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PHASE I CULTURAL RESOURCES SURVEY AND ARCHEOLOGICAL INVENTORY OF A PROPOSED 1.12 HA (2.87 AC) BORROW PIT AND AN ASSOCIATED ACCESS ROAD, ASCENSION PARISH, LOUISIANA

FINAL REPORT
OCTOBER 2004

PREPARED FOR:

U.S. ARMY CORPS OF ENGINEERS
NEW ORLEANS DISTRICT
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13. ABSTRACT ***(Maximum 200 words)***

This document presents the results of a Phase I cultural resources survey of a proposed borrow pit and associated access road in Ascension Parish, Louisiana. This survey was conducted by R. Christopher Goodwin & Associates, Inc., in July 2003 by R. Christopher Goodwin & Associates, Inc.; it was performed on behalf of the U.S. Army Corps of Engineers, New Orleans District. The proposed borrow pit is located on the right descending bank of the Mississippi River (northeast of River Mile 180), and it measures approximately 1.16 ha (2.87 ac) in size.

This area was subject to pedestrian survey and backhoe trenching in order to identify any subsurface cultural features or material. In addition, the proposed access road that measures approximately 165 m (541 ft) in length by 15 m (49 ft) in width also was subjected to survey using the same field methods. Therefore, a total of 1.4 ha (3.4 ac) was examined for cultural resources as part of the proposed undertaking.

The proposed project items were characterized as possessing moderate to high probability for containing intact cultural deposits based on results of the previous cultural resources investigation entitled *Phase I Cultural Resources Survey and Archeological Inventory of the Alhambra to Hohen-Solms and Hohen-Solms to Modeste Project Items, Ascension and Iberville Parishes, Louisiana* (George et al. 2000).

Despite an intensive field effort, his investigation failed to result in the identification of any archeological sites or historic structures within the Areas of Potential Effect. Phase I cultural resources survey and archeological inventory of the proposed borrow pit and access road project items resulted in the identification of only modern (i.e., post 1950) cultural material. No additional testing of the proposed borrow pit and associated access road is recommended.

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PHASE I CULTURAL RESOURCES SURVEY AND ARCHEOLOGICAL INVENTORY OF A PROPOSED 1.12 HA (2.87 AC) BORROW PIT AND AN ASSOCIATED ACCESS ROAD, ASCENSION PARISH, LOUISIANA

Final Report

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By

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October 2004

For

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CHAPTER I

INTRODUCTION

This document presents the results of Phase I cultural resources survey and archeological inventory of two proposed project items in Ascension Parish, Louisiana (Figure 1). These project items consisted of a proposed borrow pit area and an associated access road (Figure 2). This investigation was completed by R. Christopher Goodwin & Associates, Inc., in July of 2003 on behalf of the U.S. Army Corps of Engineers, New Orleans District. All fieldwork was performed in accordance with the National Historic Preservation Act of 1966, as amended; the National Environmental Policy Act of 1969, as amended; *Louisiana's Comprehensive Archaeological Plan* (Smith et al. 1983); and the Scope of Work drafted by the U.S. Army Corps of Engineers, New Orleans District.

Project Description

The proposed project items are located on the right descending bank of the Mississippi River in the vicinity of River Mile 180. They are bound by the Mississippi River to the east and State Road 405 to the west (Figures 1 and 2). The proposed borrow pit measures approximately 75 x 150 m (246.06 x 492.13 ft) in length. The associated access road, which measures approximately 165 m (541 ft) in length and extends in an easterly direction from the borrow pit project item, turns north and it terminates at a gate leading to the extant levee. Figure 3 depicts the location of the borrow pit and access road in relation to the levee and the Mississippi River.

These project items were surveyed for cultural resources in anticipation of the excavation of the borrow pit by the U.S. Army Corps of Engineers, New Orleans District. According to that agency, the currently proposed construction plans are associated with the proposed Hohen-Solms to Modeste Levee Enlargement Project in Ascension Parish, Louisiana. The newly proposed project item is situated in an area deemed to have high potential for containing intact cultural deposits, as determined during the previous cultural resources investigation entitled *Phase I Cultural Resources Survey and Archeological Inventory of the Alhambra to Hohen-Solms and Hohen-Solms to Modeste Project Items, Ascension and Iberville Parishes, Louisiana* (George et al. 2000). The research design and field methods utilized in completing this investigation are reviewed briefly below.

Research Design and Field Methods

The current investigation was designed to identify, record, and assess the distribution of all cultural resources situated within the Areas of Potential Effect. The proposed project items were determined to be located in an area of moderate to high potential for containing intact cultural resources. Areas of probability for containing intact cultural deposits were designated on the basis of the previous cultural resources investigation mentioned above.

Fieldwork associated with this investigation consisted of a combination of pedestrian reconnaissance and backhoe trenching; all survey was limited to the Areas of Potential Effect associated with the proposed project items. A multi-staged approach was utilized to complete the fieldwork for this project. This approach initially consisted of pedestrian survey throughout each of the proposed project items. After the completion of this portion of the investigation, backhoe trenches were excavated systematically throughout the Areas of Potential Effect. Backhoe trenches were

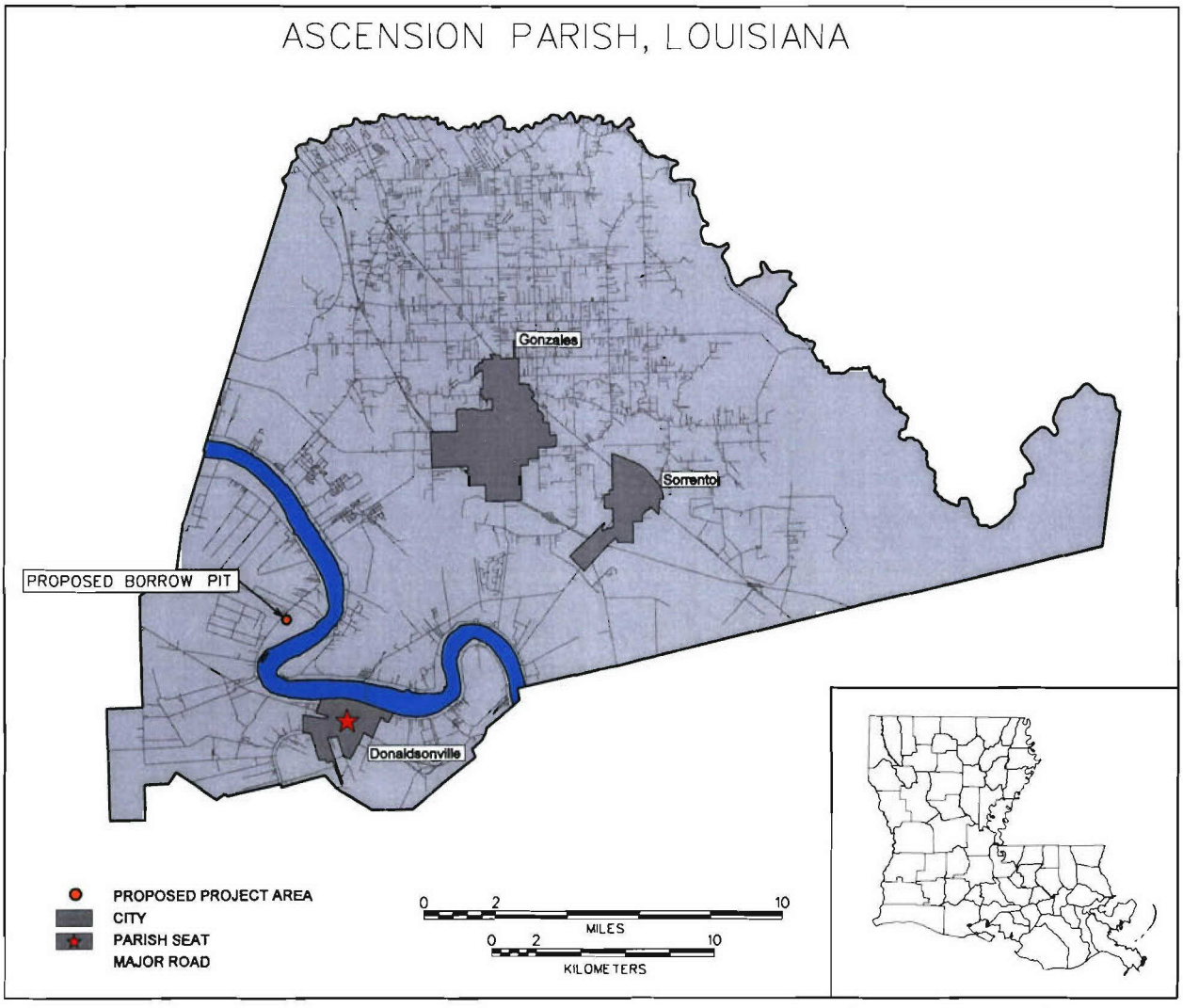

Figure 1. **Map of Louisiana depicting the location of the proposed Alhambra Borrow Pit project items in Ascension Parish, Louisiana.**

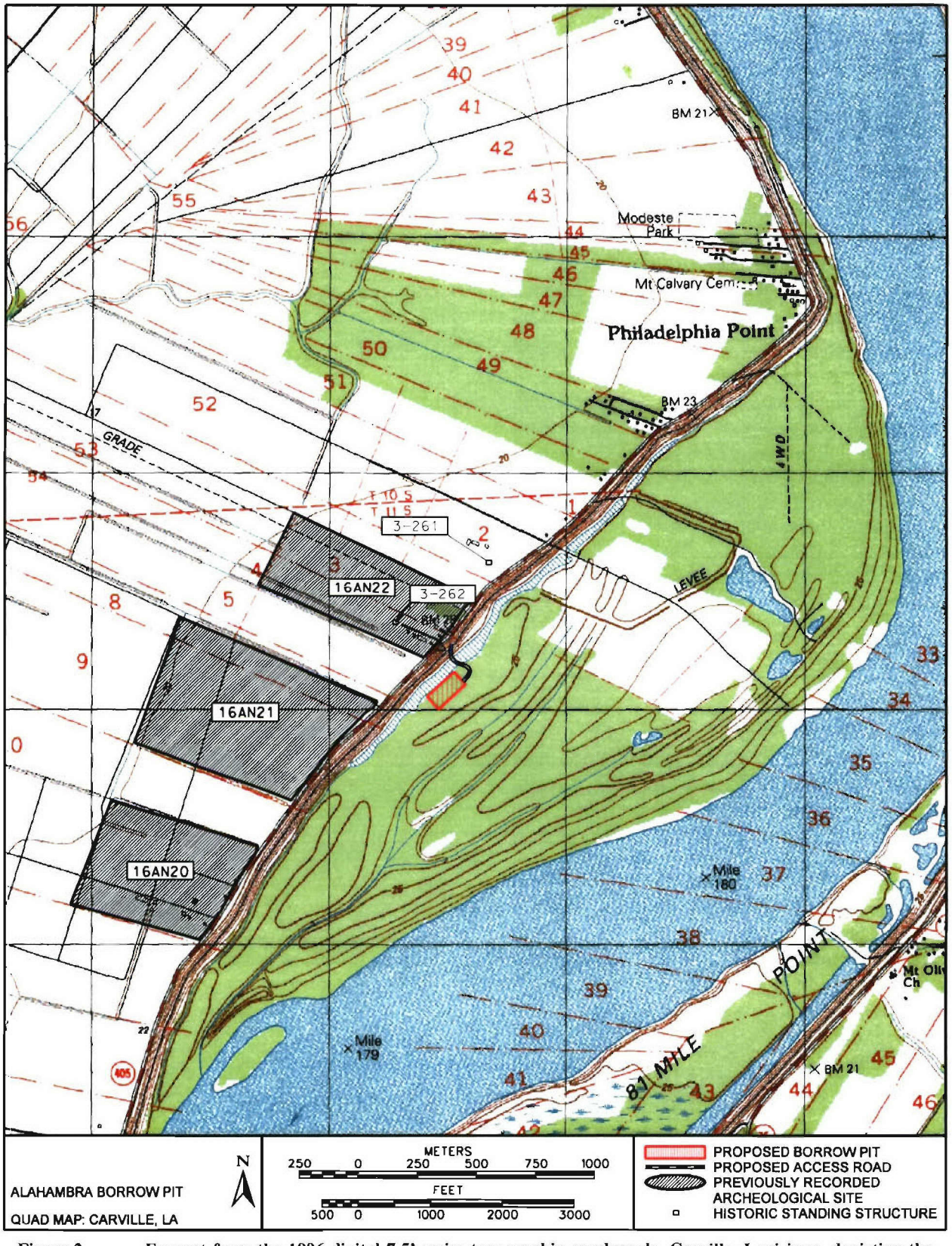

Figure 2. **Excerpt from the 1996 digital 7.5' series topographic quadrangle, Carville, Louisiana, depicting the location of the proposed Alhambra Borrow Pit project items in relation to previously recorded archeological sites and historic period structures within 1.6 km (1 mi.) of the project area.**

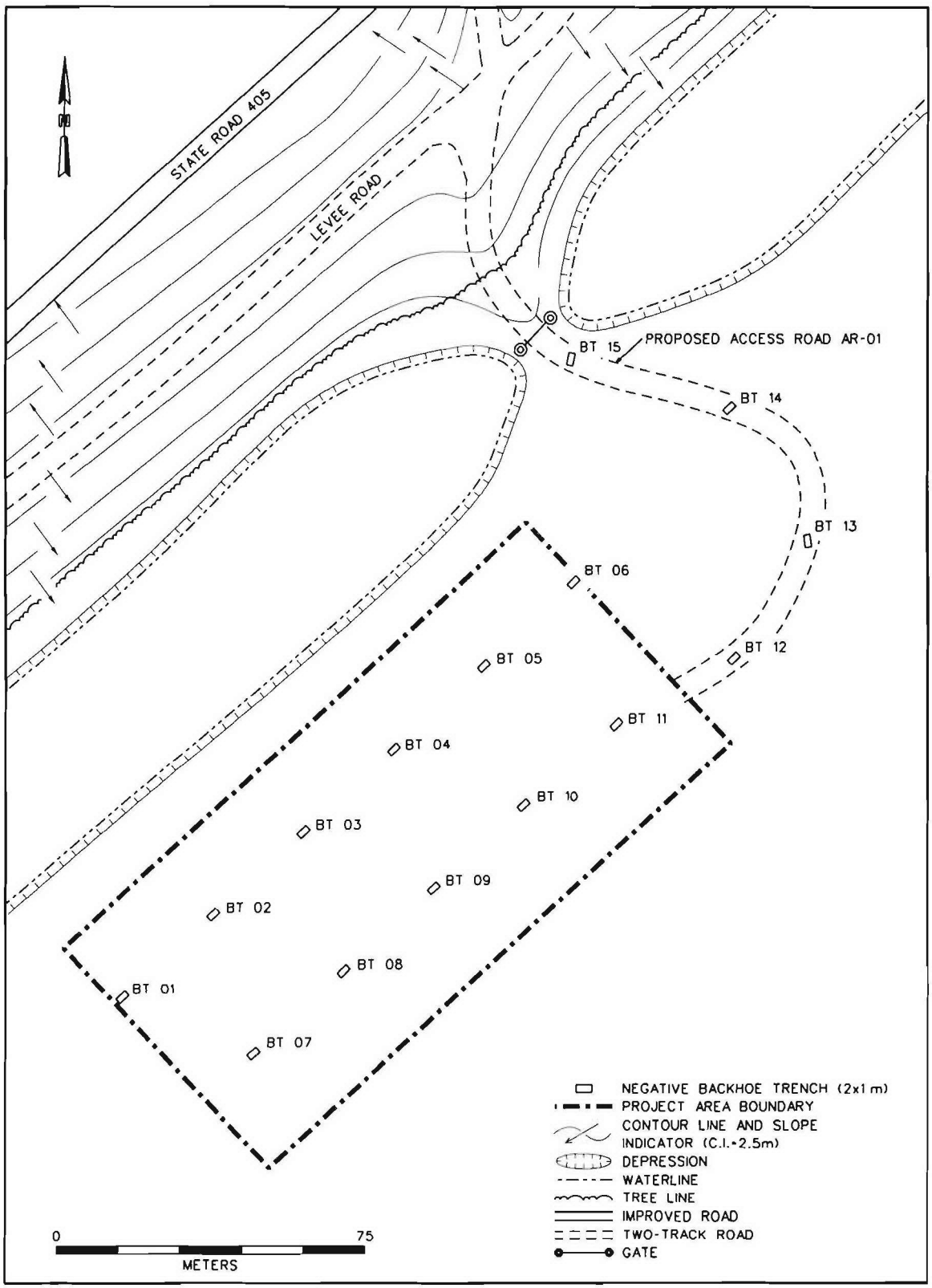

Figure 3. **Plan view of the proposed Alhambra Borrow Pit project items.**

excavated at 30 m (98.4 ft) intervals throughout each proposed project item. A total of 1.4 ha (3.4 ac) was surveyed during this investigation.

Project Results

This Phase I cultural resources survey and archeological inventory of the proposed borrow pit and an associated access road in Ascension Parish, Louisiana failed to identify any cultural resources. The results of cultural resources investigation for each project item are reviewed briefly below.

Borrow Pit

A total of 11 of 11 (100 percent) backhoe trenches were excavated throughout the proposed borrow pit area. Excavation of these trenches resulted in the identification of modern (i.e., post 1950) cultural material only; no historic cultural material was recovered during survey. The identified artifacts consisted of three wire nails that originated from the uppermost portion of Stratum I in Backhoe Trench 4 (Figure 3). All of this material, which originated from a clearly disturbed stratum represented by mottled soil deposits, was modern in origin; thus, none of these items was collected. Aside from the three wire nails discussed above, the current Phase I cultural resources survey and archeological inventory failed to result in the identification of any historic cultural material or intact cultural deposits during the investigation of the borrow pit project item.

Access Road

A total of 4 of 4 (100 percent) backhoe trenches were excavated during survey of the proposed access road. Modern material also was observed during pedestrian survey and trench excavation for the access road. A single modern ceramic (a terracotta flowerpot sherd) was identified on the ground surface approximately 5 m (16.4 ft) south of Backhoe Trench 14 (Figure 3). Within Backhoe Trench 15, several modern bolts and screws were observed but not collected; these were noted between the surface and approximately 35 cm (13.8 in) below the surface. This trench was located on an existing access road and therefore had an abundance of road fill on top of the original soil horizon (Figure 3). None of the above-mentioned modern artifacts were collected during survey. The Phase I cultural resources survey and archeological inventory failed to result in the identification of any historic cultural material or intact cultural deposits during the investigation of the access road project item.

Recommendations

Phase I cultural resources survey and archeological inventory of the proposed borrow pit and access road project items resulted in the identification of only modern (i.e., post 1950) cultural material. This comprehensive Phase I cultural resources survey and archeological inventory failed to result in the identification of any historic cultural material or cultural features. In addition, visual reconnaissance of those areas situated within and immediately adjacent to the proposed project items did not result in the identification of any historic standing structures. As a result, no additional testing of the proposed borrow pit and associated access road is recommended.

Project Personnel

Mr. David R. George, M.A., R.P.A., served as Principal Investigator for this project and he supervised all aspects of the investigation. Ms. Alicia Ventresca, M.A., served as the Project Manager and she directed the fieldwork associated with this investigation; she was assisted by Mr. Peter Cropley, B.A., and Ms. Carrie Humphrey, B.A. Ms. Katy Coyle, M.A., coordinated the historic research for this project. Graphics found in this report were completed by Mr. David Stitcher, B.A. Finally, production of this report was completed by Ms. Heidi Post, B.A.

Organization of the Report

The natural setting of the proposed project reach is presented in Chapter II. It includes a brief overview of the geomorphology, soils, flora, fauna, and climate of the region. The prehistory of the project reach is outlined in Chapter III. The history of the study area is chronicled in Chapter IV; it consists of a narrative that describes the historic plantations that once existed in the immediate vicinity of the proposed project items, as well as a general history of the region. A review of all previously recorded archeological sites, previously recorded historic period standing

structures, and previously completed cultural resources surveys located within the vicinity of the proposed project items is contained in Chapter V. The field methods used to complete this investigation are discussed in Chapter VI. The results of this investigation, including a description of each identified cultural resource, are described in Chapter VII. A summary and management recommendations are presented in Chapter VIII.

CHAPTER II

NATURAL SETTING

Introduction

This chapter provides an overview of the geology, physiography, geomorphology, flora, fauna, and climate characteristic of the area encompassing the proposed borrow pit project item and associated access road. For ease of discussion, the chapter has been divided into two major sections. The first section provides a discussion of the geology, physiography, and geomorphology of the proposed project item. The second section describes the flora, fauna, and climate of the project region.

Physiographic and Geologic Setting in the Vicinity of the Proposed Alhambra Borrow Pit

The proposed project items are situated within the Mississippi River deltaic plain subsection of the Gulf segment of the Gulf and Atlantic Coastal Plain province of North America (Murray 1961). The deltaic plain consists of a flat, low-lying tract of alluvial land that is dominated by two landscapes: (1) broad expanses of intratidal wetlands situated in shallow basins characterized by swamps, marshes, shallow lakes, and tidal channels; and (2) the low, narrow natural levee ridges (meander belts) that flank the present course of the Mississippi River and its numerous abandoned deltaic distributaries. These distributary ridges form a network and system analogous to a skeletal framework, the basic pattern of which has been known and mapped for decades (Fisk 1944; Frazier and Osanik 1965; Kolb and VanLopik 1958) (Figure 4).

Because of its size, and location the proposed project area is characterized only by two types of terrain: the natural levee ridge and the adjacent backswamp. The natural levees, the focus of historic occupation along the Mississippi River, form a flat, but gently sloping, ridge that attains a maximum (crest) elevation of nearly 6 m (20 ft) adjacent to the river channel. From there, the levees slope distally to a mean elevation of less than 3 m (10 ft) in the backswamp areas; i.e., on the landward side of the artificial flood control levees. Surface runoff from the natural levees is toward the backswamp.

Geologically, the deltaic plain overlies the northern portion of the east-west trending Gulf Basin, a deep structural trough or geosyncline where the continental crust, composed of Paleozoic basement rocks, has been depressed and where mostly unconsolidated sediments of fluvial, estuarine, and marine origin accumulated during the Cenozoic Era. These sediments have developed to a thickness of tens of thousands of meters. The basin is still characterized by subsidence and active faulting.

The Mississippi River deltaic plain represents the surface manifestation of a relatively thin, seaward thickening prism of Holocene deltaic and shallow marine deposits that overlie Pleistocene deposits of similar origin (Kolb and VanLopik 1958). The increase in thickness toward the Gulf of Mexico is due at least in part to scouring by the Mississippi River in its present channel and subsequent deposition. The contact between the Holocene prism and the underlying Pleistocene-age deposits is a widely recognized and mapped erosional unconformity (Kolb 1962; Kolb and VanLopik 1958; Saucier 1994).

In general terms, this prism consists of a mixture of clays and silts that grade downward into a series of silts and fine sands (Kolb 1962). The upper half of the prism, which measures

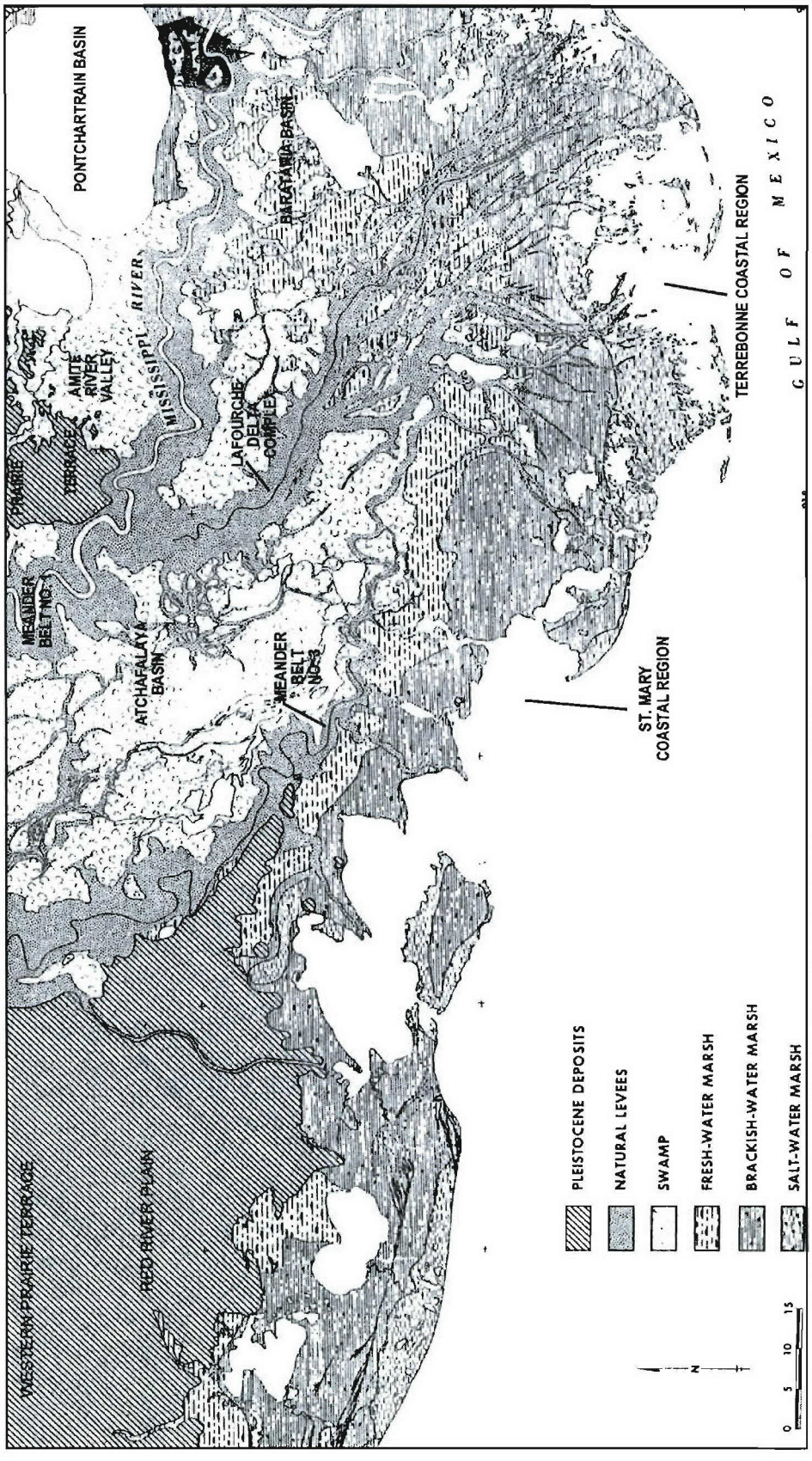

Figure 4. Major geomorphic subdivisions in southeastern Louisiana (modified from O'Neil 1949).

approximately 9.1 m (30 ft) in thickness, represents sediments laid down by fluvial processes in terrestrial and paludal environments, while the lower half represents sediments laid down by both fluvial and marine processes in paludal to nearshore Gulf environments.

The prism of Holocene deltaic deposits represents a series of distinctive sedimentary cycles initiated by upstream diversions of Mississippi River flow, with each cycle correlating with a discrete delta complex. Each of these cycles resulted in sediments being laid down in multiple environments ranging from freshwater to saline in the dynamic zone of interaction where the river empties into the Gulf. The cumulative result of these cycles has been the net buildup and seaward extension of the deltaic plain. Each delta complex in turn consists of a series of delta lobes, a lobe being defined as that portion of a complex that forms during a relatively short period of time (a matter of centuries) and that can be attributed to a single or discrete set of deltaic distributaries (Saucier 1994). Because of the prevailing influence of subsidence and sea level rise, each lobe typically has experienced a constructional or progradational phase in which fluvial processes dominate, and a subsequent destructional or transgressive phase in which marine processes become progressively more important.

Basic Geologic Controls

Geologic controls that affect the Holocene deltaic plain of the Lower Mississippi River Valley in the project region take the form of two prevailing, regional, and interrelated processes: subsidence and sea level rise. These processes are integral factors in the major cyclical landscape and environmental changes that have taken place in this dynamic deltaic plain setting. Subsidence involves five basic factors or natural processes (Kolb and VanLopik 1958). It can be defined simply as the relative lowering of the land surface with respect to sea level or it may involve other processes. These include: a) true or actual sea level rise, b) sinking of the basement (Paleozoic) rocks due to fluctuations in the earth's crust, c) consolidation of the thousands of meters of sediments in the Gulf Basin, d) local consolidation of deposits near the surface due to desiccation and compaction, and/or e) tectonic activity such as faulting. All five processes have been active in southern Louisiana during the Quaternary period (Pleistocene and Holocene epochs) and they have continued into the modern era.

Until the early 1960s, most Gulf Coast geologists believed that the rapid rate of postglacial sea level rise (the Holocene transgression) abruptly slowed approximately 5,000 years ago when sea level had attained essentially its present level. Since that time, the rate of rise has been relatively slow, and it does not represent a major component of subsidence in the area. Calculations of subsidence rates have been made in several portions of the deltaic plain using radiocarbon dates and observations of geologic structures (e.g., Kolb and VanLopik 1958). These calculations indicate that subsidence rates increase sharply from north to south and reach their maximum in the modern delta southeast of New Orleans, whereas they increase less sharply to the north of that point. It is estimated that the rate of subsidence in the region of the proposed project area for at least the last few centuries has been about 1.0 mm/yr (0.04 in./yr), and it may be accelerating.

Within the last several decades, most geologists have come to realize that sea level did not attain its essentially present level (±1 m) until approximately 3,500 years ago, and about 5,000 years ago, the level was perhaps a meter or more lower than at present. Consequently, the subsidence rate mentioned above is valid for no more than the last 3,500 years; prior to that time, a higher rate for the sea level rise component of subsidence would have made the total subsidence rate much higher. It is now becoming more widely accepted that the rate of sea level rise during the Holocene has been episodic rather than steady, producing a step shape to the sea level rise curve (Penland et al. 1987). Penland et al. (1987), for example, have postulated that between 3,000 and 4,000 years ago, the rate of sea level rise was about 6.0 mm/yr whereas sea level was relatively stationary for about 2,000 years prior to that period.

Geomorphic Processes and Depositional Environments

The proposed project area lies along the trunk course of the Mississippi River as it cuts

through the deltaic plain. Over the past half century, various geologists (see Saucier 1994) have offered several models of deltaic plain stratigraphy and chronology. While the ages of certain of the numerous distributaries and their associations with certain delta complexes have not been firmly established and remain speculative, a basic widely accepted model outlining the overall framework of the deltaic plain and its major components is available (Frazier 1967) (Figure 5).

The Mississippi River in the vicinity of the proposed project items has been the trunk course responsible for the development of six recognized delta lobes of the St. Bernard Complex (Figure 5). While the river discharged through this area for at least the last 4,800 years (see discussion below), its discharge has waxed and waned as lobes were being formed in other complexes such as the Lafourche Complex. Active sedimentation and natural levee growth has not been continuous in the project region.

Three environments of deposition are represented in the upper several meters of the Holocene sedimentary sequence in the vicinity of the proposed project item. Each is discussed below in order of their relative importance. A fourth environment (or series of related environments) is present in the subsurface deposits in the vicinity of the proposed borrow pit. Although the environment is not directly related to the human occupancy of the project area, its presence and characteristics are important in understanding the Holocene land-use history of the region.

Natural Levees

Natural levees form along streams or rivers that carry high sediment loads and that periodically overtop their banks. Most natural levee deposits are formed during floods by sediment-carrying sheet flow that is filtered by heavy vegetation. During times of major flooding, however, overbank flow may become channelized, forming crevasses. Scour pools and incised channels may form across the natural levee crests, and they will be backfilled naturally with silt and fine sand as the flood waters recede. Consequently, either one or both of two depositional patterns may result across the distal natural levee. The first is a fan-shaped crevasse splay that radiates outward from the point of crevassing and that consists of a thin veneer of mostly silts with some clays. The second is a small distributary-like channel (sometimes called a crevasse channel) that extends into the backswamp area flanking the natural levee. The crevasse channel is conspicuous because of a small, downstream-narrowing, flanking natural levee ridge. Flow through the crevasse channel may last no longer than a single major flood event or it may persist over several successive floods. With both the splays and the crevasse channels, a net effect is an unusual widening of the natural levee ridge near the point of crevassing.

According to the published soil survey report for the project region, soils of the higher natural levees are classified as the Commerce series (Spicer et al. 1976, 1977). More distal parts of the natural levees are comprised of finer-grained deposits, and they exhibit soils classified as Convent series. Before being cleared for agriculture, the vegetation assem-

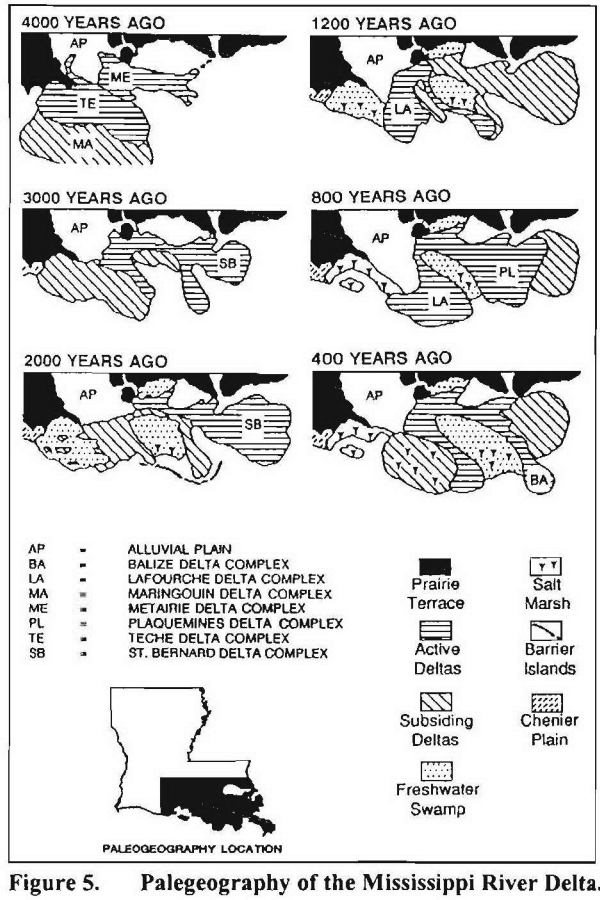

Figure 5. Palegeography of the Mississippi River Delta.

blage of the natural levees consisted of mixed, deciduous, hardwood species such as oaks (*Quercus* sp.), bitter pecan (*Carya illinoensis*), red maple (*Acer rubrum*), and green ash (*Fraxinus pennsylvanica*) with an understory dominated by dwarf palmetto (*Sabal minor*).

