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U.S. Army Corps
of Engineers
New Orleans District

CULTURAL RESOURCES INVESTIGATIONS OF LAROSE TO GOLDEN MEADOW HURRICANE PROTECTION PROJECT LEVEE SECTION D-NORTH (COMPROMISE ALIGNMENT), LAFOURCHE PARISH, LOUISIANA

March 1992

FINAL REPORT

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New Orleans, LA 70123

PREPARED FOR:

U.S. Army Corps of Engineers
New Orleans District
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During July and August 1991, R. Christopher Goodwin & Associates, Inc., conducted Phase I archeological investigations along the Larose to Golden Meadow Hurricane Protection Project Levee Section D-North compromise alignment, near Galliano, in Lafourche Parish, Louisiana. The survey was conducted for the U.S. Army Corps of Engineers, New Orleans District; this report forms an addendum to Goodwin, Hinks et al. 1991. Survey consisted of pedestrian survey augmented by the excavation of systematically placed shovel testing within the approximately 110 ac project corridor. No archeological remains or historic standing structures were located within the project area; no additional archeological testing was recommended.

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REPLY TO
ATTENTION OF:

Planning Division
Environmental Analysis Branch

To The Reader:

This cultural resources effort was designed, funded, and guided by the U.S. Army Corps of Engineers, New Orleans District as part of our cultural resources management program. The work documented in this report was performed to provide information needed to assess cultural resource impacts which could result from construction of the Levee D- North, compromise alignment which is part of the Larose to Golden Meadow Hurricane Protection Project.

This report has been reviewed and accepted by the New Orleans District. We commend the contractor's efforts and careful scholarship.

Howard R. Bush
Howard R. Bush
Authorized Representative
of the Contracting Officer

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

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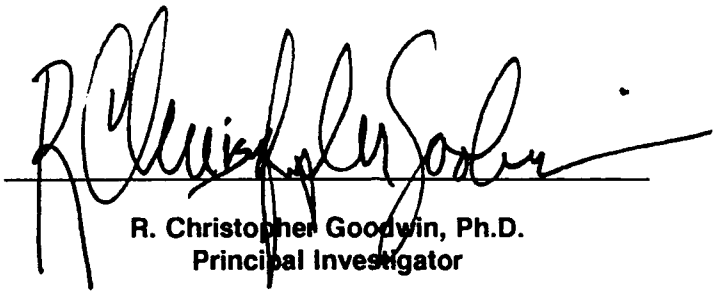
FINAL REPORT



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By

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March 1992

For

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ACKNOWLEDGMENTS

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At R. Christopher Goodwin & Associates, Inc., William P. Athens served as Project Manager. Stephen Hinks supervised field investigations; archeological assistants included David Courington, John Wright, Larry Pete, Pete Lambousy, and Gregory Lambousy. Susan Barrett Smith developed the land tenure history of the property. Shirley Rambeau prepared the graphic materials for inclusion in the report. Estella Bryans-Munson edited the report; and, Christine Herman produced it.

CHAPTER I

INTRODUCTION

Introduction

This report presents the results of supplemental archeological investigations along West Fork Bayou L'Ours and Bayou Raphael, in Lafourche Parish, Louisiana (Figure 1). The survey was conducted during July and August 1991 by R. Christopher Goodwin & Associates, Inc., for the U.S. Army Corps of Engineers, New Orleans District, pursuant to Delivery Order 05 of Contract DACW29-90-D-0018 (Appendix I).

The current investigations form the second cultural resources study associated with the Corps of Engineers' planned construction of Levee Section D-North of the Larose to Golden Meadow Hurricane Protection Project. The completed levee is designed to protect settlement along Bayou Lafourche, including the communities of Larose and Golden Meadow, from hurricane induced tidal surges. The 1990 study (Goodwin, Hinks et al. 1991) consisted of archeological survey along a planned levee alignment corridor extending from the Bayou Raphael natural levee northward approximately 1.4 km (0.85 mi) to West Fork Bayou L'Ours. From there, the corridor extended northwestward along the east bank natural levee of the West Fork Bayou course approximately 4.3 km (2.7 mi), terminating at a pipeline canal. Two proposed borrow pit locations also were tested.

During the 1990 study, one archeological site was located and tested within the project area. Bayou L'Ours Mounds (16LF54) was a two-mound prehistoric village site situated on the west bank of West Fork Bayou L'Ours, at a small crevasse splay. Materials recovered from the site suggest a Troyville through Mississippian occupation, with a possible late Marksville component. A wide variety of ceramic sherds and faunal material were recovered during site testing, including the remains of one human burial. Based on collected data, Bayou L'Ours Mounds was evaluated as a significant archeological resource; avoidance of the site was recommended (Goodwin, Hinks et al. 1991).

In response to landowner concerns, a new Levee Section D-North compromise alignment subsequently was designed. The compromise alignment extends along the distal edges of both the West Fork Bayou L'Ours and Bayou Raphael natural levees; this new alignment was surveyed during the current investigations (Figure 1). The compromise levee alignment measured approximately 7.7 km (4.8 mi) long; however, only the southern 1 km (0.6 mi) had been tested previously for cultural resources. Therefore, only approximately 6.7 km (4.2 mi) of the 7.7 km linear corridor required survey.

The entire 6.7 km (4.2 mi) long, 61 m (200 ft) wide levee corridor was surveyed for cultural resources. In locations where the corridor crossed the natural levees, the corridor was widened to 91 m (300 ft). The survey was designed to identify and to evaluate all archeological sites and pre-1945 standing structures located within the project area. Archival research emphasized the area's land tenure history. Collected data were designed to aid in interpretation and evaluation of any identified historic archeological resources discovered within the project corridor.

Field work consisted of intensive pedestrian survey augmented by systematic shovel testing; approximately 110 acres (44.5 ha) were surveyed for cultural resources. No archeological sites or standing structures were located within the project area.

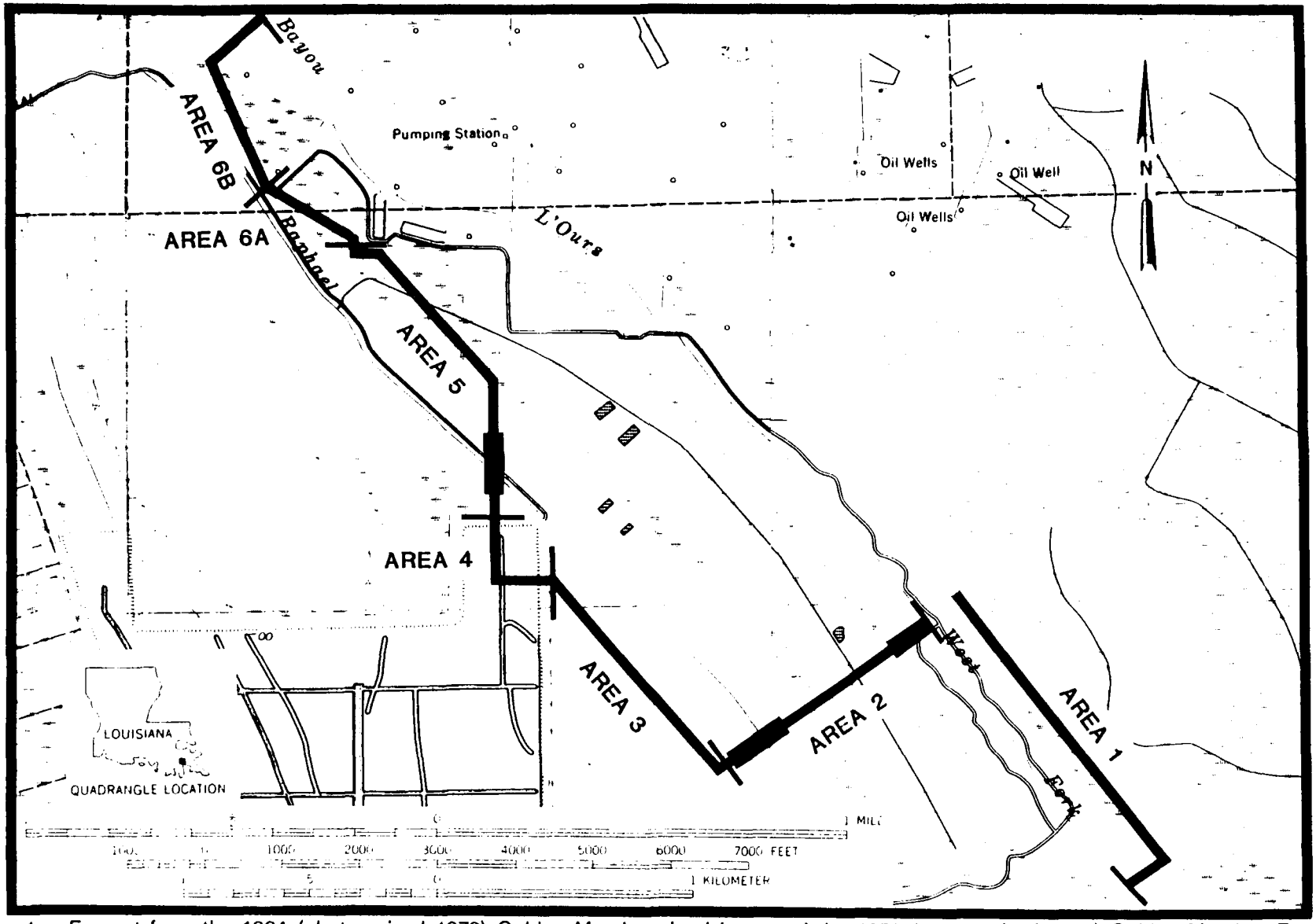

Figure 1. Excerpt from the 1964 (photorevised 1979) Golden Meadow, Louisiana, and the 1956 (photorevised 1979) Golden Meadow Farms, Louisiana USGS 7.5' series topographic quadrangles showing the 1991 project area.

Organization of the Report

This report forms an addendum to the initial report (Goodwin, Hinks et al. 1991). As such, data concerning the natural setting, previous archeological investigations, the prehistoric setting, and the region's historic development have not been included in this report; these are included in the previous volume. Geologic and geomorphic developments of the project area are presented in Chapter II. Prehistoric settlement is described in Chapter III. The land tenure history is reviewed in Chapter IV. Finally, field methods, results of the investigations, and management recommendations are contained in Chapter V. Appendix I contains the project Scope of Services.

CHAPTER II

NATURAL SETTING

Introduction

This section provides a summary of environmental factors concerning the geomorphological setting of the project area as a background in which to view the occurrence of cultural resources. The goal of this section is to identify and to describe those environmental factors that influenced the use of the area by prehistoric Native Americans and the archeological deposits they left behind.

The project area lies within the Terrebonne coastal region, which consists of Assumption, Terrebonne, and Lafourche parishes (Figure 2). The abandoned distributaries of the Teche delta complex, which forms part of the Late Holocene delta plain, dominates the northeastern half of this region. These distributaries radiate southeastward from Bayou Teche at Morgan City until they disappear under the Lafourche delta complex. Three to five meters of marsh and bay deposits underlie the surface of the Teche delta plain. The Lafourche delta complex occupies the southeastern half of this region. Its distributary ridges radiate southeastward from Houma and disappear beneath freshwater marshes or end at barrier island systems. Only one to two meters of marsh and bay deposits underlie the surface of the Lafourche delta plain (Figure 2) because it has subsided less than the Teche delta plain, relative to present sea level (Penland et al. 1987, 1988; Weinstein and Gagliano 1985).

Pleistocene and Holocene History

During the Late Quaternary Period, the accumulation and dissolution of continental ice sheets caused sea level to fluctuate, generally between 20 to 70 m below present sea level in 20,000 year cycles. As a result, the shoreline migrated as much as 140 km north and south across the Louisiana Continental Shelf. The maximum high stands of sea level occurred at approximate periods of 140,000 years during interglacial periods such as the Holocene and Early Sangamonian stages. The Ingleside-Pamlico Barrier Island Chain marks the shoreline formed by the highest sea stand of the Sangamonian stage (Suter et al. 1987).

Sea level dropped to about 120 m below present sea level approximately 21,000 years ago, during the Late Wisconsinan stage. The shoreline, within the project area, moved to a position 40 to 60 km south of the modern shoreline, subaerially exposing large areas of the continental shelf. Fluvial systems that flowed across the Central Louisiana Continental Shelf entrenched and formed deep valleys. The Mississippi River, for example, cut over a 100 m deep and 15 to 40 km wide valley into the coastal plain and continental shelf. This river valley follows a course northwest to southeast through Assumption and Terrebonne parishes (Morton and Nummedal 1983).

Sea level, during the Late Wisconsinan stage, rose from approximately 120 m below present sea level approximately 20,000 years Before Present (B.P.) to 30 m below present sea level by 10,000 years B.P. (Figure 3). As sea level rose, a thickness of unnamed fluvial, estuarine, and marine sediments filled the Mississippi River Valley. As the shoreline migrated landward, its shoreface eroded 7 to 10 m of the sediment filled Mississippi River Valley to form an erosional surface called a "ravinement surface" (Frazier 1967; Suter et al. 1987).

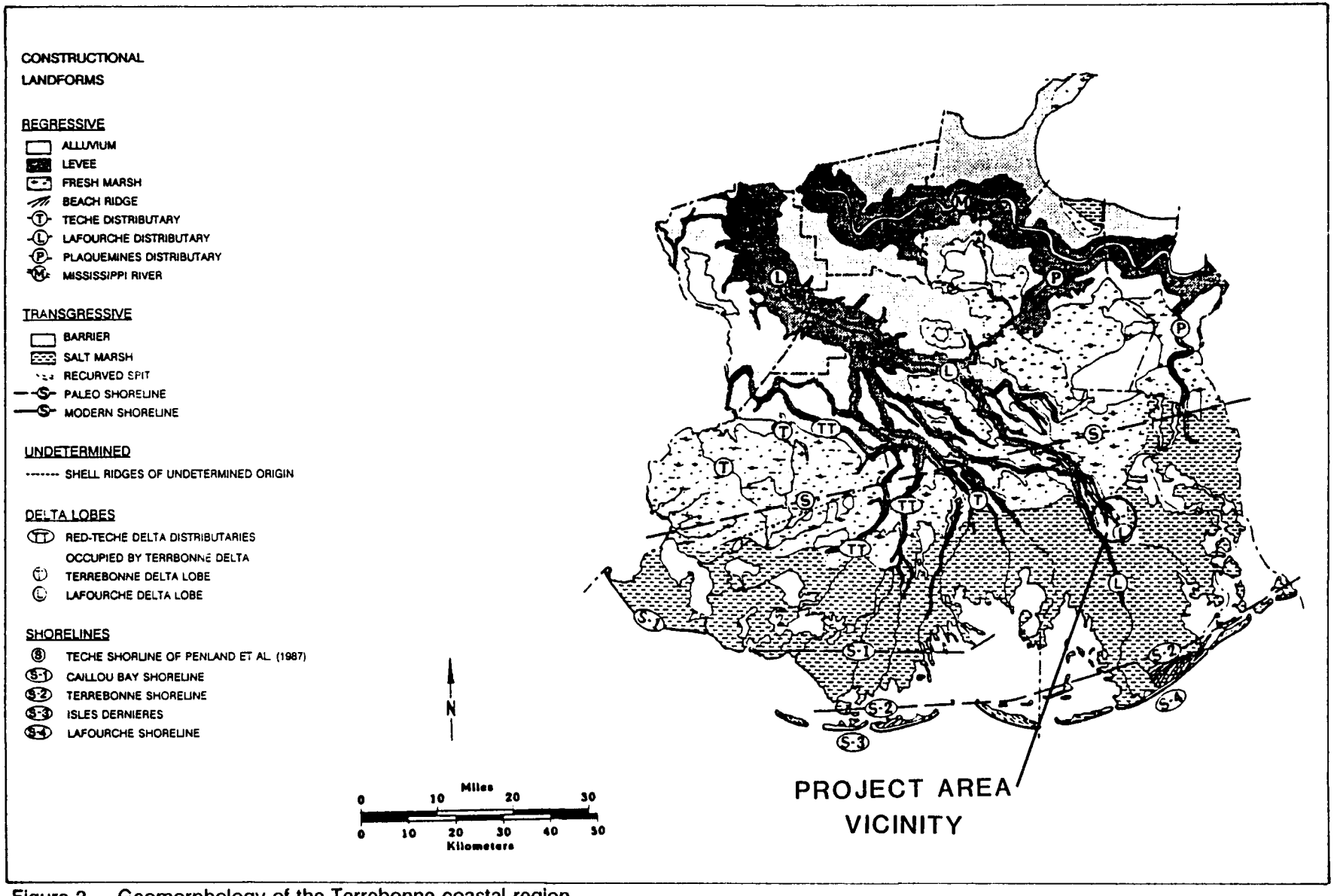

Figure 2. Geomorphology of the Terrebonne coastal region

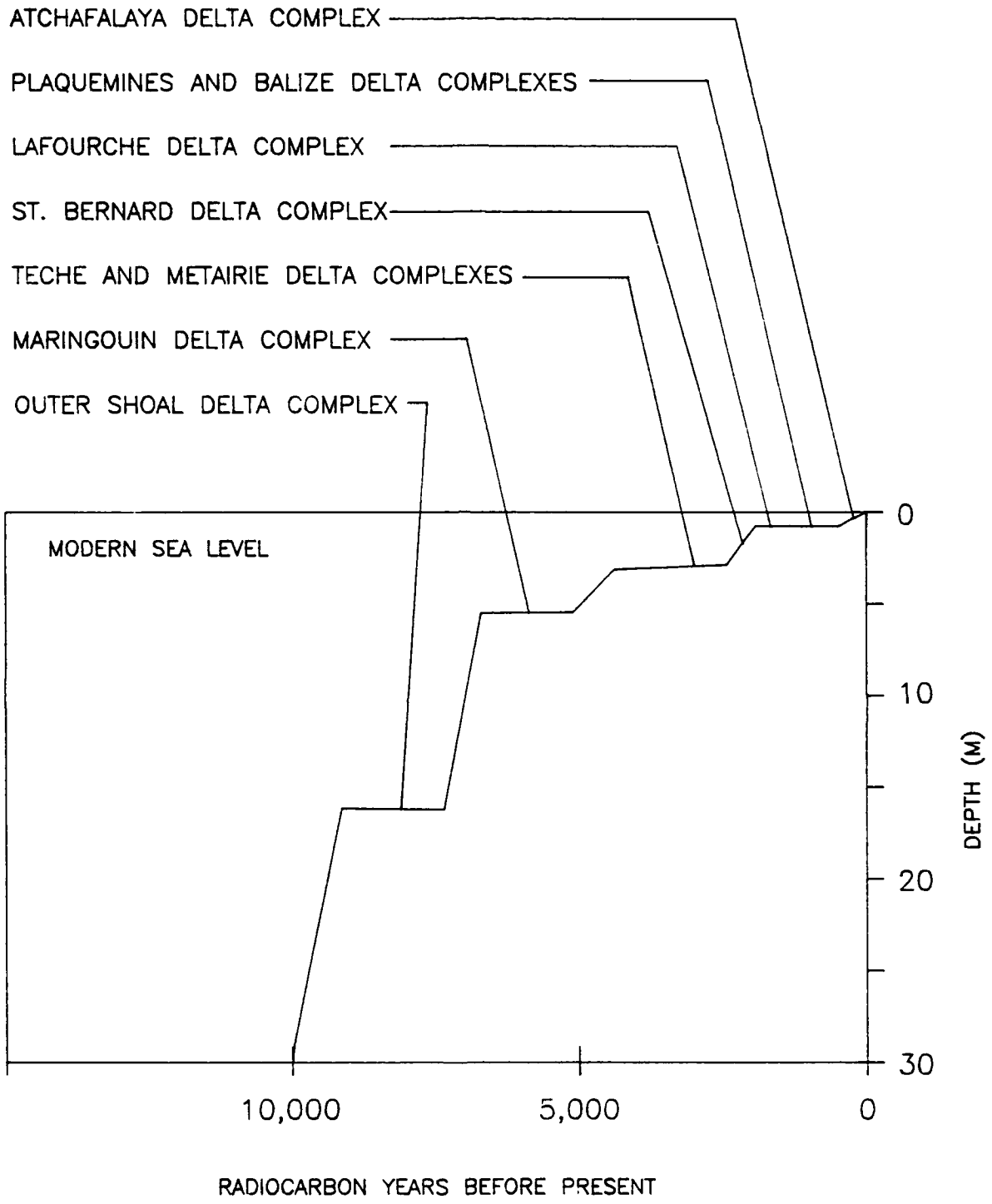

Figure 3. Chronology of delta complexes and relative sea level rise.

Mississippi Delta Plain

During the Holocene Epoch, the Mississippi River constructed the Mississippi delta plain as a series of delta complexes. Each delta complex consisted of a cluster of deltas associated with an individual course of the Mississippi River. The cluster of deltas resulted from the switching of the locus of deposition at the end of a specific river course. When a Mississippi River course was abandoned, the associated delta complex become inactive since it was deprived of its source of sediment and water. The new river course, in turn, created a new delta complex at its gulfward end. If sea levels remained unchanged, the active delta complex generally coalesced with the previous delta complex to form a common geomorphic surface (Frazier 1967, 1974).

The current Mississippi River delta plain consists of two separate delta plains, the Late Holocene and Modern delta plains. The Modern delta plain lies imbricated gulfward upon the Late Holocene delta plain such that it partially buries it. The delta complexes that form the Late Holocene plain overlie an "Earlier" Holocene delta plain and delta complex (Penland et al. 1987, 1988). An examination of Frazier's data (1967, 1974) indicates that the Late Holocene delta plain represents the surface of the Maringouin deltaic complex. The Mississippi River built this delta complex approximately 7000 years B.P. in the area of the Ilses Dernieres when sea level remained stable (Figure 4).

The Modern delta plain consists of two shelf-phase delta complexes that the Mississippi River constructed approximately 6000 years B.P. Between 6000 and 3400 years B.P., the Mississippi River then formed the Metairie delta complex in southeastern Louisiana and the Teche delta complex near and east of Marsh Island (Figure 4). During the deposition of the Metairie and Teche delta complexes, sea level remained unchanged at about 6 m below present sea level (Figure 3) (Frazier, 1967; Penland et al. 1987, 1988; Weinstein and Gagliano 1985).

Within the Lake Perchant Quadrangle, a series of low, shell ridges have been interpreted by researchers such as McIntire (1958), Penland et al. (1987), Smith et al. (1986), and Weinstein and Gagliano (1985) to be relict, transgressive shorelines of varying significance (Figure 2). Penland et al. (1987), by reference to McIntire (1958), imply that these shell ridges are part of a significant transgressive shoreline, called the Teche shoreline. The Teche shoreline truncates the Teche delta complex and delta plain and separates it from the younger Lafourche delta complex. Penland et al. (1987) view these ridges as the edge of a shoreline that moved inland as much as 40 km and deeply eroded the transgressed surface of the Late Holocene delta plain. However, Weinstein and Gagliano (1985) maintain that this relict beach ridge truncates the Maringouin delta complex. Thus, the ravinement surfaces cuts across the surface of the Maringouin delta complex instead of the Teche delta complex.

Recent work in the Lake Perchant area has found that these shell ridges are of uncertain origin (Weinstein and Kelley 1989). These shell ridges possibly may represent shell middens that contain evidence of Marksville and younger periods like that which is present at the Oak Chenier site (16SMY49). The possibility that these shell ridges represent shell middens is uncertain. The known occurrence of Tchula and Poverty Point sites on a submerged, but intact, distributary ridge southeast of Penland et al.'s (1987) so-called "Teche Shoreline," and radiocarbon dates such as 5930 and 6682 years B.P. obtained from lag sands lying upon the ravinement surface associated with the Teche shoreline, indicate that the model by Weinstein and Gagliano (1985) basically is correct.

Two delta lobes of the St. Bernard delta complex prograded gulfward despite a rapid rise in sea level between 3400 and 1800 years B.P. (Figures 3 and 4). The larger of the two delta lobes prograded eastward forming much of what is now St. Bernard Parish. The smaller delta lobe built southward from the area of New Orleans into the area now occupied by the Barataria Interlobe Basin (Frazier 1967; Penland et al. 1987).

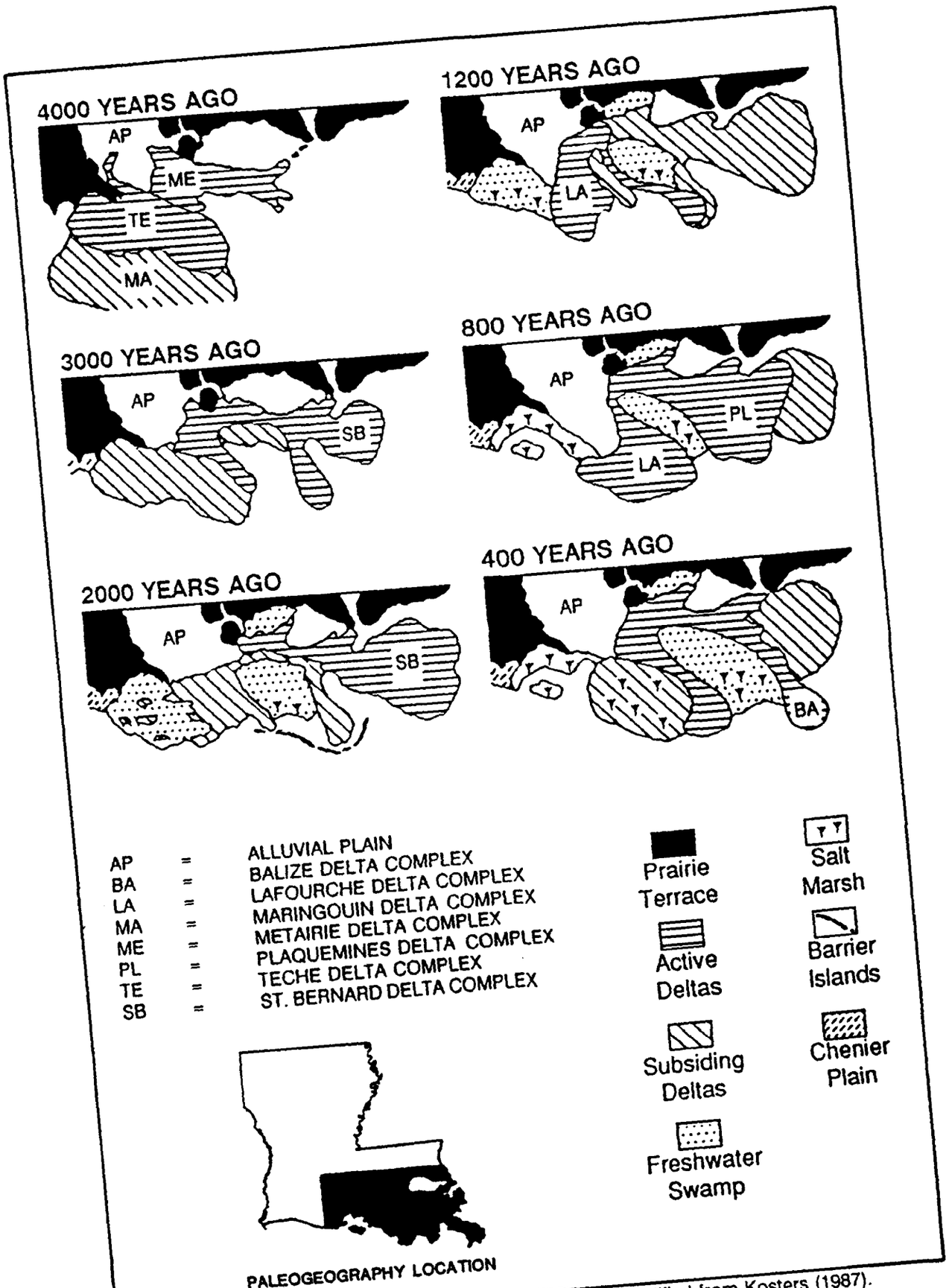

Figure 4. Paleogeography of the Mississippi River Delta. Modified from Kosters (1987).

The surface of the Modern delta plain consists of deltaic complexes built gulfward starting about 2500 B.P. after eustatic sea level reached modern levels. Initially, the Mississippi River built the shelf-phase deltas of the Lafourche delta complex south of Donaldsonville. Later, a gradual change in the course of the Mississippi River started the progradation of the shelf-phase Plaquemine delta complex and the shelf-edge Balize delta southeast of Belle Chase (Figure 4). The partial diversion of the Mississippi River down the Atchafalaya River started the construction of the Atchafalaya delta complex (Penland et al. 1987; Weinstein and Gagliano 1985).

During the deposition of the Modern delta plain, sea level was near present levels. However, relative sea level has continued to rise, mainly in response to compactional subsidence. This rate of relative sea level rise varies from 30 to 60 cm per century within the Modern delta plain as a result of variations in the thickness, composition, and age of underlying sediments (Penland et al. 1988).

Barataria Interlobe Basin

The project area lies on the western edge of the Barataria Interlobe Basin. This basin formed about 2000 years B.P. with the progradation of the Lafourche delta complex southward into the project area and the later development of the Plaquemine deltaic complex (Figure 4). This basin was a rich source of faunal and floral resources for the prehistoric inhabitants of the project area. Since 2000 years B.P., the configuration, sedimentary environments, fauna, and flora of the Barataria Interlobe Basin have changed with time (Kosters 1987, 1989).

Investigation of the Project Area

The investigation of geomorphic features within the project area was accomplished through the examination and analysis of aerial photographs, and a review of existing studies, e.g., Goodwin, Hinks et al. (1991). Goodwin, Hinks et al. (1991) mapped the geomorphic features within the project area using both 1941 USDA-Agricultural Stabilization and Conservation Service (ASCS) aerial photography and soil data from Matthews (1984). In addition, the geomorphic investigations also used scattered foundation borings logged by the U.S. Army Corps of Engineers, New Orleans District.

Geomorphology of the Project Area

The right-of-way of the proposed artificial levee zigzags across the natural levees of Bayou Raphael and West Fork Bayou L'Ours and the indistributary marshes associated with them (Figure 5). The southern end of the planned alignment extends from the Bayou Raphael natural levee northward across indistributary marshes to the West Fork Bayou L'Ours natural levee. That southern portion which lies south of West Fork Bayou L'Ours was not included within the current study area since it was surveyed previously (Goodwin, Hinks et al. 1991). The current project area originates along the northern side of West Fork Bayou L'Ours. Area 1 extends northward approximately 120 m (400 ft) across the West Fork Bayou L'Ours natural levee to its distal edge. From there, it extends northwestward approximately 1,415 m (4,650 ft) along the interface zone between the natural levee and the adjacent marsh (Figures 1 and 5).

The approximately 945 m (3,100 ft) long Area 2 extends from West Fork Bayou L'Ours, southwestward across its natural levee and through the interdistributary marsh a short distance southeast of a large brine pond. Its southwestern end crosses the entire Bayou Raphael natural levee, terminating at the edge of the freshwater marsh (Figures 1 and 5). Areas 3 and 4 extend through this marsh along the southwestern side of the Bayou Raphael natural levee. Area 3 measures nearly 1130 m (3700 ft) long. The

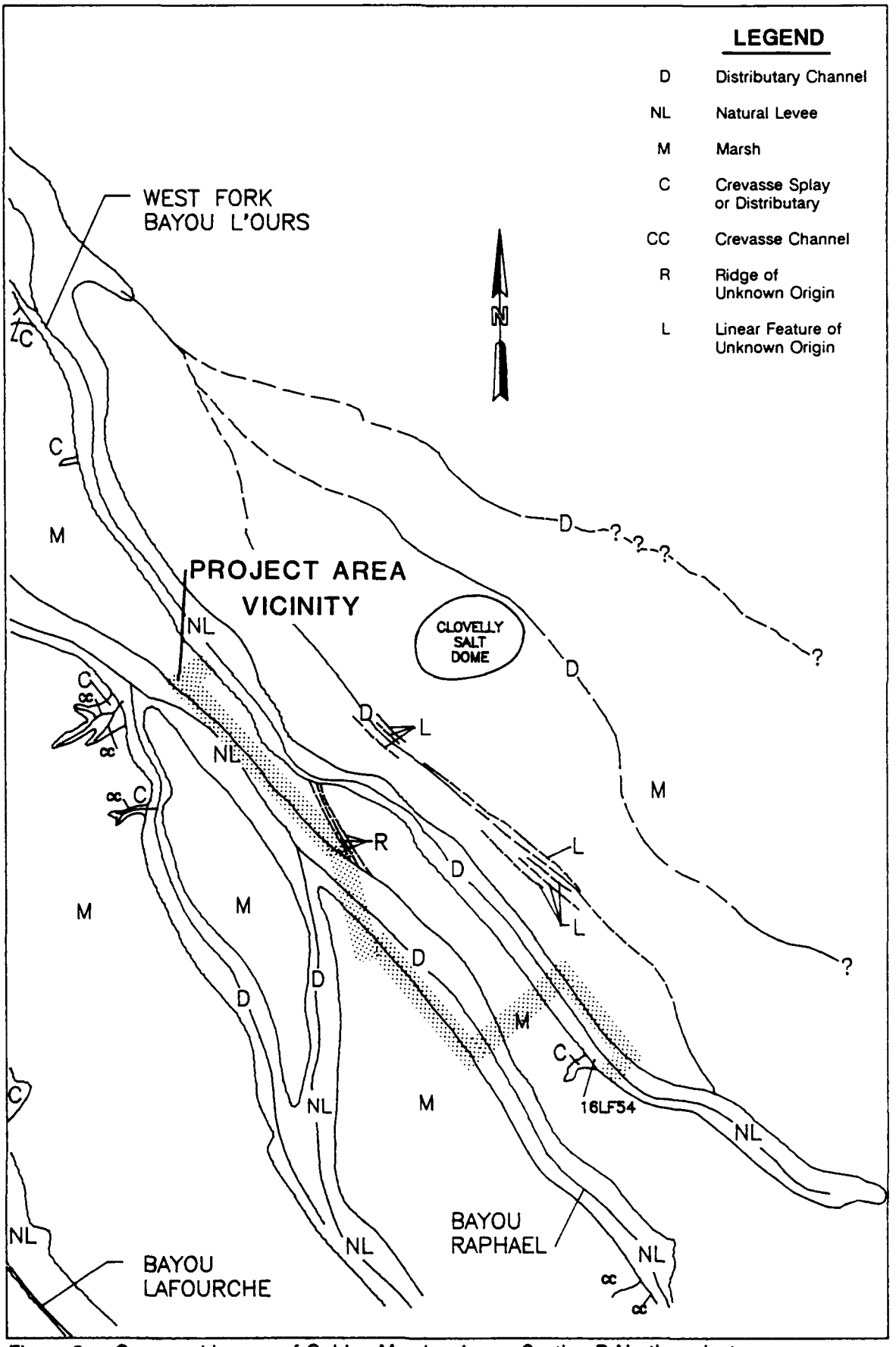

Figure 5. Geomorphic map of Golden Meadow Levee Section D-North project area

approximately 400 m (1310 ft) long Area 4 is drained, and currently is covered with overgrown fields (Figures 1 and 5). The southern half of Area 5 extends northward 440 m (1450 ft) across the Bayou Raphael natural levee, while the remainder extends about 860 m (2820 ft) northwestward through drained interdistributary marsh that lies between Bayou Raphael and West Fork Bayou L'Ours. Within this interdistributary area, it cuts across ridges of unknown origin that connect the two bayous. Area 5 terminates at Loop Road (Figures 1 and 5). Finally, the nearly 1300 m (4264 ft) long Area 6 continues within the interdistributary marsh between Bayou Raphael and West Fork Bayou L'Ours, with northern end terminating on the Bayou L'Ours natural levee (Figures 1 and 5).

Walker and Avery (1989) show the subsurface stratigraphy for the eastern part of the survey area. Fine-grained natural levee sediments, 3 to 4 m thick, rest upon 3 to 5 m of distributary channel silts and sands. The sediments of both facies become thinner and pinch out away from the center of West Fork Bayou L'Ours. Logs from the U.S. Army Corps of Engineers' foundation borings within the proposed levee right-of-way suggest that similar lithologies and thicknesses of natural levee and distributary channel sediments underlie the natural levees of Bayou Raphael. Both Walker and Avery (1989) and Kosters (1987) indicate that the 3 to 5 m of clay and sandy clay with abundant shells that underlies the distributary sediments apparently accumulated within an open bay. The depositional environment of the sediments beneath the open bay deposits cannot be determined because of insufficient data.

Penland et al. (1987, 1988) consider Bayou Raphael and West Fork Bayou L'Ours to be distributaries of their Bayou Terrebonne delta that formed between 1270 and 830 years B.P. They believe that West Fork Bayou L'Ours built the Bayou Terrebonne delta of the Lafourche delta complex approximately 20 km gulfward from their Teche shoreline. The presence of a Baytown site, 16LF53, on Kings Ridge and a possible Late Marksville component at Site 16LF54 suggests that the model proposed by Penland et al. (1987, 1988) underestimates the age of Bayou Raphael and West Fork Bayou L'Ours.

In contrast, Weinstein and Gagliano (1985) consider both Bayou Raphael and West Fork Bayou L'Ours to be a delta lobe of their Lafourche delta complex that advanced southward across the uneroded Late Holocene delta plain of the Teche delta complex between 2000 and 1600 years B.P. (Figure 4). Both studies (Weinstein and Gagliano 1985; Penland et al. 1987, 1988) indicate that the shoreline was located at least 25 km south of the project area during this time period. According to the interpretations of Weinstein and Gagliano (1985), Bayou Raphael and West Fork Bayou L'Ours reached this shoreline and functioned as minor distributaries of a delta lobe of their Lafourche delta complex for the next 700 years. Their model is consistent with the age of known sites on West Fork Bayou L'Ours and Kings Ridge.

Crevasse splays and distributaries occur along Bayou Raphael, West Fork Bayou L'Ours, and other distributaries (Figure 5). Within the vicinity of the project area, Site 16LF54 lies at the junction of a prominent crevasse distributary of West Fork Bayou L'Ours. The presence of archeological sites at such junctions is a common association within the Mississippi River delta plain (Gagliano 1984).

Adjacent Distributary Systems

Aerial photographs indicate that an unnamed branch of the West Fork Bayou L'Ours distributary system lies just northeast of the project area (Figure 5). The three branches of this distributary system have subsided to the extent that they almost have been completely buried by marsh in a manner illustrated by Fisk (1960). The similarity in the extent to which it and the Des Amoreux distributary have sunk into the marsh implies that they were abandoned within a short time of each other, although the exact age is unknown. This distributary system probably was one of many small distributary systems such as Bayou Des Amoreux and Kings Ridge, which were active while the Lafourche delta complex prograded through the project area (Weinstein and Gagliano 1985).

Bayou Lafourche is the relict, primary distributary of the Lafourche delta complex. Although the flow through it began to wane about 1000 years B.P., Bayou Lafourche continued to carry a significant flow of water and sediments until it was artificially closed at Donaldsonville in 1904 (Weinstein and Gagliano 1985).

Older Holocene and Late Pleistocene Sediments

Kolb and Van Lopik (1958) show that the sediments deposited by the Lafourche delta complex represent only the upper part of approximately 61 m (200 ft) of Holocene deltaic sediments that underlie the project area. These sediments lie upon the weathered, and presumably deeply eroded, continental shelf that was exposed during the Late Wisconsinan stage. To the west, Kolb and Van Lopik (1958) demonstrate that a buried, entrenched valley is adjacent to the project area. The fluvial and estuarine sediments that fill this valley probably consist of Late Pleistocene deposits that escaped destruction by the transgression of the shoreline across the project area.

Structural Influence on Geomorphology of the Project Area

Within the project region, 1941 ASCS aerial photographs exhibit anomalous distributary ridge patterns (Figure 5). The central and northernmost ridges of the unnamed distributary diverge from the typical radiating pattern within Sections 29, 30, 31, and 32 of R22E, T18S. Immediately to the east, the central ridge abruptly changes course and converges with the southernmost ridge of the unnamed distributary. Also within Section 31, three distributary ridges -- West Fork Bayou L'Ours, Bayou Raphael, and the southernmost ridge -- converge and then diverge anomalously. The ridges of the unnamed distributary are defined clearly within Sections 29 and 32, but become indistinct to the east and west.

The convergence and divergence of these distributary ridges centers around a point in the northern half of Section 32 of R22E, T18S that is underlain by the Clovelly Salt Dome. The caprock of the salt dome has risen to a depth of only 119 m (389 ft) below mean sea level (New Orleans Geological Society 1960) (Figure 5). The Clovelly Salt Dome has affected distributary ridges adjacent to it either by impeding the subsidence of or by uplifting the delta plain that lies immediately above it. In either case, the distributary systems preferentially prograded around the high portion of the deltaic plain over the Clovelly Salt Dome.

Soils of the Project Area

The Allemands series, Fausse-Sharkey association, Lafitte-Clovelly association, Rita series, and Sharkey series are associated with specific landforms within the project area. The soils of the Fausse-Sharkey association are restricted to the natural levees of the West Fork Bayou L'Ours and the lower segment of Bayou Raphael. The Sharkey series characterizes the higher natural levees of Bayou Raphael and its unnamed distributaries. The Lafitte-Clovelly association occurs within the brackish water marshes that occupy the indistributary areas between Bayou Raphael and West Fork Bayou L'Ours. The indistributary areas west of Bayou Raphael and either its unnamed distributaries, and east of Bayou Lafourche are occupied by the Allemands and Rita series (Matthews 1984).

The Sharkey series and the Fausse-Sharkey association consist of soils developed within the relict natural levees of abandoned deltaic distributaries. Within the project area, these natural levees rise little more than 1 m above sea level. Sharkey soils are poorly drained, medium acid to moderately alkaline inceptisols developed within the crests and intermediate elevations of these natural levees. Typically, its sola consist of a 91 to 152 cm thick A-Bg-B horizon sequence with a clay surface layer, and either a silt loam, silty clay loam, or silty clay subsurface layer. Sharkey soil has a high shrink-swell potential; when dry, it can

develop cracks that are 2 cm or more wide at a depth of 50 cm. Fausse soils are very poorly drained, medium acid to mildly alkaline entisols associated with marshes that developed along the edge of partially submerged natural levees. Typically, its sola consist of a 64 to 117 cm thick A-Bg-Cg horizon sequence with clay surface and subsurface layers. Although seldom dry enough to crack, the Fausse soil has a high shrink-swell potential (Matthews 1984).

The Lafitte-Clovelly association consists of level, saline, very poorly drained, semifluid, organic soils. These soils occur within the broad interdistributary brackish marshes that lie between Bayou Raphael and West Fork Bayou L'Ours, and east of West Fork Bayou L'Ours. Lafitte soils are very poorly drained, neutral to moderately alkaline histosols developed within the herbaceous plant material. Typically, its sola consist of a 129 to greater than 250 cm thick O Horizon that forms part of an Oa-IICg horizon sequence with a mucky surface layer and a semifluid clay subsurface layer. Lafitte soils occur within the center of intermediate marshes. Clovelly soils are found along the edges of the interdistributary, brackish marshes. The Clovelly soils represent marsh that has covered the edges of relict, subsided natural levee ridges. Included within the Lafitte-Clovelly association are small, unmapped patches of soils developed in silt loam and clay silt. These unmapped, Vacherie-like soils have developed within small crevasse splays, such as that adjacent to Site 16LF54 (Matthews 1984).

Soils of the Allemands and Rita series occur west of Bayou Raphael. These soils developed within the freshwater marshes that lie between Bayou Raphael and its unnamed distributaries and Bayou Lafourche. Many of these freshwater marshes have been drained. Rita soils are poorly drained, extremely to slightly acid entisols that developed within former freshwater marshes. Typically, its sola consist of a 51 to 102 cm thick O Horizon that forms part of an Oa-IIBg-IICg-IIICg horizon sequence with a thin (5 to 10 cm thick) mucky surface layer and either a silty clay loam, silty clay, or clay subsurface layer often underlain by either silt loam, very fine sandy loam, or loamy very fine sand. Generally, Rita soils have developed within the edges of interdistributary, freshwater marshes adjacent to natural levees. The interior portions of freshwater marshes are characterized by Allemands soils that have an organic surface layer, O Horizon, that is greater than 41 cm thick (Matthews 1984).

Fauna and Flora of the Project Area

The flora and fauna of the project region varies greatly between the natural levees and adjacent freshwater swamp. The differences in fauna and flora result from the distinct differences in the drainage of each area (Penfound and Hathaway 1938).

Natural Levees

The natural levees within the project area are covered by a natural levee oak forest. The principle overstory within an oak forest would have been water oak (*Quercus nigra*), overcup oak (*Quercus lyrata*), cottonwood (*Populus deltoides*), sweetgum (*Liquidambar styraciflua*), sycamore (*Platanus occidentalis*), redgum, black willow (*Salix nigra*), hackberry (*Celtis laevigata*), swamp privet (*Forestiera acuminata*), water locust (*Gleditsia aquatica*), and honey locust (*Gleditsia triacanthos*). The understory of these forests includes shrubs such as (*Baccharis* sp.), buttonbush (*Cephalanthus occidentalis*), wax myrtle (*Myrica cerifera*), dwarf palmetto (*Sabal minor*), marsh elder, elderberry (*Sambucus canadensis*), and yaupon (*Ilex vomitoria*) and vines such as trumpet creeper (*Campis radicans*), poison ivy (*Rhus radicans*) and rattan vine (*Berchmis scandens*). The groundcover of the natural levee consists of various grasses (*Gramineae* sp.) and sedges (*Cyperaceae* sp.) (Penfound and Hathaway 1938).

The natural levee oak forests support a large variety of fauna. The fauna include large mammals such as white-tailed deer (*Odocoileus virginianus*), and black bear (*Ursus americanus*). Gray squirrel (*Sciurus carolinensis*), fox squirrel (*Sciurus niger*), eastern cottontail (*Sylvilagus floridanus*), and swamp rabbit (*Sylvilagus aquaticus*) also exploit this habitat. The fauna of these oak forests includes predator mammals such as red fox (*Vulpes fulva*), gray fox (*Urcyon cinereoargenteus*), raccoon (*Procyon lotor*), long-tailed weasel (*Mustela frenata*), mink (*Mustela vison*), and bobcat (*Felis rufus*). These species, together with raptors, are important in limiting the size of rabbit, mouse, squirrel, and bird populations. The mink and raccoon also are important as fur bearers along with opossum (*Didelphis virgiana*), and the historically introduced nutria (*Mycocaster coypus*). Some of the birds found within natural levee oak forests are painted bunting (*Passerina cirris*), red-winged blackbird (*Agelaius phoenicews*), common crow (*Corvus brachyrhynchos*), common night hawk (*Chordeiles minor*), screech owl (*Otus asio*), black vulture (*Coragyps atratus*), turkey vulture (*Cathartes aura*), and many others. The oak forests are home for amphibians, including various salamanders, toads, tree frogs, and true frogs. The numerous reptiles found within the oak forests consist of a number of iguanids, skinks, lizards, snakes, pit vipers, and turtles (Lowery 1974a, 1974b; Penfound and Hathaway 1938).

The transition zone between the natural levee oak forest and marsh varies according to the type of swamp that lies adjacent to the natural levee. If the adjacent marsh is freshwater marsh, then the transition zone consists of a very narrow band of cypress-gum swamp dominated by either bald cypress (*Taxodium distichum*) or a variety of species of gums (*Nyssa* sp.). If the adjacent marsh either is brackish or intermediate marsh, then tne transition zone consists of dense shrubs and cane (Penfound and Hathaway 1938).

Fresh and Intermediate Marshes

The interdistributary marshes in the project area either consist of fresh or intermediate herbaceous marsh. The marsh that is immediately adjacent to the project area on the natural levees of West Fork Bayou L'Ours lies within a belt of intermediate marsh less than 1.5 km wide. The intermediate marsh grades eastward into brackish water marsh and northwestward into freshwater marsh. The indistributary marsh between Bayou Raphael and West Fork Bayou L'Ours also consists of intermediate marsh, and consists of freshwater marsh between Bayou Raphael and either its unnamed distributaries or Bayou Lafourche (Kosters 1989). Some of the freshwater marsh has been drained (Matthews 1984).

Intermediate marsh is characterized by a community of narrow leaved, persistent plant species. Because of an irregular tidal regime, the intermediate marsh is oligohaline with a salinity that averages about 3.3 parts per thousand. Shifts in salinity will change it quickly either to brackish or freshwater marsh. Within Lafourche Parish, the overall trend is a landward shift of freshwater to intermediate marsh and intermediate to brackish water marsh as a result of continuing salt water intrusion. Typically, the permanently flooded marsh contains scattered open pools and ponds (Chabreck 1972; Craig et al. 1987).

The flora of the intermediate marsh is characterized by a diversity of species, many of which are found in the adjoining freshwater and brackish water marshes. Wire grass (*Spartina patens*) typically is the dominant plant within the intermediate marsh. Other characteristic species include roseau cane (*Phragmites communis*), bulltongue (*Sagittaria lancifolia*), coastal water hyssop (*Bacopa monnieri*), spikesedge (*Eleocharis* sp.), three-cornered grass (*Scirpus olneyi*), giant bullrush (*Scirpus californicus*), common threesquare (*Scirpus americanus*), deer pea (*Vigna luteola*), seashore paspalum (*Paspalum vaginatum*), switch grass (*Panicum virgatum*), bearded spangletop (*Leptochloa frascicularis*), camphor-weed (*Pluchea camphorata*), walter millet (*Echinonchloa walteri*), fragrant flatsedge (*Cyperus odoratus*), alligator weed (*Alternanthora philoxeroides*), southern naiad (*Najas guadalupensis*), big cordgrass (*Spartina cynosuroides*), and gulf cordgrass (*Spartina spartineae*). Within the intermediate marsh, epiphytic and benthic algae are biologically significant components (Chabreck 1972; Craig et al. 1987).

Freshwater marsh consists of communities composed of varying admixtures of broad and narrow leaved persistent vegetation and non-persistent emergents. It has the greatest plant diversity and highest soil organic content of any marsh type. Freshwater marsh communities are adapted to salinities that are usually less than 2.0 parts per thousand and typically average about 0.5 to 1.0 parts per thousand. With the intrusion of salt water, freshwater marsh changes to either a more saline marsh type or open water. Within Lafourche Parish, salt water intrusion has caused, and is continuing to cause, an extensive loss of freshwater marsh (Chabreck 1972; Craig et al. 1987).

The flora of the freshwater marsh is heterogeneous and varies from location to location. The primary factors that govern the distribution of species within freshwater marshes appear to be the frequency and duration of flooding. Both of these factors are strongly related to the microtopography within any freshwater marsh. Substrate type, current flow, salinity, competition, and allelopathy also strongly influence the patterns of species distribution within it. Commonly, the dominate species within the freshwater marsh is the maidencane (*Panicum hemitomon*). Other characteristic species include spikesedge (*Eleocharis* sp.), bulltongue (*Sagittaria lancifolia*), alligator weed (*Alternanthora philoxeroides*), wire grass (*Spartina patens*), roseau cane (*Phragmites communis*), coastal water hyssop (*Bacopa monnieri*), coontail (*Ceratophyllum demursum*), fragrant flatsedge (*Cyperus odoratus*), water hyacinth (*Eichhornia crassipes*), pickerelweed (*Pontederia cordata*), arrow arum (*Peltandra virginica*), pennyworts (*Hydrocotyle* sp.), common duckweed (*Lemma minor*), water milfoils (*Myriophyllum* sp.), white water lily (*Nymphaea odorata*), cattail (*Typha* sp.), bladderworts (*Utricularia* sp.), deer pea (*Vigna luteola*), and southern wildrice (*Zizaniopsis miliacea*). Both epiphytic and benthic algae are biologically significant components of the freshwater marsh flora (Chabreck 1972; Craig et al. 1987).

The freshwater and intermediate marshes support a rich fauna. The animals that inhabit and use these marshes include many of those found in the adjacent natural levee oak forest. Of these, the nutria (*Myocastor coypus*), beaver (*Castor canadensis*), river otter (*Lutra canadensis*), American alligator (*Alligator mississippiensis*), and various birds, frogs, water snakes, turtles, and salamanders are the typically permanent inhabitants of these marshes. Wood duck (*Aix sponsa*), American black duck (*Anas rubripes*), common teal (*Anas crecca*), mallard (*Anas playtyrhychos*), killdeer (*Charadrius vociferus*), American bittern (*Botaurus lentiginosus*), roseate spoonbill (*Ajaja ajaja*), reddish egret (*Egretta rufescens*), black-shouldered kite (*Elanus caeruleus*), peregrine falcon (*Falco peregrinus*), black rail (*Laterallus iamaiccensis*), osprey (*Pandion haliaetus*), glossy ibis (*Plegadis falinellus*), bald eagle (*Haliaeetus leucocephalus*), white pelican (*Pelecanus erythrothynchos*), and brown pelican (*Pelecanus occidentalis*) are a few of the many birds that can be found within both the freshwater and intermediate marshes. The ponds, pools, ditches, and sloughs within these marshes also contain a considerable abundance and variety of fish (Chabreck 1972; Craig et al. 1987; Lowery 1974a, 1974b; Penfound and Hathaway 1938).

Climatology

The survey area has a humid subtropical climate with prevailing southerly winds. The long summers are hot and humid and the winters are warm. The winters are interrupted occasionally by incursions of cool air from the north (Matthews 1984).

Data recorded at New Orleans between 1955 and 1977 suggest an average annual rainfall of 150 cm (59 in). July, August, and September are the wettest months; average precipitation varies from 15.7 to 16.1 cm (6.19 to 6.32 in). October is the driest month with an average precipitation of 7.21 cm (2.84 in). The heaviest one-day rainfall in New Orleans during the period of record was 24.9 cm (9.8 in) on May 31, 1959. Rainfall and hurricane storm surge are the main causes of flooding within the study area. The rainfall associated flooding results from either near-stationary cold fronts or hurricanes. Both causes are capable of producing rainfall at the rate of one or more inches per hour (Matthews 1984).

The movement of Maritime Tropical Air Masses from the Gulf of Mexico keeps temperatures within the project area from varying greatly during the year. According to data recorded at New Orleans between 1955 and 1977, the average maximum annual temperature of this area is 25.2° Centigrade (77.4° Fahrenheit). In winter, the average maximum annual temperature is 12.2° Centigrade (54° Fahrenheit). The coldest month is January, with an average maximum temperature of 16.4° Centigrade (61.5° Fahrenheit). In summer, the average normal maximum annual temperature is 32.2° Centigrade (90° Fahrenheit). The hottest month is July, with an average maximum temperature of 32.4° Centigrade (90.4° Fahrenheit). The lowest recorded temperature, which occurred at New Orleans on January 4, 1963, is -10° Centigrade (14° Fahrenheit). The highest recorded temperature, which occurred at New Orleans on June 27, 1967, is 36.7° Centigrade (98° Fahrenheit) (Matthews 1984).

CHAPTER III

PREHISTORIC SETTLEMENT IN THE REGION

Introduction

Prehistoric settlement within the southeastern Louisiana delta was intricately tied to the area's geomorphic development. Prehistoric peoples efficiently exploited the available natural resources of the rich alluvial deltaic environment. In this chapter, the relationship between the project area's geomorphological development and anticipated prehistoric settlement are discussed. This is followed by an overview of recorded aboriginal settlement along the Lafourche delta lobe, and a discussion of prehistoric settlement patterns observed in the area. An overview of the region's prehistoric development is contained in Goodwin, Hinks et al. (1991).

As discussed in Chapter II, both Bayou Raphael and West Fork Bayou L'Ours are typical, minor deltaic distributary ridges. The Clovelly Salt Dome has altered either actively or passively the courses of these and other distributary ridges within the general region. They both prograded into the project area starting about 2000 to 1600 years B.P. as active distributaries of a prograding Lafourche delta lobe of the Lafourche delta complex and became inactive sometime prior to 1000 years B.P. Since their abandonment, pedogenic and biologic processes have modified strongly the sediments that compose the natural levee and the crevasse splays and distributaries associated with Bayou Raphael and West Fork Bayou L'Ours.

Archeological Resources of Deltaic Environments

As documented by many studies, the majority of archeological deposits present within the Mississippi Delta Plain occur upon the subaerial or partially submerged natural levees of major bayous and rivers. Apparently, the natural levees of relict distributary ridges, e.g., Bayou Raphael and West Fork Bayou L'Ours, were the preferred location for human settlement and other activities on delta plains because of many factors. Natural levees provided comfortable dwelling spots, rich deltaic ecosystems, habitats for terrestrial game that provided food sources, raw materials, proximities to open water for both subsistence and transportation, and locations safe from natural hazards such as flooding and low hurricane storm surges. Finally, after agriculture was established, the surfaces of natural levees provided the only common sources of arable land available on the delta plain (Britsch and Smith 1989; Kniffen 1936; Weinstein and Kelley 1989).

However, the character of the natural levees within the project area would have limited the practice of agriculture. The narrow widths, clayey soils, and shallow water tables that characterize the Bayou Raphael and West Fork Bayou L'Ours natural levees probably restricted the practice of agriculture within the project area.

Within the Mississippi Coastal Plain, sites are distributed in a typical north-to-south pattern along the natural levees of crevasse channels. This site distribution pattern is linear, since the available elevated ground consists of linear landforms such as the natural levees of trunk channels and distributaries. This pattern has been illustrated by a number of studies, e.g., Gagliano (1984), McIntire (1958), and Pearson et al. (1989). Within this overall linear distribution of sites, the major residential site complexes are situated strategically at the confluence of distributary channels with the trunk channel of deltaic complexes (Weinstein and Kelley 1989). Factors concerning comfort, transportation, and subsistence apparently determined the location of major residential sites at these confluences. The confluences might have been selected for these sites for reasons of comfort and possibly safety; they tend to have natural levees both higher and wider than

normal. Also, the confluence of sluggish channels is typically the locus of freshwater fauna and flora. Finally, confluences gave local residents an easy and commanding access to the distributary system that served as "highways" for their watercraft.

Within the natural levees, pedogenic processes would have influenced greatly the preservation of archeological deposits. The slightly acidic surface layer of the Fausse and Sharkey series soils within the project area certainly would have affected the preservation of faunal materials. For example, the occurrence of both well-preserved and corroded shell at Bayou L'Ours Mounds (16LF54) indicates the differential preservation that occurs within these soils (Goodwin, Hinks et al. 1991).

The high shrink-swell potential of the Fausse and Sharkey series also could affect the integrity of the archeological deposits. If subject to repeated wetting and drying, argilliturbation can churn soils with a high shrink-swell potential (Wood and Johnson 1978). Currently, the shallow water table within the project area significantly inhibits the churning of these soils by limiting the degree to which the soils can dry. Because subsidence has lowered the elevation of the natural levees within the project area, the water table may have been lower, and limited argilliturbation may have occurred in the past (Goodwin, Hinks et al. 1991).

A significant potential for encountering deeply buried sites exists within the project area. As previously noted, the lack of a well-defined transgressive shoreline and the distribution of archeological sites indicate that a transgressive shoreline did not erode the surface of the Teche delta complex prior to deposition of the Lafourche delta complex as claimed by Penland et al. (1987, 1988). Rather, as proposed by Weinstein and Gagliano (1985), the Teche delta complex remained relatively intact as it was buried by the subsequent Lafourche delta complex. Thus, the natural levees of distributary systems on the surface of the Teche delta complex and the archeological deposits that they contain apparently remain intact (Smith et al. 1986; Goodwin, Hinks et al. 1991).

Also, archeological deposits might be preserved within deeply buried valley fills that underlie the project area. As previously discussed, the landward migration of the shoreface eroded the upper 7 to 10 m of the coastal plain during the Late Wisconsinan stage and Early Holocene Epoch to form an erosional surface called a "ravinement surface." This erosion probably destroyed any archeological deposits on the upland surfaces of the former coastal plains. Because fluvial sediments that form the valley fill of the Mississippi River lay below the level of the ravinement surface, archeological deposits buried within the alluvial fill of the Mississippi River Valley probably survived its formation by transgressive erosion. During later stillstands of sea level within the Holocene, delta progradation buried the ravinement surface and the surviving valley fill under Holocene marine and deltaic sediments. As a result, any surviving archeological deposits related to the initial occupation of south-central Louisiana are buried beneath tens of meters of sediment (Pearson et al. 1986; Suter et al. 1987).

Known Prehistoric Settlement Along the Lafourche Delta Lobe

In this section, known prehistoric settlement within the region is summarized through examination of recorded prehistoric archeological sites. The project region is defined as the Lafourche delta lobe, the eastern portion of the Lafourche Delta Complex, which extends from the vicinity of Thibodaux southeastward through Lafourche Parish to the Gulf of Mexico. It includes Bayou Lafourche and its distributary system. The delta lobe is bounded to the east by the Barataria Interlobe Basin, and to the west by the Terrebonne delta lobe (Goodwin, Heinrich et al. 1991).

Beginning in 1987, an intensive multi-year survey of Golden Ranch Plantation, near Gheens, Louisiana, was conducted by Coastal Environments, Inc. (Pearson et al. 1989). Nearly 140 prehistoric and historic archeological sites have been recorded on that plantation, primarily along Bayou Matherne, Bayou

Chateau de Cypres, Petit Bois Bayou, and Lake Salvador. Most of the prehistoric sites are shell middens occupying similar landforms, and patterns of settlement observed among these sites already have been discussed (Pearson et al. 1989). Therefore, following consultation with the Louisiana Division of Archaeology, only a representative sample of these sites, approximately one fifth, have been tabulated on Table 1. No attempt is made here to examine distribution of sites in the region over time; with the exception of the Golden Ranch Plantation sites, insufficient temporal data are known about most of the sites in the region for such a study to be meaningful.

Historic archeological sites are not discussed at length in this section. Historic sites reflect land use that is tied to the region's historic development within an economic system of personal land ownership. Historic settlement is based extensively on availability of land, especially large tracts of land for agriculture, and land adjacent to navigable waterways for transportation. The tendency was for most historic settlements to occur along wide natural levees, such as most of Bayou Lafourche. Many of the smaller tributaries, such as West Fork Bayou L'Ours and Bayou Raphael, were not utilized extensively until development of the modern petroleum industry. Unlike aboriginal settlement, historic European settlement rarely was linked with procurement of natural resources such as flora, game, and *Rangia cuneata* and other marine resources.

Table 1 contains a listing of recorded prehistoric archeological sites on the Lafourche delta lobe, including the sample of sites recorded during the Golden Ranch Plantation surveys. This table is divided into shell middens, sites with earthen mounds, and other (or unidentified) prehistoric sites. The table includes site descriptions, geomorphic locations, and soil associations. Based on these data, several patterns of settlement were observed; these are summarized below.

Most of the prehistoric sites recorded in the parish are shell middens. The majority of these shell middens are situated on natural levees, including subsided natural levees. Fewer sites are found on beaches (e.g., 16LF7 - 16LF9), or former beaches (apparently 16LF78). The large shell middens (e.g., 16LF1, 16LF3, and 16LF99), that normally are associated with habitation sites, typically lie in the same geomorphic locations as mound sites. Shell middens are found throughout the natural levee system, including the proximal and distal portions of crevasse splays. Factors that appear to influence location of shell middens are the presence of at least seasonably dry land, and proximity to desired natural resources such as shellfish and other marine resources. The numerous small shell middens scattered along waterways such as Bayou Matherne and Petit Bois Bayou suggest these midden locations were used until the local resources were depleted. Once transportation of declining shellfish and marine resources to a given shell midden became inefficient, another location was chosen and the inhabitants resumed harvesting of the marine resources. This resulted in formation of a new shell midden, or continued building of a previously existing shell midden.

Most recorded shell middens extend to the modern ground surface. A small number are buried under various thicknesses of alluvium. For example, Sites 16LF57 through 16LF63, a series of Troyville through Plaquemine shell middens situated along West Fork Bayou L'Ours upstream from the current project area, are buried under 0.3 to 0.6 m of alluvium. Likewise, Site 16LF246 was exposed during dredging across the subsided natural levee of Middle Fork Bayou L'Ours. Other buried shell middens are anticipated, having been covered through subsidence, and deposition of post-occupation alluvium. As mentioned above, Teche delta complex sites may occur in the area underneath the subsequent Lafourche delta complex deposits; because of their depth, most probably will never be located.

A number of prehistoric earthen mound sites have been identified in the Lafourche delta lobe region (Table 1), including Bayou L'Ours Mounds (16LF54), located near the current project area. These mound sites are located either at crevasse splays or the confluence of two or more bayous. As mentioned above, this same pattern also was observed at the large shell midden habitation sites in the region. These locations provided wider and generally somewhat higher natural levees than other locations along the bayous. In addition, active crevasses, or intersecting bayous would provide efficient riverine access to a variety of

Table 1. Recorded Prehistoric Archeological Sites in the Lafourche Delta Region.[1]

SITE NUMBER	NAME	SITE DESCRIPTION	GEOMORPHIC LOCATION	SOIL ASSOCIATION[2]	NRHP ELIGIBILITY
Prehistoric Shell Midden Sites					
16LF1	Toups Place	Troyville through Mississippian shell midden and village site	Natural levee of West Fork Bayou L'Ours, between two crevasse splays	Co	Potentially significant
16LF3	Bayou Matherne	Coles Creek through Historic Indian Contact shell middens, with eighteenth through twentieth century historic domestic component	Natural levee, at confluence of Bayous Vacherie and Matherne	Cm	Potentially significant
16LF7	West of Belle Pass	Plaquemine and Mississippian shell midden beach deposit	Gulf of Mexico beach, between Belle Pass and Timbalier Bay	FE	Not eligible
16LF8	Bay Marchand	*Neo-Indian shell midden* beach deposit	*Gulf of Mexico beach* between Belle Pass and Pass Fourchon	FE	Not eligible
16LF9	East of Pass Fourchon	Neo-Indian shell midden beach deposit	Gulf of Mexico beach between Pass Fourchon and Bay Champagne	FE	Not eligible
16LF10	Cheniere Caminada	Neo-Indian shell midden beach deposit	Natural levee, at convex side of Bayou Thunder von Tranc, approximately 2 river miles from the Gulf of Mexico	SA	Unknown
16LF11	Bayou Thunder von Tranc	Prehistoric unknown shell midden	Apparent submerged natural levee along Bayou Thunder von Tranc near the Gulf of Mexico	SA	Unknown
16LF12	Caminada Bay	Neo-Indian shell midden beach deposit	Beach deposit along the west side of Caminada Bay	SA	Unknown

Table 1, continued

SITE NUMBER	NAME	SITE DESCRIPTION	GEOMORPHIC LOCATION	SOIL ASSOCIATION[2]	NRHP ELIGIBILITY
16LF31	Bayou L'Eau Bleu	Mississippian shell midden	Natural levee of Bayou Blue near its intersection with Bayou L'Eau Bleu	Co	Unknown
16LF34	Bayou Lafourche	Small Plaquemine shell midden on the bank of the bayou	Natural levee of Bayou Lafourche	SA	Not eligible
16LF35	Larose	Coles Creek shell mound with a possible Marksville component	Natural levee of relict unnamed bayou	AE	Potentially significant
16LF39	None	Troyville and Coles Creek mostly subsurface shell midden surmounted by a modern camp	Largely submerged natural levee of Grand Bayou	TB	Unknown
16LF40	None	Troyville and Coles Creek thin shell midden along the bank of the bayou	Largely submerged natural levee of Grand Bayou Blue which is near the branching off of Bayou Faleau	TB	Unknown
16LF41	None	Coles Creek *Rangia* and *Ostrea* shell midden along the bank of the bayou	Largely submerged natural levee of Grand Bayou Blue	TB	Unknown
16LF42	None	Neo-Indian shell midden on the bank of the bayou	Natural levee of Grand Bayou Blue, at Confluence of Bayou Tete de Ours	TB	Unknown
16LF43	None	Neo-Indian shell midden	Natural levee of Grand Bayou Blue	TB	Unknown
16LF49	None	Series of Neo-Indian shell middens	Natural levee of Bayou Lafourche	SA	Unknown

Table 1, continued

SITE NUMBER	NAME	SITE DESCRIPTION	GEOMORPHIC LOCATION	SOIL ASSOCIATION[2]	NRHP ELIGIBILITY
16LF50	None	Coles Creek, Plaquemine and Mississippian shell midden with late nineteenth through early twentieth century cemetery	Natural levee of Bayou Lafourche	SA	Potentially significant
16LF57	None	Troyville through Plaquemine shell midden buried under 0.3-0.6 m of alluvium	Natural levee of West Fork Bayou L'Ours	Cm	Unknown
16LF58	None	Troyville through Plaquemine shell midden buried under 0.3-0.6 m of alluvium	Natural levee of West Fork Bayou L'Ours	Cm	Unknown
16LF59	None	Troyville through Plaquemine shell midden buried under 0.3-0.6 m of alluvium	Natural levee of West Fork Bayou L'Ours	Cm	Unknown
16LF60	None	Troyville through Plaquemine shell midden buried under 0.3-0.6 m of alluvium	Natural levee of West Fork Bayou L'Ours	Sk	Unknown
16LF61	None	Troyville through Plaquemine shell midden buried under 0.3-0.6 m of alluvium	Natural levee of West Fork Bayou L'Ours	Sk	Unknown
16LF62	None	Troyville through Plaquemine shell midden buried under 0.3-0.6 m of alluvium	Natural levee of West Fork Bayou L'Ours	Sk	Unknown
16LF63	None	Troyville through Plaquemine shell midden buried under 0.3-0.6 m of alluvium	Natural levee of West Fork Bayou L'Ours	Co	Unknown
16LF77	Tisamond Foret Canal	Prehistoric unknown shell midden with possible modern shell deposits	Coastal marsh, adjacent to Gulf Intracoastal Waterway	AE	Unknown

Table 1, continued

SITE NUMBER	NAME	SITE DESCRIPTION	GEOMORPHIC LOCATION	SOIL ASSOCIATION[2]	NRHP ELIGIBILITY
16LF78	Bayou Catahoula	Neo-Indian and Tchefuncte shell midden	Coastal marsh along Gulf Intracoastal Waterway, near Bayou Catahoula, and apparently near a former Lafourche Delta shoreline	AE	Potentially significant
16LF82	None	Coles Creek, Plaquemine and Mississippian shell midden	Natural levee of Belle Pass near the Gulf of Mexico	SA	Potentially significant
16LF83	None	Neo-Indian, Plaquemine and Historic Contact Indian *Ostrea* shell midden	Natural levee of lower Bayou Lafourche	SA	Unknown
16LF84	None	Neo-Indian shell midden with possible modern shell deposit	Natural levee of Belle Pass, just downstream from its divergence from Bayou Lafourche	SA	Unknown
16LF85	None	Neo-Indian shell midden	Natural levee of Belle Pass near the Gulf of Mexico	SA	Unknown
16LF86	None	Mississippian *Ostrea* shell midden	Natural levee of Belle Pass near the Gulf of Mexico	SA	Unknown
16LF88	Bayou Raphael	Neo-Indian apparent shell midden	Natural levee of Bayou Raphael	Sk	Unknown
16LF97	None	Plaquemine shell midden	Apparent subsided natural levee near Bayou Lafourche	AE	Unknown
16LF99	Boudreaux	Plaquemine shell midden and village site	Natural levee of Bayou Lafourche, at crevasse splay	Sh	Unknown
16LF100	East Fork Bayou L'Ours	Neo-Indian shell mound or midden	Natural levee of East Fork Bayou L'Ours	TB	Unknown

Table 1, continued

SITE NUMBER	NAME	SITE DESCRIPTION	GEOMORPHIC LOCATION	SOIL ASSOCIATION[2]	NRHP ELIGIBILITY
16LF101	Shell Pond	Coles Creek shell midden	Apparent subsided natural levee of East Fork Bayou L'Ours	TB	Unknown
16LF102	Kings Ridge	Prehistoric unknown apparent shell midden	Natural levee of East Fork Bayou L'Ours	LA	Unknown
16LF108	Grand Bayou	Late Coles Creek and Plaquemine shell midden	Natural levee of Grand Bayou, near a small unnamed tributary	LA	Unknown
16LF110	G.R. 2 and 3	Neo-Indian shell midden	Natural levee at the intersection of Bayou Vacherie and Bayou Chateau de Cypres	Mostly Sr; some Tn (along Bayou Chateau de Cypres)	Potentially significant
16LF112	G.R. 5	Neo-Indian shell midden	Natural levee of Bayou Matherne, at crevasse splay	BB	Potentially significant
16LF113	G.R. 6	Prehistoric unknown shell midden	Natural levee of Bayou Matherne	Cm	Unknown
16LF134	G.R. 39	Prehistoric unknown shell midden	Natural levee of Petit Bois Bayou	Cm	Potentially significant
16LF135	G.R. 40 and 41	Three prehistoric unknown shell middens on bank of bayou	Natural levee	Cm	Potentially significant
16LF136	G.R. 42, 50, 51 and 52	Plaquemine shell midden, and late nineteenth century industrial through modern earthworks and railroad bed associated with logging	Natural levee, at confluence of Petit Bois Bayou and Bayou Vacherie	Sr	Potentially significant

Table 1, continued

SITE NUMBER	NAME	SITE DESCRIPTION	GEOMORPHIC LOCATION	SOIL ASSOCIATION[2]	NRHP ELIGIBILITY
16LF137	G.R. 43 and 44	Plaquemine and Historic Indian contact shell midden	Natural levee of Bayou Matherne, near crevasse splay	Cm	Potentially significant
16LF138	G.R. 45	Neo-Indian shell midden	Natural levee of Petit Bois Bayou	Cm	Potentially significant
16LF159	G.R. 88, A and B	Plaquemine shell midden	Natural levee of Bayou Matherne, at small crevasse splay	Cm	Unknown
16LF162	G.R. 92	Prehistoric unknown shell midden	Natural levee of Petit Bois Bayou	Mostly Co; also some Cm	Potentially significant
16LF163	G.R. 93	Neo-Indian shell midden	Natural levee of Petit Bois Bayou, near distal end of small crevasse splay	Cm	Potentially significant
16LF187	G.R. 117	Prehistoric unknown shell midden	Natural levee of Bayou Matherne	Cm	Unknown
16LF188	G.R. 118	Prehistoric unknown shell midden	Natural levee of Bayou Matherne	Co	Unknown
16LF212	Golden Ranch 144	Prehistoric unknown shell midden	Distal natural levee of Petit Bois Bayou	Co	Potentially significant
16LF213	Golden Ranch 145	Prehistoric unknown shell midden	Natural levee of Petit Bois Bayou	Sk	Potentially significant
16LF214	Golden Ranch 146	Prehistoric unknown shell midden	Natural levee of Petit Bois Bayou	Co	Unknown
16LF216	Golden Ranch 148	Prehistoric unknown shell midden	Natural levee of Petit Bois Bayou	Cm	Unknown
16LF246	Middle Fork Bayou L'Ours	Neo-Indian shell midden exposed during dredging	Natural levee of Middle Fork Bayou L'Ours	TB	Unknown

Table 1, continued

SITE NUMBER	NAME	SITE DESCRIPTION	GEOMORPHIC LOCATION	SOIL ASSOCIATION[2]	NRHP ELIGIBILITY
Prehistoric Earthen Mound Sites					
16LF15/ 16LF28	Bayou Grand Coteau	Small prehistoric unknown earthen mound	Natural levee of Bayou Grand Coteau, near a small crevasse splay	Co	Unknown
16LF32	Bayou Blue	Prehistoric unknown earthen mound	Natural levee of Bayou Blue, near a small crevasse splay; precise location unclear	Co	Unknown
16LF33	Bergeron School	Two small Plaquemine and Late Mississippian earthen mounds	Natural levee of Bayou Blue, at a crevasse splay	Cm	Potentially significant
16LF48	None	Troyville and Coles Creek pyramidal earthen mound	Natural levee of Bayou L'Ours, adjacent to a crevasse splay	Cm	Potentially significant
16LF54	Bayou L'Ours Mounds	Troyville through Mississippian ceremonial center, with a possible late Marksville component; with two earthen mound, village site, shell middens, and one known burial	Natural levee of West Fork Bayou L'Ours, at a crevasse splay	FA	Evaluated as eligible
16LF55	Alombro Cemetery	Prehistoric unknown earthen mound group and habitation site	Largely subsided natural levee of East Fork Bayou L'Ours, at confluence with subsided West Fork Bayou L'Ours natural levee	TB	Potentially significant
16LF64	Clovelly	Coles Creek to Mississippian earthen mound and adjacent shell midden habitation site	Natural levee at confluence of Bayous Poignard, Pierce, and des Amoreaux	KE	Unknown

Table 1, continued

SITE NUMBER	NAME	SITE DESCRIPTION	GEOMORPHIC LOCATION	SOIL ASSOCIATION[2]	NRHP ELIGIBILITY
Other Prehistoric Sites					
16LF36	La Rose	Coles Creek (Bayou Cutler phase) and Plaquemine buried earthen midden	Distal Bayou Lafourche natural levee	Cm	Unknown
16LF37	Leeville	Prehistoric unknown site (site type unknown)	Natural levee of Bayou Lafourche	SA	Unknown
16LF111	Golden Ranch 4	Prehistoric unknown habitation site	Natural levee of Bayou Matherne, at a small crevasse splay, and near a larger crevasse splay	Cm	Potentially eligible

[1]Data from the State Site Files, Louisiana Division of Archaeology, Department of Culture, Recreation and Tourism, Baton Rouge, Louisiana.

[2]SOIL LEGEND (Matthews 1984)

AE = Allemands muck (n = 4)
BB = Barbary-Faussee association (n = 1)
Cm = Commerce silt loam (n = 17½)
Co = Commerce silty clay loam (n = 8½)
FA = Fausse-Sharkey association (n = 1)
FE = Felicity loamy fine sand, frequently flooded (n = 3)
KE = Kenner muck (n = 1)
LA = Lafitte-Clovelly association (n = 2)
SA = Scatlake muck (n = 12)
Sh = Sharkey silty clay loam (n = 1)
Sk = Sharkey clay (n = 5)
Sr = Sharkey clay, occasionally flooded (n = 1½)
TB = Timbalier-Bellpass association (n = 9)
Tn = Tunica clay, frequently flooded (n = ½)

natural resources, including natural levee, marsh, and marine species. While not confirmed archeologically, agriculture also may have been practiced in these relatively large, well-drained, fertile areas.

Some natural levee distributary systems and portions of them, apparently were utilized more intensively than others. For example, the Bayou Matherne, Bayou Chateau de Cypres, and Petit Bois Bayou natural levees were settled extensively by aboriginals. During their 1987 - 1989 surveys of Golden Ranch Plantation, most of which were conducted along these waterways, Pearson et al. (1989) recorded and examined 93 aboriginal sites within the estimated 43 linear km (27 linear mi) of natural levee surveyed, for an average of over two prehistoric sites along every linear km. On the other hand, the approximately 4.5 km (2.8 mi) long portion of the West Fork Bayou L'Ours natural levee that was surveyed during the 1990 investigations (Goodwin, Hinks et al. 1991) resulted in identification of only one site, Bayou L'Ours Mounds.

Several factors may contribute to this apparent differential land utilization. A dominant factor probably was proximity to natural resources, such as shellfish. Bayou Matherne flows into Lake Salvador, providing ready access to its rich environmental ecosystem. In addition, the natural levees along the upper portions of the Golden Ranch Plantation bayous are somewhat wider and higher than those along West Fork Bayou L'Ours, providing better land for long-term habitation. In addition, socio-political or religious factors that cannot be discerned from the archeological record may have influenced settlement patterns. Additional intensive survey of different distributary systems in the region is necessary to more fully understand these site distribution patterns.

In some parts of the country, there appears to be a clear correlation between soil types and site distribution. Recognizing this, some investigations of large tracts have been conducted in which specific soil types have been emphasized (e.g., Goodwin, Athens et al. 1991). Soil associations of the recorded archeological sites in the region were examined to ascertain whether or not a pattern was discernable within this dynamic active delta environment (Table 1). Prehistoric sites have been recorded in 14 of the 21 soil types and associations identified within the parish. These 14 soil types and associations range from the well-drained Commerce silt loam soils that normally lie along the crest of the natural levees, to freshwater and saline marsh soils. While 26 (38.8 per cent) of the 67 sites on Table 1 lie on the well-drained natural levee Commerce soils, another 28 sites (41.8 per cent) are located on soils classified as marsh, including Allemands muck, Kenner muck, and Lafitte-Clovelly, Scatlake muck, and Timbalier-Bellpass associations.

Based on collected data, modern soils associations within the parish have only a minimal correlation with prehistoric settlement. Other than beach deposits, prehistoric settlement concentrated on natural levee landforms that existed at the time of settlement. However, post-occupational subsidence and subsequent accumulation of alluvium have changed many of the soil associations over time. Many of the smaller natural levees (e.g., East Fork Bayou L'Ours and much of West Fork Bayou L'Ours) have subsided into the surrounding marsh; their current morphology inaccurately reflects landform conditions encountered by the area's prehistoric inhabitants. Predictive models in the region should emphasize visible and submerged natural levees as opposed to modern soil associations. Examination of soils, however, can be used to identify many of the crevasse splays in the region, some of which are not readily discernable on topographic quadrangles.

In summary, numerous prehistoric archeological sites have been recorded along the Lafourche delta lobe (Table 1). These sites primarily include shell middens and sites with earthen mounds. Based on the observed distribution, most of the sites are located on natural levees, including subsided natural levees. The shell middens generally are scattered at numerous locations along these natural levees that afforded aboriginals both elevated dry terrain, and efficient access to predominantly marine resources. Most of the larger habitation sites, including mound sites and large shell middens, are situated at crevasse splays or the confluence of waterways. These locations provided generally higher, wider natural levees, and access to an increased quantity of exploitable natural resources. While not yet confirmed, limited agriculture also may have occurred at these locations. Some of the distributary natural levee systems in the region apparently

were utilized more intensively than others, probably reflecting more habitable land, and more efficient access to natural resources at those locations. Finally, modern soil associations in the region only have a limited correlation to prehistoric settlement, since post-occupational land changes have modified these associations. Additional recordation and excavation of archeological sites in the region are necessary to understand better prehistoric settlement in the region.

CHAPTER IV

LAND TITLE HISTORY

Introduction

The Larose to Golden Meadow Levee Section D-North (Compromise Alignment) project area traverses Section 31, T18S, R22E, and Sections 6, 7, 10, and 11, T19S, R22E, all east of Bayou Lafourche in Lafourche Parish. The land use history of the immediate area was discussed previously (Goodwin, Hinks et al. 1991); therefore, only the land title history of the current project area will be addressed here.

Allain-LeBreton Property

Most of the project area lies in marshland currently owned by the Allain-LeBreton Company: the southwestern quarter of Section 31, T18S, R22E; the southwestern quarter and the southeastern quarter of Section 6; the northern half and the northern half of the southeastern quarter of Section 7; the northeastern quarter and the eastern half of the northwestern quarter of Section 10; and, the northwestern quarter of the northwestern quarter, the southern half of the northwestern quarter, the southwestern quarter, and the southeastern quarter of Section 11, T19S, R22E (Lafourche Parish Tax Assessor 1990:Ward 10LB, Assessment No. 2573000). This assessment includes all of the project area, except for those portions crossing the southeastern quarter of the southeastern quarter of Section 7 and the northwestern quarter of the northwestern quarter of Section 10 (Figure 6). The previous report (Goodwin, Hinks et al. 1991) contains a title discussion of the Allain-LeBreton Company property; this chapter studies the area's title history in greater detail. Figure 7 is a schematic representation of that chain of title.

The 1832 township survey of T19S, R22E, depicted the project area as "low open swamp and prairie." Section lines were marked by dotted lines, but were not labeled, suggesting that those sections were not surveyed. Section 31, T18S, R22E, was surveyed "so far as practicable in the winter and spring of 1840;" the bayous and southern boundary of the township were not surveyed for another 32 years. In 1872, the land between West Fork Bayou L'Ours and Bayou Raphael, including a portion of Section 31, was designated as a "low wood ridge" (McCarty and Henderson 1832; Righter and McCollam 1872). The project sections were selected by the State of Louisiana through congressional acts in 1849-1850 (approved in 1852), but were not purchased by private individuals for several more years (*Abstract of Lands* 1869).

Camille Zeringue was the original patentee of the northern half of the southwestern quarter of Section 31, T18S, R22E, granted by the State on June 29, 1859. Patents on the remaining fractional sections containing the Allain-LeBreton portion of the project area were issued on March 18, 1867, to J. F. Zeringue, who transferred the lands to Camille Zeringue the next day (Figure 6). The acreage was described in these documents as "swampland subject to tidal overflow" (Conveyance Book 10, Folio 320 [COB 10:320]; COB 15:131, 134, 135, 138, Lafourche Parish Clerk of Court).

As discussed previously (Goodwin, Hinks et al. 1991), Camille and his son, Jean Fortune Zeringue, were sugar planters in Jefferson Parish. Camille Zeringue died on January 6, 1872, leaving his Lafourche Parish property to his widow, Magdelene Lise Roman Zeringue, and five children, Jean Fortune, Lise, Camille, Celeste, and Marie Adeline; however, his Judgment of Possession, rendered in Jefferson Parish, was not filed until March 6, 1913. Subsequent successions for Magdelene, Marie Adeline, and Jean Fortune Zeringue passed their respective interests to the three surviving sisters, Lise, Camille, and Celeste, all of whom remained single and became nuns associated with various southern Louisiana convents (COB 49:460, Entry No. 2,736; COB 45:136 [No. 1552, 28th Judicial District Court (JDC), Jefferson Parish, Probate Court

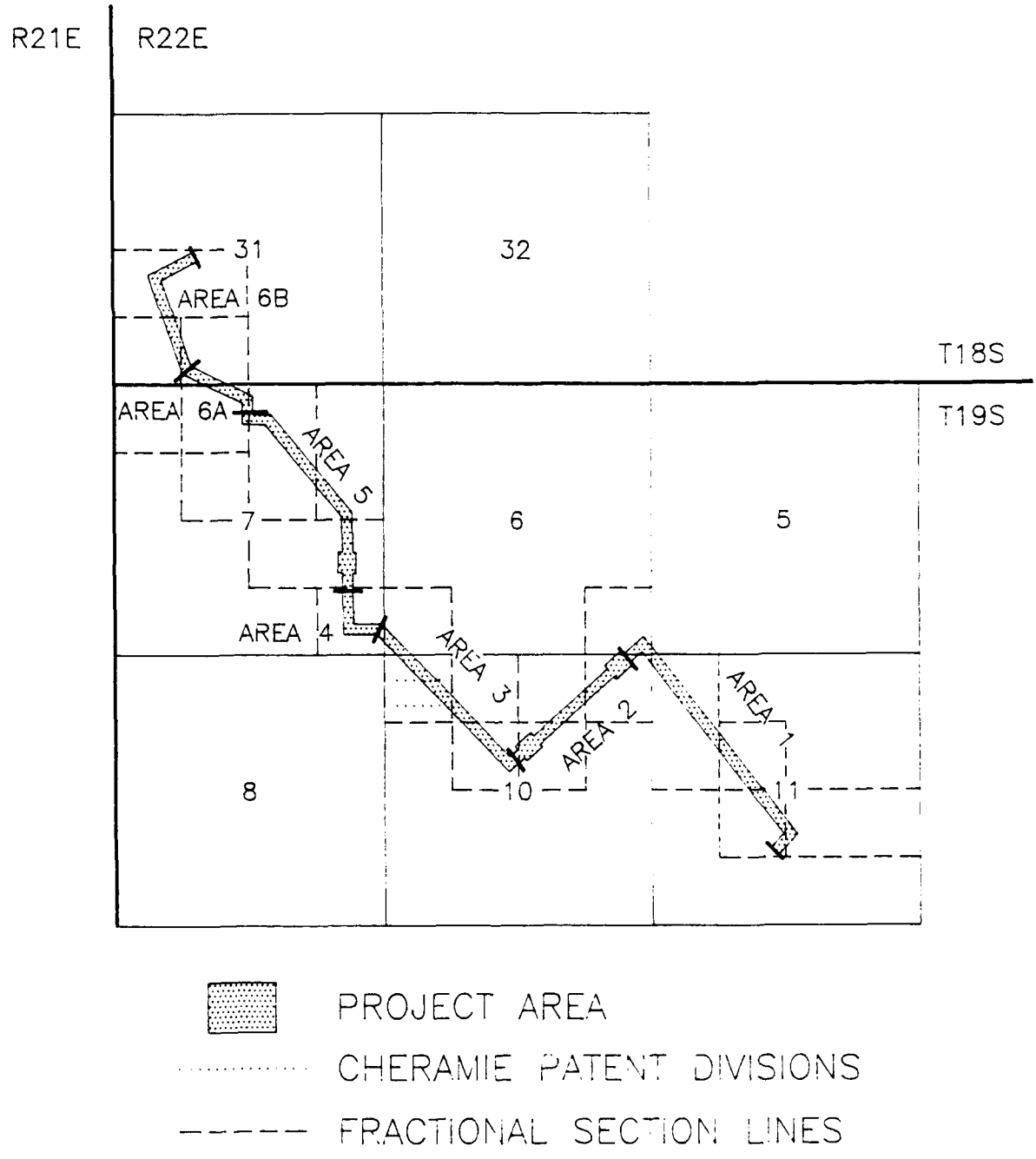

Figure 6. Reproduction of approved township surveys of T18S, R22E (1872), and T19S, R22E (1832), South Eastern District, Louisiana, showing the survey area, with patented section fractions added.

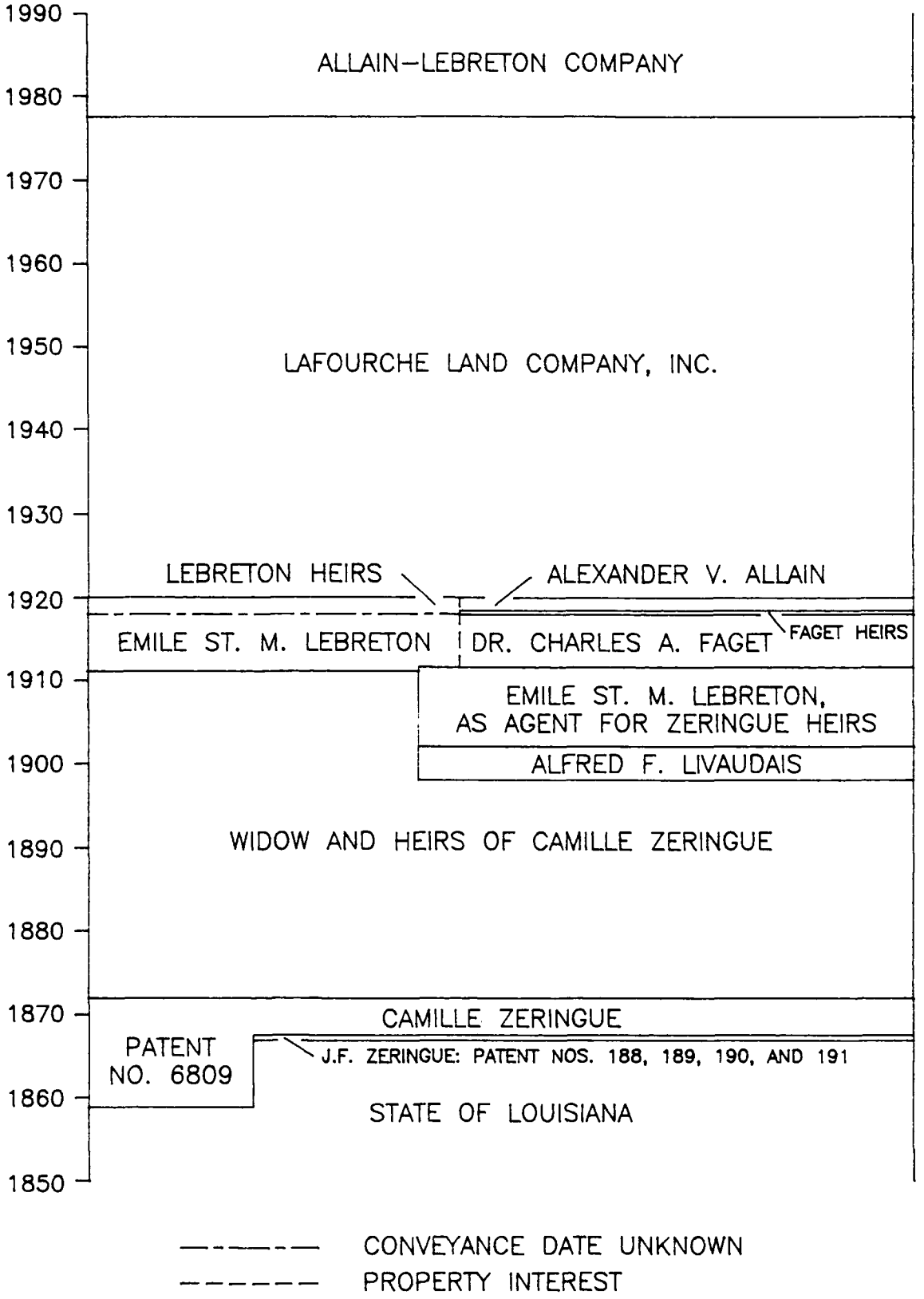

Figure 7. Schematic representation of land tenure for the Allain-LeBreton portion of the survey area from patent date to present.

No. 255]; COB 45:136; COB 49:426, No. 2,685 [Probate No. 1270, 28th JDC, Jefferson Parish]; COB 44:139, Lafourche Parish Clerk of Court).

On July 2, 1898, 1800 acres belonging to Camille Zeringue's Lafourche estate were adjudicated to Alfred F. Livaudais for unpaid 1897 taxes. Emile St. M. LeBreton purchased the acreage from Livaudais for $50.00 in January 1902; a later document stated that LeBreton acquired the property as an agent for the Zeringue heirs. On April 1, 1911, LeBreton purchased the remaining Zeringue acreage, or 738/1600 of the total, from Lise, Camille, and Celeste Zeringue as his own personal property (COB 31:736; COB 37:197; COB 44:139; COB 45:42, 43, Lafourche Parish Clerk of Court).

A few months later, on November 13, 1911, the three Zeringue sisters donated an 8/16 interest, plus 62/100 of 1/16 interest (total of 862/1600 interest), in their Lafourche property to Dr. Charles A. Faget of Orleans Parish, as settlement of Joseph Lombard's claim against the estates of Camille and Fortune Zeringue and heirs. Faget was the legatee of Mrs. Amelie Lombard, deceased wife of Laurent Faget, who was the sole heir of Joseph Lombard. Apparently, this claim was monetary only ($10,354.67, with interest) and did not involve a prior interest in the Zeringue real estate in Lafourche Parish. Judgment of Possession for Dr. Faget and his wife, Azelie Laroque-Turgeau, was rendered on July 30, 1918, leaving their interest in the Zeringue property to their eight children, who then sold the 862/1600 interest to Alexander V. Allain in October of that year (COB 44:139; COB 49:402 [Probate No. 124,438, Civil District Court, Division B, Orleans Parish]; COB 49:460, No. 2,736; COB 102:496, No. 57,926, Lafourche Parish Clerk of Court).

On October 29, 1920, Alexander Allain and the heirs of Emile St. M. LeBreton, including Allain's wife, Marguerite St. M. LeBreton, sold all interest in the former Zeringue lands to the Lafourche Land Company, Inc. The property was described in this document as 3,323 acres of timber and prairie land. Notations of mineral leases, royalty sales, and right of way deeds in the conveyance indices of Lafourche Parish note oil and gas activity on this acreage throughout the rest of the century. Effective December 31, 1977, Lafourche Land Company, Inc., transferred title to all leases, funds, and property to the Allain-LeBreton Company, which has retained title to the present day (COB 52:199, No. 5,204; COB 614:190, No. 461,677, Lafourche Parish Clerk of Court; Lafourche Parish Tax Assessor 1990:Ward 10LB, Assessment No. 2573000).

Louisiana Land and Exploration Company Property

A portion of the project area currently is assessed to the Louisiana Land and Exploration Company; it crosses the southeastern quarter of the southeastern quarter of Section 7, T19S, R22E, southwest of Bayou Raphael. The total assessment covers 37,614.89 acres of agricultural land, sea marsh, and miscellaneous lands (Lafourche Parish Tax Assessor 1990:Ward 10LB, Assessment No. 3330100). Louisiana Land and Exploration has held title to that section fraction since 1928. Figure 8 charts the chain of title prior to that year.

Patent No. 7870, containing the southeastern quarter of the southeastern quarter of Section 7 among its 600 acres, was issued by the State of Louisiana to John M. Dresser of Ouachita Parish on May 23, 1901 (Figure 6). On October 8, 1907, Dresser, acting as vice-president for North Louisiana Land Co., Ltd., of Monroe, Louisiana, sold 18,352.10 acres in Lafourche Parish, including the southeastern quarter of the southeastern quarter of Section 7, to Louisiana Meadows Company of New Orleans (President: Edward Wisner). The records checked in Lafourche Parish did not contain a direct conveyance of that portion of Section 7 from Dresser to the North Louisiana Land Company. John Dresser did sell a number of neighboring tracts (totaling 34,087.96 acres) to North Louisiana Land Company in January 1904; however, omission of the subject portion of Section 7 could have been an oversight. Dresser, however, was an interest holder in North Louisiana Land Co., Ltd., when he agreed to sell all of his interest in the company to Edward Wisner (April 10, 1907); he may have purchased the southeastern quarter of the southeastern quarter of Section 7 in 1901 as an agent for the company (COB 37:508; COB 41:325; COB 39:171; COB

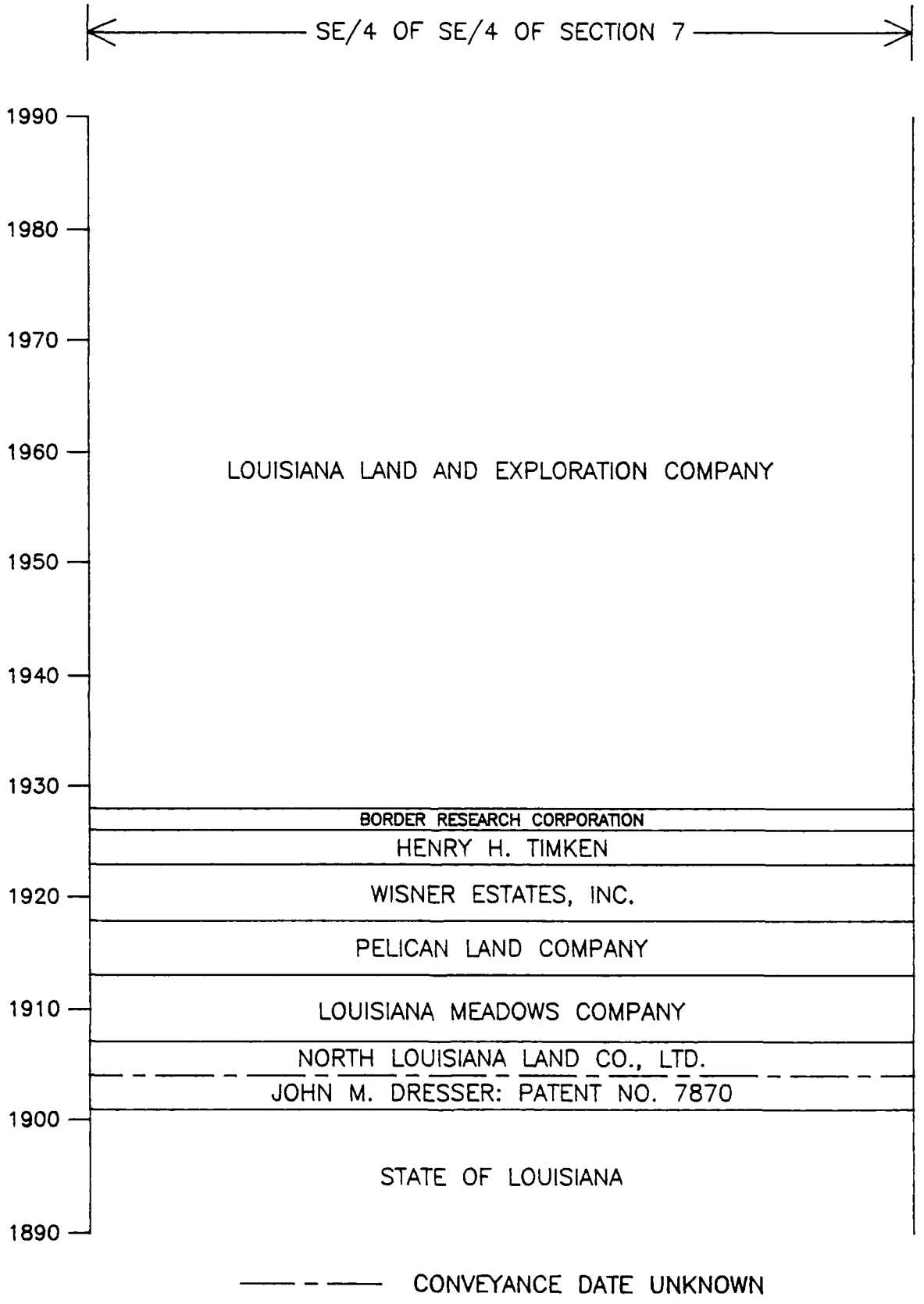

Figure 8. Schematic representation of land tenure for the southeastern quarter of the southeastern quarter of Section 7, T19S, R22E, from patent date to present.

49:518, No. 2,830, Lafourche Parish Clerk of Court). Moreover, there may have been an indirect conveyance of the subject property; Dresser and Wisner both were active, as individuals and as officers for various companies, in innumerable southern Louisiana property transactions.

On August 18, 1913, Louisiana Meadows Company sold 34,710.97 acres in Lafourche Parish, including the southeastern quarter of the southeastern quarter of Section 7, T19S, R22E, to Pelican Land Company. The purchase price was only $10.00 cash and "other good and valuable considerations," indicating that Pelican (organized July 13, 1913) apparently was another Dresser/Wisner company. Pelican Land Company changed its name on February 1, 1918, to Wisner Estates, Inc. (COB 45:430; COB 49:245, No. 2,396, Lafourche Parish Clerk of Court).

Wisner Estates' Lafourche Parish lands were seized in 1921 for unpaid parish taxes and were sold at Sheriff's Sale on October 19, 1923, to Henry H. Timken of Canton, Ohio. Timken previously filed suit in Orleans Parish against Wisner Estates, Inc. On February 2, 1926, Timken sold thousands of acres in six Louisiana parishes to Border Research Corporation. This sale included the Lafourche property acquired from Wisner Estates in 1923. Border Research Corporation changed its name on January 19, 1928, to Louisiana Land and Exploration Company (COB 54:504, No. 8,944; COB 57:538, No. 12,772; COB 60:283, No. 15,061, Lafourche Parish Clerk of Court). Louisiana Land and Exploration Company has retained title to the southeastern quarter of the southeastern quarter of Section 7 through the current parish tax assessment (Lafourche Parish Tax Assessor 1990:Ward 10LB, Assessment No. 3330100).

Laurence Cheramie Patent

Patent No. 1919, including the northwestern quarter of the northwestern quarter of Section 10, T19S, R22E, was issued by the State to L. [Laurence] Cheramie on July 31, 1874 (Figure 6) (COB 16:267, Lafourche Parish Clerk of Court). The Cheramie family was represented along Bayou Lafourche as early as January 1, 1789, when Joseph Cherami [sic] and his wife, Gertrude Michel, were recorded in the Spanish census of inhabitants of the Lafourche district. Cherami [sic] owned six arpents of land on which he planted corn and raised a few hogs (Robichaux 1973). By the early nineteenth century, he apparently claimed some oak-ridged land tracts to the southeast, near the Chênière Caminada; James Leander Cathcart noted those lands belonging to Joseph Cher-Ami [sic], a long-time area resident, in his 1818 report of Jean Lafitte's former Barataria hideouts (Uzee 1985).

Laurence Cherami [sic] was listed as a 32-year-old Louisiana-born farmer in the 1860 Lafourche Parish census records. His property and home, valued then at $500.00, were situated west of the project item, probably in T19S, R21/22E, along the left descending bank of Bayou Lafourche (Toups and Foret 1986). Cheramie apparently made the 1874 purchase of 160 acres to supplement his farmland to the west. A few months after acquisition of the property in Section 10, he sold the northernmost five arpents to his neighbors, Francois Gisclard [Gisclair] and Martial Pitre, retaining the balance of the section fraction for himself (Figure 6) (COB 16:37, 36, Lafourche Parish Clerk of Court). Figure 9 charts ownership for each tract from patent to present.

The Francois Gisclair Estate

On October 20, 1874, Laurence Cheramie sold the northernmost 17 1/2 arpents of the northwestern quarter of the northwestern quarter of Section 10 to Francois Gisclard [sic]. This tract measured 2 1/2 arpents in width, by "depth of confirmation," and was bounded to the north by Section 6, to the east by the northeastern quarter of the northwestern quarter of Section 10, to the south by Martial Pitre, and to the west by Section 8 (Figure 6) (COB 16:37, Lafourche Parish Clerk of Court). The 1860 Lafourche Parish census recorded 24-year old Gisclair [incorrectly transcribed, Isclard] as a Louisiana-born farmer and head of a

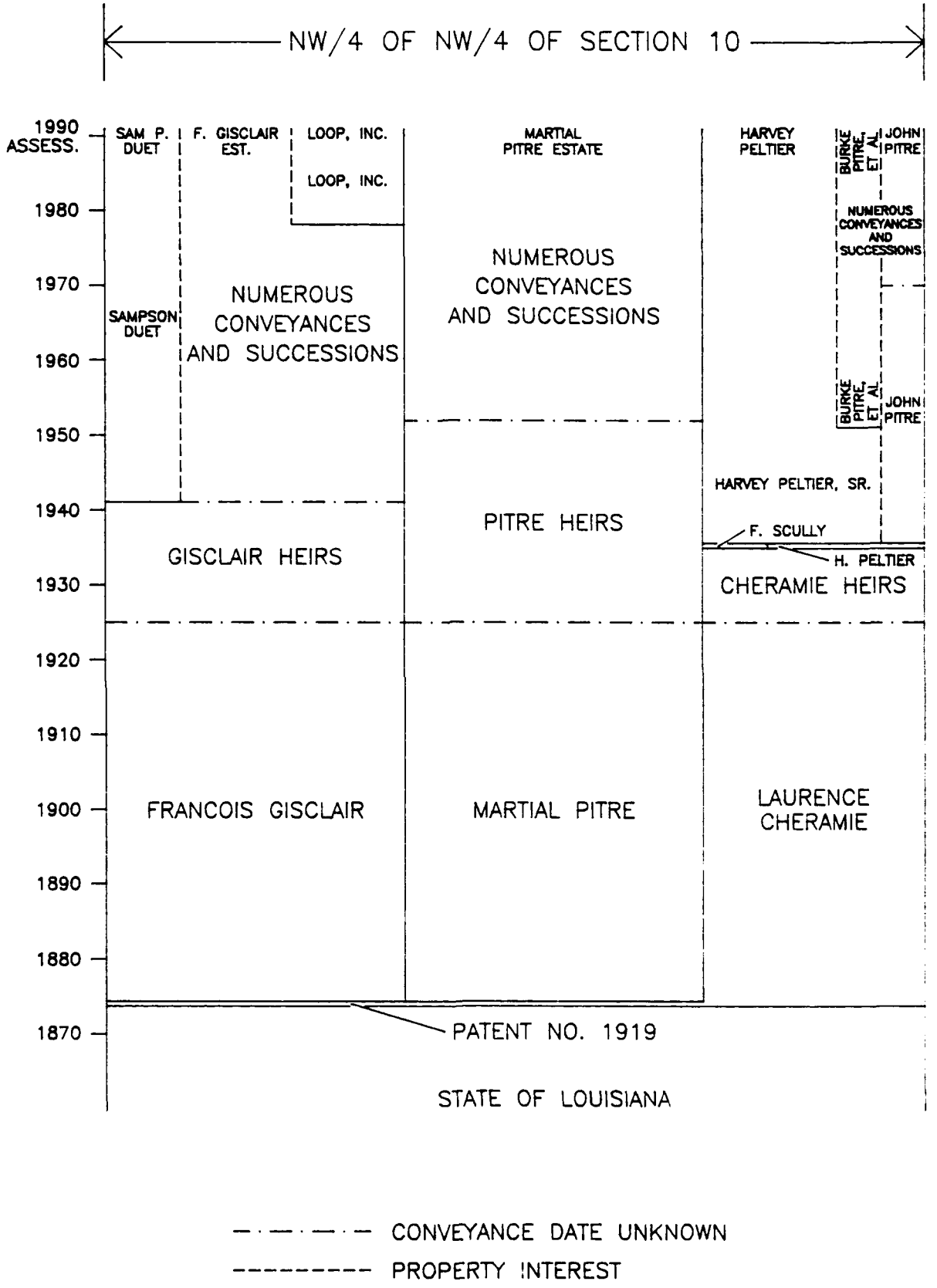

Figure 9. Schematic representation of land tenure for the northwestern quarter of the northwestern quarter of Section 10, T19S, R22E, from patent date to present.

household that, in addition to his wife, Celima [Celina Pitre], and two small children (Oscar, aged two years, and Amelie, aged four months), apparently included a brother, Millien Isclard [sic], and his wife, Augustine. Gisclair's property in 1860 was located along the left descending bank of Bayou Lafourche, north of Laurence Cheramie's farm; the 1874 purchase from the Cheramie patent apparently was an extension of Gisclair's original farm (Toups and Foret 1986; Murray n.d.). Francois Gisclair's date of death was not found in the researched parish records, but title to the property apparently remained within his family through the late nineteenth century and well into the twentieth century.

Oscar Gisclair sold the property interest inherited from his parents, Francois and Celina Gisclair, to Sampson Duet (married to Frazia Gisclair) on March 7, 1941 (COB 99:92, No. 53,704, Lafourche Parish Clerk of Court). Duet was not named on the Tobin plat of T19S, R22E, but the interest apparently remained in his family (Tobin ca. 1954). The current parish tax assessment lists Sam P. Duet as co-owner, with the Francis [sic] Gisclair Estate, of the northern 2 1/2 arpents of the northwestern quarter of the northwestern quarter of Section 10, less 10 acres sold to Loop, Inc. (Lafourche Parish Tax Assessor 1990:Ward 10LB, Assessment No. 2468300).

Scattered throughout this time period, from the interest sale to Duet in 1941 to the present day, were numerous transactions among the Gisclair heirs and to other individuals (COB 153:306, No. 97,097; COB 308:366, No. 217,680; COB 653:146, No. 488,926; COB 661:383, No. 494,478; Conveyance Indices, Lafourche Parish Clerk of Court). Beginning in 1978, several interest holders sold their shares to Loop, Inc., a pipeline company that has retained interest in the property through the present (COB 649:785, No. 485,495; COB 662:48, No. 494,719; Conveyance Indices, Lafourche Parish Clerk of Court).

Currently, there are two assessments in the northwestern quarter of the northwestern quarter of Section 10: one to the Francis [sic] Gisclair Estate and Sam P. Duet, the other to "Loop, Inc., and Others." Gisclair and Duet are assessed with the northern "2 1/2 arpents from north to south," original boundaries given, less and except 10 acres sold to Loop, Inc. The property description incorrectly lists T29S, R22E; there is no T29S in this part of Louisiana. Loop, Inc., and Others are assessed with a 5-acre tract in the northeastern corner and a 20-acre tract, the latter measuring 2 1/2 arpents in width and bounded below by the Martial Pitre Estate (Lafourche Parish Tax Assessor 1990:Ward 10LB, Assessment No. 2468300 and No. 2468500). This acreage totals more than the Gisclair tract contains, which has 17 1/2 arpents, or approximately 14.81 acres. Without detailed study, it is impossible to calculate the correct acreage and to determine exactly who owns what percentage of the original Gisclair tract.

The Martial Pitre Estate

The tract immediately below the Gisclair parcel was purchased from Laurence Cheramie by Martial Pitre on October 20, 1874. The property was described as a tract measuring 2 1/2 arpents in width, by "depth of confirmation," and bounded above by a tract "sold this day" to Francois Gislard [sic] (Figure 6) (COB 16:36, Lafourche Parish Clerk of Court). The 1860 census for Lafourche Parish listed 21-year old Martialle [sic] Pitre under the household of Mrs. David Pitre (apparently his mother or close relative); Pitre's wife, Rosalie [Duet], and two-year old son, Louis, were also recorded. Although Martialle [sic] Pitre's occupation was not listed, he undoubtedly helped run the family property, valued then at $450.00, situated along the left descending bank of Bayou Lafourche between the farms of Francois Isclard [sic] and Laurence Cherami [sic], to the north and south, respectively. Like Gisclair and Cheramie, Pitre must have purchased the fractional tract in Section 10 as an addition to his family's land (Toups and Foret 1986; Murray n.d.). Although Martial Pitre's date of death was not found in the conveyance records checked, his estate apparently has remained within his family to the present day.

On July 7, 1952, Ramo Pitre sold the property interest he had inherited from Martial Pitre to Guilmo J. Pitre. Ramo Pitre was an heir to Laurence Cheramie, as well, and held interest in the southernmost tract

of the Cheramie patent, which is discussed later in this chapter (COB 163:557, No. 106,382; COB 223:51, No. 150,901, Lafourche Parish Clerk of Court). Parish tax records and a number of transactions indicate that other interest holders in that southern tract also held interest in the Martial Pitre estate (COB 814:3, No. 580,301; COB 847:721, No. 597387; COB 955:785, No. 652,727, Lafourche Parish Clerk of Court). The Martial Pitre Estate still is assessed with the tract described today as 2 1/2 arpents, with a depth crossing the northwestern quarter of the northwestern quarter of Section 10, bounded above by Francis Gislard [sic] and below by the estate of Laurence Cheramie (Lafourche Parish Tax Assessor 1990:Ward 10LB, Assessment No. 2468400).

Peltier/Pitre Property

After selling the northern five arpents of the northwestern quarter of the northwestern quarter of Section 10 to Gisclair and Pitre in 1874, Laurence Cheramie retained the southern portion (approximately 1.87 arpents, or 359.70 ft wide) for himself. Parish records did not note Cheramie's date of death, but this portion of Section 10 apparently remained in his family's name until 1935. On January 2 of that year, the property of Celeste Terrebonne, wife of/and Laurence Cheramie, "long since deceased," was adjudicated at Sheriff's Sale to Harvey A. Peltier and Frederick C. Scully, in the proportions of an undivided 7/10 interest and an undivided 3/10 interest, respectively. This sale was the result of a lawsuit brought by Peltier against Scully and the numerous heirs of Laurence Cheramie; all right and title of both plaintiff and defendants were adjudicated. Among the listed heirs, were Martial Pitre and Ramo Pitre (probably Martial Pitre's sons), discussed previously in this chapter (COB 72:451, No. 27,884, Suit No. 7,230, 17th JDC, Lafourche Parish Clerk of Court). Lafourche Parish records listed several marriages between the neighboring Cheramie and Pitre families, resulting, of course, in numerous common heirs (Toups and Foret 1986, Murray n.d.).

Five months after acquiring the Cheramie property, Scully and Peltier agreed to partition the property; Harvey Peltier was assigned the tract in the northwestern quarter of the northwestern quarter of Section 10 as a portion of his 70 per cent interest. On August 15, 1935, Peltier sold an undivided 1/5 interest in the parcel to John Pitre. Peltier held title to the remaining 4/5 interest until March 28, 1951, when he sold another undivided 1/5 interest to Burke Pitre, Viola Pitre Pierce, Bella Pitre Lerille, Florida Pitre Hebert, and Birdie Pitre Hebert (COB 73:387, No. 28,949; COB 73:588, No. 29,293; COB 152:177, No. 96,033, Lafourche Parish Clerk of Court). Harvey Peltier, or his family, apparently retain the remaining 3/5 interest today (Lafourche Parish Tax Assessor 1990:Ward 10LB, Assessment No. 2570400).

In 1956, the heirs of Laurence Cheramie raised objections to the 1935 lawsuit (Suit No. 7,230, 17th JDC) and subsequent sale to Harvey Peltier and Frederick Scully, claiming that the Cheramie family still had a right to interest in the property. A final settlement was reached in December 1956, and the parties filed a Compromise Agreement on June 25, 1957. In return for an interest in the property belonging to Harvey Peltier, Sr., John Pitre, and Burke Pitre, et al., the Cheramie heirs agreed to withdraw from the lawsuit insofar as the subject tract (labeled Tract A in the agreement) was concerned; each of the 32 listed Cheramie heirs received an undivided .00XXXXXX interest (X/100-millionths of the whole) in varying amounts (COB 223:51, No. 150,901, Suit No. 9,932, 17th JDC, Lafourche Parish Clerk of Court).

Burke Pitre died prior to September 8, 1958, and John Pitre prior to October 3, 1978, when records referring to their successions began appearing in the Lafourche conveyance records. Throughout the latter part of the twentieth century, a number of documents were filed conveying various heirs' property interests among themselves and to other individuals (COB 240:285, No. 162,989; COB 252:213, No. 171,575; COB 643:295, No. 481,281; COB 645:51, No. 482,099; COB 732:211, No. 539,390; COB 814:3, No. 580,301; COB 847:721, No. 597,387; COB 955:785, No. 652,727, Lafourche Parish Clerk of Court). The current tax roll still assesses 1/5 of the southernmost tract of the northwestern quarter of the northwestern quarter of Section 10 to John Pitre and another 1/5 to "Burke Pitre and 4 als," indicating that most of the interest has remained within the Pitre families (Lafourche Parish Tax Assessor 1990:Ward 10LB, Assessment No. 2570400).

Summary

The conveyance records researched in Lafourche Parish give little indication of land use in the project area. The character of the terrain appears to have remained constant throughout its history. Patent records described most of the subject property as "swampland subject to tidal overflow;" current tax assessments list it as sea marsh with no improvements. According to one parish resident, this area probably has been used only for hunting and trapping (John Pugh, Jr., personal communication 1990). That opinion is supported by the presence of the burned remains of a single-cabin camp at the southeastern end of Segment 3 of the 1990 cultural resources survey of Levee Section D, Larose to Golden Meadow Hurricane Protection Project (Goodwin, Hinks et al. 1991). This location is part of the Allain-LeBreton Company property, on the West Fork Bayou L'Ours natural levee, adjacent to the current project corridor (Goodwin, Hinks et al. 1991). In addition, there has been considerable mineral activity in the region since the 1930s; potential petroleum royalties may even have been one of the reasons behind the Cheramie/Peltier/Pitre struggles for property interest. Given the lack of development in the project vicinity and the nature of the land itself, it is highly unlikely that any features of historical importance are present in the project area.

CHAPTER V

FIELD METHODS, RESULTS, AND RECOMMENDATIONS

Field Methods

In accordance with the Scope of Services (Appendix I), the survey corridor was examined for cultural resources through a combination of pedestrian survey and systematic shovel testing. Based on the distribution of natural and cultural features situated along the proposed project corridor, the project area was divided into six survey areas (Areas 1 - 6); Area 6 was divided further into Subareas 6A and 6B (Figures 1 and 10). This division enhanced accuracy of collected data, and simplified ordering of field notes. The survey extended from the southeastern end of the project area in Area 1, and in a general northwestward direction to its terminus in Subarea 6B.

The survey was designed to locate, to identify, and to assess the significance of all cultural resources situated along the planned compromise levee corridor. Four parallel transects (Transects 1 - 4), each spaced 20 m apart, were placed within each survey area; these transects were parallel to the centerline of the planned levee. An additional transect was placed along either side of the survey corridor near the West Fork Bayou L'Ours and Bayou Raphael natural levees. The latter transects were designated Transects 1A and 4A within their corresponding survey areas (Figure 10).

Shovel tests were excavated at 50 m intervals along each transect; shovel tests along adjacent transects were offset. Each shovel test measured approximately 30 x 30 cm, and each was excavated into sterile subsoil. While soils from some shovel tests were screened through 0.6 cm (0.25 in) wire mesh, because of their high clay and water content, most excavated soils were hand sifted for artifacts. Shovel tests were not excavated in areas covered with standing water. Stratigraphic descriptions were recorded of all shovel tests, and all shovel tests were backfilled upon completion of the archeological recordation process. A total of 446 shovel tests were excavated within the 110 ac (44.5 ha) project area. The project area also was photographed prior to completion of field work.

Results of the Field Investigations

Area 1 was an approximately 1.5 km long corridor located at the southeastern end of the 1991 project area. The remainder of the compromise levee alignment between Area 1 and the existing levee to the south was surveyed in 1990, as portions of Segments 1A and 1B (Goodwin, Hinks et al. 1991:2). Area 1 extended northeastward from West Fork Bayou L'Ours approximately 120 m into the marsh adjacent to the wooded natural levee. From there, it extended northwestward through marsh, along the edge of the natural levee woods (Figures 1 and 10). Since the levee alignment was designed to avoid woods, Transect 2 was placed along the surveyed levee centerline. This placed Transect 1 near the distal edge of the natural levee tree line. The east bank natural levee crossing of West Fork Bayou L'Ours, located at the terminal end of Area 1, was not surveyed. This area was surveyed previously in 1990 (Goodwin, Hinks et al. 1991). During survey, 103 shovel tests were excavated within Area 1; no cultural materials were located within any of these shovel tests.

Area 2 stretched from West Fork Bayou L'Ours, southwestward across Bayou Raphael to the distal edge of the west bank of the Bayou Raphael wooded natural levee (Figures 1 and 10). Survey of this approximately 945 m long area emphasized the terrain southeast of the surveyed centerline. Transect 2 was placed along the surveyed centerline, with Transects 3 and 4 placed to the southeast. Additional survey transects were placed on either side of the survey corridor at the two natural levee crossings (Figure 10).

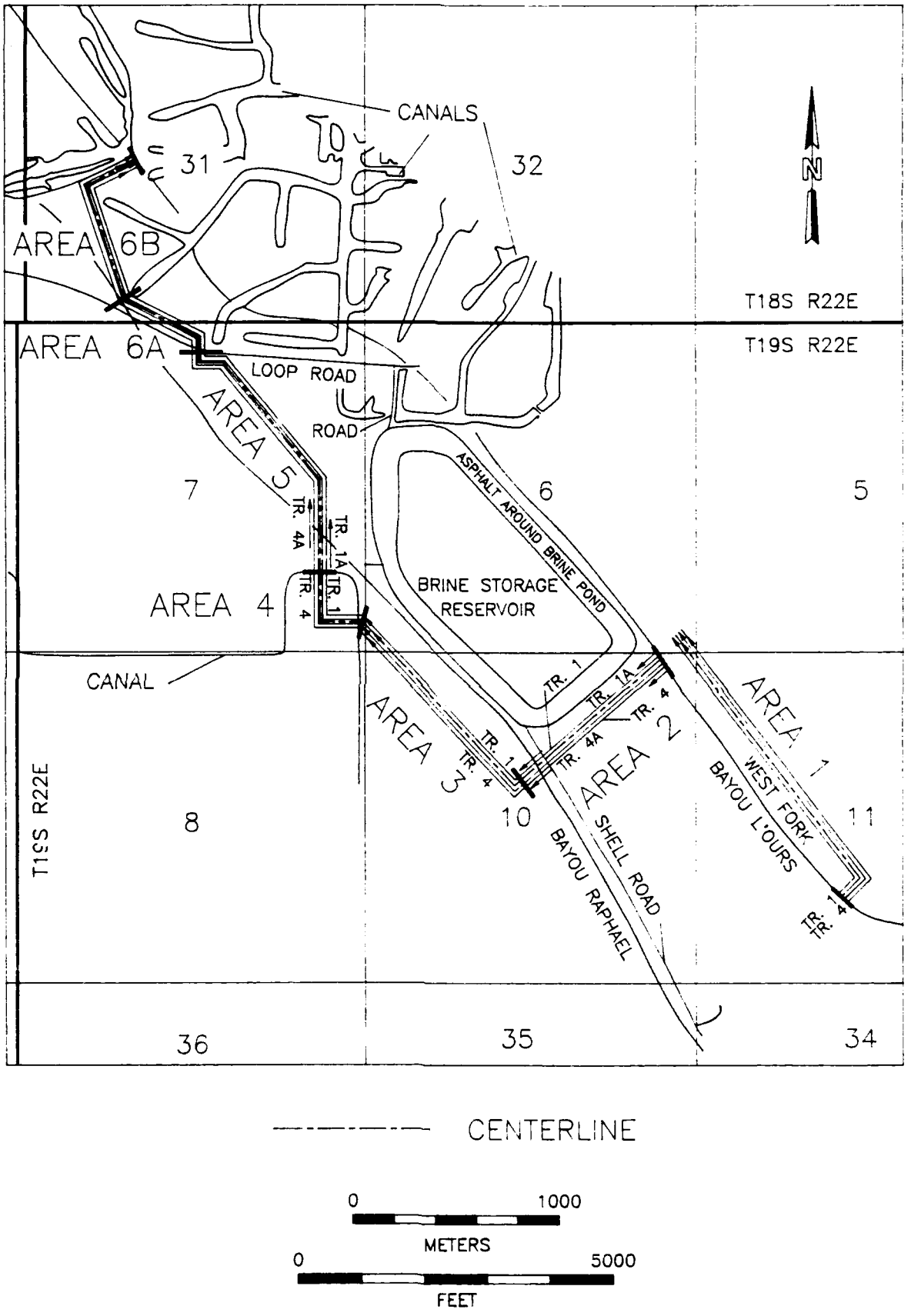

Figure 10. Plan of the 1991 project area, showing survey transects and landscape features.

A total of 82 shovel tests were excavated within Area 2. These shovel tests demonstrated that soil deposits within the two natural levees were disturbed extensively, apparently by construction of the nearby brine storage reservoir (Figure 10). While gravel, *Rangia*, and oyster shell were associated with the modern mixed deposits, no potentially important materials were observed in, or recovered from, any of the shovel tests within Area 2.

Area 3 extended through marsh from Area 2 northwestward approximately 1.1 km to an existing canal (Figures 1 and 10). The alignment proceeded parallel and adjacent to the Bayou Raphael wooded natural levee, in a similar geomorphic location as most of Area 1. Since the alignment was designed to avoid the woods, survey emphasized the marsh. Therefore, Transect 2 was situated along the planned levee centerline, placing Transect 1 near the distal natural levee tree line. Much of Transect 3, and the entire length of Transect 4, lay within 8 to 30+ cm of standing water; no shovel tests were excavated within standing water. Fifty-six shovel tests were excavated within the area; no cultural materials were located within any of these tests.

Area 4 consisted of a small L-shaped portion of the planned alignment that was bounded on either side by a canal (Figures 1 and 10). This 400 m long area extended west and north through drained marsh, which currently is covered by tall grasses. Within Area 4, and the remaining survey areas, the surveyed levee centerline was centered between Transects 2 and 3. No cultural materials were located within the 24 shovel tests excavated in Area 4.

The approximately 1.3 km long Area 5 extended from Area 4 northward across Bayou Raphael and its natural levee. From there, it continued northwestward, parallel to the Bayou Raphael natural levee, to Loop Road (Figures 1 and 10). Additional Transects 1A and 4A were excavated at the Bayou Raphael natural levee crossing. The area traversed a portion of the ridge of unknown origin discussed in Chapter II (Figure 5). In addition, Bayou Raphael (16LF88), a previously recorded Neo-Indian habitation site and shell midden, purportedly was located in the vicinity of the Area 5 east bank natural levee crossing of Bayou Raphael. The site's precise location is unclear, and no evidence of it was found. No cultural materials were located in the 107 shovel tests excavated within Area 5 other than a small amount of modern debris observed in one of the shovel tests.

Area 6 formed the northwestern terminus of the survey corridor. Area 6A extended northwestward approximately 450 m from Loop Road to Bayou Raphael. Area 6B continued approximately 850 m north-northwestward and eastward from Bayou Raphael to the project area terminus at the existing levee (Figures 1 and 10). The majority of the area fell within marsh and drained woods near the distal edge of the Bayou Raphael natural levee. That portion near the proximal natural levee was disturbed extensively by construction of an oil storage tank facility, a small pavilion, and a packed shell parking lot. The northern leg of Area 6B gradually merged with an existing levee that aligns a canal; no shovel tests were placed on the existing levee. A total of 74 shovel tests were excavated within Area 6. No cultural materials were observed within Area 6 other than modern debris in the vicinity of the shell parking lot adjacent to Bayou Raphael.

Summary and Recommendations

Pedestrian survey and excavation of 446 shovel tests along the proposed Levee Section D-North compromise levee alignment corridor failed to yield any evidence of archeological deposits or historic standing structures. These negative data reflect the area's natural and historic development. Most of the project area lies in marsh and drained marsh near the West Fork Bayou L'Ours and Bayou Raphael natural levees. These areas normally were not utilized extensively by prehistoric or historic peoples. The natural levees of the two bayous were the most probable portions of the project area to contain cultural resources. However, the 1990 excavations along West Fork Bayou L'Ours (Goodwin, Hinks et al. 1991), in which only

one aboriginal site, Bayou L'Ours Mounds (16LF54), was located along approximately 4 km of surveyed natural levee, suggests that prehistoric settlement along these bayous generally was scattered. Other than limited hunting and trapping, the project area vicinity was not utilized extensively during the historic period until the mid twentieth century development of the petroleum industry. No archeological sites were located within the 1991 project area. No further testing is recommended along the Levee Section D-North compromise alignment.

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APPENDIX I

SCOPE OF SERVICES

CELMN-PD-RA 10 June 1991

Contract DACW29-90-D-0018
Delivery Order 5

SCOPE OF SERVICES

CULTURAL RESOURCES INVESTIGATIONS OF LAROSE TO GOLDEN MEADOW HURRICANE PROTECTION PROJECT COMPROMISE ALIGNMENT, LAFOURCHE PARISH, LOUISIANA

1. Introduction

The U.S. Army Corps of Engineers, New Orleans District (NOD), is constructing the Larose to Golden Meadow Hurricane Protection Project in Lafourche Parish, Louisiana. All parts of the project except for the redesigned alignment of Levee Section D (the Compromise Alignment, see map) have been previously surveyed for the presence of cultural resources (Goodwin et al 1986, 1991).

This delivery order calls for an intensive cultural resources survey of the alignment of Levee Section D. The contract period for this work is 205 days.

2. Study Area

The project is located in southeastern Louisiana within Lafourche Parish. The project involves completing hurricane protection levees ringing properties lying along Bayou Lafourche in the area including the communities of Larose and Golden Meadow. Levee section D runs approximately 3.5 miles, mostly along the edge of the crest of the natural levee of Bayou Raphael. The area to be surveyed consists of approximately 120 acres of land.

3. Background Information

Comprehensive background studies and research design creation have already been done for the area as part of the Archeological and Historical reports prepared for the other segments of the project (see Goodwin et al 1986, 1991). This existing material obviates the need for independent background and literature search under this delivery order. This existing material provides adequate research and background. The results of the work done under this delivery order will be presented as an appendix to the 1991 Levee Section D report completed under Contract DACW29-88-0121.

Levee section D, compromise alignment does not fall within areas previously subjected to formal archeological survey. One site is located near the project area, the Bayou Raphael Site (16LF88) It is recorded as a Neoindian village or camp site with shell midden . No standing structures appear on aerial photographs of the area. No properties currently listed in or determined eligible for inclusion in the NRHP are recorded in the project area.

The levee alignment runs the length of the natural levee of a well developed distributary channel. The presence of additional archeological sites in this landform context is highly probable. The known sites need to be formally evaluated to determine their exact relationship to the project impact area. Bayous L'Ours and Raphael are suggested to be streams which prograded across an eroded and subsiding system of Bayou Blue lobe interdistributary lakes and bays. The natural levees of these streams are thus late Bayou Lafourche lobe deposits and archeological sites located on them should not be more than 500 to 600 years old.

4. General Nature of the Work to be Performed.

One area of study which contains approximately 200 acres within Lafourche Parish, Louisiana, will be addressed under this delivery order. The investigation will utilize SELACRMP, and the reports on contiguous parts of the project for general background, overview and research perspectives. The work will be divided into three phases :

(1) Mobilization and Title Search
(2) Intensive Cultural Resources Survey and Site Assessment
(3) Data Analysis and Report Preparation

5. Study Requirements

Phase 1: Mobilization and Title Search

A title search will be done for the study area. The title search will provide a history of land ownership as context for the evaluation of archeological sites which may be found by the survey. A review of pertinent geomorphological sources will be done to refine the survey methodology. No extensive literature review or historic map research will be performed under this delivery order. The need for extensive background work is obviated by the comprehensive nature of previous Larose to Golden Meadow Project and SELACRMP studies.

Phase 2: Intensive Cultural Resources Survey and Site Assessment

Upon completion of Phase 1, the contractor will conduct an intensive pedestrian survey augmented with systematic subsurface testing. No excavation will be permitted within any existing levee. It is suggested that the Contractor utilize a 20-meter transect width and a shovel-testing interval of 50 meters in an offset pattern. This testing regime should be conducted to the greatest extent possible depending on the density of tree cover. Shovel tests will be approximately 30x30 cm in the horizontal plane down to sterile subsoil. All excavated soil will be screened through 1/4 inch wire mesh. All shovel tests will be backfilled. This systematic procedure will be supplemented with judgmental shovel testing based upon the background research.

State site forms will be completed and state-assigned site numbers will be utilized for all archeological sites located by the survey. All sites located in the survey area will be mapped, photographed, and tested using shovel, auger, and limited controlled surface collection to determine depth of deposit, site boundaries, stratigraphy, cultural association, and possible activity areas. All cultural resources located by the survey will be evaluated against the National Register criteria contained in Title 36 CFR Part 60.4 and within the framework of the historic setting to assess the potential eligibility for inclusion in the National Register.

Further test excavations to determine site significance within the context of the Contractor's technical proposal will be conducted at a maximum of one site which the Contractor, in consultation with and approval by the COR, deems possibly eligible for inclusion in the National Register. Should the survey locate more than one site which requires further testing to determine eligibility, such testing is beyond the scope of this delivery order. Test excavations will include excavation of two or more 1m x 2m test units as necessary. All test excavations will be backfilled. All profiles and features excavated will be mapped and photographed. Any pre-World War II standing structures located in the right-of-way will be recorded using state standing structure forms and a minimum of three clear black and white photographs. All such structures will be professionally evaluated to determine historical association and National Register eligibility. For structures located in the project right-of-way, the Contractor shall also address the archeological component of the site. No structures are anticipated.

A full assessment of the extent of previous adverse impacts to the unknown cultural resource base where levee construction has been completed should be attempted through field investigations.

Upon completion of the Phase 2 field work, a management summary succinctly reporting the results of the background research and the field survey shall be submitted to the COR within 14 days (see section 6).

Phase 3: Data Analysis and Report Preparation

All data will be analyzed using currently acceptable scientific methodology. The Contractor shall catalogue all artifacts, samples, specimens, photographs, drawings, etc., utilizing the format currently employed by the Louisiana State Archeologist. The catalogue system will include site and provenience designations.

The results of this investigation will be presented as an appendix to the previously completed Levee Section D Cultural Resources report. Title search and survey results, and analyses performed under this delivery order will be integrated to produce an appropriately illustrated, scientifically acceptable draft appendix.

All cultural resources located by the survey within the study area will be evaluated against the NRHP criteria contained in Title 36 CFR Part 60.4 and within the framework of the historic setting to assess the potential eligibility for inclusion in the NRHP. The Contractor will classify each site as being *eligible*, *potentially eligible*, or *not eligible*. for inclusion in the NRHP.

6. Reports

Management Summary

Four copies of the management summary, one set of U.S.G.S. quadrangle maps accurately delineating site locations, and one set of site forms for any sites located will be submitted to the COR within 14 days after completion of field work (68 days after date of order). The management summary will succinctly report the results of the field investigations, i.e. number, type, brief description and assessment of project impacts for all cultural resources located and preliminary assessments of site significance. If cultural resources are identified during the survey, the report will recommend which (if any) of them should be avoided in the lay out of the levee alignment. The summary report is not intended to be a lengthy interim report, but shall contain enough information to serve as a planning aid and a means of informing the COR .

Monthly Progress Reports

Throughout the duration of the delivery order, one copy of a brief and concise statement of progress shall be submitted with and for the same period as the monthly billing voucher. These reports, which may be in letter form, should summarize all work performed, all information gained, or any problems encountered during the preceding month. A concise statement and graphic presentation of the Contractor's assessment of the monthly and cumulative percentage of total work completed by task shall be included. The monthly report should also note difficulties, if any, in meeting the contract schedule.

Draft and Final Reports

Five copies of the draft report (appendix) integrating all phases of this investigation will be submitted to the COR for review and comment 107 days after date of date of order. The Contractor shall submit state site forms for sites discovered in the course of work under this delivery order as an additional appendix to the draft report/appendix.

The written report shall follow the format set forth in MIL-STD-847A with the following exceptions: (1) separate, soft, durable, wrap-around covers will be used instead of self covers; (2) page size shall be 8-1/2 x 11 inches with 1-inch margins; (3) the reference format of American Antiquity will be used. Spelling shall be in accordance with the U.S. Government Printing Office Style Manual dated January 1973. A copy of the Delivery Order Scope-of-Services shall be bound with the Final Report.

The COR will provide all review comments to the Contractor within 42 days after receipt of the draft report/appendix (149 days after date of order). Upon receipt of the review comments on the draft report/appendix, the Contractor shall incorporate or resolve all comments and submit one preliminary copy of the final report/appendix to the COR within 21 days (170 days after date of order). Upon approval of the preliminary final report/appendix by the COR, the Contractor will submit 30 copies and one reproducible master copy of the final report/appendix to the COR within 205 days after date of order. Included as an appendix to the Final Report/appendix will be a complete and accurate listing of cultural material and associated documentation recovered and/or generated. The contractor will also deliver one copy of the report/appendix on IBM-compatible disks in either Microsoft Word™ or ASCII format.

In order to preclude vandalism, the final report/appendix shall not contain specific locations of archeological sites. Site specific information, including one set of project maps accurately delineating site locations, site forms, black and white photographs and maps, shall be included in an appendix separate from the main report/appendix.

7. References

The study will be conducted utilizing current professional standards and guidelines including, but not limited to:

-The National Park Service's draft standards entitled, "How to Apply the National Register Criteria for Evaluation," dated June 1, 1982;

-The Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation as published in the Federal Register on September 29, 1983;

-Louisiana's Comprehensive Archeological Plan dated October 1, 1983;

-The Advisory Council on Historic Preservation's regulation 36 CFR Part 800 entitled, "Protection of Historic Properties."

-The Advisory Council on Historic Preservation's Section 106, Update/3 entitled, "Manual of Mitigation Measures (MOMM)" dated October 12, 1982.

-Agency for Conservation Archeology, Eastern New Mexico University Southeast Louisiana Cultural Resource Management Plan (SELACRMP).

-R. Christopher Goodwin and Associates, Inc., Cultural Resources Survey of the Western Sections of the Larose to Golden Meadow Hurricane Protection Project, Lafourche Parish, Louisiana, dated September 18, 1986.

-R. Christopher Goodwin and Associates, Inc., Cultural Resources Survey of the Larose to Golden Meadow Hurricane Protection Project, Levee Section D, Lafourche Parish, Louisiana, dated March, 1991.

8. Attachments

Location of Work Area (previously furnished)

9. Disposal of Records and Artifacts

All records, photographs, artifacts, and other material data recovered under the terms of this delivery order shall be recorded and catalogued in a manner compatible with those systems utilized by the Louisiana SHPO and by State and Federal agencies which store archeological data. They shall be held and maintained by the Contractor until completion of the delivery order. Final disposition of the artifacts and records will be in accordance with applicable Federal and State laws. Unless otherwise specified, artifacts will be returned to the landowner or permanently housed with the Louisiana Division of Archaeology and Historic Preservation or in a repository selected by the State Archeologist. The Principal Investigator shall inform the COR in writing when the transfer of data has been completed and shall forward to the COR a catalogue of items entered into curation. The location of any notes, photographs or artifacts which are separated from the main collections from the project area which are used in data analyses will remain in private ownership. The Contractor shall be responsible for delivery of the analyzed archeological material to the individual landowners, the Louisiana SHPO's office, or any other repository designated by the Government following acceptance of the final report. All artifacts to be permanently curated will be cleaned, stabilized, labeled, catalogued on typed State curation forms, and placed in sturdy bags and boxes which are labeled with site, excavation unit or survey collection unit provenience.

10. Schedule

Initiate Phase 1 (Mobilization & Title Search)-14 days after date of order

Initiate Phase 2 (Field Survey & Site Assessment)-32 days after date of order

Submit Management Summary- 68 days after date of order

Submit Draft Report/Appendix-107 days after date of order

Receive NOD comments-149 days after date of order

Provide Preliminary Copy of Final Report/Appendix-170 days after date of order

Submit Final Report/Appendices-205 days after date of order