U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL MARINE FISHERIES SERVICE
SILVER SPRING, MARYLAND

ENVIRONMENTAL ASSESSMENT OF LAKE SALVADOR SHORELINE PROTECTION DEMONSTRATION CWPPRA PROJECT BA-15, Phase II

ST. CHARLES PARISH, LOUISIANA

JUNE 1997

PREPARED BY:

St. Charles Parish
Coastal Zone Management Section

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1.0 INTRODUCTION

This Environmental Assessment (EA) evaluates the impacts of a project to demonstrate the effectiveness of different breakwater structures and shoreline reconstruction in halting erosion and promoting sediment deposition along the central portion of the northwestern Lake Salvador shoreline. Lake Salvador Shoreline Protection Demonstration Phase II, a supplement project to BA-15, adds an additional method of construction to the original demonstration project, as well as an additional 9000 linear feet of shoreline protection.

This project is part of the Coastal Wetlands Planning, Protection and Restoration Act (Pub. L. No. 101-646, Title III-CWPPRA) made law in 1990. Five federal agencies and the State of Louisiana have combined in a Task Force to implement the "comprehensive approach to restore and prevent the loss of coastal wetlands in Louisiana" as mandated by CWPPRA. The five federal agencies involved are: The U.S. Department of the Army, the U.S. Department of Commerce, the U.S. Department of the Interior, the U.S. Department of Agriculture, and the U.S. Environmental Protection Agency (U.S. EPA). The Lake Salvador Shoreline Protection Demonstration Project is included on the Third Annual Priority Project List as a demonstration project (Louisiana Coastal Wetlands Conservation and Restoration Task Force, 1993) and will soon be ready for implementation.

The Lake Salvador Shoreline Protection Demonstration Project will test the effectiveness of various constructed breakwaters to provide shoreline protection in soils having highly organic, unconsolidated sediments with poor load bearing capacities that cannot support traditional shoreline stabilization structures. Phase I of this project will construct four different types of breakwaters in Lake Salvador: grated apex structures, geotextile tubes, angled timber fences and vinyl sheet piles. Additionally this phase includes a dredge and fill section to protect and refurbish broken shoreline. Phase II of this project adds a rock breakwater to the structures being evaluated. This phase will allow direct comparison of the four new structures and dredge and fill from Phase I to the traditionally accepted technique used in Phase II.

1.1 Technical Background

The Louisiana Coastal Zone contains 7.9 million acres of which about 3 million acres are coastal marshes. These marshes currently are being converted to open water at a rate of 34.9 square miles per year (Barras *et al.*, 1994). This rate is similar to that measured in previous years by Gagliano *et al.*, 1981 and DeLaune *et al.*, 1991. This conversion is the result of natural and anthropogenic factors that have altered the hydrology and physical integrity of these wetlands and still persist today.

The primary pattern of land loss in the Louisiana Coastal Zone results from the submergence of coastal marshes and subsequent conversion to open water (Turner, 1990). Generally, submergence occurs when the rate of vertical accretion, including mineral sediment deposition and organic matter accumulation, does not equal or exceed the rate of geologic subsidence and the eustatic sea level rise. Consequently, these marshes begin to break apart and create open shallow ponds within the marsh interior. This ponding increases until the entire marsh area has converted to open water.

Coastal marshes are constructed and nourished by hydrological processes that influence site-specific chemical, physical and biological processes which affect plant growth and mineral sediment deposition (Mendelssohn and Burdick, 1988). Because these processes are interrelated, the site-specific factors influencing conversion of marsh to open water may vary widely and are difficult to assess.

Natural factors associated with coastal land loss include subsurface compaction and subsidence, eustatic sea level rise, physical substrate scouring and erosion, and periodic tropical cyclonic storms (Craig *et al.*, 1979; Boesch *et al.*, 1983). In addition, site-specific natural influences such as increased herbivore activity can promote land loss within coastal marshes (Nyman *et al.*, 1993b).

Anthropogenic activity accounted for 26 percent of total wetland loss within Louisiana between 1955 and 1978 (Turner and Cahoon, 1988). These direct losses were caused by dredging canals and creating spoil banks, draining land, and expanding agricultural and urban areas.

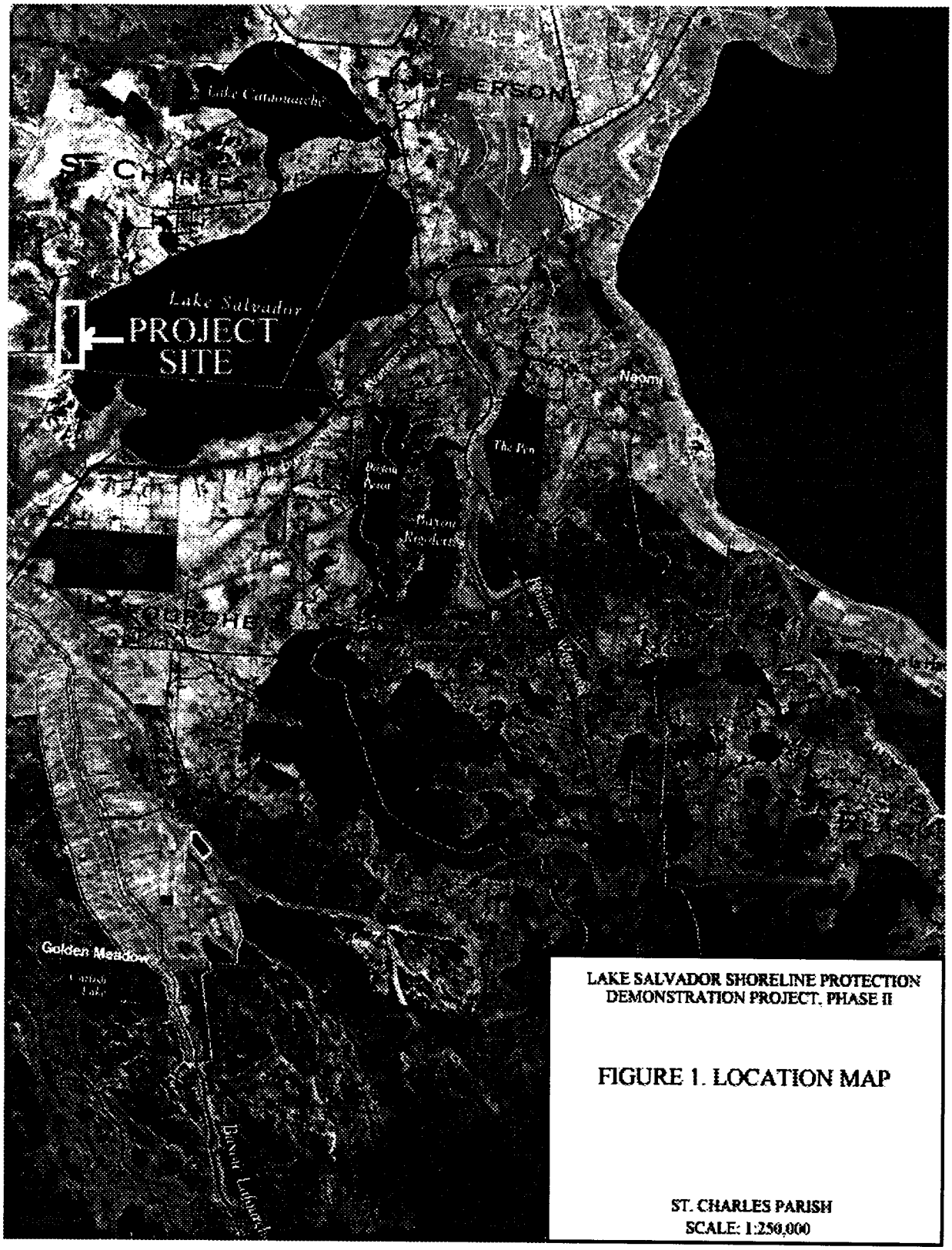
Turner and Cahoon (1988) attribute indirect causes of wetland loss to (1) temporal trends in estuarine salinity, (2) saltwater intrusion in waterways, (3) saltwater movement in marshes, (4) plant responses to salinity change and submergence, and (5) subsidence, water level rise and sediments. Indirect losses were exacerbated by levee construction for flood protection along the Mississippi River (Templet and Meyer-Arendt, 1988), extensive canal construction associated with oil and gas exploration (Turner *et al.*, 1982) and navigation channel development and maintenance dredging. These large-scale perturbations altered existing patterns of surface hydrology and sediment distribution over large areas and facilitated saltwater intrusion into coastal marshes.

1.1.1 Barataria Basin

The Barataria Basin is essentially the western and southern floodplain of the lower Mississippi River. The Lake Salvador Shoreline Protection Demonstration Project is within the central Barataria Basin and is located 22.4 miles southwest of New Orleans, Louisiana (Figure 1).

The Barataria Basin forms a 1,565,000-acre triangle with its apex in the north at the junction of Bayou Lafourche and the Mississippi River. The eastern and western boundaries of the basin are formed by the levees of the Mississippi River and Bayou Lafourche, respectively, with the Gulf of Mexico forming the southern boundary (Louisiana Coastal Wetlands Conservation and Restoration Task Force, 1993).

The Barataria Basin forms part of a larger estuarine system referred to as the Barataria-Terrebonne Estuary (Barataria-Terrebonne National Estuary Program, 1991). This system is characterized by broad, near sea level wetlands situated between a series of slightly elevated ridges which are levees of distributary channels of the lower Mississippi River. Their slightly elevated position in the landscape is a result of rapid deposition of coarse mineral sediments during seasonal flooding events. The estuaries represent a lower, interdistributary position in the landscape which has been continuously leveled by the slow even deposition of fine silt and clay particles and light organic debris following seasonal flooding events (Conner and Day, 1987).



LAKE SALVADOR SHORELINE PROTECTION
DEMONSTRATION PROJECT, PHASE II

FIGURE 1. LOCATION MAP

ST. CHARLES PARISH
SCALE: 1:250,000

Land loss within the Barataria Basin was estimated at 5,700 acres per year between 1973 and 1990 (Louisiana Coastal Wetlands Conservation and Restoration Task Force, 1993). The Mississippi River's hydrologic influence on the geomorphology and ecology of the Barataria Basin combined with the river's historical use as a primary transportation route has significantly influenced this land loss rate during the past 50 years.

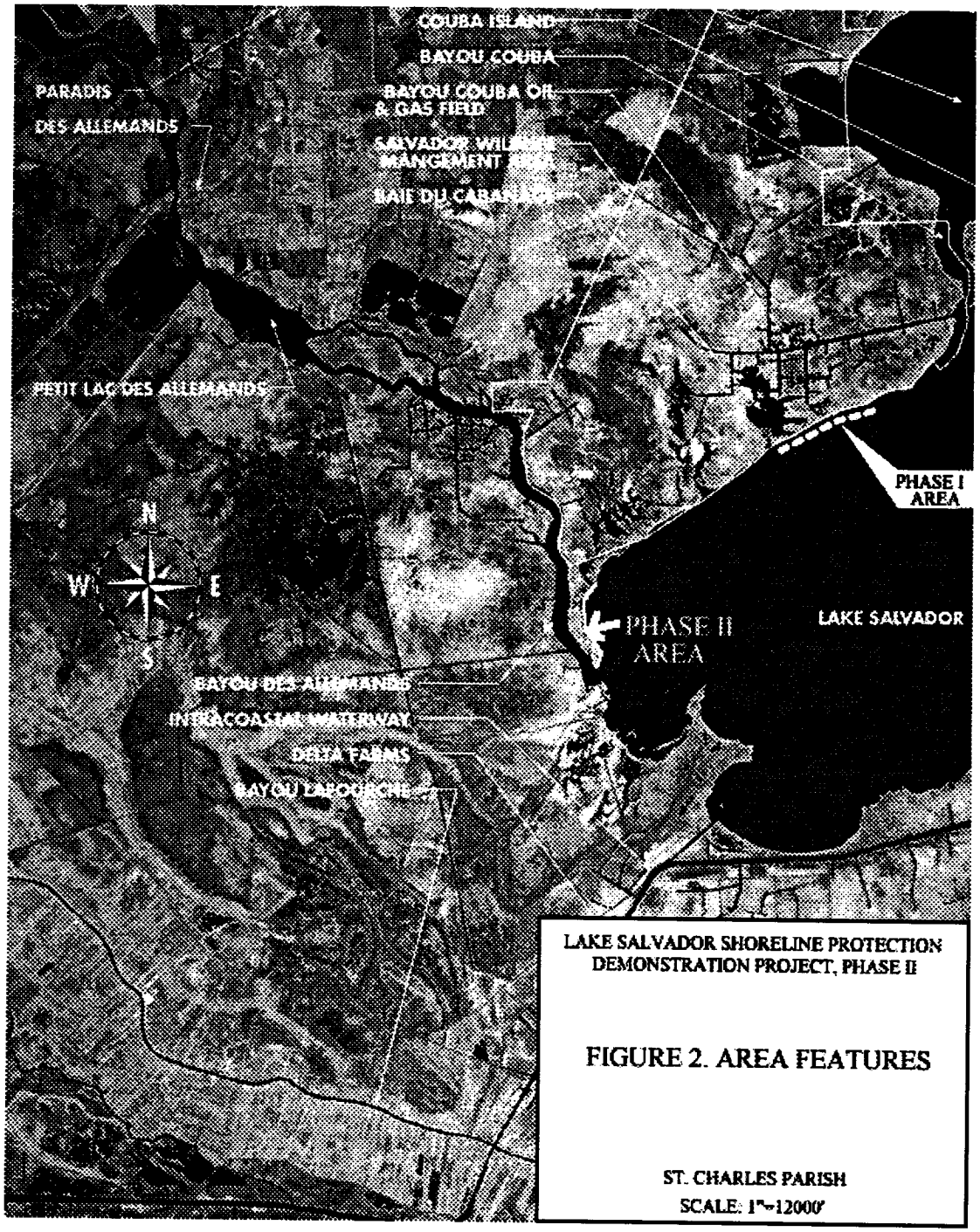
The current channel shifting within the Mississippi River deltaic plain from the Plaquemines-Modern delta lobe to the prograding Atchafalaya Delta lobe initiated a natural process of delta lobe deterioration within the Barataria Basin (Neil and Deegan, 1986). During this phase, the hydrologic influences of freshwater that have constructed wetlands in the Barataria Basin are gradually replaced by marine influences of the Gulf of Mexico such as tides, gulf water levels, and wind-driven resuspension (Madden, et al, 1988). As the freshwater influx slowly decreases, the existing freshwater marshes slowly convert to more saline marshes as their hydrologic influences become replaced by marine influences.

In addition to natural processes, anthropogenic activities such as levee construction, dredging canals, creating spoil banks, and draining for agriculture land have restricted the influx of fresh river water into the upper Barataria Basin, thus accelerating the infiltration of salt water (Turner and Cahoon, 1988). The transition of freshwater marshes to intermediate and saltwater, that accompanies natural delta lobe deterioration, has been accelerated as a result of man's activities.(Neil and Deegan, 1986). Although saltwater intrusion remains a function of both natural and man-made causes, accelerated saltwater intrusion into historically brackish and intermediate marshes resulting from channelization, levee construction, erosion, or other related activities is viewed as a preliminary indication of marsh submergence and conversion to open water (Craig *et al.*, 1979). This process has occurred throughout the lower Barataria Basin which has experienced some of the highest rates of land loss in the Louisiana Coastal Zone (Barras *et al.*, 1994).

1.1.2 Lake Salvador

Lake Salvador, a shallow 44,800-acre freshwater lake, is tidally influenced and located within the central portion of the Barataria Basin. Although freshwater inputs into the upper basin have been limited by flood control levees and the closure of Bayou Lafourche at Donaldsonville, high rainfall has maintained the primarily freshwater marsh ecology within the project area (Madden *et al.*, 1988). The southeastern portion of the lake is affected by low salinity waters introduced via Bayous Perot and Rigolettes and the Barataria Bay Waterway. Lake Salvador is part of a dominant water exchange route between the upper and lower basin which will be expanded by the proposed Davis Pond Freshwater Diversion Project that will reintroduce Mississippi River water into the upper Barataria Basin (Louisiana Coastal Conservation and Restoration Task Force, 1993).

Lake Salvador and the surrounding area offer significant recreational benefits (Figure 2). Sections of the Lake Salvador shoreline are part of the 31,000-acre Salvador Wildlife Management Area (SWMA) to the west and the 12,400-acre Jean Lafitte National Historic Park to the east. Surrounding



LAKE SALVADOR SHORELINE PROTECTION DEMONSTRATION PROJECT, PHASE II

FIGURE 2. AREA FEATURES

ST. CHARLES PARISH

SCALE: 1"=12000'

the lake are numerous navigational waterways that provide access to the lower basin and Gulf of Mexico, including Bayou Segnette Waterway, the Barataria Bay Waterway, and the Gulf Intracoastal Waterway. Private fishing camps are located along the shoreline of Lake Salvador and its adjacent waterways. Canal dredging for oil and gas exploration has occurred along the shores and within the lake; the largest field is the Bayou Couba Oil and Gas Field near the northeast shoreline of the lake.

Land loss in the Lake Salvador area is primarily a result of shoreline retreat caused by wave-generated erosion. The shoreline retreat rate averages 13 feet per year for Lake Salvador (Figure 3) and in some areas could widen waterways that would accelerate tidal scouring within the lake or breach into adjacent marshes and accelerate ponding (Louisiana Coastal Wetlands Conservation and Restoration Task Force, 1993). Thus, protection of the Lake Salvador shoreline is a key factor to reducing the rate of land loss in this area.

1.2 Project Location

The Lake Salvador Shoreline Protection Demonstration Project is located on the northwest shoreline of Lake Salvador in the Barataria Basin in Section 37, Township 16 South, Range 21 East, and Section 41, Township 15 South, Range 21 East, St. Charles Parish, Louisiana (Figure 3). The site is approximately 22.4 miles south-southwest of New Orleans, Louisiana.

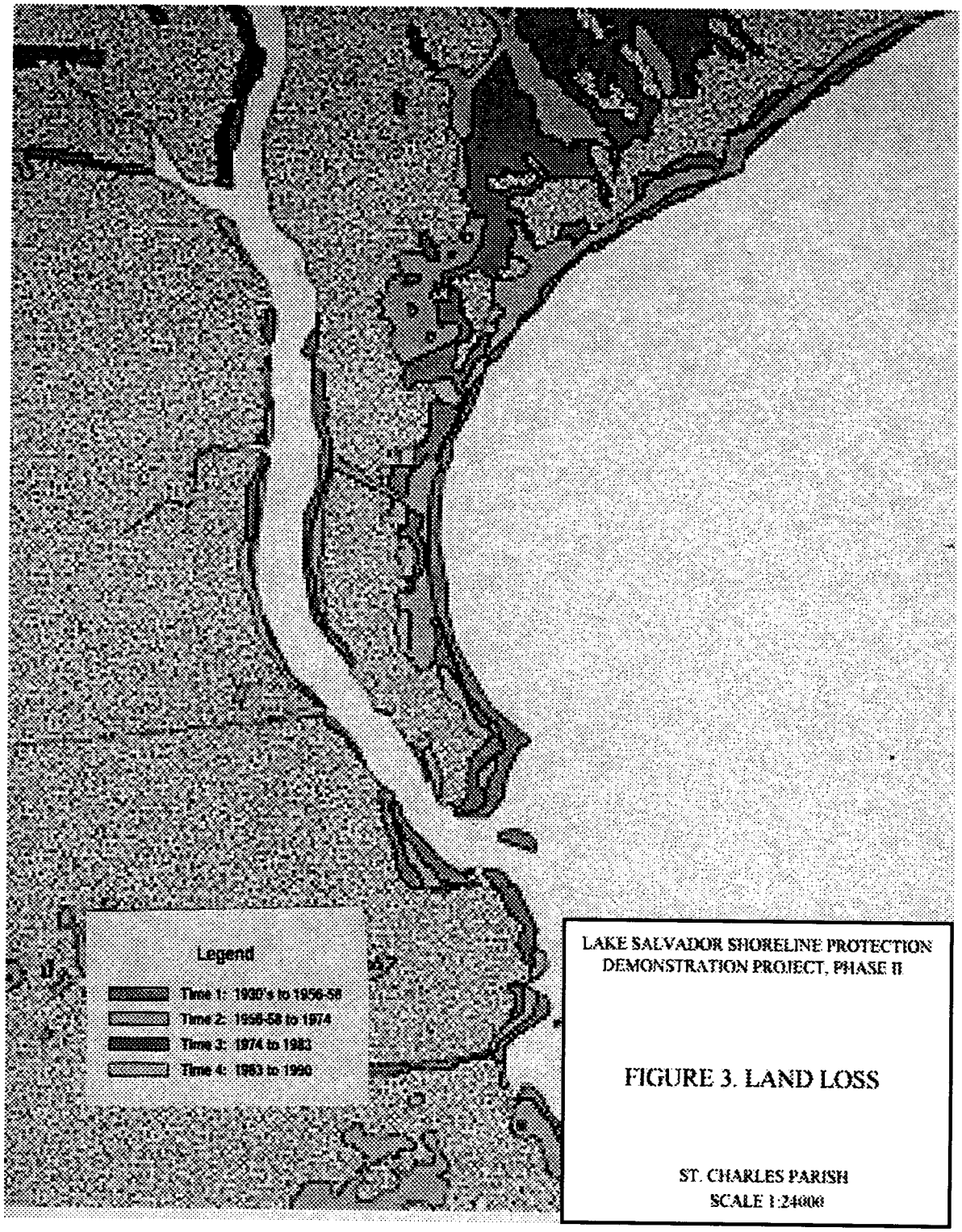
1.3 Project Funding

Seventy-five percent of the funding for this demonstration project is provided through CWPPRA with 25 percent cost sharing by the State of Louisiana Department of Natural Resources (LDNR). In addition St. Charles Parish is providing in-kind services for the completion of the necessary permits, landrights and Environmental Assessment. The project is administered by cooperative agreements between the U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service (NMFS) and LDNR.

2.0 PURPOSE AND NEED FOR ACTION

2.1 Purpose

A major goal of CWPPRA is to "restore and prevent the loss of coastal wetlands in Louisiana." The act also provides for "small-scale projects necessary to demonstrate the use of new techniques or materials for coastal wetlands restoration." The purpose of the Lake Salvador Shoreline Protection Demonstration Project is to evaluate the effectiveness of various constructed breakwaters and dredged material to provide shoreline protection in areas having highly organic, unconsolidated sediments. In phase II the rock breakwater structure will be constructed in 3 feet of water approximately 100 to 200 feet from the shoreline and will be evaluated for its ability to re-establish the historical shoreline by encouraging shoreline sediment deposition and reducing the erosive activity associated with wind-generated waves and tidal scouring, and will be compared to the other methods implemented in Phase I of the project



LAKE SALVADOR SHORELINE PROTECTION
DEMONSTRATION PROJECT, PHASE II

FIGURE 3. LAND LOSS

ST. CHARLES PARISH
SCALE 1:24000

2.2 Need for Action

The Lake Salvador Shoreline Protection Demonstration Project is one of four demonstration projects recommended by the Louisiana Coastal Wetlands Conservation and Restoration Task Force in 1993 and is the only such project designed to evaluate various shoreline protection structures and evaluate their cost effectiveness. The need to implement the Lake Salvador Shoreline Protection Demonstration Project is based on the potential to identify structures that can significantly reduce the loss of freshwater marsh by providing long-term shoreline protection of marsh ecosystems established on unconsolidated organic deposits. The potential success of the project could play an important role in contributing to the overall effort to reduce coastal land loss by improving the health and stability of fresh and intermediate marshes. In addition to the structures, the feasibility of shoreline reconstruction to retard lake expansion into adjacent open water areas will be assessed.

2.2.1 Preliminary Performance and Cost Analysis

The use of shoreline protection structures in Louisiana coastal wetlands having an unconsolidated organic substrate is a developing technology. The results of this demonstration project could be used to design and implement a full-scale shoreline restoration project in the same area or in other marshes having similar organic substrates and will be analyzed in close conjunction with the results of Phase I of this project.

2.2.2 Protection of Highly Productive Freshwater Marshes

The loss of freshwater marshes in the Louisiana Coastal Zone from 1956 to the present represents a significant natural resource loss. According to the Wetland Value Assessment (WVA) of the original Lake Salvador Shoreline Protection Demonstration Project, implementation would protect approximately 180 acres of freshwater marshes, benefit 130 acres of submerged aquatic vegetation and enhance 880 acres of coastal wetlands

2.3 Authorization

NMFS is the Federal sponsor for implementation of the Lake Salvador Shoreline Protection Demonstration Project. This project was included on the Third Priority Project List (Louisiana Coastal Wetlands Conservation and Restoration Task Force, 1992). Phase II of this project was authorized by the Task Force in October of 1996. NMFS' responsibility includes conducting an environmental evaluation and other activities required for final decision-making in compliance with the National Environmental Policy Act (NEPA) of 1969. To meet NEPA compliance requirements, an EA must be conducted for each wetland project site that is modified or restored. The Lake Salvador Shoreline Protection Demonstration Project Phase II, identified as BA-15 Phase II in the CWPPRA Restoration Plan, is located in St. Charles Parish. It is classified as a demonstration project (Louisiana Coastal Wetlands Conservation and Restoration Task Force, 1993).

3.0 ALTERNATIVES INCLUDING PROPOSED ACTION

The project site and scope were identified by the Louisiana Coastal Wetlands Conservation and Restoration Task Force (1993) and are reviewed in the Third Priority Project List. An LDNR-contracted Engineering Design Report and Engineering Summary for the Lake Salvador Shoreline Protection Demonstration Project was prepared by C-K Associates, Inc. (C-K Associates) in June 1995 (Contract No. DNR 25030-95-22).

Originally, the Lake Salvador Shoreline Protection Demonstration Project was designed to improve the health of 4,070 acres of interior marsh by restoring the historical shoreline along 4.2 miles of shoreline northwest of Bayou Des Allemands utilizing two different designs of timber pylon breakwater structures. The proposed Lake Salvador Shoreline Protection Demonstration Project is an alternative to the original CWPPRA project BA-15 that was submitted to the Louisiana Coastal Wetlands Conservation and Restoration Task Force and Phase II is a supplemental project to BA-15. The selection of the additional demonstration alternative was based on the need to incorporate an additional structure type that has design potential to accomplish the project goals. Therefore, the alternative analysis of this EA will be limited to the no- action alternative and the preferred alternative. The final location of the second phase of this demonstration project was selected to 1) take advantage of dealing with only one land owner, Box Energy Corp., 2) attempt a reduction of shoreline erosion in an area of considerable public interest.

3.1 No-Action Alternative

The no-action alternative would deprive us of the opportunity to evaluate the cost effectiveness of various types of structures and placement of dredged material in protecting the shoreline of Lake Salvador. Failure to implement the Lake Salvador Shoreline Protection Demonstration Project would not satisfy the need to develop breakwater structures that provide long-term shoreline protection in freshwater marshes having unconsolidated organic sediments in the Louisiana Coastal Zone. The no-action alternative is contrary to the recommendations of the Louisiana Coastal Wetlands Restoration Plan and the intent of the Task Force. Also, no action would not be in concert with recommendations of other long-term plans for protecting or restoring Louisiana's coastal wetlands (Edwards *et al.*, 1995; Gagliano, 1994; van Heerden, 1994).

Due to the need to protect our coastal wetlands as evidenced by the public funding through the CWPPRA, the no-action alternative was not the preferred alternative.

3.2 Preliminary Alternative

The original demonstration project was to construct four experimental types of breakwater structures on the western edge of Lake Salvador, between Baie du Chactas and Bayou Des Allemands. The demonstration project was moved northeast along the Lake Salvador shoreline because of the questionable liability arising from the use of untested structure types near privately owned property. The preliminary alternative, therefore, was to construct the four test structures at a site that is more isolated and completely owned by a state agency, the Louisiana Department of Wildlife and Fisheries. This alternative was appended because of public concerns and official objection from St. Charles Parish.

3.3 Preferred Alternative

The preferred alternative is to add a second Phase to the BA-15 project, one which addresses the original project area. The additional structure type is to be a rock breakwater (Figure 4), which has been previously shown to reduce wave energies, thus reducing shoreline erosion, according to the Louisiana Department of Natural Resources. This alternative satisfied the concerns of local citizens and officials. The use of shell reinforcement has been tried in other shoreline areas of Lake Salvador, this alternative was eliminated from consideration because of unsatisfactory results. Because Phase II of this project involves a more tested alternative type, liability is much lower. The conditions of the area are similar to those of Phase I. Results of this phase can therefore be compared the results of Phase I. The Lake Salvador Shoreline Protection Demonstration Project Phase II provides an opportunity to evaluate the effectiveness and costs associated with one additional structure type in reducing shoreline erosion and promoting sediment deposition along the shoreline of Lake Salvador.

4.0 AFFECTED ENVIRONMENT

The Lake Salvador Shoreline Protection Demonstration Project is located within the Barataria Basin in St. Charles Parish along the central portion of the northwestern Lake Salvador shoreline. This shoreline protection demonstration project would begin at the mouth of Bayou Des Allemands and extend northward for 9000 feet, parallel to shore, in the shallow waters of the lake (Figure 5).

The Barataria Basin, bounded by Bayou Lafourche on the west and the Mississippi River on the east, is a large estuarine system. Due to flood control and hurricane protection levees along the Mississippi River and Bayou Lafourche, rainwater is the only source of freshwater to the basin (Hartman *et al.*, 1988). Barataria Basin varies in habitat from freshwater wetland forests in the upper basin to salt marshes along the Gulf of Mexico (Conner *et al.*, 1986). Lake Salvador, located in the central portion of the Barataria Basin, receives freshwater runoff from the upper areas, but also is influenced by the northward movement of brackish water from the Gulf of Mexico via Bayou Perot and the Barataria Bay Waterway.

Jean Lafitte National Historical Park, managed by the U.S. Department of Interior National Park Service, is located along the northeastern shoreline of Lake Salvador. The SWMA is located in the project vicinity and is managed by the Louisiana Department of Wildlife and Fisheries. The remaining perimeter of the lake is privately owned. Breakwater structures will be constructed in the shallow waters of Lake Salvador and will protect freshwater marsh containing small marsh ponds. Dredged material will be placed to reestablish the shoreline in two areas and create marsh elevations.

4.1 Physical Environment

The long-term processes of Mississippi River delta building and deterioration has influenced the project area's physical environment. In the early 1900s, land losses overtook land accretion and the Louisiana Coastal Zone began losing land at a high rate. Causes for this loss range from various natural phenomena (subsidence, storm-induced wave erosion, and subsurface geologic control) to man's activities (dredging channels for navigation and oil and gas access, channelization of streams, and levee construction). The average land loss for Cutoff, Hahnville and New Orleans Quadrangles, which include the western shoreline of Lake Salvador, was 0.22, 0.11 and 0.17 square miles per year respectively for 1938-1958; 0.53, 0.57

LAKE SALVADOR SHORELINE PROTECTION
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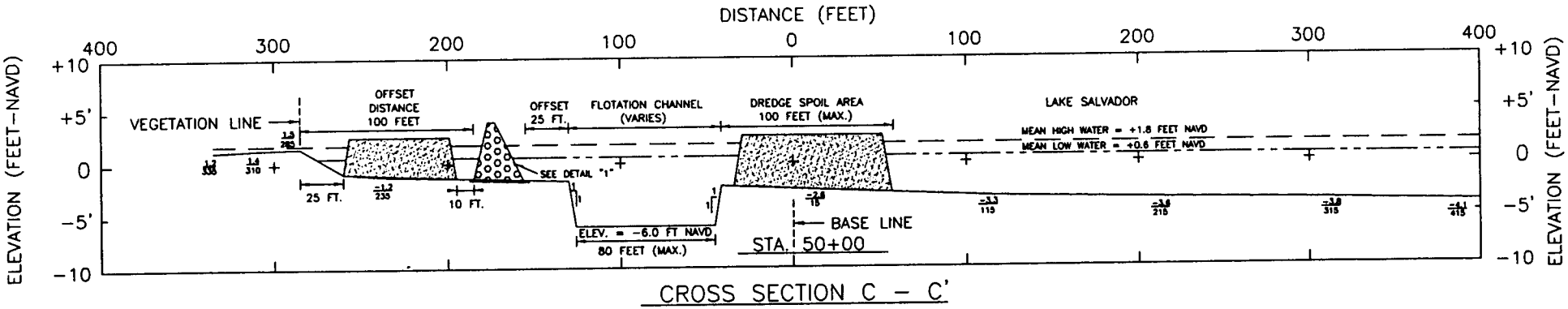
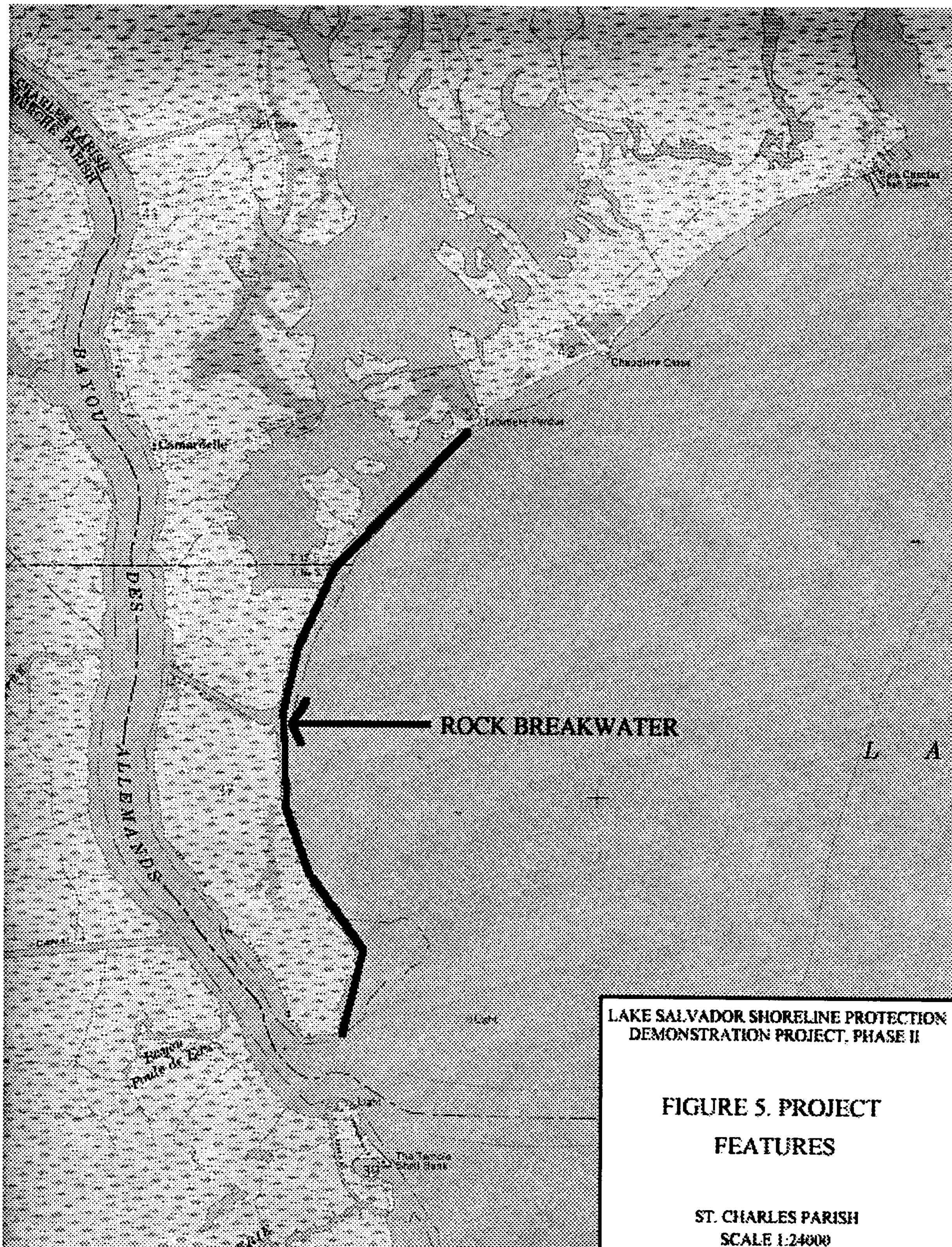
ST. CHARLES PARISH

FIGURE 4. TYPICAL CROSS SECTION



CROSS SECTION C – C'



LAKE SALVADOR SHORELINE PROTECTION DEMONSTRATION PROJECT, PHASE II

FIGURE 5. PROJECT FEATURES

ST. CHARLES PARISH
SCALE 1:24000

and 0.26 for 1958-1974; and 0.39, 0.43 and 0.14 for 1974-1983 (Britsch and Kemp, 1990). Barras and others (1994) confirmed the land losses in this area.

Shoreline erosion rates reported in the Louisiana Coastal Wetlands Conservation and Restoration Task Force (1993) for the project area are approximately 13 feet per year. Several areas of the Lake Salvador shoreline have breached (May and Britsch, 1987) which resulted in large areas of interior marsh converting to open water (Figure 3). Within the 4,070 acres of shallow open water and fresh marsh of the initial project area, 1,000 acres of marsh have converted to open water since 1956. This equates to approximately 25 percent of the land in the initial project area. The shoreline protection structure of the demonstration project Phase II will protect approximately 9000 feet of shoreline and adjacent marsh.

4.1.1 Geology, Soils and Topography

The Barataria Basin was formed during the last 7,000 years as three of the five major delta-building lobes of the Mississippi River overlapped this area. During the last century construction of flood control and hurricane protection levees along Bayou Lafourche and the Mississippi River has exacerbated wetland loss in the basin by retaining sediment-laden waters within their channels. Therefore, the land is sinking because sediment aggradation no longer matches subsidence (Sasser, 1994). Each of the three major causes of land loss (subsidence, erosion due to wave energy and storms, and erosion associated with the decay of abandoned river deltas) currently is taking place in the Barataria Basin (Mumphrey *et al.*, 1978).

Lake Salvador is located in the central portion of the Barataria Basin in the sump between the two ridges formed by the banks of the Mississippi River and Bayou Lafourche. The lake is about 44,800 acres in size (Louisiana Department of Environmental Quality, 1994) with a mean depth of 2.5 meters. (Madden *et al.*, 1988). Lake Cataouatche, Baie du Cabanage, Baie du Chactas, and Bayou des Allemands are the major freshwater contributors to Lake Salvador on the north and western sides.

Bayou Perot, in the southeastern portion of the lake, and the Barataria Bay Waterway via Bayou Villars and Bayou Segnette are sources of brackish water.

The soils of the project area marshes are classified as Kenner Muck, which is a level, very poorly drained organic soil with thin layers of mineral material within the organic material (U.S. Department of Agriculture, 1987). The thickness of the organic material ranges from 51 to over 100 inches. These soils occur in freshwater marshes and are ponded and flooded most of the time. Kenner Muck is suitable only for wildlife habitat; it is not suited for cropland, pasture or urban development.

Lake bottom soils are not classified, however, surface probes conducted during a field investigation on August 21, 1995, indicated soft, unconsolidated sediments near the shoreline of the project area. Geotechnical investigations off Couba Island (three probes) and between Bayou des Allemands and Bois Chactas Shell Bank (three probes) (northeast and southwest, respectively, of the project area) were performed several years ago (Eustis Engineering Company, Inc., 1993a and b). The

upper 7 to 10 feet consists of soft to very soft black humus and extremely soft to soft dark gray or black clay and organic clay. Underlying this, with one exception, is extremely soft to very soft gray clay with humus layers, decayed roots and organic matter to depths of 12 to 16.5 feet. Beneath this are extremely soft to soft gray clay with silt lenses and pockets, clayey silt lenses and layers, and shell fragments to the boring depths of 40 to 50 feet. Sandier sediments have been reported (Cropog, 1996) further offshore in the area of the historic lake bottom. According to engineering design, structures will be placed in water from 2.3 to 2.6 feet deep. The proposed dredging for fill would occur at depths of 3 to 5 feet.

The freshwater marshes of the Barataria Basin can be divided into emergent and floating types. Emergent marsh vegetation is firmly rooted in sediments, whereas floating or flotant marsh vegetation grows on a buoyant peat substrate held together by a matrix of living roots. In the project area, the entire mat would float on: (a) clear water, (b) organic ooze, or (c) semifluid organic ooze (Sasser *et al.*, 1994). Conditions necessary for a floating marsh are a low bulk density substrate free of mineral sediments and plants with extensive fibrous root systems. The organic matter content at Lake Salvador was 83 percent of dry mass (Swarzenski, 1991).

Figure 3 indicates that the shoreline in the project area is slightly scalloped and has retreated from 300 to 1,400 feet since 1938 (May and Britsch, 1987). Marsh elevation is low, ranging from approximately 1 foot to 1.5 feet NGVD. Most of the shoreline berm has eroded so that there is little difference in elevation between the marsh/water interface and the interior marsh. Clusters of live oak trees (Quercus virginiana) occur in scattered areas of interior marsh with slightly higher elevations and shallow water ponds have formed in depressions.

4.1.2 Climate and Weather

The Barataria Basin has a humid, subtropical climate. It is characterized by long, hot and humid summers, and short, mild and humid winters. Average daily maximum temperatures from May to October range between 84° to 91° Fahrenheit (F). Average daily maximum and average daily minimum winter temperatures between November and April ranges are 61° to 78°F and 41° to 58°F, respectively (U.S. Department of Agriculture, 1987). Cold spells usually last three days due to the dominance of warm gulf air moving inland from the coast year round. A winter temperature of 32°F or less is expected 15 days per year and there is only a 20 percent chance of temperatures falling below 20°F during the winter.

Copious rains fall throughout the year as a result of the dominant coastal air masses moving inland and mixing with continental air. Average annual rainfall is 60 inches per year and heavy thunderstorms occur frequently. Less rainfall usually occurs in the fall months and snow only occurs at intervals of decades. The growing season for the project area varies between 280 and 290 days (Schumacher *et al.*, 1988).

4.1.3 Air Quality

Air quality over Lake Salvador is good. Air masses are highly unstable in this area due to coastal activity. There are no industrial or automotive air

emissions in the vicinity. Oil fields near Bayou des Allemands, Baie du Chactas, Baie du Cabanage, and Bayou Couba would be the closest source of emissions.

4.1.4 Surface Water Resources

Water Quality

The water quality of surface waters of Lake Salvador is good. Data obtained from the Louisiana Department of Environmental Quality (1994) rate surface waters of Lake Salvador as fully supporting, but threatened for primary contact recreation, secondary contact recreation, and propagation of fish and wildlife. The sources of contamination are minor industrial point sources, petroleum activities, spills, contaminated sediments, recreational activities and upstream sources (Louisiana Department of Environmental Quality, 1994).

Nutrient and chlorophyll a levels are much lower than in Lake Salvador than in other lakes in the Barataria Basin (Conner and Day 1987). This is due to (1) the lack of agricultural runoff directly into Lake Salvador and (2) Deeper channels of the Bayou Segnette Waterway, Bayou Villare, Bayou Barataria and Barataria Bay Waterway provide a direct connection between Lake Cataouache and the lower Barataria Basin. These man-made and/or maintained channels effectively divert runoff water away from Lake Salvador so that it does not serve as a runoff nutrient processor.

Salinity

Lake Salvador is marginally influenced by tides. The upper reach of tidal influence is listed as Bayou des Allemands at des Allemands. The reported salinity range (Madden *et al.*, 1988) of Lake Salvador is 0 to 6 parts per thousand (ppt). Vegetation maps (Chabreck and Linscombe, 1988), and numerous publications (Conner and Day, 1987; Hatton *et al.*, 1983; Conner *et al.*, 1986; Swarzenski *et al.*, 1991; Sasser, 1994) indicate that the project area is fresh; however, the southeastern and eastern perimeter of Lake Salvador is classified as intermediate marsh.

Salinities of Lake Salvador were more related to local precipitation than Mississippi River discharges in contrast to lower regions of the basin. When saltwater intrusion increased in the lower estuary, salinities of 1 to 2 ppt were detectable in central Lake Salvador (Orlando *et al.*, 1993). After construction and operation of the Davis Pond Freshwater Diversion, the entire area surrounding Lake Salvador will freshen and the project area will be less tidally influenced.

4.2 Biological Environment

4.2.1 Vegetative Communities

Chabreck and Linscombe (1988) classify the land area adjacent to the project site as fresh marsh. Vegetation typical of freshwater emergent marsh includes bulltongue (Sagittaria lancifolia), wapato (Sagittaria latifolia), roseau cane (Phragmites communis) and cattail (Typha latifolia) (Conner *et al.*, 1986).

Although floating marsh vegetation generally is dominated by maidencane (Panicum hemitomon), the seasonally floating marsh which occurs near Lake Salvador is composed of bulltongue (Sasser *et al.*, 1994). Marsh fern (Thelypteris palustris), royal fern (Osmunda regalis), deerpea (Vigna luteola), spikerush (Eleocharis spp.), and smartweed (Polygonum sagittatum) are often present in fresh marshes.

During a field investigation of the initial project area in 1993, the percent of vegetative species recorded was bulltongue, 25 percent; smartweed, 40 percent; cattail, 10 percent; elephants ear (Colocasia antiquorum), 5 percent; bulrush (Scirpus validus), 5 percent; and traces of 11 other species. At the time of the 1995 field investigation to the revised location, marsh vegetation was predominately bulltongue. Within the SWMA, clusters of live oak trees occur at the site of Indian shell middens (Neuman, 1977).

4.2.2 Fish and Wildlife Resources

The freshwater habitat of the project area supports bass (Micropterus salmoides), bream, crappie (Pomoxis sp.), catfish (Ictalurus sp.), drum (Aplodinotus grunniens) and garfish (Lipisosteus sp.). Thompson and Forman (1987) reported 31 species of freshwater fishes within the freshwater habitat of Barataria Basin. Gulf Menhaden (Brevoortia patronus) constitute an important commercial fishery in coastal waters. This species, which is estuarine dependent, has been reported in Bayou des Allemands and as far north as Lac des Allemands (Turner *et al.*, 1974). Access by fishery organisms to these freshwater areas is via Lake Salvador. Juveniles of other estuarine dependent species, such as the blue crab (Callinectes sapidus) and shrimp (Penaeus sp.), also would use this area seasonally (RPI International, Inc., 1989).

Game species in SWMA are waterfowl, deer, rabbit, squirrel, rail, gallinule, and snipe. Furbearing animals present are mink, nutria, muskrat, raccoon, opossum, and otter. There is a large population of alligator (Louisiana Department of Wildlife and Fisheries, 1993). Within Barataria Basin marsh habitats, more than 200 species of birds, 30 species of mammals and 70 species of reptiles and amphibians have been reported (Hartman *et al.*, 1988).

In 1990, a census of wading birds and seabird nesting colonies was conducted in Louisiana. Twenty-seven species of colonial nesting waterbirds were studied (Martin and Lester, 1990). The closest sites to the project area were Gheens and Lake Cataouatche West. No nests were observed at Gheens in 1990 although 1,000 to 5,000 birds used the area the previous year. At the Lake Cataouatche West station, there were approximately 750 nesting adults in 1990. The number of birds observed were 450 cattle egrets (Bubulcus ibis), 150 white ibis (Eudocimus albus), 75 little blue herons (Egretta caerulea), and 75 snowy egrets (Egretta thula) (Martin and Lester, 1990).

4.2.3 Threatened and Endangered Species

Threatened and endangered birds listed for the State of Louisiana include the bald eagle (Haliaeetus leucocephalus), Eskimo curlew (Numenius borealis),

Bachman's warbler (Vermivora bachmanii), ivory-billed woodpecker, (Campephilus principalis) and the red-cockaded woodpecker (Picoides borealis) (U.S. Fish and Wildlife Service, 1992). The American alligator (Alligator mississippiensis), Louisiana black bear (Ursus americanus luteolus, and the Florida panther (Felis concolor coryi) also are listed as threatened or endangered and occur statewide. Only the bald eagle and the alligator would be expected in the fresh marshes of the project area. There were five bald eagle nests reported in the Barataria Basin in 1991 (Louisiana Coastal Wetlands Conservation and Restoration Task Force, 1993).

4.3 Cultural Environment

4.3.1 Historical or Archaeological Resources

The Louisiana Department of Culture, Recreation and Tourism has indicated that there was one archaeological site within the project area. According to the Site Record Form, a 27 foot long wooden dugout canoe dating to 1540-1650 was excavated and removed within the project area. However, the Department of Culture, Recreation, and Tourism, Office of Cultural Development, Division of Archaeology has indicated by letter that the demonstration projects will have no effect on this site. A copy of this letter is contained in Appendix B. Although the scattered clumps of live oak trees within the SWMA are located on the site of Indian shell middens (Neuman, 1977), it is not anticipated that these middens would be eligible for the National Register of Historic Places. A copy of the Site Record and location map showing the location of the canoe and Indian shell middens are contained in Appendix B.4.3.2 ... Economics (Employment and Income)

4.3.2 Economics (Employment and Income)

Catfish and bullhead harvested from Lac des Allemands and Lake Salvador averaged 1.3 million pounds annually from 1963 through 1976 and ranged from 2.0 million pounds in 1963 to under 1 million pounds in 1970 (U.S. Army Corps of Engineers, 1984). Due to changes in collection and data storage of fishery statistics, more recent figures for Lake Salvador are unavailable.

Fishery landings (all fisheries including oysters, shrimp, etc.) for Lafitte and Barataria, towns located southeast of Lake Salvador, ranked 47th among United States ports for value of commercial fishery landings in 1993. The dockside value of landings for 1991 through 1993 was $11.8, $11.9 and $11.0 million, respectively (U.S. Department of Commerce, 1994). Although little, if any, of these resources were harvested in Lake Salvador, the freshwater habitat of the lake and surrounding marshes could have been used by juvenile stages of commercially important species.

4.3.3 Land Use

Aerial infrared photographs of the project area reveal that the shoreline and the landward areas around Lake Salvador are sparsely inhabited. There are clusters of camps (Figure 2) located along the eastern shore of Bayou des Allemands near its junction with Lake Salvador, on spoil deposits along an oil and gas access canal, and on a probable abandoned bayou ridge,

Tabatiere Perdue. The interior marshland near the project area is part of the SWMA (Figure 2).

4.3.4 Recreation

Freshwater fishing and boating activities take place on Lake Salvador and within the SWMA. Fishermen often harvest bass, bream, crappie, catfish, drum and garfish. Game species hunted in the SWMA are waterfowl, deer, rabbit, squirrel, rail, gallinule, and snipe (Louisiana Department of Wildlife and Fisheries, 1993). Commercial fishing is prohibited in the SWMA (Louisiana Department of Wildlife and Fisheries, 1993).

4.3.5 Noise

Lake Salvador and the SWMA are state-owned with no industry other than the oil and gas fields at Bayou des Allemands, Baie des Chactas, Baie du Cabanage and Bayou Couba. Ambient noise in the area results from oil and gas activities, boats, hunters, or wildlife.

4.3.6 Infrastructure

Natural lakes and bayous and dredged waterways (oil and gas access canals) constitute the surface transportation network within the project area (Figure 2). There are two pipelines which cross the southern third of Lake Salvador. The southernmost one is a 16-inch diameter gas line, while the other, a 10-inch diameter Texaco line, breaches the shoreline somewhat north of the project area (Waite, 1992). There are several camps located west of the project area, on Bayou Des Allemands.

5.0 ENVIRONMENTAL CONSEQUENCES

In general, the adverse environmental consequences of the no-action alternative exceed those of the preferred alternative. Dredging and construction of the proposed activities would have short-term localized impacts which would be offset by the long-term environmental benefits. A thorough assessment of the environmental consequences of the preferred alternative is provided below.

5.1 Physical Environment

5.1.1 Geology, Soils and Topography

The structures, as long as they remain in place, are intended to demonstrate potential techniques to reduce or prevent tidal and wave-induced erosion of the shoreline in the protected areas. Berm restoration and marsh creation would prolong the shoreline and reduce wave-induced erosion.

Sediments within Lake Salvador would be redistributed during storms depending on the direction and force of the winds and currents. It is anticipated that the structures would facilitate sedimentation along the shoreline by providing small areas of relatively calm water. The lake bottom disturbed by dredging should gradually smooth out due to sloughing of the sides and sediment deposition.

5.1.2 Climate and Weather

Shoreline protection structures are designed to maintain their structural integrity for 20 years under standard weather conditions and will be monitored for 3 to 5 years. Since structures are not designed to withstand hurricane conditions, they could be damaged by such events. Loose construction material could adversely impact adjacent wetlands and the absence of structures would leave the shoreline vulnerable to wave erosion again. Inclement weather could temporarily delay the implementation of the proposed activities.

5.1.3 Air Quality

Minor temporary adverse impacts would result from the proposed activities. Exhaust emissions from construction or dredging equipment with airborne pollutants should be quickly dissipated by prevailing winds and be limited to the construction phase of the project.

5.1.4 Surface Water Resources

Short-term adverse impacts to surface water resources would be limited to the designated dredging, construction and access sites (dredged channels required for equipment and supplies) in Lake Salvador. Short-term adverse impacts to surface water quality would include increased turbidity in waters near the dredging and construction sites. These impacts would be limited to the construction phase of the project. Because Lake Salvador is rather turbid, impacts would be minor and temporary.

5.2 Biological Environment

5.2.1 Vegetative Communities

The proposed activity should result in positive impacts on vegetative communities within the project area. Implementation of the Lake Salvador Shoreline Protection Demonstration Project is intended to demonstrate measures to maintain the shoreline landward of the structures and reduce wave-induced scour and land loss. Structures which prove to be successful would protect vegetation along the shoreline and in the marsh from the effects of erosion.

5.2.2 Fish and Wildlife Resources

Short-term adverse impacts to fish would occur during the construction phase of the project. These impacts include impingement of organisms during dredging, smothering of non-mobile benthic organisms in dredged material deposition sites at the marsh creation area and increased turbidity in waters near the construction sites. Mobile fishery species are expected to move out of the area directly impacted by construction. Birds would avoid the area.

Berm restoration and marsh creation plus the protection of shoreline vegetation behind the structures would allow the continued contribution of organic detritus and nutrients to the aquatic food web of Lake Salvador.

The hard surfaces of the structures would provide attachment areas for sessile organisms.

5.2.3 Threatened and Endangered Species

Although the project area is within the known range of bald eagles, no adverse impacts are anticipated since there are no nesting sites within the project area.

It is likely that implementation of the project would slow or reverse land loss, thus preserving an area suitable for foraging habitat for bald eagles.

5.3 Cultural Environment

5.3.1 Historical or Archaeological Resources

There would be no adverse impacts to historical or archaeological resources since no sites, other than the excavated dugout canoe, are expected in the dredging or construction areas.

5.3.2 Economics

No impacts to economic resources would result from the proposed activity.

5.3.3 Land Use

No adverse impacts to current land use would result from the proposed activity. Marsh creation is expected to extend the life of the marsh in the two fill areas and the sacrificial berm would nourish the shoreline until leveled by waves.

5.3.4 Recreation

Some temporary adverse short-term impacts to recreation would occur as a result of dredging activity. These include increased turbidity of surface water and increased noise within the project area during the time of construction.

It is likely that benefits from the proposed activities would include preservation and creation of marsh for wildlife and fisheries habitat. The solid foundation of the structures would provide a base for attached animals and plants, therefore concentrating a food supply and providing shelter for some aquatic organisms.

5.3.5 Noise

Short-term adverse impacts, limited to construction, include increased noise associated with dredging and installation of the structures.

5.3.6 Infrastructure

There will be no adverse impacts to infrastructure. There are no major pipelines in the area. Small flow lines, if any, in the project area would be avoided.

All structures will be marked with warning signs to indicate an obstruction exists.

6.0 CONCLUSIONS

This EA finds that no significant adverse environmental impacts are anticipated by the implementation of the Lake Salvador Shoreline Protection Demonstration Project. This conclusion is based on a comprehensive review of relevant literature, site-specific data, and project-specific engineering reports. This finding supports the recommendations of the CWPPRA Task Force, including NMFS, the sponsoring agency. The natural resource benefits anticipated from the implementation of Lake Salvador Shoreline Protection Demonstration Project are expected to enhance and sustain the diverse ecosystem of Lake Salvador. The knowledge gained from testing different structure types will be applicable in other organic substrates.

7.0 PREPARERS

This EA was prepared by Earl Matherne , St. Charles Parish Coastal Zone Management Section. It is based on the EA for Phase I of this project, written by GOTECH, Inc. and C-K Associates, Inc. under contract to NMFS. Sections were written by Mr. Bruce Dyson and Ms. Peggy Jones of GOTECH, Inc. and Mr. Jeff Heaton, Mr. Scott Nesbit and Ms. Laurie Pierce of C-K Associates, Inc. under the direction and guidance of Dr. Teresa McTigue of NMFS. In addition to Dr. McTigue, invaluable reference material and guidance were provided by Mr. John Foret, Mr. Rickey Ruebsamen, Mr. Tim Osborn and Dr. Eric Zobrist of NMFS.

8.0 FINDING OF NO SIGNIFICANT IMPACT

Based on the conclusions of this document and the available information relative to the Lake Salvador Shoreline Protection Demonstration Project Phase II (CWPPRA Project BA-15 Phase II), there will be no significant environmental impacts from this action. Furthermore, preparation of an environmental impact statement for constructing various types of shoreline protection structures is not required by the National Environmental Policy Act or its implementing regulations.

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APPENDIX A

CULTURAL RESOURCE ASSESSMENT

KATHLEEN BABINEAUX BLANCO
LIEUTENANT GOVERNOR

State of Louisiana
OFFICE OF THE LIEUTENANT GOVERNOR
DEPARTMENT OF CULTURE, RECREATION & TOURISM
OFFICE OF CULTURAL DEVELOPMENT
DIVISION OF ARCHAEOLOGY

PHILLIP J. JONES
SECRETARY

GERRI HOBDY
ASSISTANT SECRETARY

January 6, 1997

Mr. Earl J. Matherne, Jr.
Parish of St. Charles
Department of Planning and Zoning
P.O. Box 302
Hahnville, Louisiana 70057

Re: Lake Salvador Shoreline Protection Demonstration Project
Phase II (BA-15, Phase II)
St. Charles Parish, Louisiana

Dear Mr. Matherne:

Reference is made to your letter dated December 27, 1996, concerning the above. A review of our files indicates that there are no sites or properties either listed on or which have been determined eligible for listing on the National Register of Historic Places in the proposed project area. In addition, there are no other known cultural resources in this area. As we anticipate no impact to significant cultural resources, we have no objections to the proposed project. However, should any archaeological material be uncovered during ground altering activities, we request that work in that area be halted and this office be notified immediately.

If we may be of further assistance, please contact Mr. Mike Mahady in the Division of Archaeology at (504) 342-8170.

Sincerely,

Gerri Hobdy
State Historic Preservation Officer

GH:MM:s

c: Mr. Stehle Harris
Louisiana Department of Natural Resources
Coastal Restoration Division
P.O. Box 94396
Baton Rouge, Louisiana 70804-9396

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

Southeast Regional Office
9721 Executive Center Dr. N.
St. Petersburg, FL 33702

FEB 3 1997 F/SEO13:DMB

MEMORANDUM FOR: F/SEC7 - Teresa McTigue

FROM: F/SE - Andrew J. Kemmerer

SUBJECT: Endangered Species Act Section 7 Review of Phase II of the Lake Salvador Shoreline Protection Demonstration (BA-15)

This memorandum is in response to your letter of January 17, 1997 and the attached Environmental Assessment concerning Phase II of the Lake Salvador Shoreline Protection Demonstration. Phase II is a supplemental project that would protect approximately 9000 feet of shoreline with a rock breakwater.

No endangered or threatened species under NMFS purview are likely to be present in the project areas, therefore we concur with your determination that the proposed activity is unlikely to adversely affect threatened or endangered species under the purview of NMFS.

This concludes consultation responsibilities under Section 7 of the Endangered Species Act. Consultation should be reinitiated, however, if new information reveals impacts of the identified activity that may affect listed species, a new species is listed, new critical habitat is designated, or the activity is subsequently modified.

If you have any questions, please contact LTJG David Bernhart, Fishery Biologist, at 813/570-5312.

cc: F/PR3

United States Department of the Interior

FISH AND WILDLIFE SERVICE
825 Kaliste Saloom Road
Brandywine Bldg. II. Suite 102
Lafayette, Louisiana 70508

January 14, 1997

Mr. Earl J. Matherne, Jr.
CZM Administrator
St. Charles Parish Department of Planning and Zoning
Post Office Box 302
Hahnville, Louisiana 70057

Dear Mr. Matherne:

Please reference your December 27, 1996, letter regarding the Lake Salvador Shoreline Protection Demonstration Project, Phase II (BA-15, Phase II). The Fish and Wildlife Service (Service) has reviewed the proposed project and provides the following comments in accordance with the Endangered Species Act of 1973, as amended, and the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.).

An inactive bald eagle (*Haliaeetus leucocephalus*) nest is located within 1 mile of the proposed project site. That nest has deteriorated to the extent that it has little potential for reoccupation by bald eagles. Although bald eagles are a Federally listed threatened species, the Service believes that the proposed project would not likely adversely affect bald eagles or any other Federally listed threatened and endangered species. No further consultation will be required unless there are changes in the scope or location of the project, or project construction has not been initiated within 1 year. If the project has not been initiated within 1 year, follow-up consultation should be accomplished via a telephone call to this office prior to making expenditures for construction. If the scope or location of the proposed work is changed, consultation should occur as soon as such changes are made.

The proposed project may impact wetlands. If the Corps of Engineers determines that the proposed project is within their regulatory jurisdiction, official Service comments will be provided in response to the corresponding Public Notice. Based on the Department of the Army permit application you attached to your December 27, 1996, letter, the Service would not likely object to issuance of the requested permit.

We appreciate the opportunity to provide comments regarding the proposed project. Should

you have any further questions, please contact Virginia Rettig (318/262-6662, extension 237) of this office.

Sincerely,

Russell C. Watson
Acting Field Supervisor

cc: NMFS, Baton Rouge, LA
LA Dept. of Wildlife and Fisheries, Baton Rouge, LA
Tom Hess, Rockefeller Refuge, Grand Chenier, LA

USDA United States Department of Agriculture

Natural Resources Conservation Service

3737 Government Street
Alexandria, Louisiana
71302

July 25, 1997

Dr. Teresa McTigue
Fisheries Biologist
National Marine Fisheries Service
Southeast Fisheries Center
U.S.L., Post Office Box 42451
Lafayette, Louisiana 70504

Dear Dr. McTigue:

RE: Natural Resources Conservation Service (NRCS) Comments on the Lake Salvador Shoreline Protection Demonstration Project (BA-15), Phase II

We appreciate the opportunity to review the environmental assessment of the above referenced project and offer the following comments for your consideration:

p.i, Table of Contents, 1.1.2 - "Lake Salvador..... .....~~3~~ **2**" 1. FORMATTING

p.iii, List of Figures - PAGE NUMBERS?

p.iii, Appendices - "Cultural Resource Assessment **letter**"

- ADD: "**Endangered and Threatened Species letters**"

p.1, 1.0, para1, sent2 - "Lake Salvador Shoreline ... as well as an additional 9000 linear feet of shoreline protection." [DOES THIS SUPPLEMENT HAVE AN EXTENDED LENGTH OVER THE ONE MILE THAT WAS APPROVED BY THE TASK FORCE?]

p.1, 1.0, para2, sent3 - "The five federal agencies ... and the U.S. Environmental Protection Agency ~~(U.S. EPA)~~." [ABBREVIATE ALL AGENCIES OR ABBREVIATE NONE, AT THIS POINT, DON'T MIX FULL NAMES AND ACRONYMS]

p.3, 1.1.2, para1, sent4 - "Lake Salvador is part of ... Davis Pond Freshwater Diversion Project ~~that will~~ **is scheduled to** reintroduce Mississippi River water ..."

p.4, 2.1 Purpose - ADD PERIOD (.) TO LAST SENTENCE.

p.5, 2.2, sent1 - "The Lake Salvador ... and *is the only such project designed to evaluate various shoreline protection structures and evaluate their cost effectiveness.*" [MAY BE TRUE ONLY FOR THIS YEAR'S PROJECTS, HOWEVER FALGOUT CANAL, POINT AU CHENE, JONATHAN DAVIS CU#2 AND OTHERS ALSO CONTAIN SIMILAR WORK]

p.5, 2.2, sent1 - This citation should include reference to the subsequent Task Force approval to include this modification and additional funding in 1996.

p.6, 3.0, sent2 - "An LDNR-contracted Engineering Design Report ... in June 1995 (Contract No. DNR 5030-95-22)." [THERE WERE A SIGNIFICANT AMOUNT OF COMMENTS ON THIS REPORT, HAVE THESE COMMENTS BEEN ADDRESSED?]

p.6, 3.2 - WHY INCLUDE THIS PARAGRAPH SINCE IT IS STATED ABOVE (3.0, PARA2, SENT4) THAT ONLY THE NO-ACTION AND PREFERRED ALTERNATIVE WILL BE ANALYZED?

p.7, 3.3, sent6 - "The conditions of the area are similar to those of Phase I." [IS THERE SUFFICIENT GEOTECHNICAL DATA TO SUPPORT THIS CLAIM? HOW COULD THE RESULTS BE REASONABLY COMPARED TO PHASE I WITHOUT THIS INFORMATION?]

p.7, 4.0, para1, sent2 - "This shoreline demonstration project ... extend northward for 9000 feet ..." [AS ON PAGE 1, 1.0, PARA1, SENT2, IS NOT THIS SUPPLEMENT OF EXTENDED LENGTH OVER THE ONE MILE THAT WAS APPROVED BY THE TASK FORCE?]

Figure 4, Cross Section C-C', approx. 200-270' on landward side - HOW CAN ORGANIC MATERIAL BE PLACED TO THESE SPECS?

Figure 4, Cross Section C-C', approx. 175-190' on landward side - WILL THIS DESIGN BE STABLE FOR THESE SOIL CONDITIONS? IT WOULD APPEAR, BASED ON INFORMATION AVAILABLE, THAT THIS DESIGN WILL NOT WORK. IS THERE ANY GEOTECHNICAL INFORMATION TO VERIFY THAT THE BASE MATERIAL CAN SUPPORT THE ROCK AT THESE SPECS? IF SO, WHO DID IT?

Figure 4, Cross Section C-C', approx. 0' - THIS WILL LIKELY NOT BE NEEDED. THE ORGANIC MATERIAL IN THE FLOTATION CANAL WILL NO DOUBT FILL IN BEHIND THE CONSTRUCTION BARGE AFTER IT HAS PASSED. THIS IS ALSO WHY WE BELIEVE THE PLANNED ORGANIC MATERIAL WILL NOT BE AS STABLE AS DRAWN.

p.8, para2, sent5 - "The shoreline protection structure ... approximately 9000 feet ..." [AS ON PAGE 1, 1.0, PARA1, SENT2, IS NOT THIS SUPPLEMENT OF EXTENDED LENGTH OVER THE ONE MILE THAT WAS APPROVED BY THE TASK FORCE?]

p.8, 4.1.1, para2, sent3 - "Lake Cataouatche, ... *are the major freshwater contributors* to Lake Salvador ..." [PAGE 7, 4.0. PARA2 STATES THAT FRESHWATER IS ONLY DELIVERED THROUGH RAINFALL]

p.8, 4.1.1, para5, sent2 - "Geotechnical ...(*northeast and southwest, respectively, of the project area*) were ..." [THESE BORINGS WERE NOT TAKEN IN THE PROJECT AREA AND SHOULD NOT BE USED FOR THIS REPORT.]

p.9, para2, sent3 thru sent5 - "In the project area, the entire mat would float ... of dry mass (Swarzenski, 1991)." [THIS PROJECT PROTECTS EMERGENT MARSH, NOT FLOTANT, THEREFORE THESE SENTENCES SHOULD BE DELETED TO AVOID CONFUSION.]

p.9, 4.1.2, para1, sent4 - "Cold spells usually last three days due to the dominance ..." [WHERE WAS THIS INFORMATION OBTAINED? IT DOES NOT APPEAR TO BE ACCURATE.]

p.11, 4.2.2..- ADD: IN 1981 A CHRISTMAS BIRD COUNT WAS CONDUCTED IN THE NEARBY JEAN LAFITTE NATIONAL HISTORIC PARK WHERE A TOTAL OF 80 SPECIES WERE OBSERVED (SEE ATTACHED LISTING).

p.12, para1, sent4 - "There were five bald eagle nests reported ..." [RECOMMEND JUST STATING THAT THERE ARE MANY AND NOT DESIGNATE A SPECIFIC NUMBER THAT MAY NOT BE ACCURATE.]

P.12, para1 - WHAT ABOUT THE ENDANGERED TURTLE SPECIES? LIKE MANY OF THE BIRD SPECIES LISTED ABOVE THEY DO NOT OCCUR AT THIS SITE, HOWEVER THEIR LACK OF OCCURRENCE IS ALSO NOTEWORTHY.

p.12, 4.3.1, sent4 - "A copy of this letter is contained in Appendix ~~B~~ A." [APPENDIX B IS NOT INDICATED IN THE TABLE OF CONTENTS]

p.12, 4.3.1, sent6 - "A copy of the site record ... contained in ~~Appendix B.4.3.2 ... Economics (Employment and Income)~~" [ARE THE SITE RECORD AND LOCATION MAP SHOWN IN A BOOK OR ECONOMICS OR IS THERE SUPPOSED TO BE AN APPENDIX B?]

p.12, 4.3.3, sent2 - "There are clusters of camps (Figure 2) located ..." [THIS CAN NOT BE SEEN ON FIGURE 2]

p.14, 5.1.2, para1, sent1 - "Shoreline protection structures ..." [What criteria was used to establish a 20 year life for shoreline protection structures? What is the anticipated life of this project; 3 to 5 years or 20?]

p.14, 5.2.2, para1, sent4 - "Birds would avoid the area **with the exception of scavengers such as gulls which may be temporarily attracted to the disturbance**."

p.15, 5.3.3, sent2 - "Marsh creation is expected ..." [IS THE ORGANIC DREDGE MATERIAL PLACED BEHIND THE ROCKS SUPPOSED TO BE THE MARSH CREATION? IF SO, THEN IT SHOULD BE SHOWN IN THE DRAWING]

p.15, 5.3.3, sent2 - "Marsh two fill areas and the sacrificial berm would ..." [DOES THIS REFER TO THE ROCK BREAKWATER? THE PROJECT LIFE IS 20 YEARS THEREFORE IT SHOULD NOT BE CONSIDERED SACRIFICIAL. IF IT DOES NOT REFER TO THE ROCK, WHAT DOES IT REFER TO?]

p.15, 5.3.4, para2, sent2 - "The solid foundation of the structures would provide a base for attached animals and plants, ..." [THE EARTHEN FILL WILL NOT BE A SOLID FOUNDATION AND IT IS UNLIKELY PLANTS WILL GROW WITH ENOUGH CONSISTENCY ON THE ROCKS.]

p.16, 7.0, sent2 - "It is based on the EA for Phase I of the project, ..." [IT DOES NOT APPEAR THAT THE COMMENTS PROVIDED BY THE TASK FORCE WERE CONSIDERED IN THIS DOCUMENT.]

p.16, 8.0, sent2 - "Furthermore, ... is not required by the National Environmental Policy Act or its implementing regulations." [THIS IS NOT A TRUE STATEMENT. YOU HAVE NOT ADDRESSED ALL OF THE STATUTES NECESSARY FOR ENVIRONMENTAL COMPLIANCE. IT IS OUR RECOMMENDATION THAT YOU INCLUDE A TABLE INDICATING THE STATUES ADDRESSED AND WHETHER OR NOT COMPLIANCE HAS BEEN NET. THESE ARE A FEW OF THE STATUTES YOU DID NOT ADDRESS:

1) CLEAN AIR ACT
2) FEDERAL WATER POLLUTION CONTROL ACT
3) COASTAL BARRIERS RESOURCES ACT
4) COASTAL ZONE MANAGEMENT ACT
5) WILD AND SCENIC RIVERS ACT
6) SUBTITLE B, HIGHLY ERODIBLE LAND CONSERVATION AND SUBTITLE C, WETLAND CONSERVATION OF THE FOOD SECURITY ACT
7) EXECUTIVE ORDER 11988, FLOODPLAIN MANAGEMENT
8) EXECUTIVE ORDER 11990, PROTECTION OF WETLANDS
9) FARMLAND PROTECTION POLICY ACT
10) NATIONAL ENVIRONMENTAL POLICY ACT OF 1969, AS AMENDED (HAS A FONSI BEEN SIGNED AND SENT TO FEDERAL REGISTRY?)

LAKE CHARLES MAYOR

Thanks again for providing us with the opportunity to review and comment on this environmental assessment. If you have any questions regarding these comments, please contact Britt Paul at (318) 473-7816.

Sincerely,

Billy R. Moore ACTING FOR

Donald W. Gohmert
State Conservationist

Attachment

cc: Rick Reubsamen, National Marine Fisheries Service
Rick Hartman, National Marine Fisheries Service
Britt Paul, NRCS, Water Resources Staff Planning Leader

Enlarged Copy

△ **945. Jean Lafitte Nat'l Historic Park, La.** 29°48'N 90°08'W, center jct. Kenta and Pipeline canals, 0.7 mi w. of La. Hwy. 45, on USGS Map, Lake Cataouatche, East, La., 7.5 min. series. Topographic; including all of Barataria Unit, Jean Lafitte Nat'l Historic Park, the Park Protection Zone, and the NE quadrant of Lake Salvador; elevation 0 to 6 ft; habitat coverage: fresh to intermediate marsh 30%, bottomland hardwood 30%, swamp 15%, lake 15%, open field 5%, urban 5%.—Dec. 22; 6:30 a.m. to 5:30 p.m. A.M.: partly cloudy. P.M.: partly cloudy, intermittent light rain. Temp. 60° to 70°F. Wind SE, 10-15 m.p.h. Wild food crop good. Four observers in 1 party. Total party-hours, 11 (6 on foot, 1 by car, 4 by boat); total party-miles, 46 (6 on foot, 20 by car, 20 by boat).

• Double-crested Cormorant 17; Great Blue Heron 8; Little Blue Heron 8; Cattle Egret 7; Great Egret 5; Snowy Egret 12; *Plegadis*, sp. 1; White Ibis 19; Mallard 7; Mottled Duck 3; Greater Scaup 2; Lesser Scaup 50; scaup, sp. 7500; Com. Goldeneye 4; Bufflehead 4; Red-breasted Merganser 1; duck, sp. 2; Turkey Vulture 25; Black Vulture 20; Sharp-shinned Hawk 3; Red-tailed Hawk 6; Red-shouldered Hawk 8; Marsh Hawk 4; Am. Kestrel 6; Sora 1; Killdeer 75; Am. Woodcock 1; Com. Snipe 2; Spotted Sandpiper 1; Greater Yellowlegs 1; Herring Gull 2; Ring-billed Gull 80; Laughing Gull 150; Bonaparte's Gull 1; Forster's Tern 15; Caspian Tern 3; Rock Dove 15; Mourning Dove 3; Great Horned Owl 1; Barred Owl 3; Belted Kingfisher 4; Com. (Yel.-sh.) Flicker 2; Pileated Woodpecker 3; Red-bellied Woodpecker 5; Yellow-bellied Sapsucker 1; Hairy Woodpecker 8; Downy Woodpecker 4; E. Phoebe 1; Tree Swallow 200; Blue Jay 6; Com. Crow 4; Fish Crow 15; crow, sp. 30; Carolina Chickadee 50; Tufted Titmouse 30; House Wren 2; Carolina Wren 20; Long-billed Marsh Wren 1; Short-billed Marsh Wren 1; Mockingbird 4; Brown Thrasher 3; Am. Robin 50; Hermit Thrush 1; Blue-gray Gnatcatcher 9; Golden-crowned Kinglet 3; Ruby-crowned Kinglet 50; Water Pipit 60; Loggerhead Shrike 3; Starling 100; White-eyed Vireo 2; Orange-crowned Warbler 14; Yellow-rumped (Myrtle) Warbler 300; Com. Yellowthroat 17; House Sparrow 1; Red-winged Blackbird 750; Boat-tailed Grackle 65; Com. Grackle 120; Cardinal 35; Am. Goldfinch 115; Savannah Sparrow 15; White-throated Sparrow 25; Swamp Sparrow 50; Song Sparrow 2.

Total, 80 species; 10,258 ± individuals.—David Muth (compiler—Jean Lafitte N.H.P., Rm. 200, 400 Royal St., New Orleans LA 70130), Norton Nelkin, Dan Purrington, Jim

635

DAVE

1982

American Birds 36:635-636

1981 Christmas Bird Count

OPTIONAL FORM 99 (7-90)

FAX TRANSMITTAL # of pages ▸ 3

To	From MARTY FLOYD
Dept./Agency NMFS	Phone # 318-473-7690
Fax # 318-482-6630	Fax # 318-473-7747

NSN 7540-01-317-7368 5099-101 GENERAL SERVICES ADMINISTRATION

Red-winged Blackbird 1000; Brewer's Blackbird 100; Com. Grackle 10,000; blackbird, sp. 5000; Cardinal 81; Am. Goldfinch 22; Rufous-sided Towhee 2; Savannah Sparrow 1 (low); Dark-eyed (Slate-col.) Junco 63; Field Sparrow 22; White-crowned Sparrow 50; White-throated Sparrow 105; Fox Sparrow 1; Swamp Sparrow 28; Song Sparrow 23 (low).

Total, 66 species; 125,458± individuals.—David & Zan Firmage, Grace Hancock, Robert Irving, Jeanne Jackson, Markham Lester, Sophia McCoy, William Shepherd, Jane Stern, Keith Sutton (compiler—5823 Browning Rd., Little Rock AR 72209).

△ **942. Arcadia, La.** 32°34'N 92°57'W, center intersection La. Hwy. 9 and I-20, to include the edge of Bryceland, Mt. Lebanon, Gibsland, Athens, Marsalis, Lake Foursome, Oak Grove; elevation 180 to 483 ft; habitat coverage: mixed hardwood and pine 30%, grazed pasture 20%, marsh 15%, bushy clearcut 15%, fencerows and hedges 10%, ponds 5%, residential 5%.—Dec. 31; 7 a.m. to 5 p.m. A.M.: mostly cloudy to overcast, fog. P.M.: mostly clear. Temp. 39° to 60°F. Wind SSE, 0-10 m.p.h. Wild food crop excellent. Fourteen observers, 13 in 4 parties, 1 at feeders; Total party-hours, 35 (18 on foot, 17 by car) plus 10 hours at feeders; total party-miles, 152.5 (22.5 on foot, 130 by car).

◆ Great Blue Heron 3; Wood Duck 2; Turkey Vulture 72; Black Vulture 27; Sharp-shinned Hawk 1; Cooper's Hawk 2; Red-tailed Hawk 1; Bobwhite 16; Killdeer 41; Com. Snipe 8; Rock Dove 20; Mourning Dove 10; Screech Owl 3; Belted Kingfisher 1; Com. Flicker 26; Pileated Woodpecker 8; Red-bellied Woodpecker 23; Red-headed Woodpecker 3; Yellow-bellied Sapsucker 8; Hairy Woodpecker 9; Downy Woodpecker 9; E. Phoebe 6; Blue Jay 114; Com. Crow 115; Carolina Chickadee 87; Tufted Titmouse 29; Brown-headed Nuthatch 2; Brown Creeper 2; House Wren 2; Winter Wren 1; Carolina Wren 28; Long-billed Marsh Wren 1; Mockingbird 18; Brown Thrasher 8; Am. Robin 202; Hermit Thrush 14; E. Bluebird 104; Golden-crowned Kinglet 2; Ruby-crowned Kinglet 65; Cedar Waxwing 27; Loggerhead Shrike 17; Starling 4; White-eyed Vireo 2; Yellow-rumped (Myrtle) Warbler 671; Pine Warbler 77; House Sparrow 21; E. Meadowlark 70; Red-winged Blackbird 70; Brewer's Blackbird 5; Com. Grackle 87; Brown-headed Cowbird 5; Cardinal 141; Purple Finch 33; Pine Siskin 103; Am. Goldfinch 306; Rufous-sided Towhee 5; Savannah Sparrow 8; Vesper Sparrow 3; Dark-eyed (Slate-col.) Junco 287; Chipping Sparrow 10; Field Sparrow 50; White-throated Sparrow 185; Fox Sparrow 2; Lincoln's Sparrow 3; Song Sparrow 7.

Total, 65 species; 3292± individuals. (In count area count week but not seen count day: Roadrunner, Great Horned Owl.)—Elise Brown, Libby Davenport, Charlotte & Temple Douglas, John Goertz, Dee & Vera Jowers, Joan Moncrief, J. W. & Joy Rabb, Chris, Joseph & Wilma Sanders (compiler—Rte. 1, Box 31, Arcadia LA 71001), Janie Thomas.

943. Baton Rouge, La. 30°22'N 91°07'W, center 0.25 mi s.e. of jct. La. Hwys. 327 and 42, as described 1975; elevation 5 to 60 ft; habitat coverage: bottomland hardwoods 35%, levees and fields 25%, lakes and cypress-[illegible] 15%, residential [illegible], fencerows and edges 5%, pines 5%.—Dec. 26; 5:30 a.m. to 6 p.m. A.M.: mostly cloudy. P.M.: overcast, intermittent light rain. Temp. 39° to 67°F. Wind E, 9 m.p.h. Thirteen observers in 7 parties. Total party-hours, 68.25 (42 on foot, 19.5 by car, 6.75 by boat) plus 5.5 hours owling; total party-miles, 358 (32 on foot, 317 by car, 9 by boat).

● Pied-billed Grebe 51; **White Pelican 1** (BC); **Anhinga 2** (BC, JL); Great Blue Heron 34; **Green Heron 1** (D & KH); Little Blue Heron 13; Cattle Egret 8; Great Egret 120; Snowy Egret 4; Black-crowned Night Heron 3; **Yellow-crowned Night Heron 1** (BC); White Ibis 535; Mallard 8; Gadwall 6; Pintail 1; teal, sp. 16; Am. Wigeon 3; N. Shoveler 4; Wood Duck 18; Ring-necked Duck 15; Lesser Scaup 3; Bufflehead 2; Ruddy Duck 209; duck, sp. 71; Turkey Vulture 12; Black Vulture 45; Sharp-shinned Hawk 9; Cooper's Hawk 1; Red-tailed Hawk 84; Red-shouldered Hawk 26; Marsh Hawk 45; Am. Kestrel 64; Bobwhite 18; Am. Coot 99; Killdeer 384; Am. Woodcock 7; Com. Snipe 19; Spotted Sandpiper 4; Least Sandpiper 54; W. Sandpiper 55; Herring Gull 1; Ring-billed Gull 48; Forster's Tern 6; Rock Dove 204; Mourning Dove 291; Barn Owl 16; Screech Owl 19; Great Horned Owl 15; Barred Owl 33; Belted Kingfisher 18; Com. (Yel.-sh.) Flicker 142; Pileated Woodpecker 11; Red-bellied Woodpecker 70; Red-headed Woodpecker 2; Yellow-bellied Sapsucker 83; Hairy Woodpecker 10; Downy Woodpecker 63; E. Phoebe 51; Tree Swallow 45; Blue Jay 233; Com. Crow 183; Fish Crow 126; crow, sp. 148; Carolina Chickadee 250; Tufted Titmouse 75; Brown Creeper 18; House Wren 55; Winter Wren 11; Carolina Wren 149; **Long-billed Marsh Wren 1** (BC); Short-billed Marsh Wren 9; Mockingbird 195; Gray Catbird 1; Brown Thrasher 73; Am. Robin 875; Hermit Thrush 17; E. Bluebird 8; Blue-gray Gnatcatcher 35; Golden-crowned Kinglet 17; Ruby-crowned Kinglet 219; Water Pipit 170; Cedar Waxwing 225; Loggerhead Shrike 115; Starling 1119; White-eyed Vireo 14; Solitary Vireo 13; Black-and-white Warbler 1; Orange-crowned Warbler 130; Yellow-rumped (Myrtle) Warbler 749; Pine Warbler 8; Palm Warbler 1; Com. Yellowthroat 37; **Am. Redstart 1** (BC); House Sparrow 117; E. Meadowlark 257; **Yellow-headed Blackbird 1** (JOG); Red-winged Blackbird 9196; Rusty Blackbird 222; Brewer's Blackbird 24; Com. Grackle 4748; Brown-headed Cowbird 5831; blackbird, sp. 2000; Cardinal 436; Purple Finch 3; Am. Goldfinch 222; Rufous-sided Towhee 76; Savannah Sparrow 61 (low); Vesper Sparrow 10; Chipping Sparrow 7; Field Sparrow 25; White-crowned Sparrow 8; White-throated Sparrow 515; Fox Sparrow 50; Lincoln's Sparrow 9; Swamp Sparrow 103; Song Sparrow 59.

Total, 113 species; 32,444± individuals.—[Adequate details for all boldfaced entries—Ed.]—Steve Cardiff, Bruce Crider, Tristan Davis, John & Julie Green, Dudley & Kathleen Harrington (compiler—940 Stanford Ave., Apt. 424, Baton Rouge LA 70808), Tom Hickcox, James Leak, Paul McKenzie, Robert Newman, C.H. Powers, Carolyn Russell.

944. Grand Isle, La. 29°12'N 90°03'W, center 0.5 mi s.w. of center of Caminada [illegible] elevation 0 to 5 ft; habitat coverage: coastal woods 45%, beaches and mudflats 35%, marsh 10%, bays 10%.—Dec. 26; 6 a.m. to 5:30 p.m. Clear. Temp. 46° to 69°F. Wind NW, 5-10 m.p.h. Ten observers in 5 parties. Total party-hours, 49 (31 on foot, 14 by car, 4 by boat); total party-miles, 195 (27 on foot, 140 by car, 28 by boat).

● Com. Loon 14; Pied-billed Grebe 29; White Pelican 663; Brown Pelican 673; Double-crested Cormorant 1173; Great Blue Heron 143; Green Heron 2; Little Blue Heron 60; Cattle Egret 2; Reddish Egret 8; Great Egret 216; Snowy Egret 657; Louisiana Heron 85; Black-crowned Night Heron 33; **Yellow-crowned Night Heron 1** [no details—Ed.]; *Plegadis*, sp. 1; White Ibis 76; Snow Goose 36; Mallard 2; Mottled Duck 11; Gadwall 3; Pintail 84; teal, sp. 20; N. Shoveler 2; Ring-necked Duck 15; Greater Scaup 134; Lesser Scaup 112,081; scaup, sp. 21,773; Com. Goldeneye 4; Bufflehead 3; Oldsquaw 2; **Black Scoter 3** [no details—Ed.]; **Red-breasted Merganser 10**; **Sharp-shinned Hawk 3**; Red-tailed Hawk 12; **Broad-winged Hawk 1** [close study—Ed.]; Marsh Hawk 16; Peregrine Falcon 2; Am. Kestrel 24; Clapper Rail 34; Sora 2; Am. Coot 50; Semipalmated Plover 72; Piping Plover 46; Snowy Plover 1; Wilson's Plover 6; Killdeer 204; Black-bellied Plover 155; Ruddy Turnstone 37; Am. Woodcock 2; Com. Snipe 5; Spotted Sandpiper 9; Willet 24; Greater Yellowlegs 61; Lesser Yellowlegs 41; Red Knot 588; Least Sandpiper 3; Dunlin 307; Short-billed Dowitcher 56; dowitcher, sp. 50; W. Sandpiper 23; Sanderling 485; Am. Avocet 1; Herring Gull 779; Ring-billed Gull 2470; Laughing Gull 10,903; Bonaparte's Gull 3; Forster's Tern 1206; Com. Tern 60; Royal Tern 102; Sandwich Tern 1; Caspian Tern 108; Black Skimmer 3698; Rock Dove 16; Mourning Dove 3; Ground Dove 1; Burrowing Owl 1; Belted Kingfisher 74; Com. (Yel.-sh.) Flicker 14; Yellow-bellied Sapsucker 3; **Scissor-tailed Flycatcher 6** [m.ob.—Ed.]; E. Phoebe 2; Tree Swallow 8; Blue Jay 38; **Tufted Titmouse 1** [all details—Ed.]; House Wren 13; Long-billed Marsh Wren 16; Mockingbird 37; Gray Catbird 3; Brown Thrasher 4; Blue-gray Gnatcatcher 7; Ruby-crowned Kinglet 13; Water Pipit 59; Loggerhead Shrike 44; Starling 584; Orange-crowned Warbler 41; N. Parula 1 [all details—Ed.]; Yellow-rumped (Myrtle) Warbler 556; Palm Warbler 40; Com. Yellowthroat 21; House Sparrow 116; E. Meadowlark 11; Red-winged Blackbird 1453; N. (Bullock's) Oriole 2 [no description—Ed.]; Boat-tailed Grackle 158; Brown-headed Cowbird 4; Cardinal 21; Am. Goldfinch 2; Savannah Sparrow 150; Sharp-tailed Sparrow 15; Seaside Sparrow 155; Swamp Sparrow 90; Song Sparrow 9.

Total, 111 species; 163,461± individuals.—Nancy Bousfield, David Muth, Nancy Newfield, Don Norman, Brent Ortego, Dan Purrington (compiler—Dept. of Physics, Tulane Univ., New Orleans LA 70118), John Sevenair, Ron Stein, Melvin Weber, Jim Whelan.

△ **945. Jean Lafitte Nat'l Historic Park, La.** 29°48'N 90°08'W, center jct. Kenta and Pipeline canals, 0.7 mi w. of La. Hwy. 45, on USGS Map, Lake Catsouatche, East, La., 7.5 min. series. Topographic; including all of Barataria Unit, Jean Lafitte Nat'l His-

toric Park, the Park Protection Zone, and the NE quadrant of Lake Salvador; elevation 0 to 6 ft; habitat coverage: fresh to intermediate marsh 30%, bottomland hardwood 30%, swamp 15%, lake 15%, open field 5%, urban 5%.—Dec. 22; 6:30 a.m. to 5:30 p.m. A.M.: partly cloudy. P.M.: partly cloudy, intermittent light rain. Temp. 60° to 70°F. Wind SE, 10-15 m.p.h. Wild food crop good. Four observers in 1 party. Total party-hours, 11 (6 on foot, 1 by car, 4 by boat); total party-miles, 46 (6 on foot, 20 by car, 20 by boat).

● Double-crested Cormorant 17; Great Blue Heron 8; Little Blue Heron 8; Cattle Egret 7; Great Egret 5; Snowy Egret 12; *Plegadis*, sp. 1; White Ibis 19; Mallard 7; Mottled Duck 3; Greater Scaup 2; Lesser Scaup 50; scaup, sp. 7500; Com. Goldeneye 4; Bufflehead 4; Red-breasted Merganser 1; duck, sp. 2; Turkey Vulture 25; Black Vulture 20; Sharp-shinned Hawk 3; Red-tailed Hawk 6; Red-shouldered Hawk 8; Marsh Hawk 4; Am. Kestrel 6; Sora 1; Killdeer 75; Am. Woodcock 1; Com. Snipe 2; Spotted Sandpiper 1; Greater Yellowlegs 1; Herring Gull 2; Ring-billed Gull 80; Laughing Gull 150; Bonaparte's Gull 1; Forster's Tern 15; Caspian Tern 3; Rock Dove 15; Mourning Dove 3; Great Horned Owl 1; Barred Owl 3; Belted Kingfisher 4; Com. (Yel.-sh.) Flicker 2; Pileated Woodpecker 3; Red-bellied Woodpecker 5; Yellow-bellied Sapsucker 1; Hairy Woodpecker 8; Downy Woodpecker 4; E. Phoebe 1; Tree Swallow 200; Blue Jay 6; Com. Crow 4; Fish Crow 15; crow, sp. 30; Carolina Chickadee 50; Tufted Titmouse 30; House Wren 2; Carolina Wren 20; Long-billed Marsh Wren 1; Short-billed Marsh Wren 1; Mockingbird 4; Brown Thrasher 3; Am. Robin 50; Hermit Thrush 1; Blue-gray Gnatcatcher 9; Golden-crowned Kinglet 3; Ruby-crowned Kinglet 50; Water Pipit 60; Loggerhead Shrike 3; Starling 100; White-eyed Vireo 2; Orange-crowned Warbler 14; Yellow-rumped (Myrtle) Warbler 300; Com. Yellowthroat 17; House Sparrow 1; Red-winged Blackbird 750; Boat-tailed Grackle 65; Com. Grackle 120; Cardinal 35; Am. Goldfinch 115; Savannah Sparrow 15; White-throated Sparrow 25; Swamp Sparrow 50; Song Sparrow 2.

Total, 80 species; 10,258+ individuals.—David Muth (compiler—Jean Lafitte N.H.P., Rm. 200, 400 Royal St., New Orleans LA 70130), Norton Nelkin, Dan Purrington, Jim Whelan.

946. Johnsons Bayou, La. 29°48'N 93°43'W, center 2.78 mi n.n.w. of Johnsons Bayou High School; elevation 0 to 5 ft; area and habitat coverage as described 1977.—Dec. 20; 6:45 a.m. to 4:45 p.m. A.M.: partly cloudy. P.M.: mostly clear. Temp. 35° to 50°F. Wind E, 10-35 m.p.h. Wild food crop good. Twenty-four observers in 11 parties. Total party-hours, 77 (40 on foot, 29 by car, 8 by boat); total party-miles, 321 (36 on foot, 225 by car, 60 by boat).

● Com. Loon 1; Pied-billed Grebe 46; Double-crested Cormorant 8; Olivaceous Cormorant 568; cormorant, sp. 3; Anhinga 1; Great Blue Heron 46; Green Heron 1; Cattle Egret 56; Great Egret 24; Snowy Egret 63; Louisiana Heron 23; Black-crowned Night Heron 16; *Plegadis*, sp. 40; White Ibis 70; Roseate Spoonbill 15; White-fronted Goose 12; Snow Goose 368; Snow Goose (blue form) 245; Mallard 57; Mottled Duck 32; Gadwall 561; Pintail 374; Green-winged Teal 3770; Blue-winged Teal 348; Am. Wigeon 134; N. Shoveler 430; Redhead 14; Ring-necked Duck 3; Canvasback 1; Greater Scaup 117; Lesser Scaup 1135; scaup, sp. 567; Red-breasted Merganser 3; Sharp-shinned Hawk 2; Cooper's Hawk 1; Red-tailed Hawk 20; Marsh Hawk 22; Peregrine Falcon 1; Merlin 1; Am. Kestrel 38; King Rail 2; Clapper Rail 2; Virginia Rail 1; Sora 5; Com. Gallinule 260; Am. Coot 325; Piping Plover 15; Killdeer 105; Black-bellied Plover 15; Ruddy Turnstone 7; Am. Woodcock 3; Com. Snipe 56; Willet 39; Greater Yellowlegs 1; Lesser Yellowlegs 7; Dunlin 6; Long-billed Dowitcher 1; dowitcher, sp. 90; W. Sandpiper 17; Marbled Godwit 6; Sanderling 45; Black-necked Stilt 148; Herring Gull 117; Ring-billed Gull 406; Laughing Gull 47; Bonaparte's Gull 6; Forster's Tern 10; Com. Tern 4; Royal Tern 29; Caspian Tern 12; Rock Dove 18; Mourning Dove 20; Ground Dove 2; Groove-billed Ani 2; Chuck-will's-widow 3 [OK—Ed.]; Belted Kingfisher 28; Com. (Yel.-sh.) Flicker 52; Red-bellied Woodpecker 1; Yellow-bellied Sapsucker 2; E. Phoebe 32; Least Flycatcher 1; Vermilion Flycatcher 2; Tree Swallow 108; Blue Jay 17; Fish Crow 505; House Wren 6; Winter Wren 1; Carolina Wren 1; Long-billed Marsh Wren 3; Short-billed Marsh Wren 27; Mockingbird 41; Brown Thrasher 65; Am. Robin 5; Hermit Thrush 1; Blue-gray Gnatcatcher 70; Golden-crowned Kinglet 2; Ruby-crowned Kinglet 56; Water Pipit 17; Loggerhead Shrike 84; Starling 1269; Solitary Vireo 3; Black-and-white Warbler 2; Orange-crowned Warbler 64; Yellow-rumped (Myrtle) Warbler 425; Yellow-rumped (Audubon's) Warbler 1; Pine Warbler 1; Palm Warbler 8; Com. Yellowthroat 18; House Sparrow 13; E. Meadowlark 84; Red-winged Blackbird 5592; Brewer's Blackbird 2; Boat-tailed Grackle 580; Great-tailed Grackle 1; Com. Grackle 340; Brown-headed Cowbird 258; Cardinal 75; Savannah Sparrow 41; Le Conte's Sparrow 7; Sharp-tailed Sparrow 18; Seaside Sparrow 61; Vesper Sparrow 2; Dark-eyed (Slate-col.) Junco 1; Field Sparrow 1; White-crowned Sparrow 4; White-throated Sparrow 49; Fox Sparrow 3; Lincoln's Sparrow 5; Swamp Sparrow 27; Song Sparrow 7.

Total, 126 species (1 additional race, 1 form); 21,158+ individuals.—Herb Bell, David Booth, Steve Cardiff, Robin Carter, Bruce Crider, Howard Davis, Tristan Davis, Janet & Ken Dozol, Caroline Eastman, Dudley & Kathleen Harrington, Stan Heath, Kem Heinebach, Bill Hemeter, H.M. & India High, David Hunter, Robert Newman, Peter Osenton, Royce Pendergast, Mac Read (compiler—1670 King Arthur Ct., Orange TX 77630), Van Remsen, Jo Sims, (Sabine Aud. Soc.).

947. Lafayette, La. 30°12'N 92°06'W, center 5.5 mi w.s.w. of Parish courthouse, as described 1972; elevation 20 to 40 ft; habitat coverage: fields and pastures 49%, deciduous woodland 27%, hedgerows 14%, residential 5%, ponds 4%, pine groves 1%.—Dec. 21; 7 a.m. to 5 p.m. Overcast, intermittent light rain. Temp. 33° to 41°F. Wind SSE, 8-15 m.p.h. Wild food crop fair. Seven observers in 5 parties. Total party-hours, 35 (19 on foot, 16 by car); total party-miles, 249 (18 on foot, 231 by car).

● Great Blue Heron 6; Cattle Egret 16; Great Egret 2; Black-crowned Night Heron 6; Turkey Vulture 33; Sharp-shinned Hawk 1; Red-tailed Hawk 99; Red-tailed (Krider's) Hawk 1; Marsh Hawk 13; Merlin 1; Am. Kestrel 18; Bobwhite 19; Killdeer 473; Com. Snipe 24; Lesser Yellowlegs 4; peep, sp. 2; Ring-billed Gull 3; Forster's Tern 23; Rock Dove 12; Mourning Dove 22; Rufous Hummingbird 1; Belted Kingfisher 3; Com. (Yel.-sh.) Flicker 26; Red-bellied Woodpecker 3; Red-headed Woodpecker 4; Yellow-bellied Sapsucker 8; Hairy Woodpecker 2; Downy Woodpecker 4; E. Phoebe 2; Tree Swallow 28; Blue Jay 90; Com. Crow 23; Fish Crow 4; Carolina Chickadee 4; Tufted Titmouse 3; House Wren 11; Winter Wren 2; Carolina Wren 9; Mockingbird 79; Brown Thrasher 13; Am. Robin 24; Blue-gray Gnatcatcher 7; Ruby-crowned Kinglet 17; Water Pipit 78; Loggerhead Shrike 94; Starling 844; Orange-crowned Warbler 3; Yellow-rumped (Myrtle) Warbler 134; Com. Yellowthroat 2; House Sparrow 378; E. Meadowlark 87; Red-winged Blackbird 6022; Rusty Blackbird 35; Brewer's Blackbird 55; Com. Grackle 3079; Brown-headed Cowbird 2032; blackbird, sp. 30,000; Cardinal 72; Purple Finch 2; Am. Goldfinch 41; Rufous-sided Towhee 6; Savannah Sparrow 130; Vesper Sparrow 103; Dark-eyed (Slate-col.) Junco 13; Chipping Sparrow 8; Field Sparrow 5; White-crowned Sparrow 19; White-throated Sparrow 108; Lincoln's Sparrow 2; Swamp Sparrow 10; Song Sparrow 17.

Total, 69 species (1 additional race); 44,524+ individuals.—Mark Bostick, Clay Chataignier, Clay Chataignier II, Marshall Eyster (compiler—226 Monteigne Dr., Lafayette LA 70506), Ricky Judice, Bruce Klapper, Mike Musumeche.

948. Monroe, La. 32°34'N 91°58'W, center jct. La. Hwys. 139 and 594 in Swartz; elevation 65 to 85 ft; habitat coverage, as described 1978.—Dec. 26; 7 a.m. to 5 p.m. A.M.: mostly cloudy. P.M.: partly cloudy. Temp. 40° to 56°F. Wind S, 0-10 m.p.h. Wild food crop good. Seven observers in 2 parties. Total party-hours, 14 (7 on foot, 7 by car) plus 3 hours owling; total party-miles, 201 (6 on foot, 195 by car).

● Pied-billed Grebe 1; Great Blue Heron 3; Snow Goose 50; Mallard 25; Pintail 5; Blue-winged Teal 1; N. Shoveler 6; Wood Duck 4; Ring-necked Duck 3; Canvasback 2; Lesser Scaup 4; Red-tailed Hawk 13; Red-shouldered Hawk 1; Marsh Hawk 3; Am. Kestrel 15; Am. Coot 300; Killdeer 38; Rock Dove 38; Mourning Dove 30; Great Horned Owl 1; Barred Owl 4; Belted Kingfisher 4; Com. (Yel.-sh.) Flicker 5; Pileated Woodpecker 1; Red-bellied Woodpecker 10; Yellow-bellied Sapsucker 4; Downy Woodpecker 5; Red-cockaded Woodpecker 3; E. Phoebe 2; Horned Lark 30; Blue Jay 27; Com. Crow 15; Carolina Chickadee 17; Tufted Titmouse 4; Carolina Wren 7; Mockingbird 15; Brown Thrasher 3; Hermit Thrush 3; E. Bluebird 9; Ruby-crowned Kinglet 15; Loggerhead Shrike 13; Starling 2160; Orange-crowned Warbler 2; Yellow-rumped (Myrtle) Warbler 5; Pine Warbler 5; House Sparrow 103; E. Meadowlark 34; Red-winged Blackbird 462; Brewer's Blackbird 172; Com. Grackle 35,120; Brown-headed Cowbird 820; Cardinal 29; Am. Goldfinch 3; Savannah Sparrow 20; Dark-eyed (Slate-col.) Junco 36; Field Sparrow 10; White-crowned Sparrow 9; White-

Conversion: Allowed
Original-Encoded-Information-Types: IA5-Text
Priority: normal
Disclose-Recipients: Prohibited
Alternate-Recipient: Allowed
Date: 14 Jul 1997 13:24:39 -0400
From: Terry McTigue <Terry.Mctigue@noaa.gov>
To: jdf1413@usl.edu (Return requested),
Tim Osborn <Tim.Osborn@noaa.gov> (Return requested)
Subject: EA Lake Salvador
Mime-Version: 1.0

---------- Forwarded with Changes ----------
From: William A Archambault at MAILHUB
Date: 7/10/97 10:37AM
To: Terry McTigue at ~NMFS-SEFC
*To: Tim Osborn at MAILHUB
Subject: EA Lake Salvador

The below comments are from Bill Archambault. We've gotten a letter from Dave Fruge with some corrections, as well. Hopefully, we'll have them all by the end of the month and can send the corrected document up for a FONSI.

Terry

Terry
I took a look at your EA for the shoreline protection demonstration project and offer the following comments. This is a well written document that clearly defines why the project is needed and what impacts will occur from the project.

The only real comment I have is that although the EA does a good job of describing the few expected short term impacts of the preferred alternative, there is no real description of the actual construction process which will be used to build the breakwater. A short description of the actual construction involved in the dredging process and rock placement phase would be helpful including the time period involved with completing the project. Overall, its a good EA that would seem to support a FONSI determination. I'll look for the formal copy for NOAA clearance in the future.

Bill

United States Department of the Interior

FISH AND WILDLIFE SERVICE
825 Kaliste Saloom Road
Brandywine Bldg. II, Suite 102
Lafayette, Louisiana 70508

July 7, 1997

Ms. Teresa McTigue, Ph.D.
National Marine Fisheries Service
Southeast Fisheries Center, Lafayette Office
USL, Post Office Box 42451
Lafayette, Louisiana 70504

Dear Ms. McTigue:

The U.S. Fish and Wildlife Service (Service) has reviewed the draft Environmental Assessment (EA) for the Lake Salvador Shoreline Protection Demonstration Project-Phase II. That project would be constructed under the authority of the Coastal Wetlands Planning, Protection and Restoration Act (CWPPRA). The Service submits the following comments in accordance with provisions of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.), and the Endangered Species Act of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.).

General Comments

The Service agrees that various types of shoreline protection structures should be investigated to determine their effectiveness in reducing erosion in highly organic environments. Soils with poor load-bearing capacities often preclude the use of rock dikes and other structures which are too heavy for the underlying soils to support. The western shore of Lake Salvador seems to be a suitable site for the proposed project as it is a rapidly eroding shoreline composed of highly organic soils. Project implementation will allow a valuable comparison of rock breakwaters with the shoreline protection measures proposed under Phase I.

The freshwater marshes in the project area provide important habitat for several Federal trust species including migratory wading birds, songbirds, and particularly, migratory waterfowl. The Service agrees that, without shoreline protection measures, loss of the adjacent marsh habitat will continue as waves erode the shoreline, and open-water areas expand to become part of Lake Salvador. Loss of emergent wetlands and conversion of shallow water areas to deeper, lake bottom would reduce the area's habitat value for a number of wetland-dependent species.

Specific Comments

Page 14, Paragraph 4 - Examination of 1995 color infrared photography indicates the existence of submerged aquatic vegetation (SAV) along the Lake Salvador shoreline extending several

hundred feet into Lake Salvador. Although project implementation will likely increase coverage of SAV by providing areas of calm water, this paragraph should address the short-term, adverse impacts to SAV from project construction.

The Service fully supports the measures proposed thus far for the Lake Salvador Shoreline Protection Demonstration Project-Phase II. Thank you for the opportunity to provide comments on the EA. If you have any questions regarding our comments, please contact Kevin Roy at 318/262-6662, extension 226.

Sincerely,

David W. Frugé
Field Supervisor

To: Bruce Dyson
Terry McTigue

DEPARTMENT OF THE ARMY
NEW ORLEANS DISTRICT, CORPS OF ENGINEERS
P.O. BOX 60267
NEW ORLEANS, LOUISIANA 70160-0267

REPLY TO
ATTENTION OF:

July 29, 1997

Planning Division
Plan Formulation Branch

Mr. Kenneth Bahlinger
Project Manager
Louisiana Department of Natural Resources
Post Office Box 94396
Baton Rouge, Louisiana 70804-9396

Dear Mr. Bahlinger:

This is in response to your letter dated June 20, 1997, requesting the review of plans and specifications for Lake Salvador Shoreline Demonstration Project (BA-15) Phase II. We have reviewed the plans and specifications on the subject project and our comments are enclosed for your information.

If you have any questions regarding our comments, please call Mr. Brian Bonanno at (504) 862-2983 or Mr. Gary Rauber at (504) 862-2543.

Sincerely,

R. H. Schroeder, Jr.
Chief, Planning Division

Enclosure

Copies Furnished:

Mr. Tim Osborn (w/enclosure)
Mr. Bill Good (w/o enclosure)
Ms. Diane D. Smith (w/o enclosure)
Mr. Rick Ruebsamen (w/o enclosure)
Mr. George Boddie (w/o enclosure)

Lake Salvador Shoreline Demonstration Project (BA-15) Phase II Review Comments

1. Dwg. 6/14. All three cross sections show a "DREDGE SPOIL AREA". This could be more appropriately labeled a "TEMPORARY STOCKPILE AREA" or "PERMANENT DISPOSAL AREA". Specify the maximum height and required slopes of the stockpiles and disposal areas.

2. Dwg. 6/14. Section B-B and C-C show an unlabeled disposal area on the land side of the breakwater. Specify whether this disposal area is mandatory, permanent, or temporary. It appears that the intention of this disposal area is a mandatory and permanent placement of dredged material. However, no required slopes or grade are given for the dredged material. According to the specification paragraph TS-3.3, one-half of the flotation channel is to be refilled; however, depending on the amount of material needed for the mandatory section, the quantity needed to refill the channel may not be available. We recommend using a mandatory disposal section with specified slopes and grade which will reduce the potential for a stability problem with respect to the breakwater. Additionally, use of plugs for the ends of the channel is recommended if no flow is desired to be captured by the channels after construction use. However, if the main reason for refilling one-half the channel is stability, then size the mandatory section such that the remaining temporary stockpile area will contain the required amount.

3. Dwg 7/14. In "Detail '1'", label which side is land side and lake side.

4. Dwg. 7/14. For a top of piling elevation of +9.92, a ground elevation of -2, and 30 ft. embedment requirement, the 40 ft. treated pile is incorrect. Please revise as necessary.

5. Dwg. 7/14. Note # 5 is not clear with respect to the direction. We recommend using "parallel to breakwater centerline" and "perpendicular to breakwater centerline" when referring to joints requiring seams and overlaps.

6. Dwg. 7/14. The second sentence in Note # 9 has a typographical error.

7. Dwg. 7/14 Note # 5 and Spec. Para. TS-5.4(B). The intentions of these two references are unclear with regards to the locations of sewn seams and overlapped panels. The specifications state that panels placed along the breakwater C/L shall be overlapped; however, reference to lake side and shoreside do not appear to be appropriate.

8. Dwg. 7/14. Note # 16 states that the location of signs are shown on drawings 2 - 5, however, the location is not shown on either of these drawings.

9. Dwgs. 10 through 14. The baseline profile is not shown past Sta. 2+50. We recommend showing the baseline profile for the entire length of the job. The best location suited for displaying the profile is the aerial plan drawings.

10. Spec. Para. TS-3. This paragraph of the specifications requires excavation to the lines and grades on the drawings. The bottom elevation is not labeled maximum. This implies that excavation to El. -6 is required. Is this the intention of the labeled excavation grade? Unless a certain quantity of excavation is required, the contractor should be given a set of boundaries to maintain and he can decide how much he needs for his equipment.

11. Spec. Para. TS-7. In the second sentence of the paragraph, the riser pipe diameter should be "two inches" instead of "two feet" to agree with drawings.

12. General. The spelling of "flotation" changes in the drawings and specifications from "flotation" to "floatation". Either spelling is correct.

13. General. The access channel shown on the plans is not covered in the specifications.

14. General. No directions are given in the plans and specifications on the refilling of the flotation channel in regards to how the material is to be placed back into the channel and how the one-half quantity will be verified. Details of the refilling process could be shown in a typical cross section.

DEPARTMENT OF THE ARMY
NEW ORLEANS DISTRICT, CORPS OF ENGINEERS
P.O. BOX 60267
NEW ORLEANS, LOUISIANA 70160-0267

REPLY TO
ATTENTION OF:

August 4, 1997

Planning Division
Environmental Analysis Branch

Theresa McTigue, Ph.D.
National Marine Fisheries Service
University of Southwestern Louisiana
P.O. Box 42451
Lafayette, Louisiana 70504

Dear Dr. McTigue:

We have reviewed the Environmental Assessment for the Lake Salvador Shoreline Protection Demonstration Project (BA-15) in St. Charles Parish, Louisiana. Section 10 and Section 404 permits were issued on May 29, 1997, from the U.S. Army Corps of Engineers for the rock shoreline protection breakwater proposed along the western shoreline of Lake Salvador. We have no additional comments to offer regarding this document.

Sincerely,

John C. Wyble
for
R. H. Schroeder, Jr.
Chief, Planning Division

State of Louisiana

M.J. "MIKE" FOSTER, JR.
GOVERNOR

JACK C. CALDWELL
SECRETARY

DEPARTMENT OF NATURAL RESOURCES

August 1, 1997

Mr. Tim Osborn, Program Officer
N.M.F.S.
Restoration Center, S/HP5
1315 East West Highway
Silver Spring, Maryland 20910

Post-it® Fax Note 7671	Date 8/5	# of pages ▶ 3
To Terry McTigue	From Esw	
Co./Dept.	Co.	
Phone #	Phone #	
Fax #	Fax #	

RE: Lake Salvador Shoreline Protection Project, Phase II

Dear Mr. Osborn:

The DNR/CRD Engineering staff has reviewed the comments submitted by you from Mr. Bruce Dyson of GOTECH, Inc., dated July 1, 1997, on the above referenced project and would like to take this opportunity to respond. Your comments are in italics.

General Comments for Plans

Comment #1 *The baseline location at the beginning of the project is found on the top of the bank where cross sections can be staked out and the vegetation line (controlling line) can be located with a short offset. Between stations 30+00 and 65+00 (approximately) the baseline spans across the receded shoreline and is located in the water, hundreds of feet from the vegetation line. This also occurs at other spots along the project. It would appear that the Contractor will have to run a sub-baseline along the top of the bank area in order to have a physical baseline to work from.*
If the Owner of the project supplies this sub-baseline and references the cross sections to it, it would appear that the construction layout would be simplified, along with the final cross sections that the Contractor will be required to submit to verify the lines and grades of the breakwater structure. If the Contractor is to

be responsible for the layout, more detailed guidelines may be in order to insure that the intended layout is achieved.

Response: We will add an additional section to the specifications for construction layout. It will require the Contractor to be responsible for layouts.

Comment #2 *The setback distance from the edge of the floatation channel to the toe of the breakwater structure is shown as 25 feet. A general dimension held by others (such as the U. S. Army Corps of Engineers) is 40 feet. The allowable setback distance for these soil conditions may need to be checked, especially with a steep (1:1) cut on the floatation channel.*

Response: The rock will be placed by dragline and graded by trackhoe. A dragline with a 100 ft boom located on the centerline of the channel, operating at an angle of 30 degrees from horizontal, would not reach the back of the structure if the setback distance was 40 ft. We feel that a 25 ft setback will be adequate.

Comment #3 *The final elevation shown on the top of the breakwater structure (detail 1) is plus 4.0. Is this an initial construction height or a final elevation after settlement has occurred? Some guidance may be in order to make it clear to the Contractor that he is, or is not, responsible to "dress up" the rock structure after initial settlements have take place.*

Response: Some initial settlement is expected. General Note 3 on page 7 of the project plans covers your concerns about final elevations. The contractor is required to conduct a second operation after 15-days to restore the section to the required shape and grade. Minor settlement of a few inches will not be addressed as the size of the rock (1.2 ft) limits the amount of correction that can be applied to a section. We feel this comment is adequately covered in the current plans.

<u>*General Comments for Specifications*</u>

Comment #1 *Section TS-3.3 that half of the dredged material will be placed back into the floatation channel in sections. Section TS-3.6 also indicates that the channel will be backfilled. It is unclear when this backfilling will take place. It may be proper to instruct the Contractor to backfill only when the Contractor's cross sections have verified the work and all breakwater structures have been accepted by the Owner.*

Response: Concur

We hope we have adequately addressed your concerns. A final draft of the plans and specifications will be administered after all comments from participating agencies have been addressed and the appropriate corrections made. If you have any questions, please feel free to call me at (504) 342-7362.

Sincerely,

Kenneth Bahlinger
Project Manager

cc: Gerry Duszynski, Assistant Administrator, DNR/CRD
George Boddie, Engineering Manager, DNR/CRD
Brian Kendrick, Engineering Supervisor, DNR/CRD
Scott Vanzant, E.I.T., DNR/CRD
Project File BA-15 Phase II

WVA

Lake Salvador Shoreline Protection (BA-15)

Candidate Project for the Third Priority List of the

Coastal Wetlands Planning, Protection and Restoration Act

Candidate Project Information Sheet

For Wetland Value Assessment

Proposed by:

State of Louisiana

June 7, 1993

{Revised in accordance with LDNR/CRD WVA meeting of June 4, 1993}

Contact: Steven Gammill DNR/CRD (504)-342-7308

Coastal Wetlands Planning, Protection and Restoration Act
BA-15 Lake Salvador Shore Protection
Project Information Sheet

Project Name: BA-15 Lake Salvador Shore Protection
Submitted By: State of Louisiana
Project Area Size: 4070 acres (2948 acres (72%) marsh, 1122 acres (28%) water)
Prepared by: Steven Gammill

Project Description:

This project is located along 4.2 miles of the north Lake Salvador shoreline bounded to the east by Baie du Chactas and to the west by Bayou des Allemandes on the St. Charles-Lafourche Parish lines. The objective of the project is to maintain or recreate the historical shoreline along this section of the lake and re-establish the historical hydrology of the interior marsh to reduce tidal scour and associated land loss. Breaches along the shoreline will be plugged and timber pylon breakwaters will be placed in four feet of water approximately 300-400 feet offshore. This project is designed to demonstrate the effectiveness of two separate types of segmented timber breakwaters in highly organic, unconsolidated sediments with poor load bearing capacities. Sediments such as those found in this area make traditional hard shoreline stabilization techniques ineffective.

Structural components of the plan include:

1. 5280 ft. of low shell armored berm to be placed in areas where the blowouts have occurred.
2. 11,088 ft. of sturdy timber pylon segmented breakwater. Breakwaters are V-shaped, 16' long spaced 10' apart on 21'4" centers. 518 pylon structures will be required.
3. 11,088 ft. of sturdy timber pylon segmented breakwater. Breakwaters are straight, 20' long spaced 10' apart on 30' centers. 370 pylon structures will be required.

Present Conditions:

1. Acres of vegetated marsh and listing of most common plant species present.

   LDNR GIS data for 1984 indicate 2948 acres (72%) of the project area is covered by emergent wetlands.

   Marsh species common to the area observed during field investigation:

25%	*Sagittaria lancifolia or S. falcata*	Bulltongue
40%	*Polygonum spp.*	Smartweed or Knotweed
10%	*Typha spp.*	Cattail
5%	*Colocasia antiquorum*	Elephants ear
5%	*Eichinochloa walteri*	Wild millet or Coast cockspur
5%	*Scirpus californicus*	Bullwhip or Giant bullrush
5%	*Scirpus californicus*	Bullwhip or Giant bullrush

Tr.	*Salix nigra*	Black willow
Tr.	*Sacciolepis striata*	Bagscale
Tr.	*Aeschynomene indica*	Sensitive jointvetch
Tr.	*Panicum dichotomiflorum*	Fall panicum or Zig zag grass
Tr.	*Bacharris halimifolia*	Groundselbush
Tr.	*Cephalanthus occidentalis*	Buttonbush
Tr.	*Sesbania drummondii*	Rattlebox
Tr.	*Solidago simpervirens*	Goldenrod
Tr.	*Vigna luteola or Vigna repens*	Cowpea or dearpea
Tr.	*Zizaniopsis miliacea*	Giant cutgrass
Tr.	*Pluchea purpurascens*	Camphorweed

2. Acres of open water:

   1122 acres (28% of the project area) of open water existed in 1984.

3. Percent of open water area listed in Item #2 dominated by aquatic plants ($\geq$ 50% canopy cover).

   Of the 1122 acres of open water in the project area, October, 1992 field observations indicate that 30% (337 acres) of these water bottoms are covered with >50% submerged and/or floating aquatic vegetation.

Submerged aquatic species present (observed in the field):

	Submerged Aquatics	
40%	*Myriophyllum spicatum*	Eurasion watermilfoil
40%	*Eichornia crassipes*	Water hyacinth
10%	*Salvinia minima*	Floating fern
5%	*Spirodela polyrhiza*	Large duckweed
5%	*Lemna minor*	Common duckweed
Tr.	*Brasenia schreberi*	Watershield
Tr.	*Nymphaea odorata*	White waterlily

4. Historical information on marsh loss trends (provide references, if available, or methods used to derive information given).

   COE land loss data:

1932 to 1958 (%/yr.)	1958 to 1974 (%/yr.)	1974 to 1983 (%/yr.)	1983 to 1990 (%/yr.)
0.177	1.284	0.956	0.282

5. Brief summary of significant historical hydrologic changes.

   The principal hydrologic changes in the area are due to land loss caused by tidal scour of fragile orgainic marsh sediments, wave and wake erosion as well as subsidence. As the marsh breaks up, resultant open water ponds form and coalesce thereby increasing fetch and erosion potential in the marsh.

6. Shoreline erosion rate (provide source if available).

   13.2 ft/yr.. (digitized from COE land loss maps)

7. Percent of open water area $\leq$ 1.5 feet in depth (relative to marsh surface)

   Estimate at least 50%.

8. Available historical salinity data, including period of record, sampling location(s) in relation to project area.

   Basin planning summaries and field readings taken in October, 1992 indicate an average annual salinity of less than 1 ppt.

9. Location, type and operation schedule (if applicable) of existing permitted and unpermitted structures.

   At the present no structures exist in the area with the exception of canal spoil banks and shell shoreline stabilization along an estimated 70% of the lakefront shoreline.

10. If there is an existing management plan for the area, is it permitted? Provide copy of permitted operational schedule scheme and permit number.

    No management plan exists at the present.

11. Location of structures, culverts, breaks in spoil banks, etc. that serve as hydrologic connections and are not identified above or are not easily seen by examination of aerial photography.

    None.

12. Estimated subsidence rate (provide reference if available).

    Basin strategic planning meetings for this area indicate the area is subsiding at a rate of approximately 0.35-0.5 in./yr.. This is among the highest in the state.

Future Conditions

1. Location, type, and operation of proposed structures and water control systems including plugs.

   See project description on page one.

2. Proposed hydrologic changes (water introductions, circulation routes, etc.) due to the project.

   The principal hydrologic change is the introduction of freshwater from the Davis Pond Freshwater Diversion to be completed in 1997 or 98. It is expected that the diversion will benefit this area.

3. Project benefits.

   The benefits listed below should reflect the net benefits attributable to the project for the 20 year analysis period.

a. Acres of emergent marsh predicted to be gained/lost without project.

It is reasonable to assume that the Davis Pond Diversion will be constructed and operating within the next five years. With this assumption, I expect that interior marsh loss will be reduced by 25%. Land loss on the Lake Salvador shore can be expected to remain at around 5 ac/yr. from a 13.2 ft/yr. erosion rate.

TY 0: **2948** ac. of emergent marsh occupying **72%** of the 4070 ac. project area.
TY 1: **13** ac. lost leaving **2935** ac. or **72%** of the brackish project area covered with emergent marsh.
TY 20: **253** ac. lost leaving **2695** ac. or **66%** of the brackish project area covered with emergent marsh.

1. Shoreline marsh loss along Lake Salvador at TY20:
((13.2'/yr erosion x 22,176)/43560) x 20 yrs. = - 134 ac

2. Interior marsh loss at TY 20:
((2948 ac. - 134 ac. shoreline erosion)x 0.002115) x 20 yr. = - 119 ac.
{where 0.002115 = 0.2115%/yr. land loss}

Total: **- 253 ac**

b. Acres of emergent marsh predicted to be gained/lost with project.

With the project in place, it is reasonable to assume that shoreline erosion will be halted along this portion of Lake Salvador during the project life. Interior marsh loss will be stopped by freshwater, sediment and nutrient input form Davis Pond diversion and the elimination of tidal scour in the interior marsh. Timber breakwaters are expected to promote accretion along the lake shore at a rate of 1'/yr.

TY 0:**2948** ac. of emergent marsh occupying **72%** of the 4070 ac. project area.
TY 1:**0** ac. gained leaving **2948** ac. or **72%** of the brackish project area covered with emergent marsh.
TY 20: **10** ac. lost leaving **2958** ac. or **73%** of the brackish project area covered with emergent marsh.

1. Shoreline marsh accretion along Lake Salvador at TY20:
((1'/yr accretion x 22,176)/43560) x 20 yrs. = + 10 ac.

Total: **+10 ac.**

SUMMARY:

Total acres of marsh lost without the project:	= - 253 ac.
Total acres of marsh gained with the project:	= + 10 ac.
Net benefit:	**= 263 ac**

c. Acres of open water aquatic vegetation predicted to be gained/lost without project.

Without the project it is estimated that as the marsh continues to deteriorate acreage of submerged aquatic vegetation will increase due to the creation of more open water habitat and the addition of freshwater and nutrients from the Davis Pond diversion. Overall percentage cover of submerged aquatics is anticipated to increase to 40% with completion of the Davis Pond Diversion. This amounts to 441 acres of open water with >50% cover of submerged and floating aquatics.

d. Acres of open water aquatic vegetation predicted to be gained/lost with project.

With the introduction of freshwater and associated nutrients from the Davis Pond Diversion in conjunction with reduction in tidal scour and turbidity from shoreline stabilization, aquatic vegetation can be expected to flourish and increase to 75%. This amounts to 916 acres of open water with >50% cover of submerged and floating aquatics.

4. Predicted plant species composition of marsh for future-with-project and future-without-project (general, in terms of dominant species).

Species composition and relative abundance is not expected to change appreciably for future with and future without project.

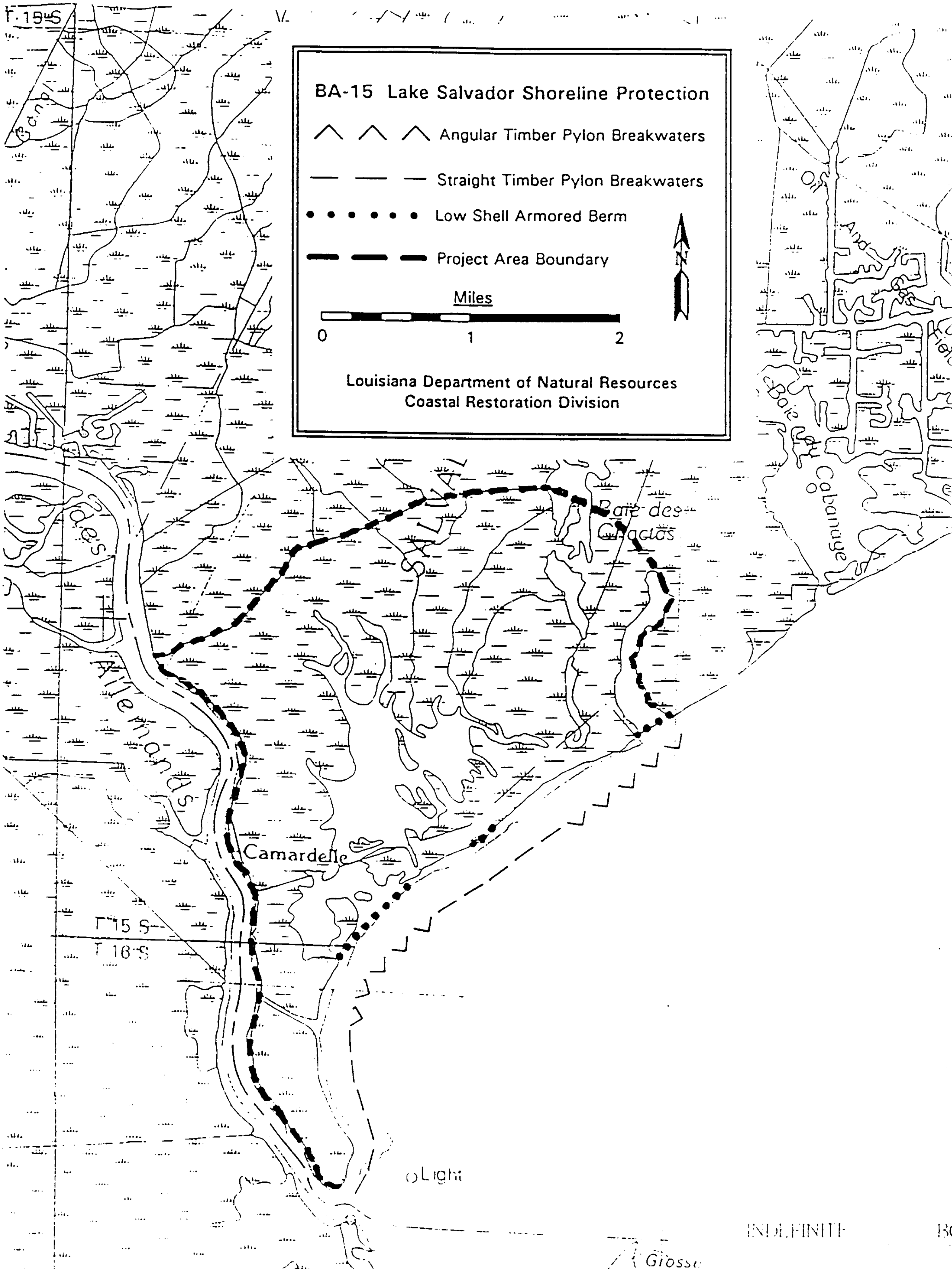
5. Estimate of open water depth (≤ 1.5 ft) in relation to marsh surface for future with project and future without project scenarios.

Percentage of open water less than 1.5 ft. deep:

Marsh	With Project (%)	Without Project (%)
≤ 1.5 ft. deep	65%	40%

9. Predicted salinities, future-with and future-without project.

0 ppt. with project and without project.


BA-15 Lake Salvador Shoreline Protection
Angular Timber Pylon Breakwaters
Straight Timber Pylon Breakwaters
Low Shell Armored Berm
Project Area Boundary
N
Miles
0
1
2
Louisiana Department of Natural Resources
Coastal Restoration Division
T 15 S
T 16 S
Allemands
Camardelle
Baie des Chactas
Baie du Cabanage
Light

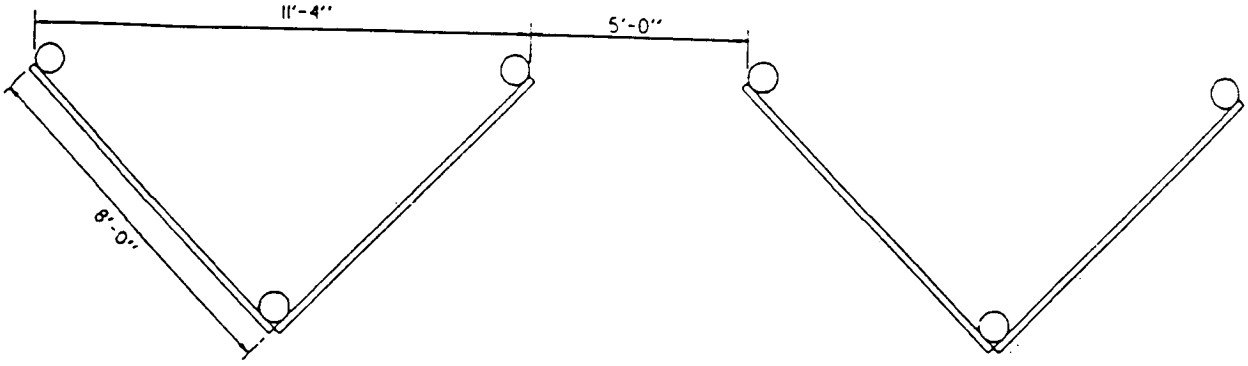


FIGURE 5 - WOOD FYLON PLAN

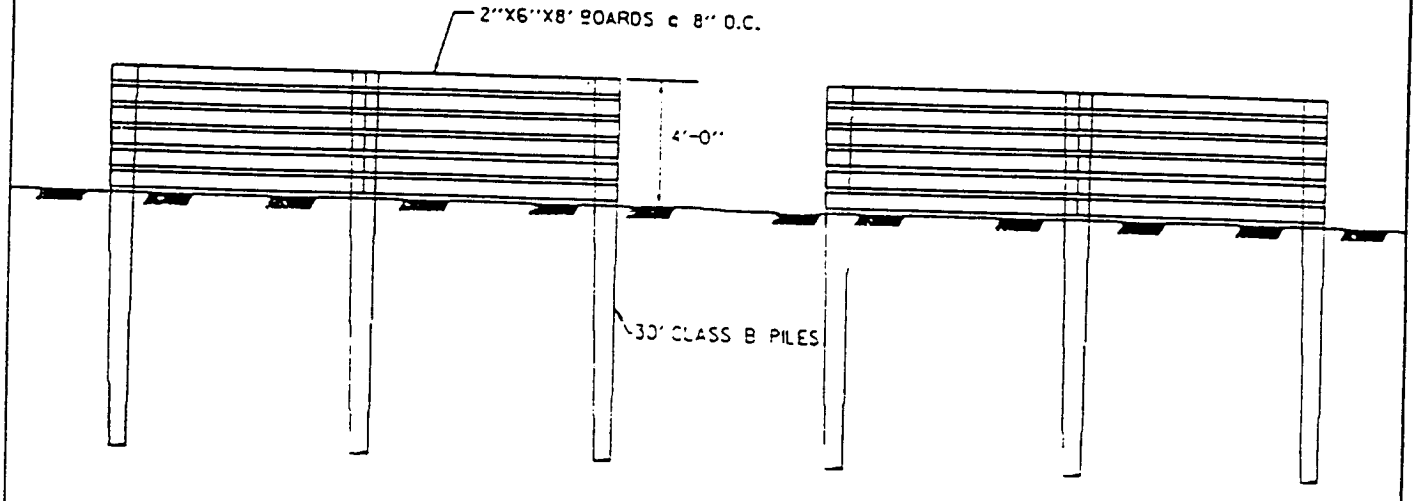
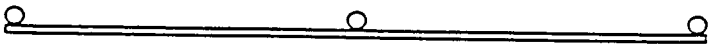


FIGURE 6 - WOOD FYLON ELEVATION

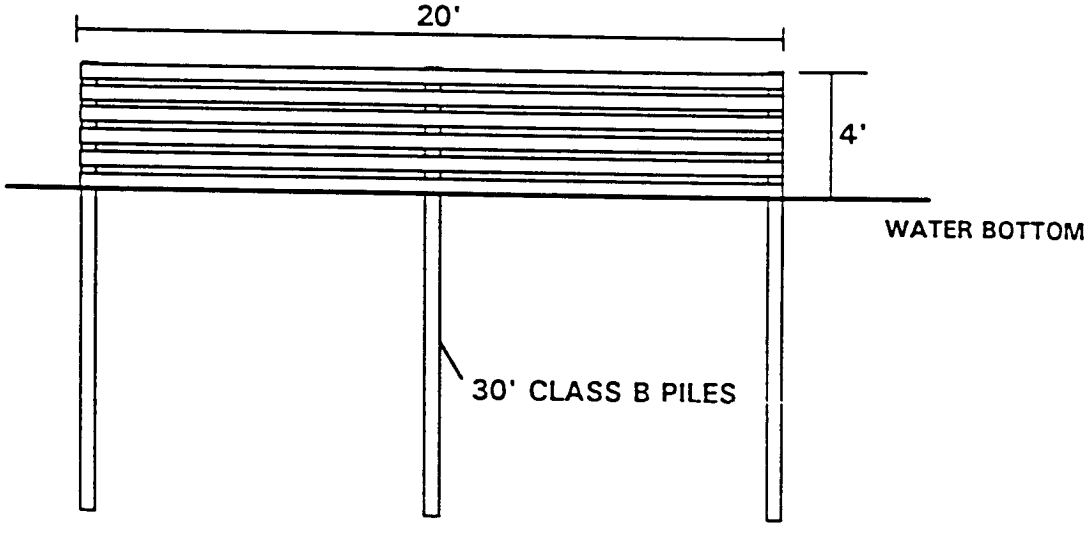
STABILIZATION OF COUBA ISLAND

FIGURES 5&6

TYPICAL STRAIGHT PYLON BREAKWATER



PLAN



FRONT VIEW

Listing for GIS file: BA_15_84.gis

Date statistics printed: 5-Nov-1992

Date statistics created: 5-Nov-1992

This file has 299 rows, and 207 columns

This image is geo-referenced to a State Plane coordinate system

The upper left corner has coordinate: 2305992, 400362.3

The cell size is (X, Y): 82, 82

The number of acres per cell is: 0.1543618

Upper left corner data file coordinate (X,Y) is: 13836, 3334

Number of classes in this variable is: 19

This file contains 8-bit data

The VARIABLE name is ba_15 - 1984 Classified TM Level One Data

VALUE	POINTS	Acres	%	DESCRIPTION
0	35524.	5483.548	0.00 %	out
1	5174.	798.668	19.62 %	Water
2	2721.	420.018	10.32 %	Broken Marsh
3	0.	0.000	0.00 %	Marsh
4	16605.	2563.178	62.97 %	Fresh Marsh
5	0.	0.000	0.00 %	Intermediate Marsh
6	0.	0.000	0.00 %	Brackish Marsh
7	0.	0.000	0.00 %	Saline Marsh
8	203.	31.335	0.77 %	Forest
9	0.	0.000	0.00 %	Swamp
10	1135.	175.201	4.30 %	Shrub/Scrub
11	0.	0.000	0.00 %	Ag/Pasture
12	0.	0.000	0.00 %	Developed
13	27.	4.168	0.10 %	Inert
14	0.	0.000	0.00 %	Beach
15	0.	0.000	0.00 %	Clouds
16	324.	50.013	1.23 %	Floating Vegetation
17	0.	0.000	0.00 %	Mixed Vegetation
18	180.	27.785	0.68 %	Unclassified
Totals:	26369.	4070.366		

Totals and Percentages are Based on Non-zero points

2948 ac wetland

'78-'84 = 40 ac/yr

0.97 %/yr

SCREENING INFORMATION SHEET
ECONOMIC EVALUATION DATA

DATE May 18, 1993

PROJECT NAME Lake Salvador Shore Protection BASIN Barataria NO. BA-15

PROJECT CONSTRUCTION COST	699,850	
FEASIBILITY AND PLANNING	17,496	2.5 % OF CONSTRUCTION
ENGINEERING AND DESIGN	69,985	10.0 % OF CONSTRUCTION
SUPERVISION & ADMINISTRATION OF E&D	10,498	1.5 % OF CONSTRUCTION
S&A OF CONSTRUCTION	69,985	10.0 % OF CONSTRUCTION
CONTINGENCES	174,963	25.0 % OF CONSTRUCTION
TOTAL FIRST CONSTRUCTION COST	1,042,777	TOTAL OF ABOVE COST
ANNUAL OPERATION & MAINTENANCE	8,748	25 % OF PROJECT CONSTRUCTION COST / 20 YEARS
ANNUAL MONITORING COST	2,150	ESTABLISHED PROTOCOL
TOTAL ESTIMATED COST	$1,260,739	TOTAL FIRST CONSTRUCTION COST + 20 * ANNUAL O & M COST + 20 * ANNUAL MONITORING COST.
BENEFITED ACRES	1,143	
TOTAL ESTIMATED COST / BENEFITED ACRES	$1,103	

Coastal We'lands Planning Protection and P oration Act
Wetland Value Assessment Wo sheet

Project: BA-15 L. Salv. Shore Prot.

Date: 6/4/93

Wetland Type: Fresh

Land Loss Rate: 0.282%/yr.

Marsh acreage: 2948 ac 72%

Water acreage: 1122 ac

Total acreage: 4070 ac

	Target Year	V1 % Marsh	V2 % SAV	V3 Marsh edge	V4 Water regime	V5 Water ≤ 1.5'	V6 Salinity	V7 Fish access
	TY0	2948 ac 72%	30%	50% = 1 40% = 3 10% = 4	10% = 2 90% = 3	50%	0	1
FWOP	1	2935 ac 72%	30%	~~50~~ 40% = 1 40% = 3 10% = 4	↓	50%	1	↓
	20	2695 66%	40%	44% = 1 40% = 3 16% = 4	↓	40%	↓	↓
					↓			↓
FWP	1	2948 72%	32%	Same as Base	↓	50%	↓	↓
	20	3376 2956	75%	51 = 1 40 = 3 9 = 4	↓	65%	✓	✓

Remarks:

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
SOUTHEAST FISHERIES CENTER
LAFAYETTE OFFICE
U.S.L., P.O. BOX 42451
LAFAYETTE, LA 70504

MARCH 1, 1999

Darin Lee
Louisiana Department of Natural Resources
Coastal Restoration Division
P.O. Box 2079
Thibodaux, Louisiana 70310

Post-it® Fax Note 7671	Date	# of pages ▶
To Tim Osborn	From T. McTigue	
Co./Dept. NMFS R.C.	Co. NMFS Lafayette	
Phone # 301-713-0174	Phone # 318-482-5915	
Fax # 301-713-0184	Fax # 318-482-6630	

Dear Mr. Lee,

Thank you for providing my office with a draft copy of Progress Report #1 for the Lake Salvador (BA-15) Demonstration Project, a project designed and constructed in a joint effort between the National Marine Fisheries Service and the Louisiana Department of Natural Resources. Dr. Andy Nyman, Mr. John Foret, and I have all had the opportunity to review the draft progress report and have a series of comments that we feel will improve the document and the analyses therein.

Our comments are pooled into the list below:

1. Page 7, second paragraph. How were the aerial photographs used to evaluate project effectiveness? It appears that they were not. If they were not used to evaluate project effectiveness, then why did the CWPPRA Monitoring Program pay for these photographs? Furthermore, two sets of preconstruction photographs were purchased; one of which was taken three years, six months prior to construction. Explain why this was done.

2. Page 7, second paragraph. Explain the necessity of having two pre-construction aerial photo interpretations, particularly the photographs over 3 years pre-construction

3. Pages 8, 10. How were the pre-construction shoreline positions determined by Picciola and Associates used to evaluate project effectiveness? It appears that they were not. If they were not used to evaluate project effectiveness, then why did the CWPPRA Monitoring Program pay for those surveys?

4. Page 8,9, & 10. How can the pre-construction shoreline positions (Picciola and Assoc.) be used to compare with the post-construction measurements (GPS)? Only those GPS points that fall on the Picciola points (if any) can be used to determine shoreline movement pre- to post-construction.

5. Table 2. Standard deviations should be provided for the estimates of erosion for reference, project, structure, and gap areas.

6. Figures 16 and 17 are too small to be useful. Even the massive erosion in the reference areas (-10.41 ft) looks like fuzz in the drawing. I suggest dropping the figures if they cannot be enlarged enough to visually reinforce the data in Table in 2.

7. Figure 16, 17. Figure 16 shows the interpolated shoreline from Picciola's data (1 data point every 200 feet, as compared to walking the shoreline with the GPS (data point every 5 feet). See comment above regarding pages 8, 9, and 10.

8. Table 3. Standard deviations should be provided for the estimates of erosion for the project and reference areas.

9. Table 4. Standard deviations should be provided for the estimates of erosion for the grated apex, geotextile tubes, angled timber fence, vinyl siding, and reference areas.

10. Page 12, last new paragraph. Wave height and wave energy data are discussed but there was no mention of the methods used to collect these data. The Stone et al. report, which is cited as the source of that information, should

be appended to this monitoring report if Stone does not intend to publish those data elsewhere. If after 5 years those data are still unpublished, then that report should be appended to the 5th year monitoring report.

11. A table listing the cost/ft, erosion based on GPS, and erosion based on erosion-markers would greatly aid readability. Making this table also discloses that very little of the data collected by Stone et al. was presented in the report. For instance,

structure type	cost ($/ft)	wave height reduction (%)	wave energy reduction (%)	GPS erosion (ft/yr)	marker erosion (ft/yr)
grated apex	390	45	?	-9.10	-13.1
geotextile tube	340	?	?	1.67	-24.7
angled timber	252	?	?	-13.17	-25.0
vinyl siding	200	80	95	-5.83	-6.95
reference	0	?	?	-13.18	-38.66

12. Page 15, first sentence. The statement that there are not enough data to statistically compare erosion rates among the structure types is false. Replicate measures of erosion were made within structure with the erosion markers. The correct SAS statements would be:

```
proc anova;
class structure marker;
model erosion = structure marker(structure);
test h=structure e=marker(structure);
```

Furthermore, statistics are not needed to compare the erosion estimates determined via GPS because those estimates are complete counts, not sampling estimates. For instance, you don't need statistics to determine that Denver won the Superbowl because all points were counted. Now, if only the points scored during every 5th minute were counted (an 8.3% sample), then statistics would be needed to estimate if Denver or Atlanta scored more points. This is why statistics are needed to compare the erosion estimates determined via erosion markers but not to compare the erosion estimates determined via GPS. This is not to imply that the GPS estimate is perfect; it still could be so full of noise as to be inaccurate.

13. Page 15, first paragraph. It appears that the writer of the report did not have ample interaction with those who developed this project's experimental design. I suggest the writer consult meeting notes for information on which to base conclusions regarding project design. Second sentence: not true.

14. Page 15, last paragraph. No data were presented to substantiate the claim that the structures killed SAV. Delete this or monitoring reports will evolve into lists of what-might-a-been's.

15. Page 15, last paragraph. No data were presented to substantiate the claim that SAV reduces erosion. Delete this or secure data or a reference to substantiate the claim.

16. Page 15, last paragraph. There were reasons why the project was built the way it was, with constraints including physical characteristics of the location, characteristics of the building materials, and project budget. Discovering the limitations and explaining them to the public will be much more useful to the public than simply claiming the project was poorly designed.

17. Too few wave height/reduction data were presented to support the claim that GPS derived data are more reliable than shoreline marker data. Also, the claim that the GPS derived data is better than the shoreline marker derived data should refer to these data and not the methodology in general. For instance, there may be too few erosion markers. Furthermore, the erosion markers were only used with a 5-month interval whereas the GPS was used with a 9-month interval. It is simply too premature to compare either the methods in general or even the methods as they were executed for this project.

18. Page 16, first full paragraph. Whole paragraph is a contradiction. Suggest expanding the last sentence into a short paragraph.

19. Page 16, last new paragraph. The first sentence contradicts the second sentence; you can't have it both ways. As mentioned earlier in these comments, the criticism of the GPS data is not consistent with reality. The GPS data do not require statistics to determine which estimate is lowest, highest, etc. The criticism of the gaps between the structures is also devoid of reality because the engineers have indicated that such structures would always be constructed with gaps to reduce cost and maintain access. Except for the last sentence (which should be expanded into a short paragraph), this paragraph should be deleted.

20. Page 17, first new paragraph. The second sentence of this two sentence paragraph is incorrect. The fact that the reference area eroded but the project area gained land during the same time period means either that the difference resulted from the structures or from natural, spatial variability in erosion. The fact that land gain was not observed in either reference suggests that this real, observed difference resulted from the structures.

21. Page 17, last paragraph. Conclusions are drawn regarding data not adequately presented in this report; i.e., the wave height and wave energy data. The last sentence of this paragraph contradicts every other sentence in the paragraph. Either delete all previous sentences, or the last.

22. Page 18, only paragraph. It is extremely premature to conclude which structure type reduces erosion the most, despite the wave energy data. No mention is made of the fact that erosion might be unrelated to wave energy, an unlikely but possible scenario. It is extremely premature to conclude which structure type is most durable. This paragraph should be deleted.

Please feel free contact Dr. Nyman, Mr. Foret, or me if you need any clarification of our comments or would like to discuss the project or monitoring plan in general. We can be reached at (318) 482-5915.

Sincerely,

Teresa McTigue

Teresa McTigue
Fisheries Biologist

cc: T. Minello, NMFS Galveston Laboratory
T. Osborn, NMFS Restoration Center