Backswamps

Backswamps (or inland swamps) are flood-basin areas situated between natural levee ridges that receive only the finest sediments (mostly clays) during times of overbank flooding and basin inundation. Backswamps are flat, poorly drained, forested tracts underlain by tens of meters of largely unoxidized gray clays mixed with some silt layers. Considerable organic matter is present throughout the deposits, but layers of pure peat are infrequent and they are restricted to the deeper swamp areas. Backswamp soils are classified as Sharkey or Barbary association and they support a swamp forest vegetation assemblage characterized by cypress (*Taxodium distichum*) and tupelo (*Nyssa aquatica*).

Point Bar

Areas of point bar accretion result from the process of stream meandering, which involves the erosion and caving of outer banks in bends and the corresponding formation of point bars along inner banks. In the subsurface, point bar deposits extend to the maximum depth of scouring in the migrating channel. The deeper deposits consist of the bed load of the river, which is mostly gray and brown silts and fine to medium sands. They become slightly finer grained in the upper several meters, with laminated clays, silts, and sands present.

Areas of relatively recent point bar accretion are characterized by distinctive sequences of linear, parallel, low, sandy ridges and clay-filled swales. Many of these occur on the batture near the proposed project item. The orientation of the ridge/swale sequences indicates the direction of movement of the parent channel. Above the lower water plane of the river, point bar deposits grade upward into natural levee deposits, i.e., where vertical accretion becomes dominant over lateral accretion after the channel migrates away from a given point. Where the rate of channel migration is slow, as it has been in the project area, subsequent natural levee growth can be considerable and it often completely obscures the underlying point bar accretion topography.

Undifferentiated Deltaic Plain

Beneath the natural levee and associated backswamp deposits located in the vicinity of the Areas of Potential Effect is a thick sequence of heterogeneous Holocene deposits referred to simply as undifferentiated deltaic plain (Kolb 1962). The sequence directly overlies the Pleistocene erosional surface. Based on subsurface information recovered from elsewhere in southeastern Louisiana (Kolb 1962; Kolb and VanLopik 1958) the sequence conceptually should consist of sediments laid down in several discrete depositional environments. The deepest zone are nearshore Gulf deposits representing the transgression of the post-glacial rising sea level across the eroded Pleistocene land surface. Typically these deposits consist mostly of silts and sands with varying amounts of clay and organic debris. Fine-grained sediments are quite limited since the area did not experience Mississippi River sedimentation at that time. The remainder of the Holocene sequence should consist dominantly of Mississippi River marginal deltaic sediments laid down in a shallow prodelta and/or interdistributary environment. These sediments consist of layers of clays, silty clays, and fine sands with abundant shells that represent the formation of the initial delta lobe of the St. Bernard complex. That was a time of slowly rising sea level, considerable subsidence, and a landscape dominated by intratidal marshes, tidal channels, and shallow lakes and bays.

Physiography and Geomorphology in the Vicinity of the Proposed Project Items

The Areas of Potential Effect are situated in the deltaic plain along the crest of the natural levee ridge of the modern (No. 1) meander belt of the Mississippi River (Figure 6). The backslope of the natural levee extends landward for several kilometers from the proposed project item. Natural levee deposits, averaging approximately 4.5 m (15 ft) in thickness, overlie older Holocene deltaic deposits (e.g., backswamp) within the vicinity of the Area of Potential Effect (Saucier 1969, 1994). Where

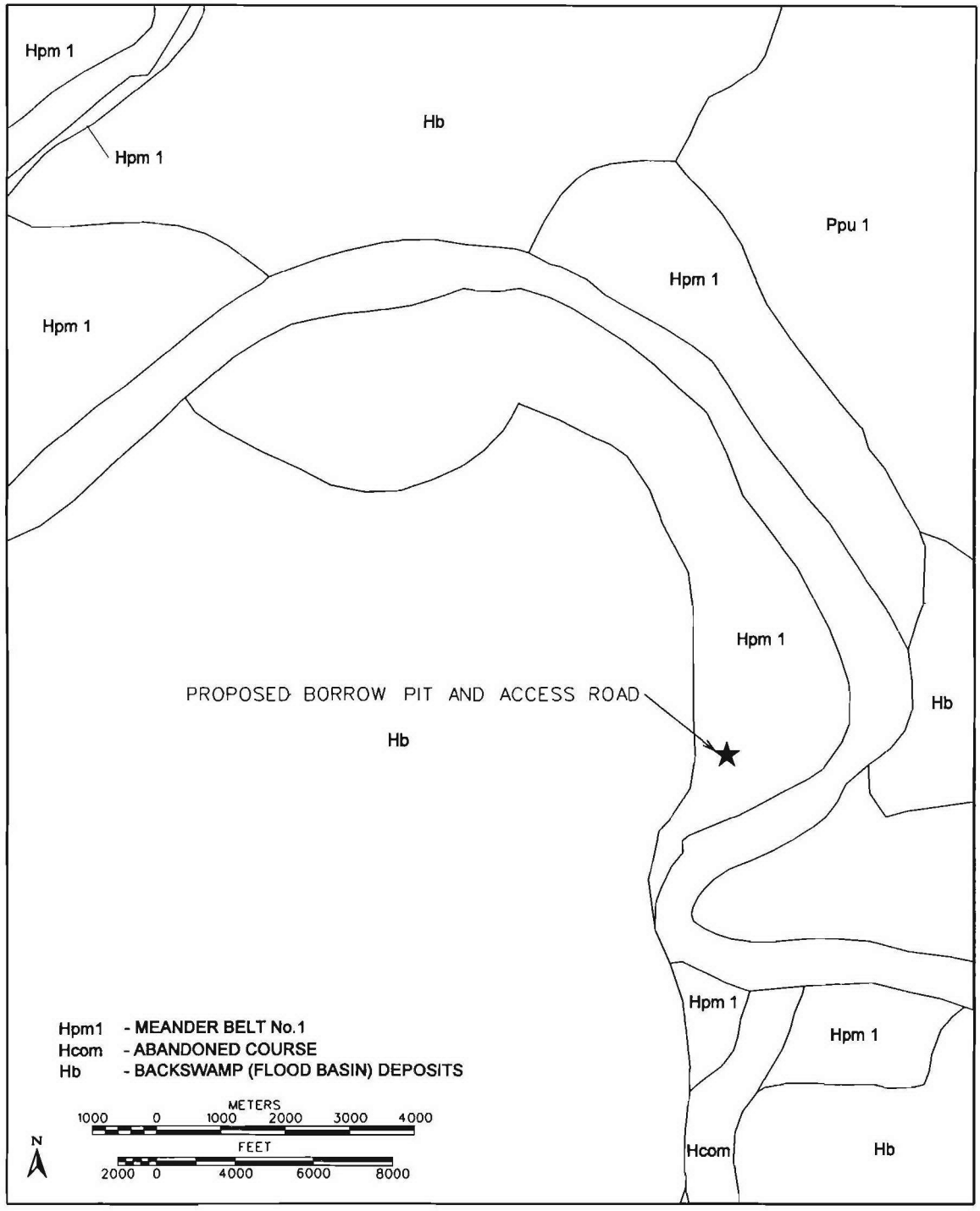

Figure 6. Geomorphic map of the vicinity of the Alhambra Borrow Pit and Access Road.

backswamp is present, it averages about 30 m (100 ft) in thickness and it is underlain by a thick mass of coarse-grained substratum deposits. Where point bar is present, the deposits extend to a depth of 30 to 40 m (100 to 131 ft) and they also are underlain by substratum deposits.

Soils of the natural levee backslopes have been mapped as primarily Convent soils with a mixture of Commerce silt loam, Commerce silty clay loam, and Vacherie silt loam. These are somewhat poorly drained and moderately to slowly permeable soils that have formed in loamy sediments on natural levees and the alluvial plain. A description of the soil profile in this area is as follows. The surface layer consists of a dark grayish brown silt that measures approximately 25.4 cm (10 in) in thickness. It is underlain by a 71 cm (28 in) thick subsoil; it consists of a grayish brown silty clay loam. Most of the area characterized by these soils is used for agriculture (Spicer et al. 1976, 1977).

On the batture areas, where the current project item is located, the soils have been mapped only as Convent association or loamy alluvial land and they are described as somewhat poorly drained and frequently flooded soils that have developed between the bankline and the flood control levees. The soil profile on the batture is described as follows. The surface layer measures approximately 35 cm (14 in) in thickness and it consists of dark grayish brown silt. The subsoil in this area extends to a depth of approximately 127 cm (50 in) below the surface layer and it is characterized by a grayish brown and/or a gray very fine sandy loam mottled with shades of brown clay (Spicer et al. 1976, 1977).

Geologic History and Chronology of the Proposed Project Items

The proposed Areas of Potential Effect are situated above the entrenched valley of the Mississippi River. The entrenched valley incised into the Pleistocene deposits (Prairie complex) during one or more glacial-stage low sea level stands. The overlying substratum deposits represent glacial outwash laid down during rising sea level, terminating about 12,000 to 11,000 years ago. At that time, the Mississippi River switched from a braided to a meandering regime, marking the beginning of the accumulation of sediments in a backswamp environment. Until about 4,800 years ago, backswamp deposits accumulated across the area. Only minor valley tributaries may have extended onto the floodplain and they flowed south to the Gulf of Mexico.

Beginning with an upstream diversion about 4,800 years ago, the river began enlarging a course through the project area and constructing a meander belt (No. 2) (Saucier 1994). As the meander belt developed, lateral shifting of the river channel began replacing backswamp deposits with point bar deposits (Figure 6). For perhaps a thousand years, the process was relatively slow because a portion of the river flow also was being discharged through the Teche trunk channel (No. 3) into the Teche delta complex to the west.

Approximately 3,800 years ago, the Teche system became inactive and full-flow conditions developed in the channel past the proposed project area. Certainly, this increased significantly the rate of meandering and probably a majority of point bar deposits post-date that event.

Archeological Considerations

Initial human presence in the area encompassing the proposed borrow pit probably coincided with the end of Mississippi River glacial outwash deposition and the beginnings of widespread backswamp conditions. Thus, it is believed that very few locations for permanent settlement were available and that conditions were not suitable for Paleo-Indian subsistence. Similar conditions probably prevailed throughout the Archaic Stage. The first landscapes suitable for significant habitation probably formed about 3,000 years ago when natural levees along the Mississippi River meander belt reached modest sizes.

Flora in the Vicinity of the Proposed Project Items

The floral community found on the floodplains of the Mississippi River within southeastern Louisiana consists of a complex mosaic of tree species that form the bottomland hardwood forests (Table 1). Prior to being cleared for agricultural development, forest vegetation along the natural levees of the proposed project area consisted of mixed, deciduous, hardwood species such as oaks (*Quercus* sp.), bitter pecan (*Carya illinoensis*), red maple (*Acer rubrum*), and green

Table 1. Trees in the vicinity of the project reach.

COMMON NAME	SCIENTIFIC NAME
Florida Maple	*Acer barbatum*
Chalk Maple	*Acer leucoderme*
Ashleaf Maple (Box-Elder)	*Acer negundo*
Red Maple	*Acer rubrum*
Silver Maple	Acer saccharinum
Red Buckeye	*Aesculus pavia*
Downy Juneberry	*Amelanchier arborea*
Hercules-Club	*Aralia spinosa*
Common (Tall) Pawpaw	*Asimina triloba*
Groundsel-Tree	*Baccharis halimifolia*
River Birch	*Betula nigra*
Gum (Woolly) Bumelia	*Bumelia lanuginosa*
Buckthorn Bumelia	*Bumelia lycioides*
Ironwood	*Carpinus caroliniana*
Water Hickory (Bitter Pecan)	*Carya aquatica*
Bitternut Hickory	*Carya cordiformis*
Pignut Hickory	*Carya glabra*
Pecan	*Carya illinoenis*
Mockernut Hickory	*Carya tomentosa*
Allegheny (Eastern) Chinkapin	*Castanea pumila*
Southern (Lowland) Hackberry	*Celtis laevigata*
Dwarf (Upland) Hackberry	*Celtis tenuifolia*
Buttonbush	*Cephalanthus occidentalis*
Redbud	*Cercis canadensis*
Fringetree	*Chionanthus virginicus*
Roughleaf Dogwood	*Cornus drummondii*
Flowering Dogwood	*Cornus florida*
Common Persimmon	*Diospyros virginiana*
Southeastern Coralbean	*Erythrina herbacea*
Beech	*Fagus grandifolia*
Swamp Forestiera	*Forestiera acuminata*
Green Ash	*Fraxinus pennsylvanica*
Pumpkin Ash	*Fraxinus profunda*
Water Locust	*Gleditsia aquatica*
Honey Locust	*Gleditsia triacanthos*
Two-wing Silverbell	*Halesia parviflora*
Common Witch-Hazel	*Hamamelis virginiana*
Carolina Holly	*Ilex ambigua*
Possumhaw (Deciduous) Holly	*Ilex decidua*
Largeleaf Holly	*Ilex montana*
American Holly	*Ilex opaca*
Common Winterberry Holly	*Ilex verticillata*
Yaupon Holly	*Ilex vomitoria*
Southern Redcedar	*Juniperus silicicola*
Sweetgum	*Liquidambar styraciflua*
Tuliptree	*Liriodendron tulipifera*
Cucumber Magnolia	*Magnolia acuminata*
Southern Magnolia	*Magnolia grandiflora*
Pyramid Magnolia	*Magnolia pyramidata*
Sweetbay Magnolia	*Magnolia virginiana*
Red Mulberry	*Morus rubra*
Southern Bayberry A121	*Myrica cerifera*
Water Tupelo	*Nyssa aquatica*
Sourgum	*Nyssa sylvatica*
Devilwood	*Osmanthus americanus*
Sourwood	*Oxydendrum arboreum*
Hornbeam	*Oystrya virginiana*
Redbay	*Persea borbonia*
Shortleaf Pine	*Pinus echinata*
Spruce Pine	*Pinus glabra*
Longleaf Pine	*Pinus palustris*

Table 1, continued

COMMON NAME	SCIENTIFIC NAME
Lobolly Pine	*Pinus taeda*
Water-Elm	*Planera aquatica*
Eastern Sycamore	*Platanus occidentalis*
Eastern (Common) Cottonwood	*Populus deltoides*
Swamp Cottonwood	*Populus heterophylla*
Chickasaw Plum	*Prunus angustifolia*
Carolina Laurelcherry	*Prunus caroliniana*
Mexican Plum	*Prunus mexicana*
Black Cherry	*Prunus serotina*
Flatwoods Plum	*Prunus umbellata*
Hoptree	*Ptelea trifoliata*
White Oak	*Quercus alba*
Southern Red (Spanish) Oak	*Quercus falcata*
Cherrybark Oak	*Quercus falcata var. pagodaefolia*
Laurel (Darlington) Oak	*Quercus laurifolia*
Overcup Oak	*Quercus lyrata*
Blackjack Oak	*Quercus marilandica*
Basket Oak	*Quercus michauxii*
Chinkapin Oak	*Quercus muehlenbergii*
Water Oak	*Quercus nigra*
Nuttall Oak	*Quercus nuttallii*
Willow Oak	*Quercus phellos*
Northern Red Oak	*Quercus rubra*
Shumard Oak	*Quercus shumardii*
Post Oak	*Quercus stellata*
Black Oak	*Quercus velutina*
Virginia Live Oak	*Quercus virginiana*
Carolina Buckthorn	*Rhamnus caroliniana*
Winged Sumac	*Rhus copallina*
Smooth Sumac	*Rhus glabra*
Dwarf Palmetto	*Sabal minor*
Sandbar Willow	*Salix exigua*
Black Willow	*Salix nigra*
Common Elderberry	*Sambucus canadensis*
Western Soapberry	*Sapindus drummondii*
Sassafras	*Sassafras albidum*
Virginia Stewartia (Silky Camellia)	*Stewartia malachodendron*
American Snowbell	*Styrax americanus*
Bigleaf Snowbell	*Styrax grandifolius*
Sweetleaf	*Symplocos tinctoria*
Baldcypress	*Taxodium distichum*
Pondcypress	*Taxodium distichum var nutans*
Carolina Basswood	*Tilia caroliniana*
Poison-Sumac	*Toxicodendron vernix*
Winged Elm	*Ulmus alata*
American Elm	*Ulmus americanus*
Cedar Elm	*Ulmus crassifolia*
Sparkleberry (Farkleberry)	*Vaccinium arboreum*
Rusty Blackhaw	*Viburnum rufidulum*
Southern Prickly-Ash	*Zanthoxylum clava-herculis*

ash (*Fraxinus pennsylvanica*). These areas were cleared for agricultural crops in the late eighteenth and nineteenth centuries, and they are now used for the production of sugar cane and rice. The remaining tree stands line the edges of the agricultural fields. Large forested areas are lacking in the immediate vicinity of the project area. Those trees located adjacent to the proposed project area include species well adapted to disturbed environments impacted by seasonal inundation.

Within the older, non-swampy portions of the alluvial plain, forest types vary in composition. Tree species typical of this area include various oaks (*Quercus* sp.), hackberry (*Celtis laevigata*), boxelder (*Acer negundo*), and American sycamore (*Platanus occidentalis*). Where disturbed, the bottomland hardwood forest of the alluvial plain is dominated by ash (*Fraxinus* sp.), boxelder, hackberry, and American sycamore, and, less commonly, oak. In the backswamp areas situated away from the natural levee, forest vegetation, where it has not been cleared, consists of cypress (*Taxodium distichum*) and tupelo (*Nyssa aquatica*). In general, the bottomland hardwood forests of the Mississippi River meander belts have been altered severely by modification of the floodplain for commercial development, borrow pits, revetment construction, and modification of flood characteristics by artificial levees.

Fauna in the Vicinity of the Proposed Project Items

In both prehistoric and historic times, the area encompassing the proposed borrow pit supported a large and varied faunal community; however, some of these species have been eliminated by historic and modern development. The following discussion lists those species that probably were present during late prehistoric and historic times.

Game animals common to the project region included white-tailed deer (*Odocoileus virginianus*), swamp rabbit (*Sylvilagus aquaticus*), eastern gray squirrel (*Sciurus carolinensis*), eastern fox squirrel (*Sciurus niger*), eastern cottontail (*Sylvilagus floridanus*) and black bear (*Ursus americanus*) (Table 2). Predatory mammals found in the bottomland hardwood environments also included the gray fox (*Urcyon cinereoargenteus*), raccoon (*Procyon lotor*), long-tailed weasel (*Mustela frenata*), mink (*Mustela vison*), and bobcat (*Lynx rufus*), as well as the endangered and regionally extinct Eastern panther (*Felis concolor*) and red wolf (*Canis niger*), respectively. In addition, the mink, raccoon, beaver (*Castor canadensis*), and opossum (*Didelphis virginiana*) all were important fur bearers that lived in the bottomland hardwood environments. These animals provided not only important sources of food, but furs used in the production of clothing, as well as for trade.

Bottomland hardwood forests and swamps also were home to a variety of amphibians, including salamanders, toads, tree frogs, and true frogs (Table 3). These amphibians typically require very moist soils, temporary pools, or permanent ponds. In addition, the numerous reptiles found within the bottomland hardwood forests included not only the American alligator (*Alligator mississippiensis*), but also a number of iguanids, skinks, lizards, snakes, pit vipers, and turtles. Like the amphibians, most of the reptiles prefer either moist or aquatic habitats. Reptiles specific to the Mississippi River in southeastern Louisiana included the Mississippi diamondback terrapin (*Malaclemys terrapin pileata*), Gulf Coast box turtle (*Terrapene carolina* major), and the Gulf salt marsh snake (*Nerodia clarkii clarkii*) (Conant and Collins 1991).

The Mississippi River in the vicinity of the proposed project item also is home to a number of fresh water fish species. These included the shovelnose sturgeon (*Scaphirhynchus platorynchus*), alligator gar (*Attactosteus spatula*), large mouth bass (*Micropterus salmoides*), and bluegill (*Lepomis macrochirus*). In addition, carp (*Cyprinus carpio*), blue catfish (*Ictalurus punctatus*), channel catfish (*Ictalurus furcatus*), white crappie (*Poxomis annularis*), freshwater drum (*Aplodinotus grunniens*), garfish (*Lepisosteus* sp.), shad (*Dorosoma* sp.), and various suckers (*Catostomidae*) also are common (Conner 1977) (Table 4).

Finally, over 100 species of birds either are or were permanent or seasonal residents of the bottomland hardwood forests (Table 5). These species include major game birds such as the wood duck (*Aix sponsa*) and wild turkey (*Meleagris gallopavo*) (Gulf States Utilities Company 1974a, 1974b; Lowery 1974a, 1974b). Bird

Table 2. Mammals in the vicinity of the project reach.

COMMON NAME	SCIENTIFIC NAME
Shorttail Shrew	*Blarina brevicauda*
Coyote	*Canis latrans*
Beaver	*Castor canadensis*
Least Shrew	*Cryptotis parva*
Armadillo	*Dasypus novemcinctus*
Opossum	*Didelphis virginiana*
Big Brown Bat	*Eptesicus fuscus*
Mountain Lion (Puma)	*Felis concolor*
Southern Flying Squirrel	*Glaucomys volans*
Red Bat	*Lasiurus borealis*
Hoary Bat	*Lasiurus cinereus*
Eastern Yellow Bat	*Lasiurus intermedius*
Seminole Bat	*Lasiurus seminolus*
River Otter	*Lutra canadensis*
Bobcat	*Lynx rufus*
Striped Skunk	*Mephitis mephitis*
House Mouse (Introduced)	*Mus musculus*
Longtail Weasel	*Mustela frenata*
Mink	*Mustela vison*
Nutria (Introduced)	*Myocastor coypus*
Mississippi Myotis	*Myotis austroriparius*
Eastern Woodrat	*Neotoma floridana*
Shrew-Mole	*Neurotrichus gibbsi*
Evening Bat	*Nycticeius humeralis*
Whitetail Deer	*Odocoileus virginianus*
Muskrat	*Ondatra zibethica*
Rice Rat	*Oryzomys palustris*
Cotton Mouse	*Peromyscus gossypinus*
White-footed Mouse	*Peromyscus leucopus*
Golden Mouse	*Peromyscus nuttalli*
Eastern Pipistrel	*Pipistrellus subflavus*
Pine Vole	*Pitymys pinetorum*
Eastern Big-eared Bat	*Plecotus refinesquei*
Raccoon	*Procyon lotor*
Norway Rat (Introduced)	*Rattus norvegicus*
Black Rat (Introduced)	*Rattus rattus*
Fulvous Harvest Mouse	*Reithrodontomys fulvescens*
Eastern Harvest Mouse	*Reithrodontomys humulis*
Eastern Mole	*Scalopus aquaticus*
Eastern Gray Squirrel	*Sciurus carolinensis*
Eastern Fox Squirrel	*Sciurus niger*
Hispid Cotton Rat	*Sigmodon hispidus*
Southeastern Shrew	*Sorex longirostris*
Spotted Skunk	*Spilogale putorius*
Swamp Rabbit	*Sylvilagus aquaticus*
Eastern Cottontail	*Sylvilagus floridanus*
Mexican Freetail Bat	*Tadarida brasiliensis*
Gray Fox	*Urocyon cinereoargenteus*
Black Bear	*Ursus americanus*
Red Fox	*Vulpes fulva*

Table 3. Reptiles and amphibians in the vicinity of the project reach.

COMMON NAME	SCIENTIFIC NAME
Northern Cricket Frog	*Acris crepitans crepitans*
Southern Cricket Frog	*Acris gryllus gryllus*
Southern Copperhead	*Agkistrodon contortrix contortrix*
Western Cottonmouth	*Agkistrodon piscivorus leucostoma*
American Alligator	*Alligator mississippiensis*
Spotted Salamander	*Ambystoma maculatum*
Marbled Salamander	*Ambystoma opacum*
Mole Salamander	*Ambystoma talpoideum*
Smallmouth Salamander	*Ambystoma texanum*
Three-toed	*Amphiuma Amphiuma tridactylum*
Green Anole	*Anolis carolinensis*
Midland Smooth Softshell Turtle	*Apalone mutica mutica*
Gulf Coast Spiny Softshell Turtle	*Apalone spinifera aspera*
Eastern Spiny Softshell Turtle	*Apalone spinifera spinifera*
Eastern American Toad	*Bufo americanus americanus*
Southern Toad	*Bufo terrestris*
Gulf Coast Toad	*Bufo valliceps valliceps*
Fowler's Toad	*Bufo woodhousii fowleri*
Woodhouse's Toad	*Bufo woodhousii woodhousii*
Eastern Worm Snake	*Carphophis amoenus amoenus*
Common Snapping Turtle	*Chelydra serpentina*
Southern Painted Turtle	*Chrysemys picta dorsalis*
Bronze Frog	*Rana clamitans clamitans*
Blackmask Racer	*Coluber constrictor latrunculus*
Timber Rattlesnake	*Crotalus horridus*
Eastern Chicken Turtle	*Deirochely reticularia reticularia*
Western Chicken Turtle	*Deirochelysreticularia miaria*
Southern Dusky Salamander	*Desmognathus auriculatus*
Spotted Dusky Salamander	*Desmognathus fuscus conanti*
Mississippi Ringneck Snake	*Diadophis punctatus stictogenys*
Corn Snake	*Elaphe guttata guttata*
Texas Rat Snake	*Elaphe obsoleta lindheimerii*
Gray Rat Snake	*Elaphe obsoleta spiloides*
Five-lined Skink	*Eumeces fasciatus*
Southeastern Five-lined Skink	*Eumeces inexpectatus*
Broadhead Skink	*Eumeces laticeps*
Southern Two-lined Salamander	*Eurycea cirrigera*
Three-lined Salamander	*Eurycea longicauda guttolineata*
Dwarf Salamander	*Eurycea quadridigitata*
Western Mud Snake	*Farancia abacura reinwardtii*
Rainbow Snake	*Farancia erytrogramma*
Eastern Narrowmouth Toad	*Gastrophryne carolinensis*
Mississippi Map Turtle	*Graptemys kohnii*
Ouachita Map Turtle	*Graptemys pseudogeographica ouachitensis*
Four-toed Salamander	*Hemidactylium scutatum*
Mediterranean Gecko (Introduced)	*Hemidactylus turcicus*
Eastern Hognose Snake	*Heterodon platirhinos*
Bird-voiced Treefrog	*Hyla avivoca*
Green Treefrog	*Hyla cinerea*
Pine Woods Treefrog	*Hyla femoralis*
Barking Treefrog	*Hyla gratiosa*
Squirrel Treefrog	*Hyla squirella*
Gray Treefrogs	*Hyla versicolor* and *Hyla chrysoscelis*

Table 3, continued

COMMON NAME	SCIENTIFIC NAME
Mississippi Mud Turtle	*Kinosternon subrubrum hippocrepis*
Speckled Kingsnake	*Lampropeltis getula holbrooki*
Louisiana Milk Snake	*Lampropeltis triangulum amaura*
Scarlet Kingsnake	*Lampropeltis triangulum elapsoides*
Alligator Snapping Turtle	*Macroclemys temminckii*
Mississippi Green Water Snake	*Nerodia cyclopion*
Yellowbelly Water Snake	*Nerodia erythrogaster flavigaster*
Broad-banded Water Snake	*Nerodia fasciata confluens*
Diamondback Water Snake	*Nerodia rhombifer*
Midland Water Snake	*Nerodia sipedon pleuralis*
Central Newt	*Notophthalmus viridescens louisianensis*
Eastern Slender Glass Lizard	*Ophisaurus attenuatus longicaudus*
Eastern Glass Lizard	*Ophisaurus ventralis*
Mississippi Slimy Salamander	*Plethodon mississippi*
Webster's Salamander	*Plethodon websteri*
Northern Spring Peeper	*Pseudacris crucifer crucifer*
River Cooter	*Pseudemys concinna*
Bullfrog	*Rana catesbeiana*
Pig Frog	*Rana grylio*
Pickerel Frog	*Rana palustris*
Southern Leopard Frog	*Rana utricularia*
Graham's Crayfish Snake	*Regina grahamii*
Delta Crayfish Snake	*Regina rigida deltae*
Gulf Crayfish Snake	*Regina rigida sinicola*
Queen Snake	*Regina septevittata*
Southern Redback	*Salamander Plethodon serratus*
Eastern Spadefoot	*Scaphiopus holbrookii holbrookii*
Southern Fence Lizard	*Sceloporus undulatus undulatus*
Ground Skink	*Scincella lateralis*
Western Lesser	*Siren Siren intermedia nettingi*
Western Pigmy Rattlesnake	*Sistrurus miliarius streckeri*
Rough Green	*Snake Opheodrys aestivus*
Razorback Musk Turtle	*Sternotherus carinatus*
Common Musk Turtle	*Sternotherus odoratus*
Marsh Brown Snake	*Storeria dekayi limnetes*
Midland Brown Snake	*Storeria dekayi wrightorum*
Florida Redbelly Snake	*Storeria occipitomaculata obscura*
Three-toed Box Turtle	*Terrapene carolina baur*
Gulf Coast Ribbon Snake	*Thamnophis proximus orarius*
Western Ribbon Snake	*Thamnophis proximus proximus*
Eastern Garter Snake	*Thamnophis sirtalis sirtalis*
Red-eared Slider	*Trachemys scripta elegans*
Rough Earth Snake	*Virginia striatula*
Western Earth Snake	*Virginia valeriae elegans*

Table 4. Freshwater fishes in the vicinity of the project reach.

COMMON NAME	SCIENTIFIC NAME
Lake Sturgeon	*Acipenser fulvescens*
Alabama Shad	*Alosa alabamae*
Skipjack Herring	*Alosa chrysochloris*
Black Bullhead	*Ameiurus melas*
Yellow Bullhead	*Ameriurus natalis*
Bowfin	*Amia calva*
American Eel	*Anuilla rostrata*
Pirate Perch	*Aphredoderus sayanus*
Freshwater Drum	*Aplodinotus grunniens*
Alligator Gar	*Attactosteus spatula*
Central Stoneroller	*Campostoma anomalum*
River Carpsucker	*Carpiodes carpio*
Quillback	*Carpiodes cyprinus*
Highfin Carpsucker	*Carpiodes velifer*
Flier	*Centrarchus macropterus*
Bluntface Shiner	*Cyprinella camura*
Red Shiner	*Cyprinella lutrensis*
Blacktail Shiner	*Cyprinella venusta*
Gizzard Shad	*Dorosoma cepedianum*
Threadfin Shad	*Dorosoma petenense*
Banded Pygmy Sunfish	*Elassoma zonatum*
Creek Chubsucker	*Erimyzon oblongus*
Lake Chubsucker	*Erimyzon sucetta*
Grass or Redfin Pickerel	*Esox americanus*
Chain Pickerel	*Esox niger*
Mud Darter	*Etheostoma asprigene*
Naked Sand Darter	*Etheostoma beani*
Rainbow Darter	*Etheostoma caeruleum*
Bluntnose Darter	*Etheostoma chlorosomum*
Swamp Darter	*Etheostoma gracile*
Slough Darter	*Etheostoma gracile*
Harlequin Darter	*Etheostoma histrio*
Brighteye Darter	*Etheostoma lynceum*
Goldstripe Darter	*Etheostoma parvipinne*
Cypress Darter	*Etheostoma proeliare*
Scaley Sand Darter	*Etheostoma vivax*
Redfin Darter	*Etheostoma whipplei*
Speckled Chub	*Extrarius aestivalis*
Western Starhead Minnow	*Fundulus blairae*
Golden Topminnow	*Fundulus chrysotus*
Blackstripe Topminnow	*Fundulus notatus*
Blackspotted Topminnow	*Fundulus olivaceus*
Mosquito Fish	*Gambusia affinis*
Goldeye	*Hiodon alosoides*
Mooneye	*Hiodon tergisus*
Cypress Minnow	*Hybognathus hayi*
Mississippi Silvery Minnow	*Hybognathus nuchalis*
Pallid Shiner	*Hybopsis amnis*
Clear Chub	*Hybopsis winchelli*
Northern Hog Sucker	*Hypentelium nigricans*
Chestnut Lampray	*Ichthyomyzon castaneus*
Southern Brook Lampray	*Ichtyomyzon gagei*
Blue Catfish	*Ictalurus furcatus*
Channel Catfish	*Ictalurus punctatus*
Smallmouth Buffalo	*Ictiobus bubalus*
Bigmouth Buffalo	*Ictiobus cyprinellus*
Black Buffalo	*Ictiobus niger*
Spotted Gar	*Lepisosteus oculatus*
Longnose Gar	*Lepisosteus osseus*
Shortnose Gar	*Lepisosteus platostomus*
Orangespotted Sunfish	*Lepomia humilis*
Dollar Sunfish	*Lepomia marginatus*

Table 4, continued

COMMON NAME	SCIENTIFIC NAME
Green Sunfish	*Lepomis cyanellus*
Warmouth	*Lepomis gulosus*
Bluegill	*Lepomis macrochirus*
Longear Sunfish	*Lepomis megalotis*
Redear Sunfish	*Lepomis microlophus*
Spotted Sunfish	*Lepomis punctatus*
Bantam Sunfish	*Lepomis symmetricus*
Rainwater Killfish	*Lucania parva*
Striped Shiner	*Luxilus chrysocephalus*
Ribbon Shiner	*Lythrurus femeus*
Redfin Shiner	*Lythrurus umbratilis*
Sturgeon Chub	*Macrhybopsis gelida*
Silver Chub	*Macrhybopsis storeriana*
Inland Silverside	*Menidia beryllina*
Spotted Bass	*Micropterus punctulatus*
Largemouth Bass	*Micropterus salmoides*
Spotted Sucker	*Minytrema melanops*
White Bass	*Morone chrysops*
Yellow Bass	*Morone mississippiensis*
Bluehead Chub	*Nocomis leptocephalus*
Ironcolor Shiner	*Nostropis chalybaeus*
Golden Shiner	*Notemigonus crysoleucas*
Emerald Shiner	*Notropis atherinoides*
River Shiner	*Notropis blennius*
Ghost Shiner	*Notropis buchanani*
Longnose Shiner	*Notropis longirostris*
Chub Shiner	*Notropis potteri*
Silverband Shiner	*Notropis shumardi*
Weed Shiner	*Notropis texanus*
Mimic Shiner	*Notropis volucellus*
Tadpole Madtom	*Noturus gyrinus*
Speckled Madtom	*Noturus leptacanthus*
Brindled Madtom	*Noturus miurus*
Freckled Madtom	*Noturus nocturnus*
Brown Madtom	*Noturus phaeus*
Pugnose Minnow	*Opsopoeodus emiliae*
Logperch	*Percina caprodes*
Blackside Darter	*Percina maculata*
Saddleback Darter	*Percina ouachitae*
Dusky Darter	*Percina sciera*
Southern Redbelly Dace	*Phoxinus erythrogaster*
Bluntnose Minnow	*Pimephales notatus*
Bullhead Minnow	*Pimephales vigilax*
Flathead Chub	*Platygobio gracilis*
Sailfin Molly	*Poecilia latipinna*
Paddlefish	*Polyodon spathula*
White Crappie	*Pomoxis annularis*
Black Crappie	*Pomoxis nigromaculatus*
Flathead Catfish	*Pylodictis olivaris*
Pallid Sturgeon	*Scaphirhynchus albus*
Shovelnose Sturgeon	*Scaphirhynchus platorynchus*
Creek Chub	*Semotilus atromaculatus*
Sauger	*Stizostedion canadense*

Table 5. Birds in the vicinity of the project reach.

COMMON NAME	SCIENTIFIC NAME
Winter Season	
Sharp-skinned Hawk	*Accipiter striatus*
Spotted Sandpiper	*Actitis macularia*
Western Grebe	*Aechmophorus occidentalis*
Henslow's Sparrow	*Ammodramus henslowii*
Le Conte's Sparrow	*Ammodramus leconteii*
Grasshopper sparrow	*Ammodramus savannarum*
Northern Pintail	*Anas acuta*
Northern Shoveler	*Anas clypeata*
American Wegeon	*Anas penelope*
Mallard	*Anas platyrhynchos*
Gadwall	*Anas strepera*
American Pipit	*Anthus rubescens*
Ruddy Turnstone	*Arenaria interpres*
Short-eared Owl	*Asio flammeus*
Lesser Scaup	*Aythya affinia*
Redhead	*Aythya americana*
Ringed-neck Duck	*Aythya collaris*
Canvasback	*Aythya valisineria*
Cedar Waxwing	*Bombycilla cedrorum*
American Bittern	*Botaurus lentiginosus*
Canada Goose	*Branta canadensis*
Buffelhead	*Bucephala albeola*
Common Goldeneye	*Bucephala clangula*
Sanderling	*Calidris alba*
Dunlin	*Calidris alpina*
Red Knot	*Calidris canutus*
Western Sandpiper	*Calidris mauri*
Least Sandpiper	*Calidris minutilla*
Pine Sisken	*Carduelis pinus*
American Goldenfinch	*Carduelis tristis*
Purple Finch	*Carpodacus purpureus*
Hermit Thrush	*Catharus guttatus*
Brown Creeper	*Certhia americana*
Semipalmated Plover	*Charadrius semipalmatus*
Snow Goose	*Chen caerulescens*
Lark Sparrow	*Chondestes grammacus*
Northern Harrier	*Circus cyaneus*
Marsh Wren	*Cistothorus palustris*
Yellow Rail	*Coturnicops noveboracensis*
Double	*Crested Cormorant*
Yellow-rumped Warbler	*Dendroica coronata*
Gray Catbird	*Dumetella carolinensis*
Rusty Blackbird	*Euphagus carolinus*
Brewer's Blackbird	*Euphagus cyanocephalus*
Merlin	*Falco columbarius*
Peregrine Falcon	*Falco peregrinus*
Common Snipe	*Gallinago gallinago*
Common Loon	*Gavia immer*
Bald Eagle	*Haliaeetus leucocephalus*
Dark-eyed Junco	*Junco hyemalis*
Herring Gull	*Larus argentatus*
Ring-billed Gull	*Larus delawarensis*
Short-billed Dowitcher	*Limnodromus griseus*
Long-billed Dowitcher	*Limnodromus scolopaceus*
Marbled Godwit	*Limosa fedoa*
Hooded Merganser	*Lophodytes cucullatus*
Swamp Sparrow	*Melospiza georgiana*
Lincoln's Sparrow	*Melospiza lincolnii*
Song Sparrow	*Melospiza melodia*
Common Merganser	*Mergus merganser*
Black-and-white Warbler	*Mniotilta varia*

Table 5, continued

COMMON NAME	SCIENTIFIC NAME
Whimbrel	*Numenius phaeopus*
Ruddy Duck	*Oxyura jamaicensis*
Savannah Sparrow	*Passerculus sandwichensis*
Fox Sparrow	*Passerella iliaca*
American White Pelican	*Pelecanus erythrorhynchos*
Eared Grebe	*Podiceps nigricollis*
Vesper Sparrow	*Pooecetes gramineus*
Sora	*Porzana carolina*
Virginia Rail	*Rallus limicola*
Ruby-crowned Kinglet	*Regulus calendula*
Golden-crowned Kinglet	*Regulus satrapa*
Eastern Phoebe	*Sayornis phoebe*
Red-breasted Nuthatch	*Sitta canadensis*
Yellow-bellied Sapsucker	*Sphyrapicus varius*
Western Meadowlark	*Sturnella neglecta*
Green Winged	*Teal Anas crecca*
Bewick's Wren	*Thryomanes bewickii*
Lesser Yellowlegs	*Tringa flavipes*
Greater Yellowlegs	*Tringa melanoleuca*
House Wren	*Troglodytes troglodytes*
Oranged-crowned Warbler	*Vermivora celata*
Solitary Vireo	*Vireo solitarius*
White-throated Sparrow	*Zonotrichia albicollis*
White-crowned Sparrow	*Zonotrichia leucophrys*
Summer and Spring Seasons	
Purple Martin	*Progne subis*
Roseate Spoonbill	*Ajaia ajaia*
Anhinga	*Anhinga anhinga*
Ruby-throated Hummingbird	*Archilochus colubris*
Broad-winged Hawk	*Buteo platypterus*
Green-backed Heron	*Butorides striatus*
Chuck-will's-widow	*Caprimulgus carolinensis*
Chimney Swift	*Chaetura pelagica*
Wilson's Plover	*Charadrius wilsonia*
Common Nighthawk	*Chordeiles minor*
Yellow-billed Cookoo	*Coccyzus americanus*
Eastern Wood-Pewee	*Contopus virens*
Yellow-throated Warbler	*Dendroica dominica*
Reddish Egret	*Egretta rufescens*
American Swallow-tailed Kite	*Elanoides forficatus*
Acadian Flycatcher	*Empidonax virescens*
Blue Grosbeak	*Guiraca caerulea*
Black-necked Stilt	*Himantopus mexicanus*
Barn Swallow	*Hirundo rustica*
Wood Thrush	*Hylocichla mustelina*
Yellow-breated Chat	*Icteria virens*
Orchard Oriole	*Icterus spurius*
Mississippi Kite	*Ictinia mississippiensis*
Least Bittern	*Ixobrychus exilis*
Swainson's Warbler	*Limnothlypis swainsonii*
Wood Stork	*Mycteria americana*
Great Crested Flycatcher	*Myiarchus crinitus*
Kentucky Warbler	*Oporornis formosus*
Northern Parula	*Parula americana*
Painted Bunting	*Passerina ciris*
Indigo Bunting	*Passerina cyanea*
Summer Tanager	*Piranga rubra*
Glossy Ibis	*Plegadis falcinellus*
White-faced Ibis *Plegadis chihi*	*Plegadis falcinellus*
Purple Gallinule	*Porphyrula martinica*
Prothonotary Warbler	*Prononotaria citrea*
Dickcissel	*Spiza americana*
Northern Rough-winged Swallow	*Stelgidopteryx serripennis*

Table 5, continued

COMMON NAME	SCIENTIFIC NAME
Least Tern	*Sterna antillarum*
Eastern Kingbird	*Tyrannus tyrannus*
Yellow-throated *Vireo*	*Vireo flavifrons*
Warbling Vireo	*Vireo gilvus*
Red-eyed Vireo	*Vireo olivaceus*
Hooded Warbler	*Wilsonia citrina*
Year Round Presence	
Anhinga	*Anhinga anhinga*
Coopers Hawk	*Accipiter cooperii*
Red-winged Blackbird	*Agelaius phoeniceus*
Bachman's Sparrow	*Aimophila aestivalis*
Wood Duck	*Aix sponsa*
Great Blue Heron	*Ardea herodias*
Great Horned Owl	*Bubo virginianus*
Cattle Egret	*Bubulcus ibis*
Red-tailed Hawk	*Buteo jamaicensis*
Red-shouldered Hawk	*Buteo platypterus*
Northern Cardinal	*Cardinalis cardinalis*
Great Egret	*Casmerodius albus*
Turkey Vulture	*Cathartes aura*
Willet	*Catoptrophorus semipalmatus*
Belted Kingfisher	*Ceryle alcyon*
Killdeer	*Charadrius vociferus*
Northern Flicker	*Colaptes auratus*
Northern Bobwhite	*Colinus virginianus*
Rock Dove	*Columbia livia*
Common Ground-Dove	*Columbina passerina*
Black Vulture	*Coragyps atratus*
Amerian Crow	*Corvus brachyrhynchos*
Fish Crow	*Corvus ossifragus*
Blue Jay	*Cyanocitta cristata*
Pine Warbler	*Dendroica pinus*
Pileated Woodpecker	*Dryocopus pileatus*
Little Blue Heron	*Egretta caerulea*
Snowey Egret	*Egretta Thula*
Horned Lark	*Eremophila alpestris*
White Ibis	*Eudocimus albus*
American Kestrel	*Falco sparverius*
American Coot	*Fulica americana*
Common Morehen	*Gallinula chloropus*
Common Yellowthroat	*Geothlypis trichas*
Loggerhead Shrike	*Lanius ludovicianus*
Laughing Gull	*Larus atricilla*
Red-bellied Woodpecker	*Melanerpes carolinus*
Red-headed Woodpecker	*Melanerpes erythrocephalus*
Wild Turkey	*Meleagris gallopavo*
Northern Mockingbird	*Mimus polyglottos*
Brown-headed Cowbird	*Molothrus ater*
Yellow-crowned Night-Heron	*Nyctanassa violacea*
Black-crowned Night-Heron	*Nycticorax nycticorax*
Eastern Screech-Owl	*Otus asio*
Tufted Titmouse	*Parus bicolor*
Carolina Chickadee	*Parus carolinensis*
House Sparrow	*Passer domesticus*
Red-cocaded Woodpecker	*Picoides borealis*
Downy Woodpecker	*Picoides pubescens*
Hairy Woodpecker	*Picoides villosus*
Rufous-sided Towhee	*Pipilo erythrophthalmus*
Pied-billed Grebe	*Podilymbus podiceps*
Blue-gray Gnatcatcher	*Polioptila caerulea*
Great-tailed Grackle	*Quiscalus mexicanus*
Common Grackle	*Quiscalus quiscula*
King Rail	*Rallus elegans*

Table 5, continued

COMMON NAME	SCIENTIFIC NAME
Clapper Rail	*Rallus longirostris*
American Woodcock	*Scolopax minor*
Eastern Bluebird	*Sialia sialis*
White-breasted Nuthatch	*Sitta carolinensis*
Brown-headed Nuthatch	*Sitta pusilla*
Chipping Sparrow	*Spizella passerina*
Field Sparrow	*Spizella pusilla*
Forster's Tern	*Sterna forsteri*
Gull-billed Tern	*Sterna nilotica*
Eastern Medowlark	*Sturnella magna*
European Starling (Introduced)	*Sturnus vulgaris*
Carolina Wren	*Thryothorus ludovicianus*
Brown Thrasher	*Toxostoma rufum*
American Robin	*Turdus migratorius*
Barn Owl	*Tyto alba*
White-eyed Vireo	*Vireo griseus*
Mourning Dove	*Zenaida macroura*

species found year round within the vicinity of the proposed project item include the red-winged blackbird (*Agelaitus phoeniceus*), red-tailed hawk (*Buteo platypterus*), great egret (*Bubulcu ibis*), great blue heron (*Ardea herodias*) and great horned owl (*Bubo virginianus*). Numerous bird species only represent spring, summer and winter inhabitants of the area encompassing the proposed project item. Notable bird species that inhabit the area during these seasons include the barn swallow (*Hirundorustica*), Mississippi kite (*Ictinia mississippiensis*), ruby-throated hummingbird (*Archilochus colubris*), and the reddish egret (*Egretta rufescens*). Bird species present during the winter season include the sparrow (*Ammodramus* sp.), sandpiper (*Calidris* sp.), American bittern (*Botaurus lentiginosus*), and the common loon (*Gavia immer*).

Climate in the Vicinity of the Proposed Project Items

Ascension Parish, Louisiana enjoys a humid subtropical climate. The mean annual temperature of the area attains a high of 78° F (26° C) and a low of 58° F (14° C). July and August are the hottest months, with an average daily temperature of 91° F (33° C). During winter, the mean daily minimum temperature declines to a low of 42° F (5.5° C) in January. Approximately 14 days of the year experience temperatures below 32° F (0° C). The winter is characterized by alternating cool and warm periods, as cold air fronts from Canada displace warmer air masses derived from the Gulf of Mexico.

The precipitation within Ascension Parish area averages 145.2 cm (57.2 in) annually and it is relatively evenly distributed throughout the year. During the cooler months, precipitation occurs typically as a result of movement along the periphery of cool and warm fronts and also as a result of cyclonic storms that originate over the Gulf of Mexico. In contrast, precipitation during the summer months occurs usually as a result of afternoon thunderstorms. October and November are the driest months of the year, with average precipitation totals of less than 10 cm (3.9 in) per month; July typically is the wettest month, with an average of 8.6 cm (3.4 in) of rainfall. The average relative humidity in Ascension Parish measures approximately 75 percent. During the late fall, winter, and early spring months, however, humidity may drop to as low as 25 percent, as cold air masses from Canada displace warm, moist air from the Gulf of Mexico.

CHAPTER III

PREHISTORIC SETTING

Introduction

This chapter describes the prehistoric cultural setting of the proposed project area in Ascension Parish, Louisiana. The Areas of Potential Effect are located along the right descending bank of the Mississippi River, and within Management Unit V as defined by *Louisiana's Comprehensive Archaeological Plan* (Smith et al. 1983). A total of eight major cultural units are used to characterize the prehistoric cultural sequence of Management Unit V. These units include: the Paleo-Indian (10,000 - 6000 B.C.), Archaic (8000 -1000 B.C.), Poverty Point (2000 - 500 B.C.), Tchefuncte (500 B.C. - A.D. 0), Marksville (100 B.C. - A.D. 400), Troyville-Coles Creek (A.D. 400 - 1200), Emergent Mississippian - Plaquemine (A.D. 1000 - 1200), and Mississippian (A.D. 1200 - 1700). Each cultural unit is described in turn below. Both the quantity and quality of the information currently known about each of these units are reflected in this discussion. Because some of these units are only poorly understood, pertinent data collected throughout the southeastern United States have been utilized to supplement this discussion.

Paleo-Indian Stage (10,000 - 6000 B.C.)

The initial human occupation of the southeastern United States generally is believed to have occurred sometime between 12,000 and 10,000 years ago (10,000 – 8000 B.C.). Archeologists have termed the earliest inhabitants to occupy this region Paleo-Indians. Archeological sites dating from this time period are characterized by a distinctive assemblage of lithic tools that include fluted and unfluted lanceolate projectile points/knives, unifacial end- and side-scrapers, gravers, and spokeshaves. In Louisiana, evidence of human occupation dating from this time period largely has been confined to the upland areas (tertiary uplands or floodplain bluffs) in the northwestern part of the state. It is unlikely that Paleo-Indians occupied the project area since habitable landforms did not exist in the project vicinity during this time. As a result, the probability of identifying evidence of Paleo-Indian occupation within the confines of the current project items is extremely low.

The earliest Paleo-Indian culture identified in North America has been named "Clovis," after the type-site in New Mexico. In the western United States, Clovis sites date from a relatively narrow period, i.e., between 8900 and 9500 B.C. (Haynes 1991; Story et al. 1990:178). The lithic tool assemblage of the Clovis Culture, and the similar Folsom Culture of the Great Plains and Southern Plains, generally is referred to as the Llano complex. While the Folsom Culture initially was believed to postdate the Clovis Culture, radiocarbon dates from Folsom component sites in Texas have produced dates ranging from ca. 8000 to 9000 B.C. (Largent et al. 1991:323-332; Story et al. 1990:189). These dates suggest that the Folsom Culture may be partially contemporaneous with Clovis Culture.

The co-occurrence of Pleistocene megafauna and several Paleo-Indian projectile points (see Brush and Smith 1994; Clausen et al. 1979; Webb et al. 1984) has led most researchers to accept the interpretation that southeastern Paleo-Indian peoples fulfilled at least a portion of their subsistence requirements by hunting and/or scavenging megafauna, including bison, mammoth and mastodon, that were present on the North American continent at the end of the

Pleistocene (Anderson et al. 1996). Current discussions among archeologists, however, have focused on the relative amount of food that these animals provided to the Paleo-Indian groups.

Some researchers (e.g., Meltzer and Smith 1986; Smith 1986) suggest that Pleistocene megafauna comprised only a small portion of the subsistence regime for Paleo-Indian peoples; others argue that megafauna provided a substantial portion of the Paleo-Indian diet (Anderson 1995; Anderson et al. 1996). Anderson (1995:151), for example, stated that "modern fauna (i.e., deer and smaller mammalian species like rabbits, raccoons, opossums, etc.) were taken only when megafauna were not readily available, and comprised second-line resources." It is likely that until more associations of Pleistocene megafauna and Paleo-Indian cultural materials and features are identified, that the role these megafauna played in the Paleo-Indian diet will not be understood clearly. Although there is little data upon which to base a firm dietary model, Paleo-Indian subsistence throughout the Southeast is believed to have encompassed a broad spectrum of resources, including fish, fowl, deer, small mammals, nuts, and gathered plants, as well as megafauna (Smith 1986:9-10; Steponaitis 1986:369; Walthall 1980:36).

Most of the archeological evidence associated with the Paleo-Indian occupation of the southeastern region is limited to surface finds of diagnostic projectile points/knives (Mason 1962). In the Lower Mississippi Valley, Paleo-Indian projectile points/knives have been recovered along valley margins but rarely in the alluvial valley or along the coastal plain. Distributional studies indicate that Paleo-Indian sites in the eastern United States tend to be located on eroded terrace and plateau surfaces (Walthall 1980).

The presence of Paleo-Indian peoples in the Lower Mississippi Valley is best documented from Maçon Ridge in northeast Louisiana. Hillman (1985) provided a prehistoric overview of the Paleo-Indian stage at Maçon Ridge that suggested that continuous human occupation of the ridge began sometime around 8000 B.C. Diagnostic projectile points/knives identified at Maçon Ridge date from the Early Paleo-Indian period (Clovis, Sandia II, and unfluted lanceolate points), the Middle Paleo-Indian period (Plainview, Scottsbluff, Quad, Hell Gap, and Pelican), and the later, transitional, "Epipaleoindian" period (Dalton, Hardin, and San Patrice projectile points). The latter period, i.e., the Epipaleoindian, originally was used by Gibson (1982) to discuss the transitional period between the Late Paleo-Indian and Early Archaic periods.

The distribution of recorded sites on Maçon Ridge suggests that this area was occupied more intensively during the Late Paleo-Indian period. Hunting camps and base camps dating from the Late Paleo-Indian period typically occur very close to streams, ponds, or sloughs, and on landforms that generally are no more than 1 m (3.3 ft) above the water source. This pattern may indicate a preference for the wooded fringes along the waterways rather than open grasslands. In contrast, Early Archaic period sites usually occur on higher elevations; this shift may reflect a transformation in the natural setting of Maçon Ridge from open grassland to open woodland (Hillman 1990).

Brain (1983) states that Paleo-Indian projectile points/knives have been recovered along some of the relict channels of the Mississippi River and from remnant Pleistocene surfaces in the floodplain that pre-date ca. 7000 B.C. In Louisiana, Paleo-Indian sites generally are found along tertiary upland ridges and uplands/floodplain bluffs (Guy and Gunn 1983). Projectile points/knives such as Clovis, Folsom, Scottsbluff, and Plainview have been recovered from these sites. Although the majority of these projectile points/knives have been found in northern Louisiana, a few have been found on late Pleistocene age Prairie Terrace deposits in southern Louisiana.

Louisiana's Comprehensive Archaeological Plan indicates that no Paleo-Indian sites thus far have been recorded in Ascension Parish. This lack is not surprising given the erratic nature of Mississippi River meandering. Paleo-Indian sites may once have existed within this parish, but they probably have been destroyed by river scouring or deeply buried by alluvial deposition.

Archaic Stage (8000 - 1000 B.C.)

The term "Archaic" was coined as a descriptor for the pre-ceramic cultures that succeeded the Paleo-Indian stage. A new combination of technological and social developments is

associated with the beginning of this stage. These developments are believed to have resulted from a warming trend, a drier climate, and a rise in sea level that occurred at the end of the Pleistocene Epoch (Willey and Phillips 1958). These changes have been correlated with the development of highly diverse and localized resource and food procurement strategies (Haag 1971). Caldwell (1958), for example, described the new hunting and gathering specializations of the Archaic stage as "maximum forest efficiency." Brain (1971) modified this phrase to "maximum riverine efficiency" in reference to the exploitation of southeastern riverine and coastal environments during this time period.

The Paleo-Indian to Archaic stage transition was accompanied by a change in projectile point/knife morphology. These changes included the emergence of a wide variety of notched and stemmed projectile point/knife forms and the disappearance of the fluted projectile point/knife type. Nevertheless, archeological evidence suggests that there was some continuity between the adaptations of the Paleo-Indian and the later Archaic peoples who occupied the Southeast (Smith 1986). Archaic stage projectile point/knife sequences follow a general trend in haft morphology that progresses from side notched to corner notched to stemmed basal forms. Other Archaic stage flaked stone artifact types included adzes, scrapers, and choppers. During the latter half of this time period, granitic rock, chert, jasper, sandstone, slate, steatite, and scoria were ground and polished into a variety of stone ornaments and tools, which included beads, gorgets, bowls, and celts/axes.

The Archaic stage generally is divided into three subdivisions or periods: Early Archaic, Middle Archaic, and Late Archaic. Each of these periods is discussed below.

Early Archaic Period (8000 - 5500 B.C.)

In the Southeast, the Early Archaic period generally began ca. 8000 - 6000 B.C. Because of regional cultural variation and the temporal overlapping of stages, however, a number of researchers view cultural developments in the early portion of this period as transitional in nature between the Late Paleo-Indian and Early Archaic cultures. As mentioned above, Gibson (1982) used the term "Epipaleoindian" to describe this transition. Hillman (1985) included the Dalton, Hardin, and San Patrice projectile point/knife types in his review of the transitional period at Maçon Ridge. Dalton projectile points/knives temporally succeeded Clovis projectile points/knives and they have been dated between 8550 - 7950 B.C. from contexts in both Arkansas and Missouri (Goodyear 1982:328). At the Stanfield-Worley Bluff Shelter (1CT125) in northwestern Alabama, the Dalton component dated from ca. 7750 - 7050 B.C. (DeJarnette et al. 1962; Griffin 1974). Dalton projectile points/knives dating from 6700 to 6450 B.C. also have been recovered in association with Kirk Notched, LeCroy, Rice Stemmed, and Graham Cave projectile points/knives in Horizon 11 at the Koster Site (11GE4) in southern Illinois. This date range suggests that Dalton projectile points/knives may extend later in time than initially was assumed.

Dalton projectile points/knives also have been recovered in association with bifacially chipped stone adzes that may have been used as woodworking tools. Chipped and ground stone celts, probably the functional equivalent of Dalton adzes, have been recovered from the Kirk Horizon in Zone 16 at the St. Albans Site (46WV27) in West Virginia and from Early Archaic sites in the Little Tennessee River Valley (Smith 1986:14). In Louisiana, artifacts associated with the Dalton Culture usually are restricted to the northern portion of the state.

Some of the earliest recognized Terminal Paleo-Indian/Early Archaic projectile point/knife types identified in Louisiana are the San Patrice, Keithville, and Pelican forms (Webb et al. 1971). San Patrice projectile points/knives originally were ascribed to an area encompassing northwest Louisiana, northeast Texas, and southern Arkansas. More recently, however, San Patrice projectile points/knives have been recovered from sites ranging from central Texas to southwest Alabama, and from southern Louisiana to central Arkansas (Brain 1983:32; Cantley et al. 1984).

The San Patrice Culture is believed to represent a regional adaptation of hunter-gatherers to the natural resources of the area. A hallmark of San Patrice is the almost exclusive use of local lithic materials for tool production. Tool assemblages include San Patrice *var. Hope* and

St. John projectile points/knives, hafted scrapers, Albany side-scrapers, unifacial scrapers, burins, and engravers (Webb et al. 1971). Recently, Keithville *var. A* and *B*, San Patrice *var. Geneill*, and New River projectile point/knife types also have been recognized in this assemblage (Brain 1983). Unfortunately, reliable radiocarbon dates for these types virtually are non-existent. Estimates based on tool morphology and stratigraphic position, however, range from ca. 8050 to 6050 B.C. (Brain 1983:25; Story et al. 1990:202; Turner and Hester 1985:147; Webb 1981). While Ensor (1986) suggested that the San Patrice projectile point/knife type, and related forms in the Southeast, may have developed from the earlier Dalton projectile point/knife forms, Story et al. (1990:197) argued that both Dalton and San Patrice types evolved from the earlier fluted point traditions.

Subsistence strategies associated with the Early Archaic period resembled those of the preceding Paleo-Indian stage. Early Archaic peoples traveled seasonally in small groups between a series of base camps and extractive sites, hunting game and collecting seasonally available edible plants (Chapman and Shea 1981; Lentz 1986; Parmalee 1962; Parmalee et al. 1976). The earliest examples of tools associated with food processing, including manos, milling stones, and nutting stones, have been recovered from Early Archaic period sites. Commonly utilized plant foods, such as walnuts, hickory nuts, and white oak acorns, could be hulled and eaten without cooking or additional processing (Larson 1980). Herbaceous seeds, which became an important food source later in the Archaic stage, generally were not utilized during the Early Archaic period (Chapman 1977; Lentz 1986). While living floors associated with hearths, shallow pit features, and milling tools are known from the Early and Middle Archaic periods, there is little evidence of subterranean food storage or of substantial dwelling structures (Steponaitis 1986:371).

Middle Archaic Period (5500 – 3000 B.C.)

During the Middle Archaic period, new social developments, possibly resulting from widespread environmental changes, affected the trajectory of prehistoric cultures. First, the effects of continental glaciation subsided, resulting in a warmer and drier climate with modern climatic and environmental conditions prevailing. Second, technological improvements, including the use of groundstone, bone, and antler implements, may have been related to adaptations to the changing environment. And finally, in some areas, there is evidence of an increased number of ranked societies.

The Middle Archaic period in the Southeast is marked by several technological advances and by changes in subsistence patterns. Temporally diagnostic Middle Archaic projectile points tend to be stemmed rather than notched. In Louisiana, they include Morrow Mountain, Johnson, Edgewood, and possibly Calcasieu types (Campbell et al. 1990:96; Green 1991; Perino 1985:195). Excavations at Site 16VN791 in Vernon Parish, in western Louisiana, produced evidence of a long tradition of corner notched projectile points/knives beginning in the late Middle Archaic period. It has been suggested that these points, and others in the region, were derived from types indigenous to central Louisiana (Campbell et al. 1990). Other technological innovations include the appearance of ground, pecked, and polished stone tools, as well as the use of celts and grooved axes for heavy woodworking, such as dugout canoe manufacture. The *atl atl*, or spear thrower, also first appeared during the Middle Archaic period.

The widespread occurrence of plant processing tools such as milling slabs, manos, and nutting stones, suggests an increase in the utilization of plant foods. Comparisons of floral and faunal assemblages recovered from Early and Middle Archaic period sites, however, indicate little change in the diversity or relative importance of the species utilized. The Middle Archaic period rough milling tools used in plant processing all have Early Archaic antecedents (Smith 1986:21).

Acorns and hickory nuts continued to be the dominant plant foods consumed during the Middle Archaic period. The remains of squash (*Cucurbita pepo*) and bottle gourds (*Lagenaria siceraria*), however, appear for the first time during the Middle Archaic. The earliest occurrence of the bottle gourd was reported from the Windover Site (8BR246) in Florida and it dated from 5340 ± 120 B.C. (Doran et al. 1990). "Squash" rinds dating from 5050 B.C. were re-

covered from the Napoleon Hollow and Koster sites in west-central Illinois. Although initially identified as the cultivar *C. pepo*, these remains are now thought to consist of the Texas wild gourd, *C. texana*, rather than cultivated squash. Although the seeds of these plants are edible, it appears that their rinds were thin, woody, and inedible; the gourds probably were collected primarily for use as containers rather than as a source of nutrition. Stronger evidence for the domestication of squash gourds occurs after 2350 B.C. (Smith 1987).

A significant increase in the utilization of fish and shellfish also occurred in many areas during the Middle Archaic period. The increasing importance of aquatic resources can be seen in the development of extensive shell middens found along many southeastern rivers. Shell middens first appeared between 4550 and 4050 B.C. during the Hypsithermal climatic episode. At that time, rivers entered a phase of aggradation and low flow that promoted the development of oxbow lakes and shallow water shoals. These habitats were favorable for mollusk growth and shellfish collection (Stein 1982). Although the food value of mollusks is low, they can be collected efficiently in bulk and they appear to have formed the foundation of the subsistence base for many semi-sedentary Archaic stage groups that resided in the southeastern United States (Russo et al. 1992).

Extensive, deep shell midden sites presumably represent locations that seasonally were reoccupied by small social groups with band-type sociopolitical organization. Excavation at other site types likewise suggests the seasonal re-occupation of areas by Middle Archaic period peoples. Large cemeteries at some Middle Archaic period sites, such as Carleston Annis (15BT5) in Kentucky, as well as Windover (8BR246) and Little Salt Spring (8SO18) in Florida, included interments established over long periods of time by groups seasonally returning to those locations (Clausen et al. 1979; Milanich 1994). These patterns may have resulted from increasing population levels during the Middle Archaic that may have led to more circumscribed territories. Territorialization is indicated by the repeated occupation of favored locations, the development of thick shell middens, and the increased emphasis on locally available raw materials utilized in stone tool production.

Late Archaic Period (3000 – 1000 B.C.)

The Late Archaic represents a time of population growth as demonstrated by an increased number of sites dating from this time period in the eastern United States. Hallmarks of the Late Archaic period include the introduction of steatite stone vessels, fiber-tempered pottery, and groundstone artifacts. Each of these artifact classes has been recovered from Late Archaic period sites throughout the Southeast. In Louisiana, projectile point/knife types dating from this time period include both corner notched and stemmed forms.

Throughout the eastern United States, Late Archaic subsistence strategies focused on a few wild resources, including deer, mussels, fish, and nuts. Jenkins (1979) recognized a seasonal procurement strategy in Middle Tennessee dating from the Late Archaic period. In the spring, macrobands formed to exploit forested riverine areas. In late fall and winter, however, the Late Archaic groups fissioned into microbands and subsisted on harvested and stored nut foods and on faunal species commonly found in the upland areas. A similar seasonal procurement strategy may have existed in Louisiana.

Late Archaic period projectile point/knife types are commonly found throughout Louisiana. Very few discrete and intact archeological deposits dating from this time period, however, have been excavated systematically, analyzed, and comprehensively reported (Neuman 1984). Late Archaic sites in the west-central and northern parts of the state that have been studied systematically have produced projectile point/knife types that include Bulverde, Carrollton, Delhi, Ellis, Ensor, Epps, Gary, Kent, Macon, Marcos, Palmillas, Pontchartrain, Sinner, and Yarbrough types. Groundstone objects recovered from these sites include celts/axes, plummets, and steatite bowl fragments (Campbell et al. 1990; Jeter et al. 1989; Smith 1975). In addition, there is evidence for widespread trade in shell, copper, slate, greenstone, and jasper ornaments, including carved stone zoomorphic locust beads, during Late Archaic times (Blitz 1993; Brose 1979; Smith 1986:31; Steponaitis 1986:374).

Mounds appear for the first time in the Late Archaic some time before 2000 B.C. (Gibson and Shenkel 1988:9-10). Saunders et al. (1992) believe that mounds constructed during this time period are datable based on the age of the landforms, the eluviation of fill clays from the A and E horizons to the Bt Horizon, and a lack of post Archaic stage artifacts. Currently, only four possibly Late Archaic mounds or mound complexes have been identified in northern Louisiana (Saunders et al. 1992). These sites include the Hedgepeth Mounds (Site 16LI7), the Watson Brake Mounds (Site 16OU175), the Frenchman's Bend Mounds (Site 16OU259), and Hillman's Mound (Site 16MA201).

More recently, Saunders (1994, 1996) hypothesized that mound building began as early as the Middle Archaic period. The Watson Brake Mound Site (16OU175), located near Monroe, Louisiana was identified by Northeast Louisiana University student Reca Jones in the 1970s. The site was described as circular in configuration with a diameter of approximately 275 m (900 ft); it encompassed 11 separate mounds, with each mound measuring between 1 and 6 m (3 and 20 ft) in height. Well preserved food remains recovered from the site, indicate that the Watson Brake mound group was occupied seasonally for fishing purposes. Recent research by Saunders strongly suggests that the earthworks on the Watson Brake Site are older than previously suspected, and that the mounds were constructed approximately 5,400 years ago. If this date is accurate, the mounds at the Watson Brake Site would represent the earliest example of a prehistoric earthwork in North America. This recent discovery contradicts the assumption that Middle Archaic hunting and gathering societies could not achieve the level of social organization necessary for the construction of the earthen mounds.

Poverty Point Culture (2000 - 500 B.C.)

Poverty Point represents a transitional culture that originated as early as ca. 2000 B.C., but it did not exert its full influence until much later (Neuman 1984). It is best known for exhibiting several fundamental and distinguishing characteristics of a complex society, including massive public architecture and long distance trade, while still maintaining a hunting and foraging economy. The Poverty Point type site (16WC5) is located adjacent to Bayou Maçon and near several major rivers, including the Mississippi, Tensas, Ouachita, and Boeuf, in West Carroll Parish, Louisiana. This riverine location was ideal for exploiting the flow of trade goods from other regions (Jeter and Jackson 1990:142; Muller 1978; Neitzel and Perry 1977). Evidence for long distance trade recovered at Poverty Point includes ceramics similar to those collected from the St. Johns River region of Florida, and lithic materials from deposits in Arkansas, Illinois, Indiana, Missouri, Ohio, Oklahoma, and Tennessee (Connaway et al. 1977:106-119; Gibson 1974:26, 1979, 1994; Jeter and Jackson 1990; Lehmann 1982:11-18; Webb 1982:13-14). These data suggest that Poverty Point Culture may represent the first chiefdom-level society to develop in the eastern United States (Gibson 1985a; Muller 1978).

The Poverty Point type site (16WC5) is distinguished primarily by its large earthworks and its complex microlithic industry. The earthwork includes six, 15 to 46 m (50 to 150 ft) wide, segmented ridges that formed five sides of an octagon, and several other mounds scattered throughout the site area. The largest mound, Mound A, resembles a bird, and this mound may represent a large-scale earthen effigy (Webb 1982). At the time of its construction, Poverty Point was the largest mound site in the Americas.

The material culture associated with the Poverty Point Culture is quite distinctive. Typical Poverty Point Culture projectile points include Carrollton, Delhi, Epps, Gary, Kent, Motley, and Pontchartrain types (Smith et al. 1983:152; Webb 1982:22, 47). Although these point types were in use during the Archaic stage, they also were manufactured during Poverty Point times (Gibson 1994). Other artifacts associated with the Poverty Point Culture include atl atl weights, plummets, two hole gorgets, red jasper beads and owl pendants, Jaketown perforators, finger-impressed baked clay cooking balls, clay figurines and fetishes, thin micro flints/blades, and food storage and preparation containers (Webb 1982). Container types included sandstone and steatite vessels, basketry, and ceramic vessels. Most ceramic vessels were sand tempered, although a minority contained

grit, clay, or fiber temper or no temper at all. Webb (1982) also reported the recovery of seed processing implements, stone hoes, nutting stones, and milling stones from Poverty Point sites.

While Brain (1971) argued that Poverty Point sites tended to be located in the bottomlands, Webb (1982) suggested that they occurred across four different landform types. These included: (1) Quaternary terraces or older landforms that overlook major stream courses; (2) major river levees of active or relict river channels; (3) river-lake confluences; and (4) coastal estuaries or older landform located within a coastal marsh area. These areas were ideal for exploiting forest-edge resources and for transporting exotic materials. Sites on these landforms ranged in size from large ceremonial centers to small hamlets or foraging stations.

Woodland Stage (1000 B.C. - A.D. 1200)

The emergence of the Woodland stage in Louisiana prehistory was characterized by a combination of the introduction of horticulture, the initial use of the bow and arrow, and the widespread adoption of ceramic containers. The Woodland stage includes three divisions or periods: Early Woodland, Middle Woodland, and Late Woodland. In Louisiana, the Early Woodland period (ca. 500 B.C - A.D. 1) is represented by the Tchefuncte Culture, the Middle Woodland period (ca. 100 B.C. - A.D. 400) is associated with the Marksville Culture and to a lesser extent with the Troyville Culture, and the Late Woodland period (ca. A.D. 400 - 1200) originated with the Troyville Culture, but later was dominated by the Coles Creek Culture. A discussion of each of these cultures is presented below.

Tchefuncte Culture (500 B.C. - A.D. 1)

While the Tchefuncte Culture is characterized by the first widespread use of pottery, its tool inventory otherwise resembled that of a Late Archaic period hunter-gatherer tradition (Byrd 1994; Neuman 1984; Shenkel 1981:23). The Tchefuncte Culture first was identified at the type site (16ST1) located on the north shore of Lake Pontchartrain in St. Tammany Parish, Louisiana (Ford and Quimby 1945; Weinstein and Rivet 1978). Later, the Tchefuncte Culture was defined by Ford and Quimby (1945) based on Works Progress Administration (WPA) excavations at Big Oak Island (16OR6) and the Little Woods Site (16OR1-5) in Orleans Parish during the 1930s and 1940s. While the Tchefuncte Culture initially was thought to represent a local adaptation by an indigenous population in the southern Louisiana coastal region (Ford and Quimby 1945), Tchefuncte or Tchefuncte-like ceramics have been recovered from southeast Missouri, northwest Mississippi, the Yazoo Basin, coastal Alabama, and east Texas (Brookes and Taylor 1986:23-27; Mainfort 1986:54; Neuman 1984; Webb et al. 1969:32-35; Weinstein 1986:102).

A date range from ca. 500 B.C. - A.D. 100 generally has been accepted for the Tchefuncte Culture; however, recent research indicates that dates for the Tchefuncte Culture differ widely from region to region and occasionally even within the same area (Byrd 1994; Gibson 1976a, 1976b:13; Webb et al. 1969:96; Weinstein 1986). Most archeologists agree that the Tchefuncte Culture dates from as early as 700 B.C. in the south, and that it diffused to the north where it is known as the Tchula Culture; it terminated around A.D. 100 (Gibson and Shenkel 1988:14; Perrault and Weinstein 1994:48-49; Shenkel 1974:47; Toth 1988:19). Recent evidence suggests that coastal Tchefuncte sites may have survived until ca. A.D. 300 (Byrd 1994:23; Neuman 1984:135). These dates suggest that the last remaining coastal Tchefuncte communities were coeval with sites associated with the late Marksville Culture (Toth 1988:27-28).

Tchefuncte/Tchula ceramics usually are characterized by a soft, chalky paste, and a laminated appearance in cross-section. They were fired at low temperatures and they were tempered either with sand or clay (Phillips 1970). Vessel forms consisted of bowls, cylindrical and shouldered jars, and globular pots that sometimes exhibited podal supports. While many vessels were plain, some were decorated with punctations, incisions, simple stamping, drag and jab, and rocker stamping. Punctated types usually were more numerous than the stamped types, but parallel and zoned banding, stippled triangles, chevrons, and nested diamonds also occur. During the later part of this period, red filming also was used to decorate

some vessels (Perrault and Weinstein 1994:46-47; Phillips 1970; Speaker et al. 1986:38). Tchefuncte/Tchula ceramic types included Alexander Incised, Wheeler Simple Stamped, Wheeler Punctated, Jaketown Simple Stamped, three Tchefuncte types (Plain, Stamped, and Incised), and Lake Borgne Incised (Ford et al. 1955). In addition, Ford et al. (1955) identified a variety of fiber-tempered and fiber impressed ceramic types.

For the most part, the stone and bone tool assemblages characteristic of the Tchefuncte Culture remained nearly unchanged from the preceding Poverty Point times. Stone tools included boat stones, grooved plummets, chipped celts, and sandstone saws; bone tools included awls, fishhooks, socketed antler points, and ornaments. In addition, containers, punches, ornamental artifacts, and some tools such as chisels, were manufactured from shell. Projectile point/knife types characteristic of Tchefuncte Culture include Gary, Ellis, Delhi, Motley, Pontchartrain, Macon, and Epps types (Ford and Quimby 1945; Smith et al. 1983:163). Bone and antler artifacts, such as points, hooks, awls, and handles, also became increasingly common during this period.

Interior Tchefuncte/Tchula sites generally are classified as villages or hamlets, although shell middens also have been identified. Settlement usually occurred along the slack water environments of slow, secondary streams that drained bottomlands and floodplain lakes (Neuman 1984; Toth 1988:21-23). Both burials and artifacts recovered at Tchefuncte period sites suggest an egalitarian social organization. Tchefuncte/Tchula peoples probably were organized at the band level, with as many as 25 to 50 individuals per band. The widespread distribution of similar ceramic types and motifs may imply a patrilocal residence pattern with exogamous band marriage arrangements (Speaker et al. 1986:39). Social organization probably remained focused within macrobands, and hunting, collecting, and fishing remained integral to the Tchefuncte/Tchula way of life.

Data recovered from Tchefuncte sites document the wide variety of food resources utilized during the period. Faunal remains recovered from these sites include deer, opossum, muskrat, raccoon, otter, bear, fox, dog, ocelot, wildcat, wildcat, alligator, bird, fish, shellfish, and turtle (both aquatic and terrestrial). Recovered plant remains (all non-domesticated) include squash, gourds, plums, nuts, grapes, and persimmons (Neuman 1984; Smith et al. 1983). Neuman (1984) noted that the remains of crustaceans such as crabs, shrimp, and crawfish do not appear within Tchefuncte/Tchula middens.

Marksville Culture (100 B.C. - A.D. 400)

The Marksville Culture, named for the Marksville Site (16AV1) in Avoyelles Parish, Louisiana, often is viewed as a local manifestation of the midwestern Hopewellian Culture, which extended down the Mississippi River from Illinois (Toth 1988:29-73). Complex geometric earthworks, conical burial mounds for elites, and unique mortuary ritual systems indicate a highly organized social structure during Marksville times. Some items, such as elaborately decorated ceramics, were manufactured primarily as mortuary objects. Burial items included pearl beads, carved stone effigy pipes, copper ear spools, copper tubes, galena beads, and carved coal objects. Hopewellian influences declined and mortuary practices became less complex, however, toward the end of the Marksville period (Smith et al. 1983; Speaker et al. 1986).

Ceramic decorative motifs such as cross-hatching, U-shaped incised lines, zoned dentate rocker stamping, cord-wrapped stick impressions, stylized birds, and bisected circles were shared by potters in the Marksville and Hopewell Cultures (Toth 1988:45-50). Other Marksville traits include a stone tool assemblage of knives, scrapers, celts, drills, ground stone atl atl weights, plummets, medium to large stemmed projectile points, bone awls and fishhooks, and baked clay balls. In addition, a variety of non-local artifacts commonly found at Marksville sites suggests the existence of extensive trade networks and possibly a ranked, non-egalitarian society. Some commonly recovered items include imported copper earspools, panpipes, platform pipes, figurines, and beads (Neuman 1984; Toth 1988:50-73).

Little currently is known about Marksville subsistence. Presumably, Marksville peoples employed a hunting, fishing, and gathering subsistence strategy much like those associated with

earlier periods. Oily seeds, such as marshelder (*Iva annua*), sunflower (*Helianthus annus*), and squash (*Cucurbita pepo*), and starchy seeds, such as goosefoot (*Chenopodium* sp.), maygrass (*Phalaris caroliniana*), knotweed (*Polygonum* sp.), and little barley (*Hordeum pusillum*), also were consumed (Fritz and Kidder 1993:7; Smith 1986:51). At the Reno Brake Site (16TE93) in Tensas Parish, Kidder and Fritz (1993) recovered the remains of deer, squirrel, rabbit, bird, and fish, as well as acorns, persimmon, palmetto, grapes, blackberries, and very minor amounts of *Chenopodium* and marshelder. Although maize has been identified and dated from Middle Woodland contexts at sites in Tennessee and Ohio (Ford 1987), it probably was not important in Louisiana until Mississippian times (Fritz and Kidder 1993:7, 294; Smith 1986:50-51).

Troyville-Coles Creek Period (A.D. 400 - 1200)

Troyville Culture, elsewhere described as Baytown, was named after the Troyville mound group (16CT7) in Jonesville, Catahoula Parish, Louisiana. It represents a transition from the Middle to Late Woodland period that culminated in the Coles Creek Culture (Gibson 1984). Though distinct, Troyville and Coles Creek cultures are sufficiently similar that many researchers interpret them as a single prehistoric cultural unit. According to Neuman (1984:169), 23 C^{14} dates from 14 Troyville sites in Louisiana place the beginning of the period at approximately A.D. 395. Continuing developments in agriculture and the technological refinement of the bow and arrow during this time period (reflected by the appearance of Alba, Catahoula, Friley, Hayes, and Livermore projectile point types) radically altered prehistoric life. During the Troyville cultural period, bean (*Phaseolus vulgaris*) and squash agriculture may have became widespread. This shift in subsistence practices probably initiated the development of more complex settlement patterns and social organization.

The Late Woodland Coles Creek Culture emerged from the Troyville Culture around A.D. 750, and it represented an era of considerable economic and social change in the Lower Mississippi Valley. By the end of the Coles Creek period, communities were larger and more socially and politically complex. Large-scale mound construction occurred and there is evidence for the resumption of long-distance trade on a scale not seen since Poverty Point times. These changes imply chiefdoms were reemerging in the Lower Mississippi Valley (Muller 1978). The possible diffusion of material and sociopolitical concepts from the Midwest may be indicated by the fact that Coles Creek ceramics have been recovered from early Cahokian contexts dating from ca. A.D. 900 in southeastern Missouri (Kelly 1990:136). These changes probably initiated the transformation of Coles Creek cultural traits into what now is recognized as the Plaquemine Culture sometime before A.D. 1200 (Jeter et al. 1989; Williams and Brain 1983).

Coles Creek ceramic vessels are distinguished by their grog and grog/sand tempering. Decorative motifs include cord marking, red filming, and simplified zoned rocker-stamping, as well as decorations with incised lines and curvilinear lines. Coles Creek peoples continued to use Troyville wares, with some elaborations (McIntire 1958). For instance, the Churupa Punctated and the Mazique Incised designs, both of which are characteristic of the Troyville Culture, were used by Coles Creek and later Plaquemine pottery makers (McIntire 1958). Similarly, French Fork Incised, which formed the basis for many Troyville classifications, continued to be used well into the Coles Creek period (Phillips 1970).

Coles Creek peoples also developed a new ceramic complex that included larger vessels and a wider range of decorative motifs, usually positioned on the upper portion of the vessel (Neuman 1984). Coles Creek Incised, Beldeau Incised, and Pontchartrain Check Stamped are typical examples of these wares (Phillips 1970; Weinstein et al. 1979). One distinctive decorative type, Coles Creek Incised, contains a series of parallel incised lines placed perpendicular to the rim of the vessel, often accompanied underneath by a row of triangular impressions (Phillips 1970:70; Phillips et al. 1951:96-97). Several of the ceramic motifs reflect external cultural influences. French Fork Incised motifs and decorative techniques, for example, mimic almost exactly Weeden Island Incised and Weeden Island Punctated types from the Gulf Coast of

northwest Florida (Phillips 1970:84; Phillips et al. 1951:101; Willey 1949:411-422). Pontchartrain Check Stamped ceramics also appear at the same time as the resurgence of the check stamped ceramic tradition during Weeden Island III in northwest Florida (Brown 1982:31).

Sites from the Coles Creek cultural period primarily were situated along stream systems where soil composition and fertility were favorable for agriculture. Natural levees, particularly those situated along old cutoffs and inactive channels, appear to have been the most desired locations (Neuman 1984). Most large Coles Creek sites contain one or more pyramidal mounds. Coles Creek mounds typically are larger and they exhibit more building episodes than the earlier Marksville burial mounds. While burials occasionally are recovered, the primary function of the Coles Creek mounds appears to have been ceremonial. At some Coles Creek sites, mounds are connected by low, narrow causeways; plazas occasionally are associated with these multiple mound sites (Gibson 1985b). According to Williams and Brain (1983), these traits reflect Mesoamerican influences.

The complexity of the Coles Creek mound system suggests a social structure capable of supporting a centralized authority with a sizable labor force to construct and maintain the mounds. The non-elite population probably occupied the region surrounding the large ceremonial centers (Gibson 1985b; Neuman 1984; Smith et al. 1983). In general, small Coles Creek sites consist mostly of hamlets and shell middens, and they normally do not contain mounds.

Recent work has dispelled the theory that an intensification of agriculture, particularly maize and squash cultivation, comprised the subsistence base of the Coles Creek Culture. Although Coles Creek populations exhibit tooth decay rates consistent with a diet based on starchy foods such as maize, the limited archeobotanical evidence for maize in Coles Creek midden deposits suggests that consumption of some other starchy foods may have been the cause (Kidder 1992; Steponaitis 1986). While researchers speculate that cultigens, especially squash species, were harvested by Coles Creek peoples, evidence of dependence on domesticated plants has been lacking at early Coles Creek sites (Kidder 1992; Kidder and Fritz 1993). The preponderance of evidence now available indicates that the cultivation and consumption of maize was not widespread in the lower Mississippi Valley until after the Coles Creek period, ca. A.D. 1200 (Kidder 1992:26; Kidder and Fritz 1993).

Earlier assumptions about the nature and extent of social and political differentiation during Coles Creek also must be re-examined. Square-sided, flat-topped mounds that are believed to have served as platform bases for elite structures first appeared during the Coles Creek period. Evidence for elite residential or mortuary structures often said to be associated with these mounds, however, remains elusive prior to A.D. 1000 (Kidder and Fritz 1993; Smith 1986; Steponaitis 1986). Nevertheless, both the form of the platform mounds and their arrangement around plazas may be indicative of Mesoamerican influence (Willey and Phillips 1958; Williams and Brain 1983).

Mississippian Stage (A.D. 1200 - 1700)

The Mississippian stage represents a cultural climax both in population growth and social and political organization for those cultures occupying the southeastern United States (Dye and Cox 1990; Phillips 1970; Williams and Brain 1983). The advent of the Mississippian stage is represented at sites throughout the lower Mississippi Valley and along the northern Gulf Coast. Mississippian period sites are recognized by a distinctive complex of traits that include shell tempered ceramics, triangular arrow points, copper-sheathed wooden earspools, and maize/beans/squash agriculture (Williams and Brain 1983). Mississippian sites containing large "temple mounds" and plazas have been recorded throughout the Southeast at such places as Winterville, Transylvania, Natchez, Moundville, Bottle Creek, and Etowah (Hudson 1978; Knight 1984; Walthall 1980; Williams and Brain 1983).

In the lower Mississippi Valley, the Mississippian Stage includes the Plaquemine or Emergent Mississippian period (ca. A.D. 1200 - 1450) and the Late Mississippian period (ca. A.D. 1450 - 1700). Each of these periods is described below.

Emergent Mississippian Period – Plaquemine (A.D. 1200 - 1450)

The Emergent Mississippian period - Plaquemine Culture appears to represent a transitional phase from the Coles Creek Culture to a pure Mississippian Culture (Kidder 1988). The emerging Mississippian Cultures of the Middle Mississippi Valley exerted enough influence during the latter part of the Coles Creek period to initiate the cultural changes that eventually defined the Plaquemine Culture. Plaquemine Culture peoples continued the settlement patterns, economic organization, and religious practices established during the Coles Creek period while sociopolitical structure and religious ceremonialism were intensified. This intensification suggests, among other things, a more complex social hierarchy. Large ceremonial sites, which typically contained multiple mounds surrounding a central plaza, were constructed. Smaller dispersed villages and hamlets also formed part of the settlement hierarchy (Neuman 1984).

Although Plaquemine Culture ceramics are derived from the Coles Creek tradition, they display distinctive features that mark the emergence of a new cultural tradition. In addition to incising and punctating pottery, Plaquemine Culture craftsmen also brushed and engraved their vessels (Phillips 1970). Plaquemine Culture ceramic types include Plaquemine Brushed, Leland Incised, Hardy Incised, L'Eau Noire Incised, Anna Burnished Plain, and Addis Plain. Plaquemine Brushed appears to have been the most common ware type (Kidder 1988:75).

Gregory (1969) reports that Plaquemine Culture sites in the Catahoula Basin demonstrate a propensity toward settlement in lowland areas, including swamps and marshes. This position is supported by both Jeter (1982) and Schambach (1981) in reference to southeast Arkansas and the Felsenthal region of that state. In contrast, Neuman (1984) cites Hall's observation that Plaquemine Culture sites in the upper Tensas Basin were located most frequently on well-drained natural levees characterized by sandy soils. In the Boeuf Basin, Kidder and Williams (1984) note that Plaquemine Culture components frequently overlie earlier Coles Creek period occupations.

Late Mississippian Period (A.D. 1450 - 1700)

As early as A.D. 1450, several traits that now are definitive of the Mississippian period were wide-spread across most of the Southeast. These diagnostic traits include well-planned mound groups, a wide distribution of sites and trade networks, a revival in ceremonial burial of the dead, and production of shell tempered ceramics (Griffin 1990:7-9), an innovation that enabled potters to create larger vessels (Brain 1971; Steponaitis 1983). Ceramic vessel forms include globular jars, plates, bottles, pots, and salt pans. Additionally, the loop handle appeared on many Mississippian vessels. Although utilitarian plainware was common, decorative techniques included engraving, negative painting, and incising; modeled animal heads and anthropomorphic images also adorned these ceramic vessels. Other Mississippian artifacts included chipped and groundstone tools; shell items such as hairpins, beads, and gorgets; mica and copper items; and projectile point types such as Alba and Bassett.

Mississippian subsistence was based on the cultivation of maize, beans, squash, and pumpkins, the collection of local plants, nuts, and seeds, and fishing and hunting of local species. Major Mississippian sites were located on fertile bottomlands of major river valleys, in terrain characterized by sandy and light loam soils. A typical Mississippian settlement consisted of an orderly arrangement of village houses surrounding a truncated pyramidal mound. These mounds served as platforms for temples or as houses for the elite. A highly organized and complex social system undoubtedly existed to plan these intricate communities.

Protohistoric and Early Historic Period (A.D. 1539 - 1730)

An understanding of protohistoric and historic Native American cultures of the southeastern United States is limited by our frequent inability to recognize the prehistoric cultures from which these historic groups were derived. This is due partially to the waning influence of Mississippian and, to a lesser degree, Plaquemine Culture, but primarily it is a result of the social disruption initiated by the legacy of the Hernando de Soto entrada of 1539 - 1543, and the subsequent

French and Spanish exploration and colonization of the Southeast. Native American population upheavals and depletions were related to warfare, disruptive migrations, and epidemics introduced by European contact (Davis 1984; Smith 1987).

Villages apparently remained similar to those observed previously at Plaquemine and Mississippian sites. The larger villages generally featured one or more truncated pyramidal mounds surmounted by chiefs' houses and temples; the remainder of the population lived in the area surrounding the mounds and in satellite hamlets. Houses were rectangular in shape and were constructed of poles placed in the ground, with wattle and daub walls and thatched roofs (Swanton 1946).

According to *Louisiana's Comprehensive Archaeological Plan* (Smith et al. 1983), the major Native American languages spoken in the northwestern portion of Management Unit V at the time of European contact belonged to the Muskhogean family. These linguistic groups were comprised of the Houma, Bayougoula, Acolapissa, Mugulasha, Tangipahoa, Okelousa, Washa, and Chawasha. While many of these groups lived in the southern portion of the Management Unit, the Bayougoula were associated most closely with the parishes that contain the proposed project area.

According to Kniffen et al. (1987:50), the Bayougoula (the Bayou or River People) resided on the west bank of the Mississippi River. They established a small community housing some 400 to 500 people near the Town of Plaquemine in Iberville Parish, Louisiana. On his expedition up the Mississippi River, Iberville visited a Bayougoula village located approximately one quarter of a mile from the right descending bank of the river and situated adjacent to a small creek utilized as a source of fresh water (Kniffen et al. 1987:50). Soon after the arrival of the French, the Bayougoula and the other Muskogean-speaking groups of the area, including the Acolapissa, Quinapisa, Mugulasha, and Tangipahoa, lost their separate identities as tribes. These groups simply became referred to as the Colapissas by French settlers. By the nineteenth century, there was no longer any mention of the Bayougoula tribe in Iberville or Ascension Parish. Some scholars have suggested that tribe merged with the Houma (Kniffen et al. 1987:90), but evidence demonstrating this hypothesis is lacking.

CHAPTER IV

HISTORICAL PERSPECTIVE

Introduction

The proposed project items are located within an unnumbered section situated adjacent to Sections 4 and 5 of Township 11 South, Range 14 East, along the west bank of the Mississippi River as it runs through western Ascension Parish, Louisiana. Historically, this portion of the "Acadian Coast" has been agricultural in nature; in fact, several major sugar plantations were located adjacent to the Areas of Potential Effect. While much of the region remains planted in sugar cane today, the shores of the Mississippi River in this vicinity have undergone significant industrialization in recent years. This chapter presents a general overview of the history of Ascension Parish, with an emphasis placed on the major historical influences on the region.

Early Exploration and Initial Settlement

Hernando de Soto, the Spanish conquistador, was the first European to view the Mississippi River. He visited the area during his explorations in 1541. De Soto and his men traveled through the area that later became known as Louisiana, and they reached the Gulf of Mexico in 1543. More than a century passed before another European set out to explore the Mississippi River Valley. In 1682, Robert Cavelier de La-Salle sailed down the river to its mouth and he claimed all the land for King Louis XIV of France. He named it Louisiana in his honor.

The first extensive exploration of the Louisiana territory began in 1698 by Pierre LeMoyne, Sieur d'Iberville. This "Mississippi Expedition" was designed to help keep the British out of the region (Riffel 1985:2). In part, because the Spanish had established a settlement at Pensacola in 1697, the French feared an expansion of British colonial interests southward into the Gulf region. Iberville sought to establish alliances between the French and the Native Americans who lived along the river, to serve as a bulwark against other European intrusions.

Together with his brother, Jean Baptiste LeMoyne, Sieur de Bienville, Iberville began his upriver voyage in 1699. They entered the mouth of the river from the open sea in two small boats. After a six- week journey, Iberville arrived in the vicinity of what later would become Ascension Parish and its neighbor, Iberville Parish, was named in his honor. On the east bank of the river, Iberville encountered the village of the Houma (*Oumas*), and on the west bank the village of the Bayougoula (Figure 7). Iberville noted that the Houma were better provisioned than their neighbors, the Bayougoula; the former lived in a neatly ordered village of some 140 huts, with a population of 350 men and an unknown number of women and children.

Of the Bayougoula, Iberville observed:

> In this village there were 107 huts and 2 temples; and there were possibly about 200 to 250 men and few women and children. The smallpox, which they still had in the village, had killed one-fourth of the people . . . . These Indians are the most beggarly I have yet seen, having no conveniences in their huts and engaging in no work (McWilliams 1981:63)

Iberville described the land as having "fairly good black soil" (McWilliams 1981:69). Iberville assigned Father Du Ru, a Jesuit priest, to the Bayougoula village, to organize a mission.

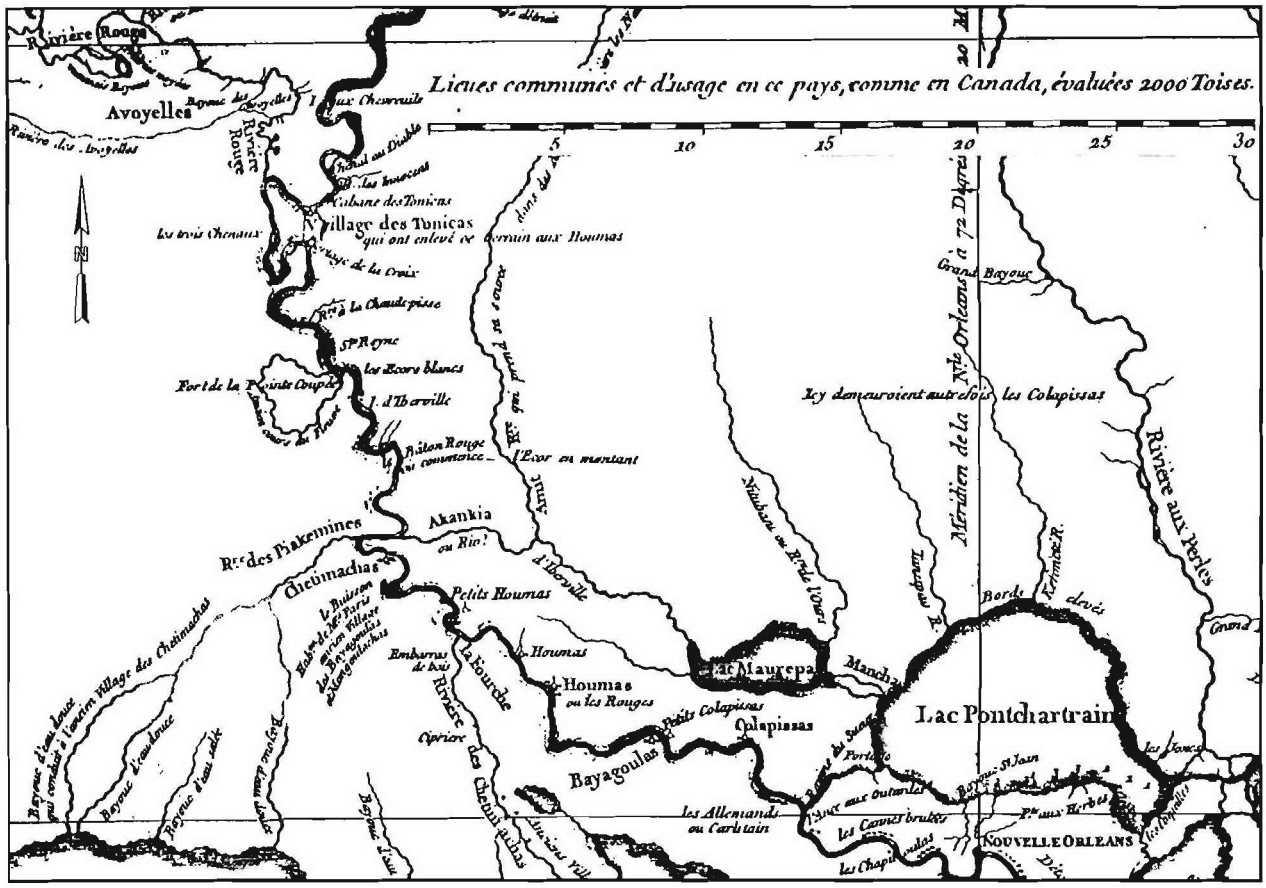

Figure 7. D'Anville map, ca. 1732-1752, depicting the village of the Bayougoula, west bank of the River, and the village of the Petit Houmas on the east bank.

Due to its involvement with European conflicts and concerns, France paid only slight attention to its fledgling colony. As a result, there was little assistance available for the Louisiana colonists during the early eighteenth century. Historian Alcee Fortier commented:

> Most of the early settlers had come to America imbued with the idea that it was a land of vast wealth, which was easily to be obtained, and they spent their time in vain searching for mines or pearl fisheries instead of opening up plantations (Fortier 1914:303).

During the winter of 1710, supplies were so scarce that the colonists were sent to live among the neighboring Native American groups just to survive.

To lessen the economic burden of managing the colony, the French government changed its policy and decided to privatize the administration and development of the colony through a series of concessions (Riffel 1985:4). The first such concession was granted to Antoine Crozat in 1712. Crozat and his Company of Louisiana was given a full monopoly over all potential production and cash-crop exports from the colony, as well as mineral rights to the land. Unfortunately, the lure of gold led Crozat on the same fruitless search as his predecessors, while efforts at settlement, agriculture, and trade languished. After only five years had elapsed from his 15-year concession, the losses seemed insurmountable and Crozat surrendered his charter in 1717.

Later that same year, France granted the Company of the West the Louisiana charter. John Law understood that the colony could not profit with such a small population. Therefore, to attract settlers to the territory, Law offered tracts of land to colonists who promised to establish agricultural settlements within the struggling colony. Colonization began in 1718. M. Paris, *dit* (called) Duvernay, a director of the Company of the West, was granted a concession near the proposed project reach (Figure 8). Penicaut, writing in 1722, described this concession:

> The first concession established was that of M. Paris, managed by M. Dubuisson, who had brought his brother and his two sisters with him, with twenty-five persons and many personal possessions. It was located twenty-eight leagues above New Orleans on the left bank of the Missicipy (sic) going upstream, in the old village of the Bayogoula. In addition to the tilling of fields, they established a silkworm factory there; for that reason they planted a great many mulberry seedlings (McWilliams 1953:211-212).

Although the Bayougoula Indians apparently had abandoned this land within the previous year, Dubuisson complained in a letter to Sieur de Bienville of daily raids made on the concession by the Chitimacha. Bienville sent an emissary to speak to the Chitimacha chief and found that the Chitimacha were willing to make peace with the French. The Chitimacha agreed to abandon their village and to settle along the Mississippi River, approximately one league below the Duvernay concession. An inventory conducted in 1726 recorded a settlement comprised of "4 square leagues containing about seventy arpents cleared and which are at present planted in rice, potatoes, etc." (Pritchard

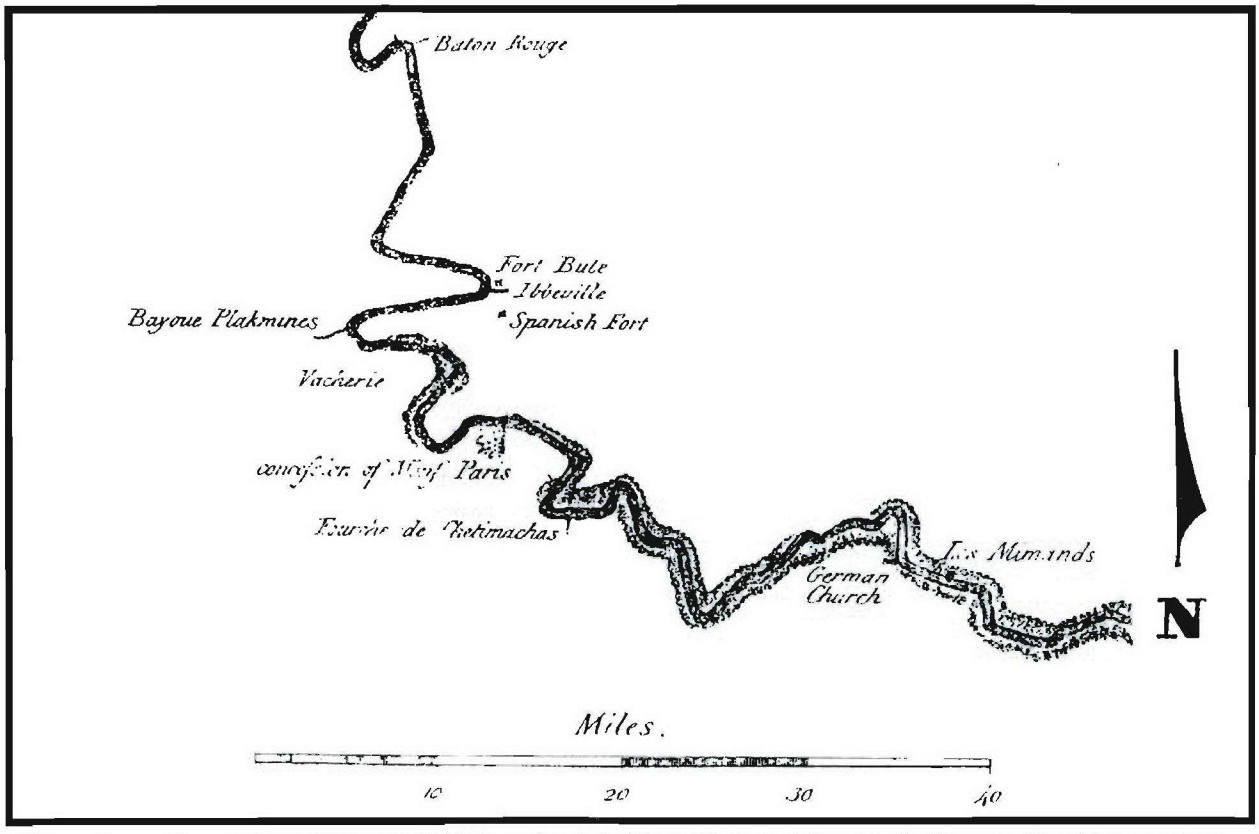

Figure 8. **Excerpt from Pittman's 1765 *Draught of the River Mississippi from the Balize up to Fort Chartres*, showing Paris Duvernay's concession (Louisiana Collection, Tulane University).**

1938:979-994) