occur in the Gulf, only the green, Kemp's Ridley, and loggerhead normally enter bays; none of which are likely to occur in the proposed project area.

The loggerhead sea turtle frequents the temperate waters of the continental shelf along the Atlantic Ocean and Gulf of Mexico, where it forages around rocks, coral reefs, and shellfish beds. Sub-adults will also commonly enter bays, lagoons, and estuaries. There are scattered records of loggerhead sea turtles within the Texas bays, all of which were subadults. Juvenile or subadult green sea turtles are known to inhabit lagoon waters and bays along the Florida and Texas coasts.

The Kemp's ridley sea turtle is the most critically endangered sea turtle. The primary range of the Kemp's ridley sea turtle is the Gulf of Mexico, but it also utilizes shallow water bays throughout its known distribution. Distribution appears closely related to the abundance of blue crabs, a favorite food item (Lutcavage and Musick, 1985). A favorite feeding ground is the crab-rich waters adjacent to the Mississippi Delta, east of Sabine Pass (Hildebrand, 1979).

The hawksbill turtle, listed as endangered by the NMFS, is rare in Texas coastal waters. Adults are extremely rare, and Hildebrand (1983) believes that the hawksbills occurring in Texas waters are waifs. This species is not likely to be found in the project vicinity.

The leatherback turtle is rare along the Texas coast. This is not surprising because the leatherback is generally considered to be a pelagic species, tending to keep to deeper offshore waters, where it feeds primarily on jellyfish. Fritts *et al*. (1983), however, found this turtle more frequently in shallower waters in the Gulf than previously supposed. The last report of a leatherback nest in Texas was more than 55 years ago (USEPA, 1992). There are no known aggregation sites or feeding areas in the project area. Therefore, this species is not likely to be found in the project vicinity.

3.0 EFFECTS OF THE PROPOSED ACTION ON LISTED SPECIES

3.1 EFFECTS ON BROWN PELICAN

Foraging pelicans are common along the Texas Coast and may be found in the project area. However, no nesting sites are located in the project area. Therefore, it is determined that the proposed project will have no effect on this species.

3.2 EFFECTS ON PIPING PLOVER

The piping plover utilizes coastal beaches and tidal flats. The nearest unit of designated critical habitat is located about 10 miles from the proposed project area, and preferred habitat for this species does not exist in the project site. Therefore, it is determined that the proposed project will have no effect on this species, nor will it adversely modify critical habitat.

3.3 EFFECTS ON GULF STURGEON

This project is not within the historical range for this species nor does suitable spawning habitat exist in the vicinity. Therefore, it is determined that the proposed project will have no effect on this species.

3.4 EFFECTS ON FISH SPECIES OF CONCERN

With the possible exception of the saltmarsh topminnow and largetooth sawfish, habitat for these species does not exist in the project vicinity. Although there is a possibility that the saltmarsh topminnow and largetooth sawfish may occur in the project area, the sawfish would not venture into

the marshes that would receive the dredged material. The saltmarsh topminnow may occur in the marshes; however, the proposed project is small in scale. Furthermore, work in the area is expected to be performed at estimated six-year intervals. Therefore, it is determined that the proposed project is not likely to adversely affect the saltmarsh topminnow, and will have no effect on the other fish species of concern.

3.5 EFFECTS ON CORALS

These species do not exist in the project vicinity, nor does suitable habitat for these species exist. Therefore, it is determined that the proposed project will have no effect on these species.

3.6 EFFECTS ON WHALES

Whales occur in offshore waters and none of these species are likely to wander into shallow coastal estuaries. Therefore, it is determined that the proposed project will have no effect on these species.

3.7 EFFECTS ON SEA TURTLES

While sea turtles may occur in the project area, turtles would not venture into the marshes that would receive the dredged material, and no nesting habitat would be affected. Furthermore, maintenance dredging would be conducted by cutterhead dredge. Therefore, it is determined that the proposed project will have no effect on these species.

4.0 CONCLUSIONS

The overall conclusion is that the proposed project will have no effect on any federally-listed threatened or endangered species, nor will it adversely modify critical habitat; also, the project is not likely to adversely affect the saltmarsh topminnow, a species of concern. Although several threatened or endangered species may occur in the project vicinity, no regularly used habitat is known to exist in the immediate project site. Should any of these species wander into the project vicinity, the size and mobility of these animals would allow them to avoid the immediate project site during dredged material discharge operations.

5.0 LITERATURE CITED

Chapman, B. R. 1984. Seasonal abundance and habitat-use patterns of coastal bird populations on Padre and Mustang Island barrier beaches. National Coastal Ecosystems Team, USFWS, FWS/OBS-83/31.

Federal Register. 1985. Endangered and threatened wildlife and plants; determination of endangered and threatened status for the piping plover. 50 CFR Part 17, Vol. 50, No. 238:50726-50733.

Fritts, T. H., A. B. Irvine, R. D. Jennings, L. A. Collum, W. Hoffman, and M. A. McGehee. 1983. Turtles, birds, and mammals in the northern Gulf of Mexico and nearby Atlantic waters.

Haig, S. M. and L. W. Oring. 1985. Distribution and status of the piping plover throughout the annual cycle. J. Field Ornithol., 56(4): 334-345.

Haig, S. M. 1987. Winter distribution and status of piping plovers on the Gulf of Mexico. Presented at Canadian Wildlife Service Symposium on Prairie Endangered Species.

Hildebrand, H. H. 1979. Historical review of the status of sea turtle populations in the Gulf of Mexico. Presented at World Conference on Sea Turtle Conservation, 26-30 Nov. Washington, D.C. 14 pp.

Hildebrand, H. 1983. Random notes on sea turtles in the western Gulf of Mexico. Pp. 34-40 in D. Owens *et al.* (eds.), Proc. Western Gulf of Mexico Sea Turtle Workshop, Texas A&M University, College Station, Texas. TAMU-SG-84-105. 74 pp.

King, K. A., E. L. Flickinger and H. H. Hildebrand. 1977. The decline of brown pelicans on the Louisiana and Texas Gulf coast. Southwest Nat. 2(4): 417-431.

Lutcavage, M. and J. A. Musick. 1985. Aspects of the biology of sea turtles in Virginia. Copeia 1985(2):449-456.

NMFS (National Marine Fisheries Service). 2004A. Office of Protected Species. http://www.nmfs.noaa.gov/prot_res/species/fish/Dusky_shark.html

NMFS. 2004B. Office of Protected Species. http://www.nmfs.noaa.gov/prot_res/species/fish/sandtiger_shark.html

NMFS. 2004C. Office of Protected Species. http://www.nmfs.noaa.gov/prot_res/species/fish/night_shark.html

NMFS. 2004D. Office of Protected Species. http://www.nmfs.noaa.gov/prot_res/species/fish/Speckled_hind.html

NMFS. 2004E. Office of Protected Species. http://www.nmfs.noaa.gov/prot_res/species/fish/saltmarsh_topminnow.html

NMFS. 2004F. Office of Protected Species. http://www.nmfs.noaa.gov/prot_res/species/fish/goliath_grouper.html

NMFS. 2004G. Office of Protected Species. http://www.nmfs.noaa.gov/prot_res/species/fish/Warsaw_grouper.html

NMFS. 2004H. Office of Protected Species. http://www.nmfs.noaa.gov/pr/pdfs/species/white_marlin.pdf

NMFS. 2004I. Office of Protected Species. http://www.nmfs.noaa.gov/pr/pdfs/species/ivory_bush_coral.pdf

NMFS. 2006A. Office of Protected Species. http://www.nmfs.noaa.gov/pr/species/fish/Gulf_sturgeon.html

NMFS. 2006B. Office of Protected Species. http://www.nmfs.noaa.gov/pr/pdfs/species/largetooth_sawfish.pdf

NMFS. 2006C. Office of Protected Species. http://www.nmfs.noaa.gov/pr/species/invertebrates/elkhorn.htm

NMFS. 2006D. Office of Protected Species. http://www.nmfs.noaa.gov/pr/species/invertebrates/staghorn.htm

Schreiber, R. W. 1980. The brown pelican: an endangered species? BioScience 30(11): 742-747.

USEPA (U.S. Environmental Protection Agency). 1992. Environmental Impact Statement — Formosa Plastics Corporation, Texas Facilities Expansion, Point Comfort, Texas. EPA 906/07-92-001.

U.S. Fish and Wildlife Service (USFWS). 1980. Selected vertebrate endangered species of the seacoast of the United States - Brown Pelican, Eastern and California Subspecies. Biological Services Program, FWS/OBS - 80/01.40, 16 pp.

USFWS. 1985. Brown pelicans in southeastern U. S. delisted after recovering from effects of DDT. Endangered Species Technical Bulletin Vol. X, No. 3.

Figure 1

Project Vicinity

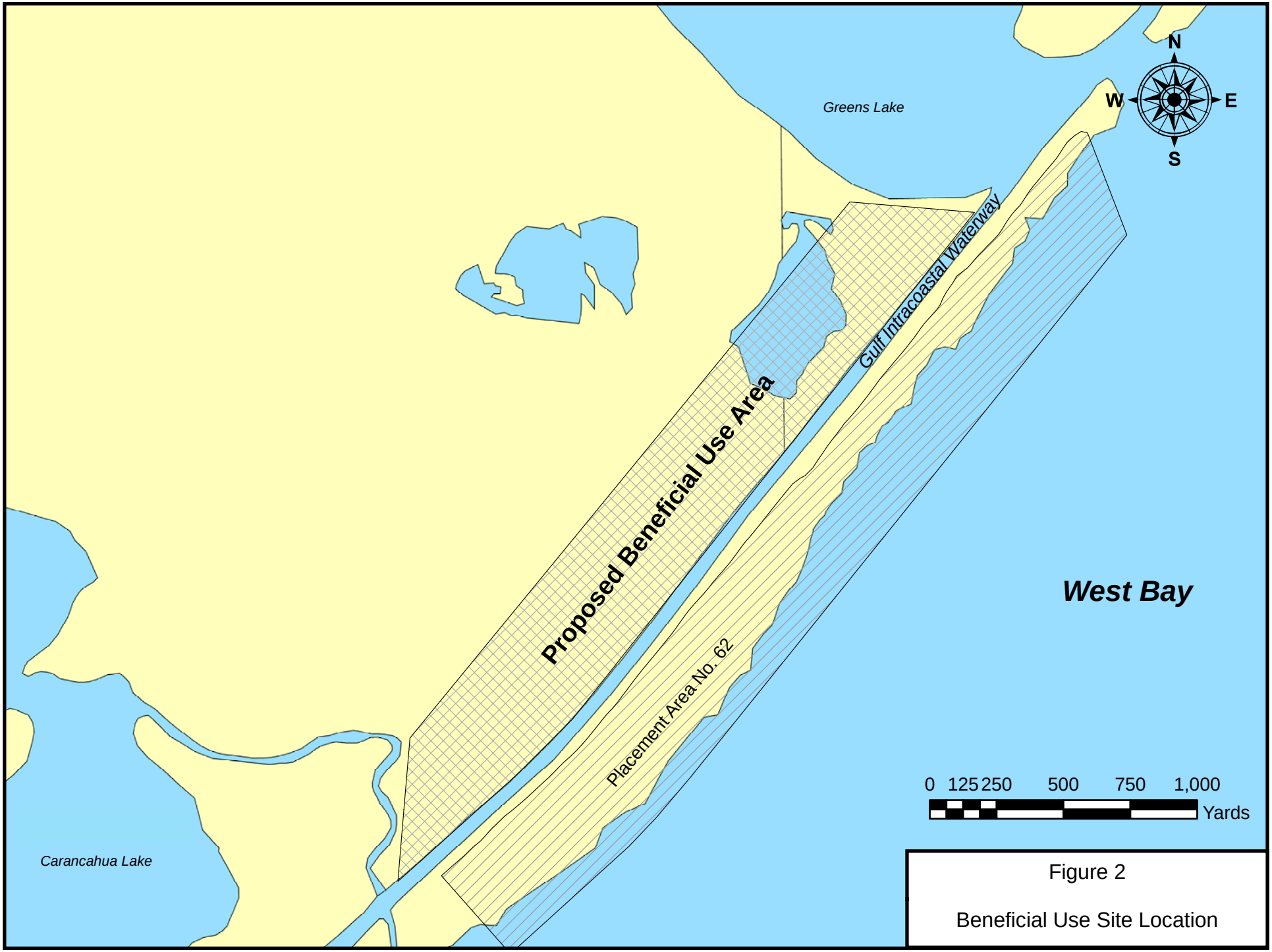


Figure 2

Beneficial Use Site Location

DEPARTMENT OF THE ARMY
GALVESTON DISTRICT, CORPS OF ENGINEERS
P. O. BOX 1229
GALVESTON, TEXAS 77553-1229

REPLY TO
ATTENTION OF

April 11, 2006

Environmental Section

Brian Cain, Ph.D.
Acting Field Supervisor
U.S. Fish and Wildlife Service
17629 El Camino Real, Suite 211
Houston, Texas 77058

Dear Dr. Cain:

This letter is in regard to the maintenance dredging and placement of dredged material from the Gulf Intracoastal Waterway (GIWW) – Galveston Causeway to Bastrop Bayou Project in Galveston County, Texas. The Galveston District is currently developing an alternative dredged material placement plan to use the material beneficially to nourish marsh habitat northwest of the GIWW between Greens Lake and Carancahua Lake.

Please review the enclosed Biological Assessment for the proposed work. The overall conclusion is that the proposed project will have no effect on any federally-listed threatened or endangered species, nor will it adversely modify critical habitat.

I am hereby requesting your written concurrence, pursuant to 50 CFR 402.13, that the proposed action will have no effect on listed species or critical habitat under your jurisdiction.

We appreciate your continued cooperation in allowing us to fulfill our responsibilities under the Endangered Species Act. Should you need additional information or have any questions please call Mr. Rob Hauch at (409) 766-3913.

Sincerely,

Robert G. Hauch
for Carolyn Murphy
Chief, Environmental Section

Enclosure

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Division of Ecological Services
17629 El Camino Real #211
Houston, Texas 77058-3051
281/286-8282 / (FAX) 281/488-5882

May 25, 2006

Carolyn Murphy
Chief, Environmental Section
Department of the Army
Galveston District, Corps of Engineers
P.O. Box 1229
Galveston, Texas 77553-1229

Dear Ms. Murphy:

This responds to your letter dated April 11, 2006 requesting Service concurrence with your "no effect" determination for the Corps of Engineers' Gulf Intracoastal Waterway (GIWW) Galveston Causeway to Bastrop Bayou Project in Galveston County, Texas. Specifically, the Corps has developed an alternative dredged material placement area to use the material beneficially to nourish marsh habitat northwest of the GIWW between Greens Lake and Carancahua Lake. This alternative placement area was developed through coordination with the Fish and Wildlife Service and other natural resource agencies.

The Service no longer concurs with "no effect" determinations.

Under Section 7(a)(2) of the Endangered Species Act, the federal action agency, or its designated representative, is responsible for determining the effects of their actions on listed species or critical habitat (50 CFR § 402.14 [a]) and is ultimately responsible for section 7 obligations. If the action agency determines its proposed action will have no effect on federally listed species or critical habitat, no contact with the Service is necessary. However, you should maintain a complete record of your evaluation, including steps leading to the determination of affect, the qualified personnel conducting the evaluation, habitat conditions, site photographs, and any other related articles. The Service's Consultation Handbook (http://endangered.fws.gov/consultations/s7hndbk/s7hndbk.htm) is available online for further information on definitions and process.

In the event the project changes or additional information on the distribution of listed or proposed species becomes available, the project should be reanalyzed for effects not previously considered.

If you have any questions, or if we can be of further assistance, please contact Catherine Yeargan at 281-286-8282.

Sincerely,

Brian W. Cain

Brian W. Cain
Acting Field Supervisor, Clear Lake ES Field Office

TAKE PRIDE IN AMERICA

DEPARTMENT OF THE ARMY
GALVESTON DISTRICT, CORPS OF ENGINEERS
P. O. BOX 1229
GALVESTON, TEXAS 77553-1229

REPLY TO
ATTENTION OF

April 11, 2006

Environmental Section

David M. Bernhart
Assistant RA for Protected Resources
Southeast Regional Office
National Marine Fisheries Service
263 13th Avenue South
St. Petersburg, Florida 33701

Dear Mr. Bernhart:

This letter is in regard to the maintenance dredging and placement of dredged material from the Gulf Intracoastal Waterway (GIWW) – Galveston Causeway to Bastrop Bayou Project in Galveston County, Texas. The Galveston District is currently developing an alternative dredged material placement plan to use the material beneficially to nourish marsh habitat northwest of the GIWW between Greens Lake and Carancahua Lake.

Please review the enclosed Biological Assessment for the proposed work. The overall conclusion is that the proposed project will have no effect on any federally-listed threatened or endangered species, nor will it adversely modify critical habitat; also, the project is not likely to adversely affect the saltmarsh topminnow, a species of concern.

I am hereby requesting your written concurrence, pursuant to 50 CFR 402.13, that the proposed action will have no effect on listed species or critical habitat under your jurisdiction.

We appreciate your continued cooperation in allowing us to fulfill our responsibilities under the Endangered Species Act. Should you need additional information or have any questions please call Mr. Rob Hauch at (409) 766-3913.

Sincerely,

Robt G. Hauch

for Carolyn Murphy
Chief, Environmental Section

Enclosure

Copy Furnished with Enclosure:

Mr. Rusty Swafford
National Marine Fisheries Service
Habitat Conservation Division
4700 Avenue U
Galveston, Texas 77551

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southeast Regional Office
263 13th Avenue South
St. Petersburg, FL 33701
(727) 824-5312; FAX 824-5309
http:\\sero.nmfs.noaa.gov

F/SER31:DK

JUN 9 2006

Carolyn Murphy
Chief, Environmental Section
Galveston District, Corps of Engineers
P.O. Box 1229
Galveston, TX 77553-1229

Dear Ms. Murphy:

This responds to your April 11, 2006, requesting section 7 consultation pursuant to the Endangered Species Act (ESA) for the Corps of Engineers (COE) proposal to use dredged material from routine periodic maintenance dredging for marsh preservation. In your letter and supporting biological assessment (BA) you determined that the project will have no effect on ESA listed species, critical habitat, or species of concern under the jurisdiction of the National Marine Fisheries Service (NMFS). You requested our concurrence with your findings.

NMFS generally has jurisdiction over all ESA listed species in the estuarine and marine environments, although jurisdiction over some marine species is shared. NMFS has jurisdiction over sea turtles in the water; however, when they are on land (e.g., during nesting), they fall under the purview of the U.S. Fish and Wildlife Service (FWS).

Projects such as described in your letter and BA occur in marsh habitat in which sea turtles do not occur. Likewise, the activity will not result in indirect threats to sea turtles or their habitats. No other federally-listed species under NMFS' purview utilizes that habitat in the project area. Therefore, you do not need to inform or consult with our Protected Resources Division on such projects. However, you should consult with the FWS on potential project impacts to species under their purview. Consultation with the NMFS Habitat Conservation Division may still be necessary to ensure that the project does not impact Essential Fish Habitat as defined under the Magnuson-Stevens Fishery Conservations and Management Act.

If you have any questions regarding the ESA section 7 consultation process, please contact Eric Hawk at (727) 824-5312. For questions about the EFH consultation process, please contact Rusty Swafford at (409) 766-3699.

Sincerely yours,

Eric G. Hawk for

David Bernhart
Assistant Regional Administrator
for Protected Resources

cc: F/SER46 – R. Swafford

File: 1514-22 F.1.TX
Ref: T/SER/2006/01705

APPENDIX C

Clean Water Act Section 404(b)(1) Evaluation
and
Section 401 Water Quality Certification

EVALUATION OF SECTION 404(b)(1) GUIDELINES (SHORT FORM)

PROPOSED PROJECT: Beneficial Use of Dredged Material For Marsh Preservation in the Vicinity of Greens Lake, Galveston County, Texas. Gulf Intracoastal Waterway, Galveston Causeway to Bastrop Bayou.

	Yes	No*
1. Review of Compliance (230.10(a)-(d))		
A review of the proposed project indicates that:		
a. The placement represents the least environmentally damaging practicable alternative and, if in a special aquatic site, the activity associated with the placement must have direct access or proximity to, or be located in the aquatic ecosystem, to fulfill its basic purpose (if no, see section 2 and information gathered for EA alternative).	**X**	
b. The activity does not appear to:		
1) Violate applicable state water quality standards or effluent standards prohibited under Section 307 of the Clean Water Act;	**X**	
2) Jeopardize the existence of Federally-listed endangered or threatened species or their habitat; and	**X**	
3) Violate requirements of any Federally-designated marine sanctuary (if no, see section 2b and check responses from resource and water quality certifying agencies).	**X**	
c. The activity will not cause or contribute to significant degradation of waters of the U.S. including adverse effects on human health, life stages of organisms dependent on the aquatic ecosystem, ecosystem diversity, productivity and stability, and recreational, aesthetic, an economic values (if no, see values, Section 2)	**X**	
d. Appropriate and practicable steps have been taken to minimize potential adverse impacts of the discharge on the aquatic ecosystem (if no, see Section 5)	**X**	

	Not Applicable	Not Significant	Significant*
2. Technical Evaluation Factors (Subparts C-F) (where a 'Significant' category is checked, add explanation below.)			
a. Physical and Chemical Characteristics of the Aquatic Ecosystem (Subpart C)			
1) Substrate impacts		**X**	
2) Suspended particulates/turbidity impacts		**X**	
3) Water column impacts		**X**	
4) Alteration of current patterns and water circulation	**X**		
5) Alteration of normal water fluctuation/hydroperiod	**X**		
6) Alteration of salinity gradients	**X**		
b. Biological Characteristics of the Aquatic Ecosystem (Subpart D)			
1) Effect on threatened/endangered species and their habitat	**X**		
2) Effect on the aquatic food web		**X**	

3) Effect on other wildlife (mammals, birds, reptiles and amphibians)		**X**	
	Not Applicable	**Not Significant**	**Significant***
2. Technical Evaluation Factors (Subparts C-F) (where a 'Significant' category is checked, add explanation below.)			
c. Special Aquatic Sites (Subpart E)			
1) Sanctuaries and refuges		**X**	
2) Wetlands		**X**	
3) Mud flats	**X**		
4) Vegetated shallows	**X**		
5) Coral reefs	**X**		
6) Riffle and pool complexes	**X**		
d. Human Use Characteristics (Subpart F)			
1) Effects on municipal and private water supplies	**X**		
2) Recreational and Commercial fisheries impacts		**X**	
3) Effects on water-related recreation		**X**	
4) Aesthetic impacts		**X**	
5) Effects on parks, national and historical monuments, national seashores, wilderness areas, research sites, and similar preserves	**X**		

	Yes
3. Evaluation of Dredged or Fill Material (Subpart G)	
a. The following information has been considered in evaluating the biological availability of possible contaminants in dredged or fill material (check only those appropriate)	
1) Physical characteristics	**X**
2) Hydrography in relation to known or anticipated sources of contaminants	**X**
3) Results from previous testing of the material or similar material in the vicinity of the project	**X**
4) Known, significant sources of persistent pesticides from land runoff or percolation	
5) Spill records for petroleum products or designated (Section 311 of Clean Water Act) hazardous substances	**X**
6) Other public records of significant introduction of contaminants from industries, municipalities or other sources	
7) Known existence of substantial material deposits of substances which could be released in harmful quantities to the aquatic environment by man-induced discharge activities	

List appropriate references:

1) Unpublished Corps of Engineer data, Gulf Intracoastal Waterway, Galveston Causeway to Bastrop Bayou, 2002.

2) National Response Center – Public Report URL http://www.nrc.uscg.mil/

	Yes	No
b. An evaluation of the appropriate information in 3a above indicates that there is reason to believe the proposed dredged or fill material is not a carrier of contaminants, or that levels of contaminants are substantively similar at extraction and placement sites and not likely to degrade the placement sites, or the material meets the testing exclusion criteria.	**X**	

	Yes
4. Placement Site Delineation (230.11(f))	
a. The following factors as appropriate, have been considered in evaluating the placement site:	**N/A**
1) Depth of water at placement site	
2) Current velocity, direction, and variability at placement site	
3) Degree of turbulence	
4) Water column stratification	
5) Discharge vessel speed and direction	
6) Rate of discharge	
7) Fill material characteristics (constituents, amount, and type of material, settling velocities)	
8) Number of discharges per unit of time	
9) Other factors affecting rates and patterns of mixing (specify)	

List appropriate references:

	Yes	No
b. An evaluation of the appropriate factors in 4a above indicates that the placement site and/or size of mixing zone are acceptable.	**N/A**	

	Yes	No
5. Actions to Minimize Adverse Effects (Subpart H)		
All appropriate and practicable steps have been taken, through application of recommendations of 230.70-230.77 to ensure minimal adverse effects of the proposed discharge.	**X**	

List actions taken:

1) Energy dissipaters will be used at the discharge to prevent scour at the placement areas. Existing vegetation will also help dissipate the flow of material and promote settling of fine-grained material.

	Yes	No*
6. Factual Determination (230.11)		
A review of appropriate information as identified in items 2-5 above indicates that there is minimal potential for short- or long-term environmental effects of the proposed discharge as related to:		
a. Physical substrate at the placement site (review Sections 2a. 3, 4, and 5 above)	X	
b. Water circulation, fluctuation and salinity (review Sections 2a. 3, 4, and 5)	X	
c. Suspended particulates/turbidity (review Sections 2a. 3, 4, and 5)	X	
d. Contaminant availability (review Sections 2a. 3, and 4)	X	
e. Aquatic ecosystem structure and function (review Sections 2b and c, 3, and 5)	X	
f. Placement site (review Sections 2, 4, and 5)	X	
g. Cumulative impacts on the aquatic ecosystem	X	
h. Secondary impacts on the aquatic ecosystem	X	

7. Evaluation Responsibility	
a. This evaluation was prepared by:	**Robert G. Hauch**
Position:	**Physical Scientist**

8. Findings	Yes
a. The proposed placement site for discharge of or fill material complies with the Section 404(b)(1) Guidelines.	X
b. The proposed placement site for discharge of dredged or fill material complies with the Section 404(b)(1) Guidelines with the inclusion of the following conditions:	

List of conditions:

c. The proposed placement site for discharge of dredged or fill material does not comply with the Section 404(b)(1) Guidelines for the following reason(s):	
1) There is a less damaging practicable alternative	
2) The proposed discharge will result in significant degradation of the aquatic ecosystem	
3) The proposed discharge does not include all practicable and appropriate measures to minimize potential harm to the aquatic ecosystem	

7/18/06 Date	Carolyn Murphy CAROLYN MURPHY Chief, Environmental Section

NOTES:

* A negative, significant, or unknown response indicates that the permit application may not be in compliance with the Section 404(b)(1) Guidelines.

Negative responses to three or more of the compliance criteria at the preliminary stage indicate that the proposed projects may not be evaluated using this “short form” procedure. Care should be used in assessing pertinent portions of the technical information of items 2a-e before completing the final review of compliance.

Negative response to one of the compliance criteria at the final stage indicates that the proposed project does not comply with the Guidelines. If the economics of navigation and anchorage of Section 404(b)(2) are to be evaluated in the decision-making process, the “short form” evaluation process is inappropriate.

WATER QUALITY DATA SHEET

Project: **GIWW - Galveston Causeway to Bastrop Bayou** PBS&J Job # _____

Date(s) Collected: 12/17/02 Tide, MLT: ___low_____

Wind Direction: South Wind Speed: ____10-15 mph___

Weather and Water Conditions: Cloudy cool, slight chop

Sample Team: Marty Heaney & Neil Bossart, PBS&J

Sample Number	GIF-GCCB-02 04A	GIF-GCCB-02 04B	GIF-GCCB-02 04C	GIF-GCCB-02 05A	GIF-GCCB-02 05B	GIF-GCCB-02 05C	GIF-GCCB-02 06A	GIF-GCCB-02 06B	GIF-GCCB-02 06C
Station	35+000	35+000	35+000	40+000	40+000	40+000	45+000	45+000	45+000
Distance From C_L (Ft.)	50' N	0	50' S	50' N	0	50' S	50' NW	0	50' SE
Water Depth (ft)	19.1	19.3	16.9	16.8	18.5	17.4	18.7	19.0	18.0
DO (mg/L)	9.97	9.98	9.99	9.30	9.29	9.29	9.61	9.72	9.91
pH (SU)	8.21	8.21	8.21	8.21	8.21	8.21	8.25	8.21	8.28
Salinity ($^{o}/_{oo}$)	15.09	15.07	15.07	14.75	14.75	14.74	14.58	14.57	14.55
Water Temp. (°C)	15.84	18.84	15.84	15.56	15.56	15.56	15.82	15.82	15.82
Air Temp. (°C)	19.6	19.6	19.6	19.5	19.5	19.5	22.1	22.1	22.1
Lat. (N)	29°17'10.4"	29°17'09.9"	29°17'09.4"	29°17'02.0"	29°17'01.5"	29°17'01.0"	29°16'47.7"	29°16'47.4"	29°16'47.0"
Long. (W)	94°56'43.7"	94°56'43.6"	94°56'43.5"	94°57'39.4"	94°57'39.3"	94°57'39.2"	94°58'32.5"	94°58'32.1"	94°58'31.7"
Time	10:20	10:24	10:29	11:25	11:36	11:42	11:50	11:54	12:05
Comments							Barge traffic	Barge traffic	

REMARKS: 06C sed. grab possessed large steel bolt.

WATER QUALITY DATA SHEET

Project: **GIWW - Galveston Causeway to Bastrop Bayou** PBS&J Job # _____

Date(s) Collected: 12/17/02 Tide, MLT: ___low slack_____

Wind Direction: South Wind Speed: ____10-15 mph___

Weather and Water Conditions: Cloudy cool, slight chop

Sample Team: Marty Heaney & Neil Bossart, PBS&J

Sample Number	GIF-GCCB-02 07A	GIF-GCCB-02 07B	GIF-GCCB-02 07C	GIF-GCCB-02 08A	GIF-GCCB-02 08B	GIF-GCCB-02 08C	GIF-GCCB-02 09A	GIF-GCCB-02 09B	GIF-GCCB-02 10A
Station	50+000	50+000	50+000	55+000	55+000	55+000	60+000	60+000	65+000
Distance From C_L (Ft.)	50' NW	0	50' SE	50' NW	0	50' SE	0	50'SE	0
Water Depth (ft)	14.1	16.9	16.0	18.2	17.9	15.8	17.8	11.5	16.8
DO (mg/L)	10.50	10.51	10.50	10.54	10.53	10.53	10.48	10.39	10.24
pH (SU)	8.37	8.36	8.36	8.36	8.38	8.37	8.39	8.39	8.39
Salinity ($^{o}/_{oo}$)	13.85	13.86	13.85	13.09	13.10	13.10	10.90	10.22	12.21
Water Temp. (°C)	16.81	16.81	16.81	16.43	16.44	16.45	16.67	16.46	16.21
Air Temp. (°C)	22.1	22.1	22.1	22.2	22.2	22.2	22.5	22.5	22.6
Lat. (N)	29°16'12.0"	29°16'11.4"	29°16'10.8"	29°15'33.0"	29°15'32.6"	29°15'32.3"	29°14'54.2"	29°14'54.4"	29°14'20.0"
Long. (W)	94°59'11.0"	94°59'10.5"	94°59'10.0"	94°59'46.6"	94°59'46.2"	94°59'45.7"	95°00'25.0"	95°00'22.0"	95°01'02.5"
Time	12:15	12:28	12:34	12:42	12:49	12:58	13:21	13:24	13:53
Comments	Shell & clay				Dup				

REMARKS:

WATER QUALITY DATA SHEET

Project: **GIWW - Galveston Causeway to Bastrop Bayou** PBS&J Job # _____

Date(s) Collected: 12/17/02 & 12/18/02 Tide, MLT: ___low_____

Wind Direction: South Wind Speed: ____10-15 mph___

Weather and Water Conditions: Cloudy cool, slight chop

Sample Team: Marty Heaney & Neil Bossart, PBS&J

Sample Number	GIF-GCCB-02 10B	GIF-GCCB-02 11	GIF-GCCB-02 12	GIF-GCCB-02 13A	GIF-GCCB-02 13B	GIF-GCCB-02 13C	GIF-GCCB-02 14A	GIF-GCCB-02 14B	GIF-GCCB-02 14C
Station	65+000	70+000	75+000	80+000	80+000	80+000	85+000	85+000	85+000
Distance From C_L (Ft.)	50' SE	50' E	50' SE	50' NW	0	50' SE	50'NW	0	50' SE
Water Depth (ft)	17.9	18.3	17.1	16.5	17.7	16.5	18.3	18.1	17.5
DO (mg/L)	10.26	10.31	10.37	9.70	9.60	9.16	9.95	9.94	10.09
pH (SU)	8.35	8.35	8.35	8.23	8.23	8.18	8.30	8.27	8.27
Salinity ($^{o}/_{oo}$)	12.43	14.11	13.24	13.01	13.33	13.88	11.80	12.78	12.78
Water Temp. (°C)	16.11	15.92	16.21	16.97	16.94	16.80	17.01	16.84	16.84
Air Temp. (°C)	22.6	22.5	22.0	20.1	20.5	20.4	20.6	20.9	20.8
Lat. (N)	29°14'02.3"	29°13'51.8"	29°12'55.0"	29°12'26.4"	29°12'26.0"	29°12'25.5"	29°12'00.8"	29°12'00.3"	29°11'59.9"
Long. (W)	95°01'02.9"	95°01'36.8"	95°02'03.7"	95°02'42.1"	95°02'41.9"	95°02'41.6"	95°03'30.4"	95°03'30.1"	95°03'29.9"
Time	13:55	14:12	14:33	10:51	10:50	10:49	11:13	11:09	11:00
Comments			Barge traffic						

REMARKS:

WATER QUALITY DATA SHEET

Project: **GIWW - Galveston Causeway to Bastrop Bayou** PBS&J Job # _____

Date(s) Collected: 12/18/02 Tide, MLT: low outgoing

Wind Direction: South Wind Speed: 7 -10 mph

Weather and Water Conditions: Cloudy cool, slight chop

Sample Team: Neil Bossart & Cody Mikeska, PBS&J

Sample Number	GIF-GCCB-02 15A	GIF-GCCB-02 15B	GIF-GCCB-02 15C	GIF-GCCB-02 16A	GIF-GCCB-02 16B	GIF-GCCB-02 16C	GIF-GCCB-02 17A	GIF-GCCB-02 17B	GIF-GCCB-02 17C
Station	90+000	90+000	90+000	95+000	95+000	95+000	100+000	100+000	100+000
Distance From C_L (Ft.)	50' NW	0	50' SE	50' NW	0	50' SE	50' N	0	50' S
Water Depth (ft)	16.5	18.2	17.9	17.6	19.1	18.4	16.8	18.7	18.1
DO (mg/L)	10.53	10.00	10.30	9.91	9.92	9.94	9.83	9.90	9.98
pH (SU)	8.32	8.33	8.32	8.31	8.31	8.30	8.30	8.31	8.31
Salinity ($^{o}/_{oo}$)	10.87	10.53	10.01	11.80	11.75	11.72	11.32	10.90	11.36
Water Temp. (°C)	17.05	17.10	17.09	16.85	16.88	16.90	16.70	16.80	16.72
Air Temp. (°C)	20.8	21.0	20.9	21.3	21.3	21.2	21.5	21.6	21.3
Lat. (N)	29°11'35.1"	29°11'34.7"	29°11'34.3"	29°11'05.0"	29°11'04.7"	29°11'04.3"	29°10'35.7"	29°10'35.2"	29°10'34.8"
Long. (W)	95°04'18.7"	95°04'18.4"	95°04'18.1"	95°05'03.6"	95°05'03.2"	95°05'02.8"	95°05'48.6"	95°05'48.3"	95°05'48.1"
Time	11:27	11:24	11:21	12:01	11:50	11:53	12:24	12:20	12:19
Comments					Dup				

REMARKS:

WATER QUALITY DATA SHEET

Project: **GIWW - Galveston Causeway to Bastrop Bayou** PBS&J Job # _____

Date(s) Collected: 12/18/02 Tide, MLT: low & outgoing

Wind Direction: South Wind Speed: 5 - 7 mph

Weather and Water Conditions: Cloudy 80%, calm to slight chop

Sample Team: Neil Bossart & Cody Mikeska, PBS&J

Sample Number	GIF-GCCB-02 18A	GIF-GCCB-02 18B	GIF-GCCB-02 18C	GIF-GCCB-02 19A	GIF-GCCB-02 19B	GIF-GCCB-02 19C	GIF-CBFH-02 01A	GIF-CBFH-02 01B	GIF-CBFH-02 01C
Station	105+000	105+000	105+000	110+000	110+000	110+000	115+000	115+000	115+000
Distance From C_L (Ft.)	50' N	0	50' S	50' NW	0	50' SE	50' NW	0	50' SE
Water Depth (ft)	17.4	18.0	16.5	19.3	19.7	18.9	18.5	18.5	18.6
DO (mg/L)	10.01	10.02	10.04	10.06	9.94	9.97	9.87	9.81	10.15
pH (SU)	8.30	8.30	8.31	8.26	8.28	8.31	8.24	8.28	8.27
Salinity ($^{o}/_{oo}$)	10.57	10.68	10.90	11.42	11.21	10.77	9.80	10.55	10.66
Water Temp. (°C)	16.88	16.89	16.90	17.19	17.60	18.21	17.11	17.24	17.24
Air Temp. (°C)	20.8	20.8	21.0	20.7	20.6	20.9	20.5	20.9	20.7
Lat. (N)	29°10'23.9"	29°10'23.4"	29°10'23.0"	29°09'58.2"	29°09'57.8"	29°09'57.4"	29°09'29.6"	29°09'29.4"	29°09'29.2"
Long. (W)	95°06'43.2"	95°06'43.0"	95°06'42.9"	95°07'31.3"	95°07'31.0"	95°07'30.7"	95°08'17.9"	95°08'17.4"	95°08'17.1"
Time	12:44	12:41	12:39	13:07	13:03	13:00	13:25	13:22	13:19
Comments									

REMARKS:

WATER QUALITY DATA SHEET

Project: **GIWW - Galveston Causeway to Bastrop Bayou** PBS&J Job # _____

Date(s) Collected: 12/18/02 Tide, MLT: ___low & outgoing_____

Wind Direction: South - southwest Wind Speed: ____7 - 10 mph__

Weather and Water Conditions: Cloudy 80%, 1 - 2 ft seas

Sample Team: Neil Bossart & Cody Mikeska, PBS&J

Sample Number	GIF-CBFH-02 02A	GIF-CBFH-02 02B	GIF-CBFH-02 02C	GIF-CBFH-02 03A	GIF-CBFH-02 03B	GIF-CBFH-02 03C	GIF-CBFH-02 04A	GIF-CBFH-02 04B	GIF-CBFH-02 05A
Station	120+000	120+000	120+000	125+000	125+000	125+000	130+000	130+000	135+000
Distance From C_L (Ft.)	50' NW	0	50' SE	50' NW	0	50' SE	50' NW	50' SE	50' NW
Water Depth (ft)	16.0	16.5	13.9	13.4	16.5	13.5	16.5	12.6	16.6
DO (mg/L)	9.64	9.62	10.36	9.34	9.36	9.65	9.29	9.30	8.88
pH (SU)	8.30	8.30	8.30	8.21	8.24	8.24	8.27	8.24	8.23
Salinity ($^{o}/_{oo}$)	14.23	14.25	14.17	10.94	10.97	10.77	10.43	9.86	8.92
Water Temp. (°C)	17.56	17.55	17.54	18.11	18.22	18.30	18.59	18.51	17.96
Air Temp. (°C)	20.4	20.8	20.7	20.6	20.7	20.7	20.5	20.6	21.3
Lat. (N)	29°09'01.5"	29°09'01.3"	29°09'01.1"	29°08'30.7"	29°08'30.4"	29°08'30.0"	29°07'54.9"	29°07'54.2"	29°07'19.1"
Long. (W)	95°09'03.8"	95°09'03.7"	95°09'03.5"	95°09'47.7"	95°09'47.3"	95°09'46.9"	95°10'26.7"	95°10'25.9"	95°11'05.6"
Time	13:46	13:41	13:39	14:58	14:56	14:54	15:13	15:11	15:34
Comments									

REMARKS:

WATER QUALITY DATA SHEET

Project: **GIWW - Galveston Causeway to Bastrop Bayou** PBS&J Job # _____

Date(s) Collected: 12/19/02 Tide, MLT: low & outgoing

Wind Direction: South - southwest Wind Speed: 0 - 5 mph

Weather and Water Conditions: Cloudy 100%, calm to slight chop

Sample Team: Neil Bossart & Cody Mikeska, PBS&J

Sample Number	GIF-CBFH-02 05B	GIF-CBFH-02 06A	GIF-CBFH-02 06B	GIF-CBFH-02 07A	GIF-CBFH-02 07B	GIF-CB-02 01A	GIF-CB-02 01B	GIF-CB-02 01C	REF A
Station	135+000	140+000	140+000	145+000	145+000	50+00	50+00	50+000	BU Site
Distance From C_L (Ft.)	50' SE	50' NW	50' SE	50' SE	50' E	50' W	0	50' W	
Water Depth (ft)	15.1	17.3	15.3	16.9	13.7	16.2	16.3	14.6	4.8
DO (mg/L)	8.96	9.01	9.05	8.95	8.98	8.94	8.75	8.88	7.22
pH (SU)	8.26	8.22	8.27	8.23	8.22	7.99	7.90	8.08	7.95
Salinity ($^{o}/_{oo}$)	8.53	8.34	8.25	9.32	9.75	5.82	8.39	5.30	6.02
Water Temp. (°C)	18.01	18.55	18.53	18.30	18.20	17.84	17.70	17.90	17.64
Air Temp. (°C)	21.4	21.2	21.3	21.0	21.3	16.8	16.9	16.9	17.2
Lat. (N)	29°07'18.4"	29°06'43.2"	29°06'42.5"	29°05'59.2"	29°05'59.0"	29°10'27.5"	29°10'27.7"	29°10'27.8"	29°10'14.2"
Long. (W)	95°11'04.8"	95°11'44.6"	95°11'43.7"	95°12'07.9"	95°12'06.8"	95°08'15.8"	95°08'15.3"	95°08'14.7"	95°07'54.1"
Time	15:32	15:48	15:46	16:00	15:58	8:14	8:16	8:19	8:41
Comments									

REMARKS:

WATER QUALITY DATA SHEET

Project: **GIWW - Galveston Causeway to Bastrop Bayou** PBS&J Job # _____

Date(s) Collected: 12/19/02 Tide, MLT: low & outgoing

Wind Direction: South - southwest Wind Speed: 0 - 5 mph

Weather and Water Conditions: Cloudy 100%, calm to 1 ft

Sample Team: Neil Bossart & Cody Mikeska, PBS&J

Sample Number	REF B	REF C							
Station	BU Site	BU Site							
Distance From C_L (Ft.)									
Water Depth (ft)	4.0	4.3							
DO (mg/L)	8.87	6.18							
pH (SU)	7.97	7.79							
Salinity ($^{o}/_{oo}$)	6.36	6.06							
Water Temp. (°C)	17.39	17.35							
Air Temp. (°C)	17.3	17.3							
Lat. (N)	29°10'16.1"	29°10'19.4"							
Long. (W)	95°07'46.8"	95°07'44.6"							
Time	8:44	8:47							
Comments									

REMARKS:

TABLE 1

CONCENTRATIONS OF DETECTED COMPOUNDS (ug/L)
WATER
GULF INTRACOASTAL WATERWAY, GALVESTON CAUSEWAY TO BASTROP BAYOU AND CHOCOLATE BAYOU WYE

Date Sampled: December 17 - 19, 2002

Parameter	WQS** Acute	WQS** Chronic	Detection Limit	GIF-GCCB-02 04	05	06	07	08	08 Dup	09	10	11	12	13	14	15	16
Antimony	N/A	N/A	3.00	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Arsenic	149	78	1.00	1.09	1.27	1.27	1.35	1.35	BDL	1.13	BDL	1.13	1.02	BDL	BDL	BDL	BDL
Chromium (total)	N/A	N/A	1.00	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Chromium (3+)	N/A	N/A	1.00	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Copper	13.5	3.60	1.00	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Lead	133	5.3	1.00	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Nickel	118	13.1	1.00	1.43	1.43	1.38	1.26	1.18	1.32	1.13	1.05	1.20	1.18	1.05	BDL	BDL	1.01
Zinc	92.7	84.2	1.00	3.63	3.90	3.95	3.97	3.21	3.10	2.81	2.84	3.57	3.27	3.05	2.25	2.37	2.92
Ammonia*	N/A	N/A	0.03	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.06	0.10	0.04	0.07
TOC*	N/A	N/A	0.10	5.9	5.2	5.80	5.35	5.80	5.8	5.66	5.44	5.94	5.65	4.50	4.94	5.3	5.18
TPH*	N/A	N/A	0.10	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Naphthalene	N/A	N/A	0.80	BDL	BDL	BDL	BDL	BDL	BDL	BDL	1.40	BDL	BDL	BDL	BDL	BDL	BDL
Diethylphthalate	N/A	N/A	1.00	BDL	BDL	BDL	BDL	BDL	BDL	BDL	1.52	2.59	BDL	6.25	BDL	BDL	BDL
bis (2-ethyl hexyl) phthalate	N/A	N/A	2.00	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

Parameter	WQS** Acute	WQS** Chronic	Detection Limit	GIF-GCCB-02 16 Dup	17	18	19	GIF-CBFH-02 01	02	03	04	05	06	07	GIF-CB-02 01	01 Dup
Antimony	N/A	N/A	3.00	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Arsenic	149	78	1.00	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Chromium (total)	N/A	N/A	1.00	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Chromium (3+)	N/A	N/A	1.00	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Copper	13.5	3.60	1.00	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Lead	133	5.3	1.00	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Nickel	118	13.1	1.00	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Zinc	92.7	84.2	1.00	2.89	3.88	2.54	1.42	2.27	3.92	2.96	3.20	2.58	2.42	3.34	1.26	1.33
Ammonia*	N/A	N/A	0.03	0.04	0.06	0.06	0.07	0.06	0.04	0.10	0.13	0.13	0.21	0.16	0.14	0.08
TOC*	N/A	N/A	0.10	5.15	4.99	5.38	4.75	4.34	4.05	4.61	4.62	4.40	4.30	4.30	5.10	10.1
TPH*	N/A	N/A	0.10	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Naphthalene	N/A	N/A	0.80	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Diethylphthalate	N/A	N/A	1.00	BDL	BDL	BDL	BDL	BDL	BDL	4.37	3.63	3.92	3.79	4.29	3.67	4.04
bis (2-ethyl hexyl) phthalate	N/A	N/A	2.00	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

Dup = Duplicate Sample
BDL = Below Detection Limits
* mg/L
** For Saltwater

TABLE 2

CONCENTRATIONS OF DETECTED COMPOUNDS (ug/L)
ELUTRIATE
GULF INTRACOASTAL WATERWAY, GALVESTON CAUSEWAY TO BASTROP BAYOU AND CHOCOLATE BAYOU WYE

Date Sampled: December 17 - 19, 2002

Parameter	WQS** Acute	WQS** Chronic	Detection Limit	GIF-GCCB-02 04	05	06	07	08	08 Dup	09	10	11	12	13	14	15	16
Antimony	N/A	N/A	3.00	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Arsenic	149	78	1.00	2.14	2.29	1.70	2.53	2.20	1.25	1.71	1.53	1.85	2.20	BDL	1.84	1.31	1.24
Chromium (total)	N/A	N/A	1.00	BDL	1.24	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Chromium (3+)	N/A	N/A	1.00	BDL	1.24	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Copper	13.5	3.60	1.00	BDL	1.45	BDL	1.26	BDL	BDL	1.71	BDL	1.46	BDL	BDL	BDL	1.39	BDL
Lead	133	5.3	1.00	BDL	BDL	BDL	BDL	2.55	BDL	4.46	1.14	4.93	2.55	BDL	BDL	BDL	BDL
Nickel	118	13.1	1.00	2.44	2.61	2.42	2.82	2.55	3.17	2.48	2.18	3.32	2.55	1.65	1.58	1.71	1.04
Zinc	92.7	84.2	1.00	3.12	9.33	5.67	9.73	6.74	15.9	9.10	4.02	14.7	6.74	3.63	4.30	2.90	2.02
Ammonia*	N/A	N/A	0.03	1.89	3.35	0.96	1.10	1.90	1.88	1.81	1.47	0.75	0.84	1.19	1.36	1.08	1.00
TOC*	N/A	N/A	0.10	6.22	6.19	5.98	5.90	6.13	6.02	6.70	6.10	5.98	5.86	9.09	7.73	6.10	4.32
TPH*	N/A	N/A	0.10	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Naphthalene	N/A	N/A	0.80	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Diethylphthalate	N/A	N/A	1.00	3.08	3.42	4.12	2.92	3.60	2.70	3.25	3.71	3.32	3.74	1.04	BDL	BDL	1.41
bis (2-ethyl hexyl) phthalate	N/A	N/A	2.00	2.36	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

Parameter	WQS** Acute	WQS** Chronic	Detection Limit	GIF-GCCB-02 16 Dup	17	18	19	GIF-CBFH-02 01	02	03	04	05	06	07	GIF-CB-02 01	01 Dup
Antimony	N/A	N/A	3.00	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Arsenic	149	78	1.00	BDL	1.52	2.39	1.10	1.16	1.02	1.64	1.00	1.34	2.02	BDL	BDL	BDL
Chromium (total)	N/A	N/A	1.00	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Chromium (3+)	N/A	N/A	1.00	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Copper	13.5	3.60	1.00	1.19	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	4.56	BDL	BDL	BDL
Lead	133	5.3	1.00	1.28	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Nickel	118	13.1	1.00	1.89	2.02	1.04	BDL	BDL	1.20	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Zinc	92.7	84.2	1.00	17.8	9.28	1.73	BDL	1.81	2.96	1.67	BDL	BDL	1.75	1.71	BDL	2.29
Ammonia*	N/A	N/A	0.03	0.27	2.00	1.51	0.63	1.49	0.64	1.32	1.50	1.23	4.80	2.67	4.04	0.20
TOC*	N/A	N/A	0.10	5.78	5.60	4.92	5.68	4.94	4.30	4.92	4.31	5.74	6.26	5.19	4.64	10.3
TPH*	N/A	N/A	0.10	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Naphthalene	N/A	N/A	0.80	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Diethylphthalate	N/A	N/A	1.00	BDL	BDL	1.05	1.13	1.51	1.58	3.10	2.93	3.30	3.18	2.26	1.77	1.42
bis (2-ethyl hexyl) phthalate	N/A	N/A	2.00	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

Dup = Duplicate Sample
BDL = Below Detection Limits
* mg/L
** For Saltwater

TABLE 3

CONCENTRATIONS OF DETECTED COMPOUNDS (dry weight)
SEDIMENT
GULF INTRACOASTAL WATERWAY, GALVESTON CAUSEWAY TO BASTROP BAYOU AND CHOCOLATE BAYOU WYE

Date Sampled: December 17 - 19, 2002

Parameter	Units	Detection Limit	NOAA ERL	GIF-GCCB-02													
				04	05	06	07	08	08 Dup	09	10	11	12	13	14	15	16
Arsenic	mg/kg	0.30	8.2	4.46	5.22	4.01	3.83	5.06	4.84	3.87	5.08	3.78	3.62	3.74	3.80	2.86	3.60
Chromium, Total	mg/kg	1.00	81.0	17.3	20.0	12.0	10.1	13.6	12.5	8.63	11.9	9.81	9.31	8.96	8.99	7.03	8.88
Chromium III	mg/kg	1.00	N/A	17.3	20.0	12.0	10.1	13.6	12.5	8.63	11.9	9.81	9.31	8.96	8.99	7.03	8.88
Copper	mg/kg	1.00	34.0	9.09	9.59	7.06	5.91	7.74	7.45	5.39	7.23	6.27	5.81	5.86	5.98	4.62	6.01
Lead	mg/kg	0.30	46.7	19.4	18.1	13.9	12.1	15.3	15.3	9.68	14.2	11.6	10.8	10.9	10.6	8.43	11.0
Nickel	mg/kg	0.50	20.9	13.0	12.2	10.1	19.2	11.5	11.5	8.32	11.7	10.1	8.98	9.29	9.03	6.98	9.09
Thallium	mg/kg	0.20	N/A	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Zinc	mg/kg	2.00	150	48.6	45.5	36.9	29.6	38.9	38.5	24.7	36.5	30.6	26.4	27.4	27.2	21.4	27.3
Ammonia	mg/kg	0.10	N/A	139	149	103	96.9	144	143	90.7	143	61.4	54.6	86.2	106	88.6	99.7
TOC	%	0.1	N/A	26.8	20.1	19.9	21.8	15.8	21.0	20.1	16.0	21.4	16.0	10.6	11.3	9.1	17.3
Diethylphthalate	ug/kg	50.0	N/A	BDL	BDL	BDL	BDL	BDL	BDL	BDL	131	BDL	BDL	BDL	164	115	BDL
Percent Solids	%	0.10	N/A	44.5	43.3	51.7	53.9	43.7	44.5	55.8	43.8	53.0	57.4	50.9	51.2	58.4	50.3
bis(2-Ethylhexyl) phthalate		50.00	N/A	BDL	BDL	BDL	97.8	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Gravel	%			0.0	0.0	0.0	9.5	0.0	0.0	1.8	0.0	0.0	8.5	0.0	0.0	0.0	0.0
Sand	%			6.7	2.6	25.0	14.4	5.7	5.3	30.8	5.5	19.2	27.2	13.5	9.0	21.5	23.9
Silt	%			40.1	52.1	42.4	46.6	42.7	51.7	40.5	47.8	46.3	41.3	52.4	59.8	52.8	39.5
Clay	%			53.2	45.3	32.6	29.5	51.6	43.0	26.9	46.7	34.5	23.0	34.1	31.2	25.7	36.6

Parameter	Units	Detection Limit	NOAA ERL	GIF-GCCB-02				GIF-CBFH-02							GIF-CB-02		
				16 Dup	17	18	19	01	02	03	04	05	06	07	01	01 Dup	REF
Arsenic	mg/kg	0.30	8.2	3.68	3.74	5.11	6.13	6.60	4.63	2.96	4.06	3.53	4.82	4.20	7.01	6.89	3.79
Chromium, Total	mg/kg	1.00	81.0	9.22	8.92	12.7	16.7	16.2	11.3	6.85	8.66	7.77	10.7	11.0	17.1	17.7	8.31
Chromium III	mg/kg	1.00	N/A	9.22	8.92	12.7	16.7	16.2	11.3	6.85	8.66	7.77	10.7	11.0	17.1	17.7	8.31
Copper	mg/kg	1.00	34.0	6.42	6.02	7.54	10.0	9.64	7.03	4.29	5.64	5.02	6.77	6.52	9.92	10.6	4.87
Lead	mg/kg	0.30	46.7	11.5	10.6	14.9	19.2	18.0	13.2	7.60	9.30	8.71	10.8	11.2	19.1	18.9	9.85
Nickel	mg/kg	0.50	20.9	9.08	8.90	11.2	14.1	14.0	11.4	7.13	8.40	8.29	10.1	11.1	14.9	13.0	7.57
Thallium	mg/kg	0.20	N/A	BDL	BDL	BDL	BDL	0.56	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Zinc	mg/kg	2.00	150	27.8	27.2	36.1	47.1	46.2	37.1	22.4	97.0	25.6	32.4	34.1	47.9	49.7	25.6
Ammonia	mg/kg	0.10	N/A	103	212	143	177	166	118	99.6	124	112	166	112	138	188	84.3
TOC	%	0.1	N/A	10.8	20.0	23.0	29.3	24.7	20.0	17.8	24.4	11.2	25.5	27.7	24.4	26.5	13.4
Diethylphthalate	ug/kg	50.0	N/A	125	163	148	52.0	137	171	73.8	BDL	BDL	120	BDL	BDL	57.6	66.5
Percent Solids	%	0.10	N/A	50.1	51.0	43.5	35.2	35.4	44.3	56.9	50.0	52.4	46.2	46.9	31.5	32.4	55.8
Gravel	%			0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3	0.0
Sand	%			23.2	15.6	13.4	9.6	8.3	26.3	34.3	28.9	33.3	21.3	18.5	4.3	3.9	32.1
Silt	%			39.8	53.4	41.4	23.1	27.4	29.3	38.3	35.6	34.6	41.3	38.0	32.2	18.9	37.1
Clay	%			37.0	30.8	45.2	67.3	64.3	44.4	27.4	35.5	32.1	37.4	43.5	63.2	76.9	30.8

Dup = Duplicate Sample
BDL = Below Detection Limit

Table 4
Target Detection Levels[a] (TDLs)
for Analysis of Sediment, Water, and Elutriate

Analyte	Sediment (Dry Wt.)	Water/Elutriate
Metals [e]		
	mg/kg	***µ*g/l**
Antimony	2.5	3 (0.02)[c]
Arsenic	0.3[b]	1 (0.005)[c]
Beryllium	1[b]	0.2
Cadmium	0.1	1 (0.01)[c]
Chromium (total)	1[b]	1
Chromium (3+)	1	1
Chromium (6+)	1	1
Copper	1[b]	1 (0.1)[c]
Lead	0.3[b]	1 (0.02)[c]
Mercury	0.2	0.2 (0.0002)[c]
Nickel	0.5[b]	1 (0.1)[c]
Selenium	0.5[b]	2
Silver	0.2	1 (0.1)[c]
Thallium	0.2	1 (0.02)[c]
Zinc	2[b]	1 (0.5)[c]
Conventional/Ancillary Parameters		
	mg/kg	**mg/l**
Ammonia	0.1	0.03
Cyanides	2	0.1[d]
Total Organic Carbon	0.1%	0.1%
Total Petroleum Hydrocarbons	5	0.1
Grain Size	1%	-
Total Solids/Dry Weight	0.1%	-
LPAH Compounds		
	***µ*g/kg**	***µ*g/l**
Naphthalene	20	0.8[b]
Acenaphthylene	20	1.0[b]
Acenaphthene	20	0.75[b]
Fluorene	20	0.6[b]
Phenanthrene	20	0.5[b]
Anthracene	20	0.6[b]

Table 4 (Cont'd.)
Target Detection Levels[a] (TDLs)
for Analysis of Sediment, Water, and Elutriate

Analyte	Sediment (Dry Wt.)	Water/Elutriate
HPAH Compounds		
	µg/kg	**µg/l**
Fluoranthene	20	0.9[b]
Pyrene	20	1.5[b]
Benzo(a)anthracene	20	0.4[b]
Chrysene	20	0.3[b]
Benzo(b&k)fluoranthene	20	0.6[b]
Benzo(a)pyrene	20	0.3[b]
Indeno[1,2,3-c,d]pyrene	20	1.2[b]
Dibenzo[a,h]anthracene	20	1.3[b]
Benzo[g,h,i]perylene	20	1.2[b]
Organonitrogen Compounds		
	µg/kg	**µg/l**
Benzidine	5	1
3,3-Dichlorobenzidine	300[b]	3[b]
2,4-Dinitrotoluene	200[b]	2[b]
2,6-Dinitrotoluene	200[b]	2[b]
1,2-Diphenylhydrazine	10	1
Nitrobenzene	160[b]	0.9[b]
N-Nitrosodimethylamine	-	3.1[b]
N-Nitroso-di-n-propylamine	150[b]	0.9[b]
N-Nitrosodiphenylamine	20	2.1[b]
Phthalate Esters		
	µg/kg	**µg/l**
Dimethyl Phthalate	50	1[b]
Diethyl Phthalate	50	1[b]
Di-n-butyl Phthalate	50	1[b]
Butyl Benzyl Phthalate	50	4[b]
Bis[2-ethylhexyl] Phthalate	50	2[b]
Di-n-octyl Phthalate	50	3[b]
Phenols/Substituted Phenols		
	µg/kg	**µg/l**
Phenol	100	10
2,4-Dimethylphenol	20	10
Pentachlorophenol	100	50
2,4,6-Trichlorophenol	140[b]	0.9[b]

Table 4 (Cont'd.)
Target Detection Levels[a] (TDLs)
for Analysis of Sediment, Water, and Elutriate

Analyte	Sediment (Dry Wt.)	Water/Elutriate
4-Chloro-3-methylphenol	140[b]	0.7[b]
2-Nitrophenol	200[b]	2[b]
4-Nitrophenol	500[b]	5[b]
2,4-Dinitrophenol	500[b]	5[b]
2-Chlorophenol	110[b]	0.9[b]
2,4-Dichlorophenol	120[b]	0.8[b]
4,6-Dinitro-o-cresol	600	10
Polychlorinated Biphenyls		
	***µ*g/kg**	***µ*g/l**
Total PCB	1	0.01
Pesticides		
	***µ*g/kg**	***µ*g/l**
Aldrin	3[b]	0.03[b]
Chlordane and Derivatives	3[b]	0.03[b]
Dieldrin	5[b]	0.02
4,4'-DDD	5[b]	0.1
4,4'-DDE	5[b]	0.1
4,4'-DDT	5[b]	0.1
Endosulfan and Derivatives	5[b]	0.1
Endrin and Derivatives	5[b]	0.1
Heptachlor and Derivatives	3[b]	0.1
Alpha-BHC	3[b]	0.03
Beta-BHC	3[b]	0.03
Delta-BHC	3[b]	0.03
Gamma-BHC (Lindane)	3[b]	0.1
Toxaphene	50	0.5
Chlorinated Hydrocarbons		
	***µ*g/kg**	***µ*g/l**
1,3-Dichlorobenzene	20	0.9[b]
1,4-Dichlorobenzene	20	1[b]
1,2-Dichlorobenzene	20	0.8[b]
1,2,4-Trichlorobenzene	10	0.9[b]
Hexachlorobenzene	10	0.4[b]
2-Chloronapthalene	160[b]	0.8[b]
Hexachlorocyclopentadiene	300[b]	3.0[b]
Hexachloroethane	100	0.9[b]
Hexachlorobutadiene	20	0.9[b]

Table 4 (Cont'd.)
Target Detection Levels[a] (TDLs)
for Analysis of Sediment, Water, and Elutriate

Analyte	Sediment (Dry Wt.)	Water/Elutriate
Halogenated Ethers		
	***µ*g/kg**	***µ*g/l**
Bis(2-chloroethyl)ether	130[b]	0.9[b]
4-Chlorophenyl phenyl ether	170[b]	0.6[b]
4-Bromophenyl phenyl ether	160[b]	0.4[b]
Bis(2-chloroisopropyl)ether	140[b]	0.7[b]
Bis(2-chloroethoxy)methane	130[b]	1[b]
Miscellaneous		
	***µ*g/kg**	***µ*g/l**
Isophorone	10	1

[a]The primary source of these TDLs was EPA 823-B-95-001, *QA/QC Guidance for Sampling and Analysis of Sediments, Water and Tissues for Dredged Material Evaluations*.

[b]These values are based on recommendations from the EPA Region 6 Laboratory in Houston; these values were based on data or other technical basis.

[c]The values in parentheses are based on EPA "clean techniques", (EPA 1600 series methods) which are applicable in instances where other TDLs are inadequate to assess EPA water quality criteria.

[d]This value recommended by Houston Lab using colorimetric method.

[e]Metals shall be expressed as Dissolved values in water samples, except for mercury and selenium, which shall be reported as Total Recoverable Concentrations.

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

December 8, 2006

Mr. Rob Hauch
U.S. Army Corps of Engineers
Galveston District CESWG-PE-RE
P.O. Box 1229
Galveston, Texas 77553-1229

Re: USACE Public Notice Number IWW-M-3-S-8

Dear Mr. Hauch:

This letter is in response to the Environmental Assessment (EA) dated November 2006, and the public notice dated December 19, 2005, regarding the proposed alternative placement site for the beneficial use of dredge material from maintenance dredging of the Gulf Intracoastal Waterway (GIWW) from the Galveston Causeway to Bastrop Bayou, Texas. The proposed alternate placement area designated as 62-A is located along a two mile reach of channel between Greens Lake and Carancahua Lake in Galveston County, Texas.

The Texas Commission on Environmental Quality (TCEQ) has reviewed the draft EA. Based on our evaluation of the information contained in these documents, the TCEQ certifies that there is reasonable assurance that the project will be conducted in a way that will not violate water quality standards.

The U.S. Army Corps of Engineers is responsible for maintaining the GIWW to its authorized dimensions to ensure navigability of the waterway. The addition of an alternate placement area will ensure that adequate long-term capacity is provided to accommodate the anticipated volume of material to be excavated from the channel over the life of the project. The proposed placement area will also facilitate management of the adjacent marsh habitat and help prevent a transition from fresh-water/brackish-water marsh to saline marsh. As a result of subsidence and erosion, the shoreline is at an elevation that permits saltwater from boat wakes and high tides to intrude into marshes. Additionally, narrow strips of land that presently isolate several lakes from the GIWW are vulnerable to erosion. The proposed placement plan is intended to result in an accumulation of dredged material to create a physical barrier that would halt or impede saltwater intrusion and bolster the barrier protecting the lakes and ponds.

The TCEQ has reviewed this action for consistency with the goals and policies of the Texas Coastal Management Program (CMP) in accordance with the regulations of the Coastal Coordination Council, 31 TAC §505.30, and has determined that the action is consistent with the applicable CMP goals and policies.

No review of property rights, location of property lines, nor the distinction between public and private ownership has been made, and this certification may not be used in any way with regard to questions of ownership.

If you require additional information or further assistance, please contact Mr. Peter Schaefer, Water Quality Assessment Section, Water Quality Division (MC-150), at (512) 239-4372.

Sincerely,

L'Oreal W. Stepney P.E., Director
Water Quality Division
Texas Commission on Environmental Quality

LWS/PS/ms

cc: Mr. Ben Rhame, Secretary, Coastal Coordination Council, P.O. Box 12873, Austin, Texas 78711-2873

APPENDIX D

Preliminary Air Conformity Analysis

PRELIMINARY AIR CONFORMITY ANALYSIS

GIWW - BENEFICIAL USE OF DREDGED MATERIAL FOR MARSH PRESERVATION IN THE VICINITY OF GREENS LAKE GALVESTON COUNTY, TEXAS

INTRODUCTION

The proposed project is located in Galveston County which is situated within the Houston Galveston Non-attainment Area (HGA). The HGA is classified as a moderate non-attainment area for ozone under the 8-hour National Ambient Air Quality Standard for ozone (TCEQ, 2006). A preliminary analysis of air contaminant emissions for the proposed project was conducted to determine if the dredging and beneficial use operations will generate nitrogen oxide (NO_x) and volatile organic compound (VOC) emissions (ozone precursors) above *de minimus* levels specified in the General Conformity rules, as established by the Clean Air Act, for the HGA. For this moderate classification, *de minimus* levels are 100 tons per year each for NO_x and VOCs. Furthermore, if potential emissions are below 100 tons per year (tpy) for both NO_x and VOCs, a Formal Conformity Determination will not be required.

METHODOLOGY

Assumptions and equipment schedules were based on routine dredging and dredged material discharge operations similar to those to be implemented for the proposed project. Specifically, activities were assumed to take place 24 hours a day / 7 days a week. The project was assumed to require about 36 days at a dredging rate of 250,000 cubic yards per month. Emission factors for the dredging and other equipment typical of this type of project were obtained using the U.S. Environmental Protection Agency's (EPA) NONROAD Emission Factors for 2005 inventory file (EPA, 2006a). This file provides emission factors and other information from the draft NONROAD 2004 model for the 2005 calendar year and was suggested by the EPA for use in estimation of emissions from non-road construction equipment. Additionally, factors were used from the EPA regulatory document "Final Regulatory Impact Analysis: Control of Emissions from Marine Diesel Engines (EPA, 2006b)." The attached table summarizes the assumptions and values used in calculating the emissions associated with the proposed project.

SUMMARY OF EMISSIONS/GENERAL CONFORMITY THRESHOLDS

The exemption thresholds for ozone precursor pollutants are 100 tpy of VOC and NO_x. Pursuant the provisions of 40 CFR 93.150, Federal agencies are required to perform a Formal

Conformity Determination when the emissions in non-attainment or maintenance areas would total or exceed threshold emission levels. If project operations result in air emissions of less than 100 tpy for both of these air contaminants, the action is not required to perform a Formal Conformity Determination and no further analysis is required to demonstrate that such actions conform to the State Implementation Plan (SIP).

Table 1
Comparison of Estimated Emissions (tons/year) to General Conformity Thresholds

	VOC	NO_x
Tons/year	3.87	36.54
General Conformity Threshold (tons/year)	100.00	100.00
Exceeds Threshold	No	No

As shown on Table 1, the potential emissions for both NO_x and VOCs from the dredging and beneficial use activities associated with the project would not exceed *de minimus* levels. Therefore, a Formal Conformity Determination is not required prior to the implementation of the project. Additionally, these actions may be presumed to conform, and may be considered less than significant in terms of their impact on attainment of the 8-hour ozone ambient air quality standard for this region.

REFERENCES

EPA. 2006a The U.S. Environmental Protection Agency's NONROAD Emission Factors for 2005 inventory file was used as a reference in obtaining emission factors for non-road diesel construction equipment. http://www.epa.gov/ttn/chief/net/2002inventory.html#nonroad

EPA. 2006b The U.S. Environmental Protection Agency's regulatory document "Final Regulatory Impact analysis: Control of Emissions from Marine Diesel Engines" was used as a reference in obtaining emission factors for dredging and marine equipment. http://www.epa.gov/otaq/regs/nonroad/marine/ci/fr/ria.pdf

HGA SIP for Diesel Construction Emission Projects was used as a reference in determining the conformity status of the project. http://www.tnrcc.state.tx.us/oprd/sips/00011sipappb.pdf

TCEQ (Texas Commission on Environmental Quality). 2006. Fact Sheet, Houston-Galveston Brazoria SIP Revision. http://www.tceq.state.tx.us/assets/public/implementation/air/sip/miscdocs/HGB_fact_sheet011906.pdf

PRELIMINARY AIR CONFORMITY ANALYSIS

GIWW - BENEFICIAL USE OF DREDGED MATERIAL FOR MARSH PRESERVATION IN THE VICINITY OF GREENS LAKE
GALVESTON COUNTY, TEXAS

Required Production of 250,000 CY per month (low production rate)

Work Duration is expected to be about 36 days

Equipment expected to be used is below:

Type	**Activity**	**Operation**	**Hours of**	**power** (HP)	**Emission Factor** (g/hp-hr)		**Emissions** (tons)	
					VOC	NO_x	VOC	NO_x
Dredging and Discharge Operations								
24" Dredge	Dredging	16	576	3400	1	6.9	2.16	14.88
	Idle	8	288	1200	1	6.9	0.38	2.63
Dredge Tender (2 @ 500hp each)	Dredging	16	1152	1000	0.3	5.3	0.38	6.72
Pipeline Tender (2 @ 500hp each)	Dredging	24	1728	1000	0.3	5.3	0.57	10.09
Low Ground Pressure Dozer	Discharge Ops	16	576	185	0.56	6.99	0.07	0.82
Amphibious Track Hoe	Discharge Ops	16	576	290	1.71	7.59	0.31	1.40
Total							3.87	36.54

APPENDIX E

Compliance with the Texas Coastal Management Program

COMPLIANCE WITH THE TEXAS COASTAL MANAGEMENT PROGRAM

BENEFICIAL USE OF DREDGED MATERIAL FOR MARSH PRESERVATION IN THE VICINITY OF GREENS LAKE GALVESTON COUNTY, TEXAS

GULF INTRACOASTAL WATERWAY GALVESTON CAUSEWAY TO BASTROP BAYOU

INTRODUCTION

The State of Texas submitted the Texas Coastal Management Program to the National Oceanic and Atmospheric Administration (NOAA) for review pursuant to §306 of the Federal Coastal Zone Management Act of 1972, as amended (16 U.S.C. 1451 *et seq*.). The TCMP was approved by the Office of Ocean and Coastal Resource Management in 1996. Federal approval of the TCMP requires that Federal actions occurring within the TCMP boundary be consistent to the maximum extent practicable with the goals and policies of the TCMP. To show compliance, Federal agencies responsible for these actions must prepare a consistency determination and submit it to the state for review. The consistency determination for this project was prepared in accordance with the "Texas Coastal Management Program Final Environmental Impact Statement," dated August 1996. Details of the proposed activity, as well as environmental impacts, are presented in sections of the accompanying Environmental Assessment (EA) and will be referenced in this determination. It is the intent of the Galveston District of the U.S. Army Corps of Engineers that all Corps projects be consistent to the maximum extent practicable with the goals and policies of the Texas Coastal Management Program.

IMPACT ON COASTAL NATURAL RESOURCES AREAS (CNRA)

Several of the CNRAs listed in 31 TAC §501.3 are found in the vicinity of the project. A description of the project, an environmental description of the site, environmental impacts resulting from the proposed activity, and results of a cultural resource investigation of the project area are presented in Sections 1.0, 3.0, and 4.0 of the EA. Following are short descriptions of each CNRA near the project and methods to minimize or avoid potential impacts resulting from the project.

- **Coastal Barrier**: The project is not located within any designated Coastal Barrier Unit. The nearest Unit is TX-05P locate about 13,000 feet from the project site. Therefore, no adverse impacts to coastal barrier are anticipated by this action.

- **Coastal Historic Area**: No historic properties have been identified in this project area.

- **Coastal Preserve**: There are no coastal preserves in the project area. The nearest coastal preserve is Christmas Bay located about 15 miles away. The next closest is Armand Bayou, located about 23 miles away. Therefore, no adverse impacts to coastal preserves are anticipated by this action.

- **Coastal Shore Area**: This resource area is a strip of land from the high-water mark on coastal beaches to 100 feet inland. None of these resources are located near the project area. The proposed beneficial uses are located approximately five miles from the coastal shore and will have no direct impacts to this area.

- **Coastal Wetlands**: The project is in an area classified as coastal wetlands under §501.3.b.5. Impacts to the area have been assessed and described in Section 4.1. Adverse impacts to existing wetlands are not anticipated from this project. A net benefit due to marsh preservation and erosion control will be realized by the project.

- **Critical Dune Area**: There are no critical dune areas located in the project area. The nearest such area is located approximately five miles from the proposed beneficial use sites.

- **Critical Erosion Area**: Part of the northern bay shoreline along Galveston Island is designated as a critical erosion area identified as Galveston Island State Park. The proposed beneficial use is located directly opposite this area at a distance of approximately three miles. Therefore, no adverse impacts to critical erosion areas are anticipated by this action.

- **Gulf Beach**: There are no Gulf beaches located near the project. The proposed beneficial uses are located approximately four miles from the nearest beach and will have no direct impacts to this area.

- **Hard-Substrate Reef**: There are no naturally occurring rock outcrops or serpulid worm reefs occurring near the project area.

- **Oyster Reef**: There are no oyster reefs located in the immediate project area. The nearest such area is located approximately 2,000 feet from the proposed beneficial use site. Dredged material will be discharged along the northern edge of the Gulf

Intracoastal Waterway away from the oysters. Therefore, no adverse impacts to oyster reefs are anticipated by this action.

- **Special Hazard Area**: These are low-lying, flood-prone areas as shown on flood insurance rate maps. The proposed beneficial uses sites are situated adjacent to existing wetlands, but will not induce increased flooding in developed areas and will not contribute to increased future flood damages in the region.

- **Submerged Land**: Numerous streams, bayous, lakes and ponds exist in the vicinity of the proposed beneficial use sites. No-discharge zones will be instituted to prevent dredged material from filling these water bodies. The proposed action suggests that some of these areas may be filled; however, such areas were included to provide future flexibility, and will only be used if doing so would have an overall benefit to the local ecosystem. Furthermore, this action would only be conducted through close coordination with the resource agencies and the landowners. Therefore, adverse impacts to submerged land are not anticipated.

- **Submerged Aquatic Vegetation**: There are no known areas of submerged aquatic vegetation growing in the project area.

- **Tidal Sand or Mud Flats**: There are no known areas of tidal sand or mud flats in the project area.

- **Water of the Open Gulf of Mexico**: The project is located inland from the Gulf of Mexico and will not affect this resource.

- **Water Under Tidal Influence**: The wetlands in the project vicinity were historically freshwater to intermediate marshes with limited tidal influence. Construction of the Gulf Intracoastal Waterway opened a conduit for tidal influence that increased the potential for salt-water intrusion. The purpose of the proposed beneficial use is to help restrict some of the tidal influence and restore the historical condition of these wetlands. Water that is entrained during the dredging process will flow across the marshes and will probably be completely absorbed. Suspended sediments will be filtered by existing vegetation so that any water that may return to the channel will be clarified, resembling natural runoff. Impacts on water quality are described in Section 4.7 and judged to be minor and of short duration.

COMPLIANCE WITH GOALS AND POLICIES

The following goals and policies of the TCMP were reviewed for compliance.

- §501.15: Policy for Major Actions
- §501.23: Development in Critical Areas
- §501.25: Dredging and Dredged Material Disposal and Placement

Compliance with §501.15: Policy for Major Actions

The U.S. Army Corps of Engineers finds that the proposed action is not a major Federal action and is in compliance with §501.15.

Compliance with §501.23: Development in Critical Areas

Critical areas, as defined by the TCMP, situated in the project site include coastal wetlands. Therefore, the locations of the proposed beneficial use site is considered a critical area. However, the purpose of the proposed plan is to use dredged material in a beneficial manner to preserve and nourish marsh habitat. Beneficial uses of dredged material is one of the objectives of the TCMP. Sections 1.0, 3.0, and 4.0 of the EA demonstrate that the project complies with §501.23(a)(1)-(7).

Compliance with §501.25: Dredging and Dredged Material Disposal and Placement

The locations of the proposed beneficial use discharge area was selected to minimize adverse impacts to existing resources and, to the maximum extent practicable, use dredged material excavated during routine maintenance of the Gulf Intracoastal Waterway in a beneficial manner to preserve and nourish marsh habitat. Sections 1.0, 3.0, and 4.0 of the EA, together with the enclosed analysis, demonstrate that the project complies with applicable subparts of this section.

CONSISTENCY DETERMINATION

The project has been reviewed for consistency with the goals and policies of the TCMP. CNRAs in the project area are identified and evaluated for potential impacts from project activities. It is determined that project activities will not adversely impact these CNRAS. furthermore, the result of the project is expected to be beneficial. Therefore, the proposed action to establish beneficial uses of dredged material for marsh preservation in the vicinity of Greens Lake is consistent with the goals and policies of the Texas Coastal Management Program to the maximum extent practicable.

COMPLIANCE WITH GOALS AND POLICIES
SECTION 501.25(a)-(f)

BENEFICIAL USE OF DREDGED MATERIAL FOR MARSH PRESERVATION
IN THE VICINITY OF GREENS LAKE
GALVESTON COUNTY, TEXAS

GULF INTRACOASTAL WATERWAY
GALVESTON CAUSEWAY TO BASTROP BAYOU

Section 501.25 Dredging and Dredged Material Disposal and Placement

(a) Dredging and the disposal and placement of dredged material shall avoid and otherwise minimize adverse effects to coastal waters, submerged lands, critical areas, coastal shore areas, and Gulf beaches to the greatest extent practicable. The policies of this subsection are supplemental to any further restrictions or requirements relating to the beach access and use rights of the public. In implementing this subsection, cumulative and secondary adverse effects of dredging and the disposal and placement of dredged material and the unique characteristics of affected sites shall be considered.

(1) Dredging and dredged material disposal and placement shall not cause or contribute, after consideration of dilution and dispersions to violation of any applicable surface water quality standards established under §501.21 of this title.

(2) Except as otherwise provided in paragraph (4) of this paragraph, adverse effects on critical areas from dredging and dredged material disposal or placement shall be avoided and otherwise minimized, and appropriate and practicable compensatory mitigation shall be required, in accordance with §501.23 of this title.

(3) Except as provided in paragraph (4) of this paragraph, dredging and the disposal and placement of dredged material shall not be authorized if:

(A) there is a practicable alternative that would have fewer adverse effects on coastal waters, submerged lands, critical areas, coastal shore areas, and Gulf beaches, so long as that alternative does not have other significant adverse effects;

(B) all appropriate and practicable steps have not been taken to minimize adverse effects on coastal waters, submerged lands, critical areas, coastal shore areas, and Gulf beaches; or

(C) significant degradation of critical areas under §501.23(a)(7)(E) of this title would result.

(4) A dredging or dredged material disposal or placement project that would be prohibited solely by application of paragraph (3) of this paragraph may be allowed if it is determined to be of overriding importance to the public and national interest in light of economic impacts on navigation and maintenance of commercially navigable waterways.

<u>Compliance</u>: The proposed action represents a beneficial use of dredged material to preserve and nourish coastal wetlands, a critical area. This action will have no significant adverse impacts on any CNRA, nor will it result in degradation of surface water quality.

(b) Adverse effects from dredging and dredged material disposal and placement shall be minimized as required in subsection (a) of this section. Adverse effects can be minimized by employing the techniques in this paragraph where appropriate and practicable.

(1) Adverse effects from dredging and dredged material disposal and placement can be minimized by controlling the location and dimensions of the activity. Some of the ways to accomplish this include:

(A) locating and confining discharges to minimize smothering of organisms;

(B) locating and designing projects to avoid adverse disruption of water inundation patterns, water circulation, erosion and accretion processes, and other hydrodynamic processes;

(C) using existing or natural channels and basins instead of dredging new channels or basins, and discharging materials in areas that have been previously disturbed or used for disposal or placement of dredged material;

(D) limiting the dimensions of channels, basins, and disposal and placement sites to the minimum reasonably required to serve the project purpose, including allowing for reasonable overdredging of channels and basins, and taking into account the need for capacity to accommodate future expansion without causing additional adverse effects;

(E) discharging materials at sites where the substrate is composed of material similar to that being discharged;

(F) locating and designing discharges to minimize the extent of any plume and otherwise control dispersion of material; and

(G) avoiding the impoundment or drainage of critical areas.

Compliance: Adverse effects of dredging and dredged material placement in this project have been minimized as described under "Compliance" for subsection (a) of this section. The beneficial use sites addressed in the Environmental Assessment (EA) would satisfy the need for maintaining navigation along the Gulf Intracoastal Waterway (GIWW), as well as use the dredged material beneficially. While some localized minor adverse impacts will be experienced, overall, the proposed action is considered to provide a net benefit to resources. No-discharge zones will be observed near existing streams, bayous, lakes and ponds to prevent impediments to drainage patterns.

(2) Dredging and disposal and placement of material to be dredged shall comply with applicable standards for sediment toxicity. Adverse effects from constituents contained in materials discharged can be minimized by treatment of or limitations on the material itself. Some ways to accomplish this include:

(A) disposal or placement of dredged material in a manner that maintains physicochemical conditions at discharge sites and limits or reduces the potency and availability of pollutants;

(B) limiting the solid, liquid, and gaseous components of material discharged;

(C) adding treatment substances to the discharged material; and

(D) adding chemical flocculants to enhance the deposition of suspended particulates in confined disposal areas,

Compliance: Sediments to be dredged from the channel have been tested for a variety of chemical contaminants of concern to resource agencies since the late 1980s. The U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service, and Texas Commission on Environmental Quality have reviewed these data and have not found any issues of concern.

(3) Adverse effects from dredging and dredged material disposal or placement can be minimized through control of the materials discharged. Some ways of accomplishing this include:

(A) use of containment levees and sediment basins designed, constructed, and maintained to resist breaches, erosion, slumping, or leaching;

(B) use of lined containment areas to reduce leaching where leaching of chemical constituents from the material is expected to be a problem;

(C) capping in-place contaminated material or, selectively discharging the most contaminated material first and then capping it with the remaining material;

(D) properly containing discharged material and maintaining discharge sites to prevent point and nonpoint pollution; and

(E) timing the discharge to minimize adverse effects from unusually high water flows, wind, wave, and tidal actions.

Compliance: Measures will be taken to prevent the dredged material from returning to the GIWW and the discharge end of the dredge pipe will be equipped with an energy dissipater to laterally spread the flow of material and prevent scour directly beneath the discharge. This will also facilitate the buildup of material near the pipe, creating the desired barrier to salt-water intrusion into the marshes. Additionally, existing dense vegetation will further slow the flow of material and help to trap the fine-grain fraction of the material, thereby minimizing impacts further from the discharge point.

(4) Adverse effects from dredging and dredged material disposal or placement can be minimized by controlling the manner in which material is dispersed. Some ways of accomplishing this include:

(A) where environmentally desirable, distributing the material in a thin layer;

(B) orienting material to minimize undesirable obstruction of the water current or circulation patterns;

(C) using silt screens or other appropriate methods to confine suspended particulates or turbidity to a small area where settling or removal can occur;

(D) using currents and circulation patterns to mix, disperse, dilute, or otherwise control the discharge;

(E) minimizing turbidity by using a diffuser system or releasing material near the bottom;

(F) selecting sites or managing discharges to confine and minimize the release of suspended particulates and turbidity and maintain light penetration for organisms; and

(G) setting limits on the amount of material to be discharged per unit of time or volume of receiving waters.

Compliance: The dredged material will not be discharged directly into water. The measures described under "Compliance" for paragraph (3), above, also satisfies this requirement. In addition, the buildup of material will be limited to two feet above existing ground elevation.

(5) Adverse effects from dredging and dredged material disposal or placement operations can be minimized by adopting technology to the needs of each site. Some ways of accomplishing this include:

(A) using appropriate equipment, machinery, and operating techniques for access to sites and transport of material, including those designed to reduce damage to critical areas;

(B) having personnel on site adequately trained in avoidance and minimization techniques and requirements; and

(C) designing temporary and permanent access roads and channel spanning structures using culverts, open channels, and diversions that will pass both low and high water flows, accommodate fluctuating water levels, and maintain circulation and faunal movement.

Compliance: The proposed beneficial use sites to be used on this project meet this requirement. Trained inspectors will be on site to ensure compliance with all standards.

(6) Adverse effects on plant and animal populations from dredging and dredged material disposal or placement can be minimized by:

(A) avoiding changes in water current and circulation patterns that would interfere with the movement of animals;

(B) selecting sites or managing discharges to prevent or avoid creating habitat conducive to the development of undesirable predators or species that have a competitive edge ecologically over indigenous plants or animals;

(C) avoiding sites having unique habitat or other values including habitat of endangered species;

(D) using planning and construction practices to institute habitat development and restoration to produce a new or modified environmental state of higher ecological value by displacement of some or all of the existing environmental characteristics;

(E) using techniques that have been demonstrated to be effective in circumstances similar to those under consideration whenever possible and, when proposed development and restoration techniques have not yet advanced to the pilot demonstration stage, initiating their use on a small scale to allow corrective action if unanticipated adverse effects occur;

(F) timing dredging and dredged material disposal or placement activities to avoid spawning or migration seasons and other biologically critical time periods; and

(G) avoiding the destruction of remnant natural sites within areas already affected by development.

Compliance: The proposed beneficial use sites meet these requirements. They do not affect circulation patterns or surrounding habitats. The proposed action is intended to preserve highly-valued marsh habitat. Cutterhead dredging is not known to affect spawning or migration and is not limited to certain seasons.

(7) Adverse effects on human use potential from dredging and dredged material disposal or placement can be minimized by:

(A) selecting sites and following procedures to prevent or minimize any potential damage to the aesthetically pleasing features of the site, particularly with respect to water quality;

(B) selecting sites which are not valuable as natural aquatic areas;

(C) timing dredging and dredged material disposal or placement activities to avoid the seasons or periods when human recreational activity associated with the site is most important; and

(D) selecting sites that will not increase incompatible human activity or require frequent dredge or fill maintenance activity in remote fish and wildlife areas.

Compliance: These requirements have been fulfilled. The proposed action is intended to preserve highly-valued marsh habitat.

(8) Adverse effects from new channels and basins can be minimized by locating them at sites:

(A) that ensure adequate flushing and avoid stagnant pockets; or

(B) that will create the fewest practicable adverse effects on CNRAs from additional infrastructure such as roads, bridges, causeways, piers, docks, wharves, transmission line crossings, and ancillary channels reasonably likely to be constructed as a result of the project; or

(C) with the least practicable risk that increased vessel traffic could result in navigation hazards, spills, or other forms of contamination which could adversely affect CNRAs;

(D) provided that, for any dredging of new channels or basins subject to the requirements of §501.15 of this title (relating to Policy for Major Actions), data and information on minimization of secondary adverse effects need not be produced or evaluated to comply with this subparagraph if such data and information is produced and evaluated in compliance with §501.15(b)(1) of this title (relating to Policy for Major Actions).

Compliance: All project channels and basins have been in place with their present dimensions since 1944. There are no modifications being planned at this time.

(c) Disposal or placement of dredged material in existing contained dredge disposal sites identified and actively used as described in an environmental assessment or environmental impact statement issued prior to the effective date of this chapter shall be presumed to comply with the requirements of subsection (a) of this section unless modified in design, size, use, or function.

Compliance: The use of existing upland placement sites are not addressed in the accompanying EA and are not subject to this determination.

(d) Dredged material from dredging projects in commercially navigable waterways is a potentially reusable resource and must be used beneficially in accordance with this policy.

(1) If the costs of the beneficial use of dredged material are reasonably comparable to the costs of disposal in a non-beneficial manner, the material shall be used beneficially.

Compliance: The proposed action is to establish new a discharge area that would beneficially use dredged material excavated during routine channel maintenance. This area is being established to create a barrier that would restrict salt-water intrusion into adjoining marsh. This would help restore, nourish and preserve the character of wetlands that were historically freshwater to intermediate marsh.

(2) If the costs of the beneficial use of dredged material are significantly greater than the costs of disposal in a non-beneficial manner, the material shall be used beneficially unless it is demonstrated that the costs of using the material beneficially are not reasonably proportionate to the costs of the project and benefits that will result. Factors that shall be considered in determining whether the costs of the beneficial use are not reasonably proportionate to the benefits include, but are not limited to:

(A) environmental benefits, recreational benefits, flood or storm protection benefits, erosion prevention benefits, and economic development benefits;

(B) the proximity of the beneficial use site to the dredge site; and

(C) the quantity and quality of the dredged material and its suitability for beneficial use.

Compliance: The proposed placement area addressed in the accompanying EA will result in the beneficial use of a significant quantity of the dredged material to be excavated during maintenance of the GIWW. Existing placement areas also will continue to be used for discharge of the dredged material from segments of the channel where beneficial uses have not been identified.

(3) Examples of the beneficial use of dredged material include, but are not limited to:

(A) projects designed to reduce or minimize erosion or provide shoreline protection;

(B) projects designed to create or enhance public beaches or recreational areas;

(C) projects designed to benefit the sediment budget or littoral system;

(D) projects designed to improve or maintain terrestrial or aquatic wildlife habitat;

(E) projects designed to create new terrestrial or aquatic wildlife habitat, including the construction of marshlands, coastal wetlands, or other critical areas;

(F) projects designed and demonstrated to benefit benthic communities or aquatic vegetation;

(G) projects designed to create wildlife management areas, parks, airports, or other public facilities;

(H) projects designed to cap landfills or other waste disposal areas;

(I) projects designed to fill private property or upgrade agricultural land, if cost-effective public beneficial uses are not available; and

(J) projects designed to remediate past adverse impacts on the coastal zone.

Compliance: See Subsections d(1) and d(2), above.

(e) If dredged material cannot be used beneficially as provided in subsection (d)(2) of this section, to avoid and otherwise minimize adverse effects as required in subsection (a) of this section, preference will be given to the greatest extent practicable to disposal in:

(1) contained upland sites;

(2) other contained sites; and

(3) open water areas of relatively low productivity or low biological value.

Compliance: All PAs used in this project are previously-designated sites or beneficial uses sites that meet the requirements in subsections d(1) and d(2), above.

(f) For new sites, dredged materials shall not be disposed of or placed directly on the boundaries of submerged lands or at such location so as to slump or migrate across the boundaries of submerged lands in the absence of an agreement between the affected public owner and the adjoining private

owner or owners that defines the location of the boundary or boundaries affected by the deposition of the dredged material.

<u>Compliance</u>: Prior to designation of new placement areas, the sites will be fully coordinated with appropriate State and Federal agencies and interested parties. Prior to use, all appropriate real estate requirements will be satisfied.

Coastal Coordination Council

P.O. Box 12873 ♦ Austin, Texas 78711-2873 ♦ (800) 998-4GLO ♦ FAX (512) 475-0680

January 9, 2007

Mr. Richard L Hansen
Department of the Army
Galveston District, Corps of Engineers
PO Box 1229
Galveston Texas 77553-1229

Re: **Beneficial Use of Dredged Material for Marsh Preservation in the Vicinity of Greens Lake, Galveston County, Texas.**
CMP#: 07-0064-F2

Dear Mr. Hansen:

Pursuant to Section 506.20 of 31 TAC of the Coastal Coordination Act, the project referenced above has been reviewed for consistency with the Texas Coastal Management Program (CMP).

It has been determined that there are no significant unresolved consistency issues with respect to the project. Therefore, this project is consistent with the CMP goals and policies.

Sincerely,

Tammy S. Brooks
Consistency Review Coordinator
Texas General Land Office

cc: Rob Hauch, COE

APPENDIX F

Distribution of the Draft Environmental Assessment

Distribution of the Draft Environmental Assessment

State Agencies

Executive Director
Texas Parks and Wildlife Department
4200 Smith School Road
Austin, Texas 78744

Director, Coastal Division
General Land Office
1700 North Congress
Austin, Texas 78711

Woody Woodrow
Regional Program Leader, Resource Protection Division
Texas Parks and Wildlife Department
1502 FM 517 E.
Dickinson, TX 77539

Honorable Rick Perry
Governor of Texas
P.O. Box 12428
Austin, Texas 78711

Leslie Savage
Railroad Commission of Texas
Environmental Services
P.O. Drawer 12967, Capitol Station
Austin, Texas 78711

Tom Adams
Governor's Office of Budget & Planning
State Single Point of Contact
1100 San Jacinto, Room 441A
Austin, Texas 78701

State Historic Preservation Officer
Texas Historical Commission
P.O. Box 12276
Austin, TX 78711-2276

Carl Masterson
Houston-Galveston Area Council
3555 Timmons, Ste. 500
Houston, Texas 77027

Chairman
Texas Commission on Environmental Quality
P.O. Box 13087
Austin, Texas 78711-3087

Galveston Bay National Estuary Program
17041 El Camino Real, Ste. 210
Houston, Texas 77058

Mr. Mark Fisher
TCEQ-MC150
P.O. Box 13087
Capitol Station
Austin, Texas 78711-3087

Gary Powell
Texas Water Development Board
Environmental Systems Section
P.O. Box 13231
Austin, Texas 78711

Mr. Raul Cantu
Texas Department of Transportation
P.O. Box 149217
Austin, TX 78714-9217

Mr. Lee Munz, Planner
TX State Soil and Water Conservation Board
P.O. Box 658
Temple, Texas 76503-0658

Mr. Robert W. Spain
Assistant Director for Resource Protection
Texas Parks & Wildlife Department
4200 Smith School Road
Austin, Texas 78744-3291

Federal Agencies

Area Supervisor
National Marine Fisheries Service
Environmental Assessment Branch
4700 Avenue U
Galveston, Texas 77550

David M. Bernhart
Assistant RA for Protected Resources
Southeast Regional Office
National Marine Fisheries Service
263 13th Avenue South
St. Petersburg, FL 33701-5511

Miles M. Croom
Assistant Regional Administrator
Habitat Conservation Division
National Marine Fisheries Service
263 13th Avenue South
St. Petersburg, FL 33701-5511

Jane B. Watson, Ph.D.
Chief, Ecosystems Protection Branch
U.S. Environmental Protection Agency
1445 Ross Avenue
Dallas, Texas 75202-2733

Mike Jansky, P.E.
NEPA Compliance Section (6EN-SP)
U.S. Environmental Protection Agency
1445 Ross Avenue
Dallas, Texas 75202-2733

Field Supervisor
U. S. Fish and Wildlife Service
17629 El Camino Real, Suite 211
Houston, Texas 77058

Mr. Eddie Seidensticker
Natural Resource Conservation Service
P.O. Box 819
Anahuac, TX 77514

Indian Tribes and Nations

Ms. Donna Stern-McFadden
Tribal Historic Preservation Officer
Mescalero Apache Tribe
P.O. Box 227
Mescalero, NM 88340-

Mr. Anthony Street
Tonkawa Tribe of Indians of Oklahoma
P.O. Box 70
Tonkawa, OK 74653-

Ms. Debbie Thomas
Historic Preservation Officer
Alabama-Coushatta Tribe of Texas
571 State Park Road 56
Livingston, TX 77351-

Other Interested Parties

Belaire Environmental, Inc.
P.O. Box 741
Rockport, Texas 78381

APPENDIX G

Comments And Responses To The Draft Environmental Assessment

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southeast Regional Office
263 13th Avenue S
St. Petersburg, Florida 33701-5511

November 28, 2006

District Engineer
U.S. Army Engineer District, Galveston
ATTN: CESWG-PE-PR
P.O. Box 1229
Galveston, Texas 77553-1229

Dear Sir:

The NOAA National Marine Fisheries Service (NMFS) has reviewed the November 2006 draft Environmental Assessment for the beneficial use (BU) of dredged material for marsh preservation in the vicinity of Greens Lake, Galveston County, Texas. The Corps of Engineers (COE) proposes to create a new placement area to be designated "PA 62-A" on the northwest side of the Gulf Intracoastal Waterway (GIWW). The proposed BU of dredged material project is designed to offset historic marsh loss caused by subsidence and erosion within the project area by creating elevations suitable for the establishment of coastal marsh. Approximately 295,000 cubic yards of material will be available for BU on an average dredging cycle of every six years. Prior to each dredging cycle, an assessment will be made to determine if the material is needed for BU in PA 62-A or if it will be disposed of in the traditional placement areas.

Based upon the information in the Draft Environmental Assessment, we concur with the COE's essential fish habitat (EFH) assessment that the proposed BU of dredged material project will not significantly impact EFH. The project has the potential to restore significant areas that have been designated as essential fish habitat for Federally managed fisheries and will provide positive benefits to living marine resources. Therefore, NMFS has no EFH conservation recommendations to provide regarding the currently proposed plans and no further EFH consultation with NMFS is required. We look forward to assisting the COE in the development of BU plans and specifications for each dredging cycle in this reach of the GIWW.

If we may be of further assistance, please contact or Mr. Rusty Swafford of our Galveston Facility at (409) 766-3699.

Sincerely,

Miles M. Croom
Assistant Regional Administrator
Habitat Conservation Division

Miles M. Croom
Assistant Regional Administrator
Habitat Conservation Division
National Marine Fisheries Service
Southeast Regional Office
263 13th Avenue S
St. Petersburg, Florida 33701-5511

COMMENT NO. RESPONSE

Thank you for your letter.

1. Discharge points will be coordinated with your agency prior to discharge operations in this area.

devon

Devon Energy Corporation
1200 Smith Street
Houston, Texas 77002

December 18, 2006

District Engineer
U.S. Army Engineer District, Galveston
ATTN: CESWG-PE-PR
P.O. Box 1229
Galveston, TX 77553-1229

Re: Comments on Proposed Beneficial Use (B.U.) Area, Greens Lake, Draft Environmental Assessment (EA)

Dear Sir:

Devon Energy has reviewed the Environmental Assessment (EA) for the proposed project. It appears that the southeast corner of the B.U. site is in close proximity to a proposed Devon dredging, drilling, and B.U. project in Greens Lake. Devon's project is described in Corps of Engineers' permit 23572. The EA does not contain sufficient detail to determine whether the proposed Corps of Engineers' project conflicts with Devon's proposed activities. Can you provide detailed plan and section drawings which clearly show the horizontal and vertical extent of the Corps' B.U. site? Can you also provide a timetable as regards the initial maintenance dredging that will use the proposed B.U. site?

Devon has spent the past three years pursuing and obtaining COE permit no. 23572. We want to be sure that the proposed Corps' B.U. site will not affect Devon's authorized project plans.

I look forward to hearing from you.

Sincerely,

Shane R. Bird
Sr. Geological Advisor
Devon Energy Corporation
1200 Smith Street
Houston, Texas 77002
713-286-5818
shane.bird@dvn.com

Shane R. Bird
Sr. Geological Advisor
Devon Energy Corporation
1200 Smith Street Houston, Texas 77002

COMMENT NO. RESPONSE

Thank you for your letter.

1. A review of your permit was conducted to ascertain any potential conflicts. The permitted feature nearest the proposed BU site is the rock breakwater. Prior to any placement of dredged material, discharge points will be determined on a case-by-case basis. These points will be selected so as not to inhibit proposed breakwater construction. Similarly, dredged material placement subsequent to breakwater construction will be conducted in a manner that would not impact the breakwater. Therefore, impacts to any permitted activities are not anticipated.

December 20, 2006

District Engineer
U.S. Army Engineer District- Galveston
Attn: Carolyn Murphy, CESWG-PE-PR
P.O. Box 1229
Galveston, Texas 77553-1229

Re: Draft Environmental Assessment, Beneficial Use of Dredged Material for Marsh Preservation in the Vicinity of Greens Lake, Galveston County, Texas

Texas Parks & Wildlife Department (TPWD) has reviewed the above referenced Draft Environmental Assessment (DEA) dated November 2006. TPWD is generally supportive of the beneficial use of dredged material (BU) to restore, enhance or protect degraded or threatened marsh systems along the Texas coast. TPWD agrees that positive environmental benefits could be derived BU along the proposed Gulf Intracoastal Waterway (GIWW) shoreline. However, the DEA lacks specific details and clarity to determine if the proposed project will result in positive benefits.

Sections 1.1 and 1.2 indicate the primary purpose of this project is to construct a berm along the GIWW to prevent saltwater intrusion from the GIWW into freshwater and brackish habitats beyond the shoreline. These sections also indicate subsidence and saltwater intrusion has resulted in a transition to a more saline condition. This is an oversimplification of processes that have led to documented marsh loss on the northern shoreline of West Bay. The primary culprit for marsh loss in this region of the coast is land surface subsidence caused by the withdrawal of subsurface fluids. This subsidence facilitated an increase in tidal exchange, which led to a plant community transition from intermediate and brackish marsh to saline marsh and a further increase in openwater. 1

The proposed project will have no impact on salinity intrusion into this marsh system. A majority of the tidal waters enters this marsh system via tidal bayous emanating from Greens and Caranchua Lakes and the volume of maintenance material to be beneficially used is not likely to affect the tidal prism of this marsh system. The entire project area is subject to irregular tidal inundation; therefore the potential benefit to freshwater fish mentioned in section 4.3 is improbable. The project can have positive impacts by addressing physical marsh loss through increasing surface elevation in openwater areas that formed through marsh subsidence and increasing the elevation or drowning marsh. 2

As stated in the DEA , dredged material can also be used to slow erosion on the banks of the GIWW. Current erosion threatens to breach several marsh ponds in this vicinity. These marsh ponds are seasonally vegetated with the widgeon grass (*Ruppia maritima*), a submerged aquatic plant that provides nursery habitat for 3

commercially and recreationally important fishery species such as brown shrimp, blue crabs and red drum. Widgeon grass nutlets also provide a vital food source for migratory waterfowl that migrate through or to the Texas coast. Therefore, when placing dredged material in the vicinity of these ponds, the Corps should ensure that fine silts not enter these natural ponds. Excessive siltation can lead to increased turbidity and physical burial of seeds preventing germination and growth.

The potential area of affect in the DEA is unclear. The text states that dredged material is expected to impact marsh up to 250 feet beyond the discharge point. However, Figure 2 denotes a project area that extends approximately 1000 feet into the marsh. The text does not specify if the discharge points will be immediately adjacent to the GIWW, or if the discharge points will be placed at any point within the proposed beneficial use area. TPWD recommends that discharge points be placed throughout the project area as well immediately adjacent to the GIWW. The greatest amount of marsh loss is occurring beyond 250 feet from the GIWW bank. Placing discharge points within the marsh will maximize the potential marsh restoration benefits of this project. 4

Texas Parks & Wildlife Department is supportive of the goals of marsh restoration and protection associated with this project. TPWD requests the Corps of Engineers coordinate directly with TPWD prior to and throughout the dredging cycles that will utilize this beneficial use area. Adequate coordination will increase the likelihood that dredged material from this section of the GIWW can be a resource utilized to restore the degraded marshes on the northern shoreline of West Bay. 5

Questions can be directed to Jamie Schubert in Dickinson at 281-534-0135.

Sincerely,

for Jarrett (Woody) Woodrow
Director of Coastal Conservation Program
Coastal Fisheries Division

JOW:WJS

Jarrett (Woody) Woodrow
Director of Coastal Conservation Program
Coastal Fisheries Division
Texas Parks and Wildlife
4200 Smith School Road
Austin. Texas 78744-3291

COMMENT NO.	RESPONSE

Thank you for your letter.

1. Comment noted.

2. Even if attempts to control salinity intrusion are unsuccessful, there is enough flexibility in the proposed plan that would allow the dredged material to be used to increase the elevations of drowning marshes or fill open-water areas.

3. Prior to any placement of dredged material, discharge points within the proposed BU site will be determined in coordination with resource agencies, and as indicated in Section 1.2, material will be prevented from flowing into ponds, lakes, bayous, streams, or ditches, unless ecologically beneficial for these features to receive the material.

4. The area delineated in the Environmental Assessment represents the limits of discharge, so the discharge point can be positioned anywhere within this area. However, there are some financial constraints that prohibit any increase in incremental costs over historical discharge practices that would be incurred. So, care must be taken to locate discharge points that would not result in additional costs, unless a non-Federal sponsor can be identified to share the extra costs.

5. As indicated in Section 1.2, coordination with resource agencies, including your agency, will be conducted to determine discharge points.