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FINAL
ENVIRONMENTAL STATEMENT

NEW ORLEANS TO VENICE, LOUISIANA
HURRICANE PROTECTION

Prepared by

U. S. ARMY ENGINEER DISTRICT, NEW ORLEANS, NEW ORLEANS, LOUISIANA

10 August 1973

NEW ORLEANS TO VENICE, LOUISIANA
HURRICANE PROTECTION

TABLE OF CONTENTS

TABLE OF CONTENTS (Cont'd)

MAPS

NEW ORLEANS TO VENICE, LOUISIANA
HURRICANE PROTECTION

( ) Draft (X) Final Environmental Statement

Responsible Office: U. S. Army Engineer District, New Orleans
New Orleans, Louisiana

1. Name of Action: (X) Administrative ( ) Legislative.

2. Description of Action:

a. This project provides for enlargement of the back levees from City Price to Venice (approximately 36 miles) on the west bank of the Mississippi River, including a new floodgate at Empire and construction of a new levee from Phoenix to Bohemia (approximately 16 miles) on the east bank. In addition, a barrier levee from Bohemia to 10 miles above the Head of Passes to protect the west bank of Plaquemines Parish from hurricane flooding ~~will be built~~. Drainage capability and roadway access will be maintained within the project area.

b. This project work is necessary in order to provide protection from hurricanes ~~that~~ induce flooding in these areas. The inundation of the developed areas as a result of hurricane action creates hazards to life and well being, damages public and private property, disrupts community and business life, and requires extensive expenditures of private and public funds for evacuation and rehabilitation ~~of residents~~ activities.

3. a. Environmental Impacts:

(1) The proposed construction will, for the most part, raise existing levees between developed areas and marsh. There will be an encroachment upon the marsh area for the new or additional width required for the higher levees, ponding areas, and borrow areas.

(2) It is expected that the new degree of protection afforded will act as a deterrent to development outside of the protected area and will therefore constitute an advantage in that encroachment by the community upon the marsh will be limited.

b. Adverse Environmental Effects: There will be some temporary adverse effects during the construction period. The greater portion of the levees will be built ~~by a~~ hydraulic fill. In this procedure material from a river or marsh is pumped onto the levee by a dredge. The water, carrying some excess material, flows into a diked area where the excess material settles out. The water plus some material too fine to settle out will flow into the surrounding waterway system. This material in the diked area will cause some temporary damage until

it is assimilated into the ground. Although this must be considered in general to be a damage, this material is useful in that it contributes in a short time to the environment by providing new material which will allow for the growth of a diversity of species of plant life in the area. The fine material, which eventually flows into the waterway, will temporarily increase the turbidity of the water but should not do any permanent damage.

There will be approximately 8,500 acres of marshland used for temporary ponding. In addition to this, approximately 1,000 acres will be required for borrow material, approximately 780 acres of marsh for levee right-of-way on the west bank, and approximately 220 on the east bank. Some 2,200 acres of upland will be used on the east bank for levee right-of-way and 400 on the west bank. There will also be some 1,200 acres of marsh used for temporary construction easement.

4. Alternatives: With respect to the levee systems around reaches A, B1, B2, and C, the only alternative is to provide no action and leave the existing levee systems as they are. This gives the people a misleading sense of security and so exposes them to possible injury or death. This alternative is, therefore, not realistic.

With respect to the barrier levee plan, ~~on the east bank to protect the west bank~~, the alternative was to ~~build~~ raise the west bank levees ~~higher in certain areas~~. This was not considered feasible because of the extensive disruption upon the populated area and environment occasioned by the need for levee setbacks and extensive foundation work for the higher levees.

The alternative of no action is not considered realistic because of the exposure of the people and their dwellings behind inadequate levees to the floods associated with hurricanes.

5. Comments Received:

Assistant Secretary - Program Policy, Department of the Interior
Environmental Protection Agency
U. S. Department of Agriculture, Soil Conservation Service
U. S. Department of Commerce, Deputy Assistant Secretary for Environmental Affairs
U. S. Department of Transportation, Bureau of Public Roads
U. S. Department of Health, Education, and Welfare
Louisiana Department of Public Works
Louisiana State Parks and Recreation Commission
Louisiana Highway Department
Louisiana Stream Control Commission
Advisory Council on Historic Preservation

6. Draft statement to CEQ 3 October 1972.
   Final statement to CEQ _____.

NEW ORLEANS TO VENICE, LOUISIANA
HURRICANE PROTECTION

FINAL
ENVIRONMENTAL STATEMENT

1. PROJECT DESCRIPTION.

a. Name and purpose. The New Orleans to Venice hurricane protection project, formerly entitled Mississippi River Delta at and below New Orleans, is an authorized project of the U. S. Army Corps of Engineers. Public Law 874, 87th Congress, 2d Session, approved 23 October 1962, authorized the construction of this project substantially in accordance with the recommendations of the Chief of Engineers in House Document No. 550, 87th Congress, 2d Session. The general area of the project includes all of the present delta portion of the Mississippi River south of New Orleans.

(1) The project is intended to provide protection to the more highly developed areas along the Mississippi River by a modification and elevation of back levees, an enlargement of the Mississippi River levees from Fort Jackson to Venice, and construction of a new levee which may be considered an extension of the Mississippi River levee on the east bank from Bohemia to 10 miles above the Head of Passes. These levees would form a protected ~~closed~~ system ~~on the west bank~~ which would require alterations in internal drainage, ~~improvement of pumping capability, and a replacement of gated drainage structures with adequate flap gated, multibarreled culverts.~~ Alterations of roads and pipeline crossing over levees will be required.

(2) There are three major areas which have proven needful of protection. Reach A of the authorized project extends for approximately 15 miles on the west bank of the Mississippi River from City Price to Tropical Bend. Reach B extends for approximately 21 miles, also on the west bank, from Tropical Bend to Venice but was subdivided into reaches B1 from Tropical Bend to Fort Jackson and B2 from Fort Jackson to Venice at the request of the Plaquemines Parish Commission Council. Work in reach B1 will consist of raising the back levee system, installing a floodgate at Empire and floodwalls at ~~ten~~ two pumping stations. In B2 the back levee will be raised and a floodwall installed at the Venice pumping station. Reach C is located on the east bank of the Mississippi River and extends approximately 16 miles from Phoenix to Bohemia. Work here consists of raising the back levee system.

(3) On the eastern side of the river a barrier levee will be constructed from Bohemia to mile 10 Above the Head of Passes (AHP) in order to prevent overtopping of the river levee system on the western side by hurricane surges coming from the east. This levee was not in the original plan but was determined to be necessary in the design stage.

The plan includes modification of approximately 10 miles of west bank levee from Fort Jackson to Venice. Louisiana Highway 23 will be relocated at Venice to pass over the modified levee system at the junction of the Mississippi River levee and the back levee.

b. Current status of project. The project is in the design and construction stages with most of the design memoranda ~~scheduled for completion in 1972~~. Construction of reach B1 was initiated in August 1968. Approximately 6.5 miles of first lift levee embankment were completed. Reach C was constructed to an interim grade by local interests as part of their contribution.

c. Benefits from the project. Benefits from the project would be in the form of flood damage prevented, based on existing and future developments within the present levee system, which provides only very limited protection at the present time. The latest analysis of the benefits and costs indicates a favorable ratio of 4.7 to 1 for this project.

2. ENVIRONMENTAL SETTING WITHOUT THE PROJECT.

a. Topography. The main topographical feature in the project area is the Mississippi River which runs through the area from a generally northwest to southeast direction in this project area. The major land features of the area consist of natural levees with dry land adjacent to the river and various bayous, flanked by extensive low marshlands.

(1) Streams. The Mississippi River is the major stream of the area. At the northern end of the project area the river is approximately one-half mile wide, and near the southern end at the Head of Passes is about 1 mile wide. No tributaries enter the river below New Orleans. A system of distributaries, however, discharges the river flow to the Gulf of Mexico. Of these outlets, only South and Southwest Passes are maintained as navigable waterways and are used by seagoing commerce. The area is laced by bayous and waterways which carry rainwater and marsh floods from the land to the Gulf of Mexico.

(2) Natural levees. Along the river and several of the bayous, natural levee formations with elevations of 5 feet or more in the northern and central portions of the region taper off to near sea level as the streams approach the gulf. These ridges range in width from a few feet at the gulfward extremities of the streams to several thousand feet in the northern part of the area. All have gentle slopes away from the streams toward the marshes.

(3) Estuarine zone.

(a) The largest portion of the area consists of low marshlands containing numerous shallow bays and lakes. The general

elevation of these marshes is approximately 0.5 to 1.5 feet above m.s.l. (mean sea level). The percentage of land varies from 70 percent near the Mississippi River to 36 percent near the gulf with the general average being about 50 percent. There are four basic types of marshes within the area which are best described by their vegetation in paragraph e(1). The shoreline facing the Gulf of Mexico has an extremely irregular appearance being heavily indented with numerous bays and tidal inlets with only a few well developed sand beaches.

(b) Salinity and pollution. The area may be classified as an interdeltaic estuary basin which has direct exposure to the sea and only limited inflow of fresh water. For this reason it is essentially saline in nature with isohaline lines of constant salt concentration generally paralleling the shoreline and ranging in magnitude from 20 p.p.t. (parts per thousand) adjacent to the Gulf of Mexico to 10 p.p.t. in the water nearer the river. The pollution problem is relatively small in this area, being essentially the associated product in the oil and sulphur industries such as brine and heated water. Industrial wastes are generally pumped into the river as are human wastes with relatively poor treatment.

(c) Water circulation. There are no published reports of studies pertaining to the circulation in this area. Because it is not a true estuary, there is no dynamic interplay between the salt and fresh water. The general circulation may be inferred from an examination of aerial photos and the projected tide tables. In general, the tide rises first near the southerly portion of the coastal area and later towards the north. This indicates a littoral current proceeding from the southeast to the northwest, which is generally in agreement with the movement of material along the shores. The general pattern of circulation, however, is wind controlled and not tide controlled so that the influence of the wind is the major factor in movement of water into and throughout the internal bays and lakes. Although generally random in nature, the predominance of winds are from out of the southwest to out of the southeast and so the general wind induced flow reinforces the tidal flow.

(d) Sedimentation. There are no active streams carrying significant quantities of sediment into this marshland area. The Mississippi River transports considerable sediment but natural flow from the river into the marsh is unusual.

(e) Fish and wildlife productivity. Estuaries are among the world's most productive natural environments. Plants within the marsh areas provide organic detritus--the basis of the food chain--and protection for the larvae and juveniles of commercial and sport species. Species such as menhaden, white shrimp, croaker, catfish and bullheads, spotted seatrout, and blue crab are found in very low salinity

water and, in general, rely heavily upon the marsh biological environment for their continued presence. Because of the fact that production data is published only on the basis of very large areas and the area affected by this project is only a very small portion of this area it would not be valid to present actual figures on a prorated basis. It is sufficient to say that this area of marsh is highly productive of fish and wildlife. The productivity of the marsh area adjacent to the project area must be inferred from the landings within the general area. It appears that, despite rather severe fluctuations from year to year, there is an apparent general increase in catch. This is probably due more to improvements in fishing techniques and market conditions than to any natural phenomena. The loss of land and the resulting encroachment of salt water will decrease the productivity and could result in the loss of certain species.

(f) Historical changes. The general marsh area adjacent to the project is undergoing considerable change. Because the depositional mechanism of the Mississippi River does not deposit new sediment in this area, it is experiencing a general loss of area. This loss is due to the combined effect of erosion, subsidence, and general relative rise in sea level. The general land loss in the marsh adjacent to the project area is in the order of 100 acres per year per 7 1/2-minute quadrangle (41,623 acres). The gulf shoreline is experiencing a general erosion all along the front but with local areas of deposition being present as the littoral material is collected at certain places.

(4) Floodways. The Pointe-a-la-Hache relief outlet is a portion of the land on the east bank which has been unleveed as a floodway from the river to the gulf. The natural levees prevent flow under normal conditions and it is only when stages are above approximately 7.0 feet that flow occurs. In the period 1951 to 1972 this occurred only 3.5 percent of the time and from 1961 to 1972 only 1.8 percent of the time. The proposed levee in this area must be considered to be a fuse plug levee which can be quickly degraded to allow the floodway to perform its function during a significant flood.

b. Geology. Generally, the subsurface consists of Holocene deposits varying in thickness from between 80 feet at New Orleans to 260 feet at Venice. The Holocene deposits consist of deltaic deposits of natural levee, marsh, interdistributary, intradelta, prodelta, abandoned distributary, and point bar. These deposits are predominately clays with lenses, layers and areas of silt and sand. An exception to this is the abandoned distributary, and point bar deposits which consist generally of granular silts, silty sands, and sands. Underlying the Holocene sediments are Pleistocene sediments of clays and silts with local concentrations of sands.

c. Tides and surges.

(1) Normal tides. Tide gage readings are available from six coastal locations. Regular gages at nine locations along the Mississippi River at and below New Orleans reflect headwater flow as well as tidal fluctuations. Thirteen of the locations have recording type gages from which hourly readings may be obtained. The period of record for these 13 locations ranges from 3 to 88 years. During 1956 and 1957, high water gages were installed at several points to record the maximum tide reaches during tropical storms. Water surface elevations for regular locations are available in "Stages and Discharges of the Mississippi River and its Outlets and Tributaries," published annually by the Mississippi River Commission; and in "Stages and Discharges of the Mississippi River and Tributaries and Other Streams and Waterways in the New Orleans District," published annually by the U. S. Army Engineer District, New Orleans. The tide along the coast is diurnal and has a range of approximately 1 foot under normal conditions. During low water periods on the Mississippi River, generally September through November, the tide is noticeable for approximately 200 miles upstream from the Gulf of Mexico.

(2) Storm driven surges. Tropical storms and hurricanes cause severe flooding in the general area of the project because of the characteristic flatness of the land. Since 1900, 49 storms have affected this area to some degree ranging from minor flooding to up to 15 feet of floodwater near the river levee system. Exact damage assessment is difficult because of a lack of detailed data on the flooding from these storms but the 13 or more major storms in this period have caused extensive property damage and destruction of wildlife. Stages from such major storms often exceed 5 feet above sea level and flooding may last from several days up to a few weeks in interior areas. The presence of levees within the area causes higher local stages than if they were not present but since extensive damage is done to the marshland at low stages there is no significant incremental damage to the marshes at the higher stages.

d. Climatology.

(1) Climate. The climate of the project area is influenced by its subtropical latitude and proximity to the Gulf of Mexico, giving characteristics of a marine climate, especially in summer when southerly winds prevail. These southerly winds produce a condition favorable for afternoon summer thundershowers. In the colder seasons the area is subjected to frontal movements which produce squalls and sudden temperature drops. Because the river water temperature is somewhat colder than the air temperature in winter and spring, river fogs are prevalent. Normally, the flood season of the river occurs from December to early June, and the hurricane season from June to October. A coincident flood and storm is possible, but would be of

such low frequency as to be considered unlikely. Climatological data for this area are contained in monthly and annual publications by the U. S. Department of Commerce, Weather Bureau, titled "Climatological Data for Louisiana," and "Local Climatological Data, New Orleans, Louisiana."

(2) Temperature. The average annual temperature is 70° Fahrenheit, with monthly means ranging from 57° in January to 83° in July and August. The maximum temperature of 102° was recorded at Belle Chasse on 7 August 1935, at New Orleans on 30 June 1954 and earlier dates, and at Port Sulphur on 31 August 1951. Minimum temperatures of 6° were recorded at Diamond on 12 February 1899 and 7° at New Orleans on 13 February 1899. Normal temperatures by months, determined by averaging Weather Service normals for a 56-year record at Burrwood and a 99-year record at New Orleans, are as follows:

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
56.8	58.2	62.2	68.8	76.0	81.7	83.1	83.2	80.4	73.5	63.6	58.4

(3) Rainfall. Precipitation generally is heavy in two fairly definite rainy periods. Summer showers occur from about mid-June to mid-September and winter rains from mid-December to mid-March. Precipitation is greatest in the warmer months due to summer thundershowers, and February has a greater average than other winter months. The average annual rainfall is 60.8 inches. At New Orleans a maximum annual rainfall accumulation of 85.73 inches was recorded in 1875 and a minimum of 31.04 inches fell in 1899. Normal monthly rainfall ranges from 7.3 inches in July to 3.3 inches in October. Monthly normals based on averaging records for Burrwood and New Orleans are as follows:

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
4.25	4.50	5.22	4.71	4.60	4.87	7.31	6.93	6.83	3.31	3.94	4.34

The maximum monthly rainfall was 29.0 inches, recorded at Belle Chasse in October 1937. Several stations have experienced periods in which no rainfall was recorded in a calendar month. Snow occurs infrequently in the area. New Orleans had an 8.2-inch snowfall on 14-15 February 1895. The last appreciable snowfalls in the project area occurred on 12 February 1958 when stations reported from 1.3 inches to 4.0 inches and on 1 January 1964 when 2.0 inches was reported at one station.

e. Botany.

(1) Marshes. There are four basic types of marshes represented within or proximate to the project area. Near the southern

end is a fresh water marsh with the characteristic vegetation being maiden cane (Panicum hemitomon), pennywort (Hydrocotyle sp.), water hyacinth (Eichhornia crassipes), pickerelweed (Pontederia cordata), alligatorweed (Alternanthera philoxeroides), and bulltongue (Sagittaria sp.). Above this, beginning near Venice and extending northward towards Fort Jackson, the marsh is of the intermediate type with a low salinity containing wiregrass (Spartina sp.), deer pea (Vigna repens), bulltongue, wild millet (Echinochloa walteri), bullwhip (Scirpus californicus), and sawgrass (Cladium jamaicense). Above this is a brackish marsh of moderate salinity extending all along the river to the northern limit of the project. This marsh contains wiregrass (Spartina patens), three-cornered grass (Scirpus olneyi), coco (Scirpus robustus), and widgeongrass (Ruppia martima). On the gulf side of this brackish marsh is a saline marsh extending to the gulf. The typical vegetation in this marsh is oystergrass (Spartina alterniflora), glasswort (Salicornia sp.), black rush (Juncus roemerianus), saltwort (Batis maritima), black mangrove (Avicennia nitida), and saltgrass (Distichlis spicata).

(2) Trees. Several species of trees are found along the natural levee flank but for the most part large stands are not found except in commercial orchards of citrus fruit trees. Among the natural levee flank, trees are the drawf palmetto (Sabal minor), live oak (Quercus virginiana), overcup oak (Quercus lyrata), willow oak (Quercus phellos), red maple (Acer drummondii), black willow (Salix nigra), wax myrtle (Myrica cerifera), hackberry (Celtis laevigata), and sweet gum (Liquidambar styraciflua). In the fringe areas will be found bald cypress (Taxodium distichum), swamp elder (Baccharis halimifolia), and possum haw (Ilex decidua).

f. Zoological elements. The fauna of this project area is typical of a coastal marsh community and includes whitetail deer (Odocoileus virginianus), cottontail (Sylvilagus floridanus) and swamp rabbits (Sylvilagus aquaticus), raccoons, numerous rats and mice, nutria (Myocastor coypus), muskrat (Ondatria zibethicus), and domestic animals such as hogs and cattle. Birds, both migratory and resident use the area. Such species as ibis, egrets, rails, dowitchers, terns, gulls, skimmers, sandpipers, herons, marsh hawks, and passerine songbirds are to be found in the area.

(1) Wintering migratory waterfowl, of particular interest due to quality as gamebird, using the marshes include blue (Chen caerulescens), snow (Chen hyperborea) and white-front geese (Anser albifrons), gadwalls (Anas strepera), pintails (Anas acuta), mallards (Anas platyrhynchos), blue-winged teal (Anas discors), green-winged teal (Anas carolinensis), shovelers (Spatula clypeata), coots (Fulica americana), redheads (Aythya americana), greater scaup (Aythya marila), lesser scaup (Aythya affinis), mergansers, widgeons (Mareca sp.),

canvasbacks (Aytha valisineria), buffleheads (Bucephala albeola), common goldeneyes (Bucephela clangula), and some black ducks (Anas rubripes). The mottled duck (Anas fulvigula) is the only resident species of waterfowl nesting and wintering in the area; grebes and loons are nongame migratory waterfowl wintering in the area, and the common snipe (Capella gallinago) is the only game species of shorebird wintering in the area. The Southern bald eagle, which is on the endangered species list (Haliaeetus leucocephalus leucocephalus) has been sighted in this area.

(2) Snakes, bullfrogs (Rana catesbeiana), leopard frogs (Rana pipiens), and turtles inhabit the area. Common snakes are the water snakes (Natrix spp.) and the water moccasin (Agkistradon piscivorus). Alligators (Alligator mississipiens) frequent the fresh to intermediate marshes. Although on the endangered species list, the alligator is present in adequate quantities in Louisiana and state authorities have requested its removal from the list.

(3) The marshes of the area provide nursery grounds for shrimp, oysters, blue crabs, and some species of fish such as menhaden. Freshwater species of fish common to the area include spotted gar (Lepisosteus oculatus), shortnose gar (Lepisosteus platostomus), alligator gar (Lepisosteus spatula), bowfin (Amia calva), buffalo, blue catfish (Ictalurus furcatus), channel catfish (Ictaluras punctatus), white bass (Morone chrysops), yellow bass (Morone mississippiensis), sailfin molly (Poecilia latipinna), gambusia (Gambusia, sp.), black (Pomoxis nigromaculatus) and white (Pomoxis annularis) crappie, largemouth bass (Micropterus salmoides), numerous sunfish, freshwater drum (Aplodinotus grunniens), and carp (Cyprinus carpio).

(4) Common saltwater species include mullet (Mugil sp.), ladyfish (Elops saurus), bay anchovy (Anchoa mitchilli), gafftopsail catfish (Bagre marinus), sea catfish (Arius felis), weakfish, red (Sciaenops ocellata) and black (Pogonias cromis) drum, spot (Leiostomus xanthurus), sheepshead (Archosargus probatocephalus), pinfish (Lagodon rhomboides), and fringed (Etropus crossotus) and southern (Paralichthys lethostigma) flounder, and croakers.

g. Man's past. Prior to the arrival of the European settlers in this area, there was native Indian activity along the banks of the Mississippi River. This is generally thought to be of a transitory, perhaps seasonal nature. When Iberville arrived at Mardi Gras Bayou, approximately 24 miles up from the mouth of the Mississippi River and nominally near the present remains of Fort St. Phillip across the river from Fort Jackson, he indicated that Indians were present in this area. In 1730, some 40 Indians were slaughtered by slaves at the direction of planters in the Choachas settlement near the English Turn concession. Probably the earliest culture in this area was the Tchefuncta, remnants of which were found near the Scarsdale Canal across the river from Belle Chasse. Other cultures were from the Cole Creek, Marksville, Troysville, Plaquemine, and Pontchartrain periods.

The actual area used by such natives would have been inundated by repeated floods from the Mississippi River and in all probability any area utilized by them would have been in the natural levee portion of the river which is presently utilized by modern man. There are no reported middens within the project limits. It appears somewhat doubtful that any other ancient sites remain and the probability that any have been covered by the present levees is relatively low.

(1) The most significant historical events since the arrival of white settlers are concerned with Fort Jackson and Fort St. Phillip. Both of these are outside of the protected areas, Fort St. Phillip is just on the edge of the east bank levee and care must be exercised during construction so as not to disturb it. These are the only historic places mentioned in the most recent National Register of Historic Places which are proximate to the project. The coordination required under Section 106 of the National Historic Act of 1966 as detailed in the Federal Register of March 15, 1972 has been accomplished in the Fort St. Phillip site. Another site, Fort de la Boulage, is located near Phoenix, approximately 1 mile from the river but is not precisely located and is well outside of the project area.

(2) It is doubtful that any additional items of significance in man's past history are in the direct path affected by construction. It is likely that memorabilia pertaining to early sulphur production, power generation, and pumping equipment are present within the project area, and hence will be protected by the project.

h. Man's present.

(1) Population.

(a) The 1970 population of Plaquemines Parish was approximately 25,200. In the years 1960, 1950, and 1940, respectively, the population was about 22,500, 14,200, and 12,300. Within the project area resided some 17,500 people in 1970 which was about 70 percent of the total population of the parish.

(b) Indications are that the population in the protected areas along the banks of the river will nearly triple during the next 50 years. Local interests recently have constructed water purification plants and distribution systems to essentially all of the developed areas along the west bank. Moderate increases in the population are indicated for areas along the east bank of the river. The population more than doubled in the area from Port Sulphur to Venice during the last 20 years. Trends in the rate of development of offshore petroleum resources will largely govern the rate of growth in these areas.

(2) Commercial activity.

(a) Industries within the general area include sulphur mining and processing, menhaden fish processing plants, seafood

canneries, furniture manufacture, ice manufacture, boat works, machine shops, a winery, petroleum storage terminal, and the servicing facilities of the oil companies. A sulphur processing plant, ship and railroad loading facilities, and an ice plant are located within the area protected by the reach A levee. Two menhaden plants, two ice plants, two boat yards, a seafood canning plant, a winery, and petroleum storage facilities are located within the reach B area. An oilfield servicing facility, a seafood cannery, and a furniture factory are located within the reach C area. There are extensive oilfield servicing facilities near the Venice Oil Field, about 4 miles southwest of Venice.

(b) There are numerous oil and gasfields in the marshlands, shallow bays, and contiguous offshore areas of the Gulf of Mexico. Sulphur is mined at Grand Ecaille and at Garden Island Bay. Extensive areas of marshlands on both sides of the river contain innumerable shallow bays, lakes, and ponds with interconnecting bayous and canals, which contribute to an extensive seafood industry and support an important fur trapping program.

(c) The principal crops are citrus fruit, truck crops, and pasture for the production of beef cattle. Essentially all citrus crops produced in Louisiana are grown on the lower Mississippi River Delta and about 86 percent is grown on the west bank between Port Sulphur and Venice. Truck crops are grown principally from Violet to Verret along the Bayou La Loutre ridge and down the east bank of the river to the vicinity of Belair, with small acreages at scattered locations throughout the area. The greater part of the pasture is located between Bertrandville and Bohemia.

(3) Transportation.

(a) Louisiana Highway No. 23 (two-lane, paved) extends from Gretna to Venice along the west bank of the Mississippi River and then follows a westerly direction for about 4 miles to the Venice Oil Field. Louisiana Highway No. 325 extends from Fort Jackson to Venice along the Mississippi River levee. Louisiana Highway No. 39 (two-lane and four-lane, paved) extends from New Orleans to Bohemia on the east bank. Free ferries over the Mississippi River are operated at Belle Chasse and Pointe-a-la-Hache. The Missouri Pacific Railroad operates a branch line from Gretna to Buras.

(b) In addition to the Mississippi River project (40-foot depth) and the Gulf Intracoastal Waterway (12-foot depth), the area is served by numerous improved waterways and natural streams navigable by shallow draft vessels throughout the area. Some of the more important waterways include the waterway from Empire to the Gulf of Mexico which connects to the Mississippi River through a state-owned

lock; the Freeport Sulphur Company Canal used for barge transport of sulphur from the Grand Ecaille Mine to Port Sulphur.

(4) Recreation. Recreational opportunities in the area attract large numbers of fishermen and hunters. Empire, Buras, Pointe-a-la-Hache, and other small communities are centers of recreational activities. A public hunting area for waterfowl is maintained by the state at the Pass a Loutre Waterfowl Management Area. Waterfowl hunting is available throughout much of the marsh. On the eastern side of the Mississippi River between Baptiste Collette Bayou and Pass a Loutre is the Delta National Wildlife Refuge. These areas are not readily accessible to the general public, but provide a fertile field for the photographer or bird watcher willing to undertake a difficult trip. The reach C project levee includes approximately 18 ramps across the levee which will provide access to commercial and industrial facilities, and fish, wildlife, and recreational resources. These provisions were provided as the result of extensive coordination with Federal and state fish and wildlife agencies from 1963 to date.

3. ENVIRONMENTAL IMPACTS OF THE PROPOSED ACTION.

a. Nature of impacts. There will be both temporary and permanent impacts of this project upon the environment. The temporary impacts will occur as a result of the construction activities and the permanent ones due to a change in the character of land and loss of land to levee construction.

In general, the proposed project will make use of three types of levee construction: a sand core hydraulic clay covered levee, an all hydraulic clay levee, and a standard cast earth levee. Impacts from the construction of the various floodgates and culverts will be similar in nature to those at any structure construction site such as dust, noise, temporary inconvenience to traffic and the like.

In general, the benefits will be associated with public protection and more efficient use of land resources for development.

b. Beneficial impacts.

(1) The major beneficial impact will be upon the people of the community by providing them a protected area from storm induced flooding, which is the purpose of the project. The protected area will offer a high degree of protection from hurricane flood damage whereas the area outside of the protection can suffer a high degree of damage from storms. The incentive therefore has been established which will limit human habitat and most commercial development to the protected area. This will produce a benefit in a somewhat reverse

fashion in that the random development of an area would produce a more adverse impact than the confined orderly development. Because the growth of this area is controlled by many factors primarily associated with resource extraction from the gulf, it is not felt that this protection will in itself occasion a growth in the community.

(2) Materials placed in the marsh area during the construction will have a beneficial effect, as well as an adverse effect to be discussed later, in that the disposal areas can use any materials deposited that increase the land/water ratio. The marsh is rapidly being destroyed by natural causes as well as those induced by man. Although the excess material will come from within the same area the redistribution will produce more exposed land area.

(3) There is a potential benefit which might arise from the standpoint of effluents quality control. The closed system concept might provide an advantage in that treatment of areal discharges, which might be required as indicated by many authorities in the not too distant future, is greatly simplified if there is a collection system such as will be present in this project. It will be economically simpler to initiate such treatment under this plan as contrasted to an unprotected open area with numerous discharge points.

c. Adverse impacts.

(1) The major adverse impact will be that associated with the levee construction. The construction of a typical sand core levee with involve the excavation of a central levee core trench on the floodside of and generally parallel to the existing back levee. When practical the excavated material will be used for the construction of the required parallel floodside hydraulic clay fill. When not practical, the trench will be hydraulically excavated and the material spoiled and retained in adjacent preconstructed ponding areas in the marsh to allow settlement of the suspended material. The retention time in the ponding areas will be controlled to insure the clarity of the effluent meets the specified environmental requirements. Hydraulic sand fill will be pumped from Mississippi River borrow areas to form the core for the levee. The effluent will flow from the levee area into the marsh carrying an insignificant amount of material. For the most part, the sediment will be trapped in the marsh vegetation. A small amount of colloidal material may remain in suspension for a considerable period of time. Although most biotic life can tolerate some degree of turbidity, there will undoubtedly be some deleterious effect.

The construction of the hydraulic clay fill cover for the sand core levee and the all hydraulic clay fill levee will be accomplished in essentially the same manner insofar as environmental aspects

are concerned. The hydraulic clay fill will be pumped into the levee hydraulic clay fill retaining area formed by the floodside retaining dike and the parallel back levee which in most instances will be utilized as the opposite site retaining dike, or when more practical, an opposite retaining dike will be constructed. The hydraulic clay fill will be obtained from marsh borrow areas generally located on the marsh side of the ponding areas within a few thousand feet of the existing back levee. The borrow areas will be hydraulically stripped of poor quality surface material which will be spoiled and retained in the adjacent preconstructed ponding areas to allow settlement of the suspended material. The retention time in the ponding areas will be controlled to insure the clarity of the effluent meets the specified environmental requirements. Likewise, the effluent from construction of the hydraulic clay fill will be spoiled and retained in adjacent preconstructed ponding areas in the marsh to allow settlement of the suspended material. The retention time in the ponding areas will be controlled to insure the clarity of the effluent meets the specified environmental requirements.

The construction of the cast earth levee will contribute a very small amount of turbidity locally during construction and, therefore, will have negligible adverse effect on the environment.

(2) The major land losses associated with the levee construction will be those involving land used for borrow purposes and for ponding. Approximately 1,000 acres, mostly marsh, will be required for borrow material. After removal of the material these acres will essentially be open bodies of fairly deep water. Such areas may ultimately find use as fishing areas or for recreational purposes but will be lost as far as marsh productivity is concerned.

There will be approximately 8,500 acres used for temporary ponds which will suffer damage. The extent of this damage will be variable in that much of the land will be converted within a short time to that more typically upland. The vegetation in this area will give variety to the area and provide forage for animals. Some of the land will revert to essentially its original condition. It would be exceedingly difficult to predict the amount of land which does so because it will depend upon the condition encountered in the construction process. In addition, approximately 780 acres of marsh will be used for levee right-of-way on the west bank and 220 on the east bank. Some 2,200 acres of uplands will be used on the east bank for levee right-of-way and 400 on the west bank.

Positioning of the levees and other features of this project has been planned so as to coincide with or be adjacent to existing smaller levees. Although this has been done primarily for economic and technical reasons, the resulting alinement reduces possible

permanent impact to a minimum. Had the alinement been through the essentially virgin marsh area, there would have been greater damage due to the necessity for greater foundation preparation for the levee because of the poorer soil foundation conditions away from the river.

The barrier on the east bank will essentially parallel the main line levees with either overbuild or setback construction with new levees built on natural levee and will produce a limited temporary adverse effect similar to all other levees in the project.

(3) The areas which are used for borrow material will produce large waterbodies in the marsh area. Although deep, these areas will not be continuous and hence will not materially increase marsh salinity. Material removed from the Mississippi River will be quickly replenished by river action and the local disturbances at the point of removal are not of any consequence.

(4) There will be temporary erosion or dust formation from the new levees during construction but no long-range effect because the levees will be sodded.

(5) Breeding areas for small animals contiguous to the levee in the transition zone between land and levee will be affected to approximately the same effect as they are by the present levee system. There will be increased land utilized for levee stability but this will be of minimal value for wildlife because it will be maintained as closely cut grass areas.

(6) There will be some dislocation of people in that the relocation of Louisiana Highway 23 will require a ramp that will need land presently used by a few structures.

(7) Fort St. Philip will have a levee built between it and the river. Although this will alter the view from a historical basis, it is the least objectionable location for the levee from an overall environmental standpoint.

(8) There is no land under the jurisdiction of the Federal Government which either is or has the potential of becoming National Register properties. Any structure in private land of historical value will be protected by this project.

(9) A temporary adverse impact on the environment will result from construction activities involving the handling of large volumes of earth excavation and earth and shell fill. The construction of the Empire floodgate and numerous other culverts and gates will cause the typical noise, dust, and inconvenience found at all

construction sites. Because of the existing regulations which are enforced and controls exerted over such construction by the construction division, these impacts should be of a minimal nature.

(10) It is not believed that any significant adverse impacts will occur due to the discharge of water into the marshland during the hydraulic fill operations. The water will be of a different chemical makeup from that in the marsh but the rate of discharge and runoff from the ponding areas should not greatly affect the surrounding waters. The freshening effect of water from the Mississippi River is not expected to be of such duration or effect as to cause changes in the plant community.

(11) Closure of the Point-a-la-Hache relief outlet will prevent the transfer to water from the Mississippi River to Breton Sound upon infrequent occasions. Concomitantly, there will be a minor loss of nutrient.

4. ANY ADVERSE ENVIRONMENTAL EFFECTS WHICH CANNOT BE AVOIDED SHOULD THE PROPOSAL BE IMPLEMENTED.

The adverse environmental effects which cannot be avoided should the proposal be implemented are essentially the same as the adverse impacts in the previous section:

a. The most significant effects are those attendant to the loss or conversion of land in the construction of the levees. Most of the 8,500 acres used for temporary ponding will convert after a short period of time to a more upland nature. Although this will provide some variety to the area and food for a different type of wildlife, it will be lost for a period of time to marsh production. In the very near future, however, this land will again revert to marsh as it subsides and succumbs to the effects of natural marine attack, ultimately to be completely destroyed as is now happening. Other portions of the ponded areas will revert, after a temporary disturbance, back to marsh. This marsh, which is rapidly being destroyed, will benefit by the addition of new material which will tend to extend its useful life, although it will suffer short-time adverse effects.

b. That land committed to borrow area or to levee construction will be lost. The borrow areas will be water masses which will eventually find some usefulness as recreational or fishing places,

but being in area where fishing already abounds will not be too advantageous. These borrow pits will not be connected to the gulf so it is not anticipated that there will be any saltwater intrusion into these areas.

c. The temporary construction effects such as dust, noise, and traffic disruption are considered to be minimal. The contracts for such works contain environmental protection clauses and it is felt that such controls and other existing regulations are well supervised and enforced.

d. The dislocation of a few structures by a ramp for Louisiana Highway 23 over the levee cannot be considered a disruption to the community because only a few, relatively isolated, structures are affected.

e. The alteration of the view from Fort St. Philip is considered to be only a minor impact because the existing levee, which will be enlarged in section and height, has already changed it considerably. The fort is not generally available to the public and is not maintained as a historic exhibit. The higher levee should afford the casual visitor a better view of the area from the levee.

f. The discharge of water into the marsh during fill handling operations will change the chemistry of the marsh water to a minor degree and may possibly introduce some contaminants or pollutants into the area. Because the rate of flow is not large and the use of retention dikes allows most suspended material to drop out, it is believed that the residual water will not be particularly damaging, although of a different chemical composition than the natural water.

g. The closure of the Point-a-la-Hache relief outlet will deprive Breton Sound of some occasional nutrients because of the loss of Mississippi River water which flows into this sound on infrequent occasions. At the same time the contaminants and pollutants which are in the river water will be denied access to the sound. In view of the fact that the amount of introduced nutrients is small compared to that from the surrounding marshes, this loss is of minor consequence and overall the impact will be only a nominal one.

5. ALTERNATIVES CONSIDERED TO THE PROPOSED ACTION.

a. The proposed closed system is essentially an enlargement of existing levees to provide additional protection against severe storms.

The only other protection possible would be to elevate all residential and office buildings above the flood line. This is being done for new construction of homes in certain portions of the area. However, this would allow damages to other structures such as bridges, transformer stations, garages, and so forth, to continue. Clearly, this would be impractically on a community scale, although an individual could benefit greatly by such a measure.

b. If the protection of the populace from death or injury were the only consideration, a total evacuation plan would be feasible, but again a community cannot exist with its people intact but its physical facilities destroyed. The improvement of building codes and restrictions on construction will increase protection from winds and some forms of flood damage, but the levees are still necessary. There are, therefore, no practicable alternatives to the closed levee system if structural protection from storm flooding is considered to be the primary purpose of the project plan.

c. One major alternative to the construction of the barrier on the eastern side of the river would be to raise the main stem levee on the western side of the river to an elevation which would preclude surges from the east from overtopping the western levee. Investigations have shown that to reach this desired elevation, the levee would have to be set back, and in so doing, a sizable portion of the land on the west side which is now protected (from river stages) and highly developed would be consumed by the setback. Therefore, the alternate becomes essentially no alternate when the envisioned protection project destroys the improvements that the project is intended to protect.

d. Because of the fact that all but a minor portion of this project on the east bank is based upon the improvement of an existing levee system and a significant amount of levee raising or modification has already occurred, it is difficult to evaluate an alternative of no action. In this particular case the no-action alternative would continue to allow the exposure of the human element of the environment to the dangers of medium to severe storms. In this situation man must be considered a part of the ecosystem and should be afforded an adequate degree of protection. Delay of this project will allow continued exposure of the area to the possibility of extensive hurricane damage and the exposure of the population to death or injury.

e. Although damages are computed on an annual basis, it must be realized that they all occur on a specific incident which has the possibility of occurring any time, and if one such incident occurs before the project is completed, the benefits from years will be destroyed.

6. THE RELATIONSHIP BETWEEN LOCAL SHORT-TERM USES OF MAN'S ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY.

The productivity of this area will decrease in time due to the destruction of the marsh by natural causes and such manmade works presently in existence. In the long run, this marsh will be essentially completely destroyed. With man's presence and use of the area some attempts are being made and no doubt other, more productive, attempts will be made to mitigate the results of this destruction.

If man, due to an inclination to live in a reasonably protected area, were to leave the area, there would be little incentive or benefits to support control works. If there were no control works, such as levees, the area would probably go to a more natural state and, as external channels developed from the river, more marsh would be built. It is possible that future projects, now under consideration such as the Mississippi Delta Region, will allow a balanced condition between man's presence and a nondestruction or a building mode of the marsh.

7. ANY IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES WHICH WOULD BE INVOLVED IN THE PROPOSED ACTION SHOULD IT BE IMPLEMENTED.

The major irreversible and irretrievable commitment of resources which would be involved in the proposed action should it be implemented, lies in the area of land commitment. The land used for levee construction (3,600 acres total continued marsh and upland type) and borrow material (approximately 1,000 acres) will be lost with respect to productivity. The land used for ponding of effluents and material disposal will find use either as more upland area or as marshland. This will mean that a change in productivity will occur but there will be essentially no loss from a long-range point of view.

The commitments in fuel and construction supplies must be considered as irretrievable but of small importance.

8. COORDINATION.

a. Public meetings. Three public meetings were held to obtain information on the problems caused by hurricane flooding and the views of local interests relative to their solution. The meetings were held at New Orleans, Morgan City, and Lake Charles, Louisiana, on 13, 15, and 20 March 1956, respectively. The meetings were attended by a total of about 50 representatives of business, transportation, and industrial interests, civic organizations, and Federal, state, and local agencies. The State of Louisiana, Department of Public Works, and local interests requested that maximum consideration be given to protective works required to safeguard lives and property from hurricane damages and the development of an adequate warning system, and indicated that they would actively support the studies as they progressed. Specific suggestions as to type of protection desired were not proposed.

b. Government agencies and citizen groups. Comments have been received from the following agencies and groups. Copies of the letters are attached to this statement.

(1) Environmental Protection Agency.

Comment: 1. Project description. The inclusion and discussion of the following items should strengthen this section:

a. Levee width, height, and land area.

b. Location of borrow area.

c. Method of transporting construction material.

d. Time schedules for getting levees to grade.

e. Type of levee construction - if built by hydraulic fill, will ring levees be used to control water runoff?

f. Location of the levee in relation to the subsiding area along the shoreline of Breton Sound.

Response: Items c. and e. are included in the Project Description, paragraph 1. With respect to specific engineering details it is believed that this document cannot stand alone and that specific technical information relative to the other items can best be found in the design memorandum.

Comment: 2. Environmental impact of the proposed project. Implementation of the proposed action should trigger additional

industrial and residential growth in the area. This growth could produce numerous secondary effects, such as increased volume of solid waste, increased municipal and industrial waste, home and business development resulting in increased surface runoff and additional loss of existing vegetation, and numerous other impacts - both beneficial and adverse - to the environment. We believe a detailed discussion of the secondary effects of the proposed action on the area's environment would strengthen the statement. Also, the construction of the levee system may promote a false sense of protection which could result in the relaxation of building and construction codes by local governemnt. To eliminate this possibility, we suggest that the Corps of Engineers require the enactment of stringent building codes and their enforcement as a prerequisite to implementing the project.

Response: The industrial and residential growth of this area are more rigidly controlled by considerations other than the protected area. What is suggested in the statement is that any new construction occasioned by these considerations would be more prone to locate within the protected area. Annual prehurricane season warnings are given wide circulation in this area so that the false sense of security should not occur. Building codes have been strengthened but the threat of flooding will continue unless the levees are built.

Comment: 3. Any adverse environmental effects which cannot be avoided should the proposal be implemented. The adverse impacts discussed under item 2, above, should be further discussed in this section. An example could be the possible adverse environmental effect on improperly treated municipal and industrial wastes.

Response: It is felt that improperly treated municipal and industrial wastes are regulated under other authority and the assumption must be made that these regulations will be enforced.

Comment: 4. The materials, manpower, funds, and their cost required for construction and operation of the project must be considered irreversible and irretrievable commitments of resources. Theoretically, the land and some of the material used in construction could be returned in time to a near-natural state for use by future generations. Renewable natural resources displaced as a result of the project will be irretrievable commitments for the life of the project. Any nonrenewable resource involved in the project would be an irretrievable commitment.

Response: Agreed and more attention has been given to this concept in paragraph 7.

Comment: 5. The following comments of a general nature should also be considered in developing the Final Statement:

a. Relocation of all pipelines and utilities should be accomplished in such manner as to avoid pollution of the surrounding environment.

b. A discussion of the devices, regulations, and/or constraints to be used by your agency for prevention and abatement of water, air, and noise pollution during construction would be helpful in assessing possible effects of the project on the area.

c. In many channels, borrow areas, and canals along the gulf, aquatic weeds cause operation and maintenance problems. Methods for control, particularly if herbicides are programed for use, should be discussed in the statement.

d. Clearing and disposing of the brush and vegetation along the right-of-way of the proposed project should include provisions for prevention of adverse effects on the environment. Methods of disposal should be covered in the statement. Open, uncontrolled burning should not be permitted, in order to meet the requirements given in 40 CFR 76.8.

e. If a public water supply source, treatment facility, or distribution system is to be affected by the project, precautionary measures to prevent damage to, or contamination of, the public water supply should be described.

f. Where appropriate, sanitary waste facilities should be provided and operated to treat and dispose of domestic wastes in conformance with state and Federal water pollution control regulations. Provisions of the Federal Occupational Safety and Health Act of 1970 should be considered.

Response: These general comments pertain to construction operations. It should be understood that the contractor will be required to comply with all applicable Federal, state, and local laws and regulations concerning environmental pollution control and abatement. He will be required to give appropriate consideration to air, water, land, noise and solid waste management. This will be accomplished by control of dust, smoke, and noise; prevention of any spillage of oils and greases in the water of the area, and control of disposal of debris and restoration of temporary construction site.

In the operational phase, the use of herbicides is the subject of a separate study and impact statement and the findings of that study would apply to any use in this project.

(2) United States Department of Agriculture, Soil Conservation Service.

Comment: Some of the land lost, no doubt, would be valuable farmland. This loss would be partially offset by the additional grazing provided by the sodded levees. We believe the draft could be expanded to include this thought.

Response: The land lost could possibly be valuable farmland and the sodded levees in the future could be used for grazing. The comment is appropriate but is not considered to be of significance other than to note and agree with the comment.

(3) United States Department of Commerce, Deputy Assistant Secretary of Commerce for Environmental Affairs.

Comment: The location of present levees should be more definitively indicated on the map.

Response: It is felt that the map is adequate to inform the general public and the various agencies of the present levees because, for the most part, all work except the new barrier in the east is on existing levees.

Comment: The environmental impact on Breton Sound and its adjacent marshes of placing a fuse plug levee across Pointe-a-la-Hache relief outlet south of Bohemia should be discussed.

Response: This is a good suggestion and has been done in paragraph 2.a.(4).

(4) United States Department of Health, Education, and Welfare.

Comment: We, therefore, have no objection to the authorization of this project insofar as our interests and responsibilities are concerned.

Response: The review and comment are noted.

(5) United States Department of Transportation.

Comment: The proposed project apparently will have no adverse effect on highways or bridges serving the area.

Response: The review and comment are noted.

(6) United States Department of the Interior.

Comment: The proposed action will not adversely affect any existing, proposed, or known potential unit of the National Park system, or any known natural or environmental education sites eligible or considered potentially eligible for the National Landmarks Program.

Response: Agreed.

Comment: The statement acknowledges the presence of two National Historic Landmarks (Fort Jackson and Fort St. Phillip). However, it fails to mention National Historic Landmark Fort de la Boulaye. The general map attached to the environmental statement is not sufficient to determine the possible effect on these two National Historic Landmarks and a more detailed plat should be included in the final statement.

Response: Although Fort de la Boulaye (Boulage) lies well out of the project area it has been mentioned in paragraph 2.g. for completeness. It is not possible to show details of a specific nature in a general document but additional coverage of this situation is given in the text.

Comment: We note the draft statement has been sent to the State Liaison Officer for Histori Preservation. His comments concerning the effect of the project upon nominations to the National Register of Historic Places being processed should be included in the final statement.

Response: No comments have been received from the State Liaison Officer

Comment: The statement generally describes the Mississippi River cultures in the area, but the effect of the project upon them and the significance of the archeological resources present is not defined. The final statement should include an archeological survey of the project area.

Response: This has been done to the best of our ability and resources. Library searches were made by an archeologist and an engineer experienced in historical searches.

Comment: The only recreation mentioned refers to hunting and fishing. If other recreational activities are present, they should be clearly identified in the environmental statement. This paragraph also mentions the State of Louisiana's Pass a Loutre Waterfowl Management Area as a public hunting area. Another area of public lands not mentioned in the statement is the Bureau of Sport

Fisheries and Wildlife's Delta National Migratory Waterfowl Refuge, located immediately north of the state area.

Response: The hunting and fishing are the primary recreational activities. The land is of such a nature that it is not readily suited for nature walks, birdspotting, photography, swimming, water sports, and the like. A few individuals are willing to make the effort but it is felt that it would be misleading to present such activities because they might be assumed to be readily available to the general public. The statement has been changed to reflect this potential.

Comment: Environmental impact of the proposed action. It is mentioned in this section that there will be a long-range beneficial impact as a result of the limiting effect of the project upon uncontrolled encroachment on the marsh. While the installation of the project may encourage further municipal and industrial development within the protected area, it will not prevent development of the unprotected area. The statement should recognize this impact.

Response: This is true but it is felt that development of this area is so limited by many factors that the predominant nonindustrial development will be limited to the protected area.

Comment: The statement is made that there will be a minor short-term benefit to the saltwater marshes because of temporary freshening of these marshes as a result of runoff from borrow material from the river. Temporary freshening could be detrimental to the existing vegetation and could be of such short duration that any vegetation tolerant of a salinity change may not be established. We also note that there is no discussion of the impact that dredging will have on the river.

Response: It is believed that the freshening effect mentioned will be minor and difficult to predict either benefits or damages. The statement has been changed so as to reflect this a little more clearly. It is not felt that removal of material from the Mississippi River produces any impact upon the river when compared to natural processes.

Comment: It is stated that damages to the pond areas will be temporary and that recovery is expected within a year or two. These areas will probably support a different type of flora than the surrounding marsh.

Response: This is true and the statement now states that the majority of this land will be of a more upland nature.

Comment: The statement that the project will not affect any breeding areas not already affected by the present levee system is in error. Additional breeding areas will be affected as borrow material is dredged from the river and as natural distributaries and man-made channels connected to the river are blocked by levees. Severance of distributaries will affect the distribution of waters and sedimentation for some distance from the river and have an effect on breeding areas, accretion, and erosion. The increased weight of the levees also may have some effect on subsidence of the marsh. These should be recognized in the statement.

Response: The statement was intended to be applicable only to breeding areas in the transitional land contiguous to the levees and has been changed to clarify this point. The loss of other breeding land is treated separately. There are no distributaries being blocked by the project. The weight of the levees is not expected to have any effect upon the subsidence of the marshland.

Comment: The impact statement would be more complete if the Mississippi River Delta Region project was also discussed in relation to this proposed project. The Mississippi Delta Region project plans provide four salinity control structures with training channels to introduce waters from the Mississippi River into oyster, waterfowl, and fur animal producing areas east and west of the Mississippi River to enhance production of these resources. The impact of this hurricane protection project on the successful implementation of the fresh-water control structures should be included.

Response: The status of the Mississippi River Delta Region project is such that it would be difficult to comment upon it in this statement. The comment is appropriate to note this but the project does not conflict with anything in this statement because any diversion of water to the bays will be through control structures and channels which can be built without affecting the integrity of the hurricane plan.

(7) State of Louisiana, Department of Public Works.

Comment: We have completed our review of the draft statement prepared by your office and wish to compliment you on the comprehensive coverage contained in this statement. The statement does indicate a complete overall concept, and realistic attitude toward changes to the environment resulting from the project construction.

Response: The comment is noted.

Comment: There may be some confusion in the statement resulting from the information pertaining to the proposed east bank barrier levee. Although this barrier levee will become part of the authorized project, to date no assurances have been provided by local interest. It may be best described in the impact statement as being a proposed addition to the authorized project since the statement that it "will be built" may be premature at this time.

Response: It is agreed that this comment is more precise with respect to authorization. This statement must, however, analyze the situation presented by the plans. It is possible that any element might not obtain final approval, for various reasons.

(8) Louisiana Wild Life and Fisheries Commission.

Comment: None.

(9) Louisiana State Parks and Recreational Commission.

Comment: We have reviewed the above statement and find it adequate and comprehensive, and we have no comment.

Response: The comment is noted.

(10) State of Louisiana, Department of Highways.

Comment: We have reviewed the draft environmental statement for the New Orleans to Venice Hurricane Protection prepared by your office and find that the Department of Highways has no objection to the proposed construction as outlined in that draft.

Response: The comment is noted.

(11) Louisiana Air Control Commission.

Comment: We have no further comment except that in the period since 1967 greater emphasis is being placed on air pollution control. There is no information as to whether or not there will be combustible materials from the work involved. If there will be such materials, we believe that any contract could provide for compliance with the Louisiana Air Control Commission's standards and regulations.

Response: The specifications for all construction will require such compliance.

(12) Louisiana Commission on Intergovernmental Relations.

No comments received.

(13) State of Louisiana, Stream Control Commission.

Comment: The sentence "The fine material which eventually flows into the waterway will temporarily increase the turbidity of the water but should not do any damage." is in conflict with the information preceding it. We suggest it be changed to read as follows: "The fine material which eventually flows into the waterway will temporarily increase the turbidity of the water but may not do any permanent damage."

Response: The addition of the word 'permanent' is appropriate and has been done.

Comment: The sentence "Industrial wastes are generally pumped into the river as are human wastes with relatively poor treatment." is misleading as both industrial and municipal wastes generated in the project area either already receive or are scheduled for secondary or the equivalent degree of treatment by 31 December 1972. Therefore, the sentence should be changed to reflect this information.

Response: If it can be assumed that all parties will be in compliance by the target date the comment is appropriate.

Comment: The paragraph pertaining to treatment of areal discharges states unequivocally that treatment of areal discharges in the project area will be necessary. Assuming that this includes storm water (approximately 60 inches annually) it is suggested that the statement either be documented or deleted.

Response: The statement has been modified to reflect the conditional nature of the situation.

(14) Louisiana Planning Commission.

No comments received.

(15) Louisiana Coastal Commission.

No comments received.

(16) Louisiana Land Office.

No comments received.

(17) Louisiana Public Service Commission.

No comments received.

(18) Secretary of the Metropolitan District Commission.

No comments received.

(19) Louisiana Wild Life Federation.

No comments received.

(20) Louisiana Department of Conservation.

No comments received.

(21) Louisiana State University, Department of Geography and Anthropology.

No comments received.

(22) Louisiana Historical Preservation and Cultural Commission.

No comments received.

(23) Louisiana Advisory Council on Historic Preservation.

No comments received.

(24) National Audubon Society.

No comments received.

(25) Orleans Audubon Society.

No comments received.

(26) Ecology Center of Louisiana, Inc.

No comments received.

(27) National Sierra Club.

No comments received.

(28) National Wildlife Federation.

No comments received.

(29) Gulf States Marine Fisheries Commission.

No comments received.

(30) Wildlife Management Institute.

No comments received.

(31) Commission Council, Plaquemines Parish.

No comments received.

(32) Mayor, Bohemia.

No comments received.

(33) Mayor, Buras.

No comments received.

(34) Mayor, Empire.

No comments received.

(35) Mayor, Pointe-a-la-Hache.

No comments received.

(36) Mayor, Triumph.

No comments received.

(37) Mayor, Venice.

No comments received.

(38) Advisory Council on Historical Preservation.

Comment: Although your environmental statement contains evidence of having consulted the National Register of Historic Places, this is no indication that the most current listing was utilized.

Response: This has been so stated in paragraph g(1) of section 2, understanding that this is the most current edition.

Comment: On page 15 of the draft statement, mention is made of two National Register properties within the vicinity of the proposed project. The council has been informed by the National Park Service that a third, Fort de la Boulaye is also within the project area.

Response: The information is incorrect in that the site of Fort de la Boulaye is not within the project area. Since there is interest in this site, it has been mentioned in paragraph g(2) of section 2.

Comment: In the case of land under the control or jurisdiction of the Federal Government, a statement should be made as to whether or not the proposed undertaking will result in the transfer, sale, demolition, or substantial alteration of potential National Register properties.

Response: This statement has been included in section 3, paragraph g.

Comment: In the case of lands not under the control or jurisdiction of the Federal Government, a statement should be made as to whether or not the proposed undertaking will contribute to the preservation and enhancement of non-Federally owned districts, sites, buildings, structures, and objects of historical, archeological, architectural, or cultural significance.

Response: This has been included in section 3, paragraph g.

Comment: That a comprehensive interdisplinary study has been made of all archeological, historical, architectural, and cultural resources extant in the proposed project area; the effects, if any, on these resources; and an account of steps taken to assure their preservation and enhancement.

Response: This has been done to the best of our ability. It must be recognized that an exceedingly small amount of factual information and research is available in this area. A literature search was made by an archeologist and an engineer experienced in historical matters. The coordination to insure adequate protection of the Fort St. Phillip site as required by Section 106 of the National Historic Preservation Act of 1966 has been accomplished.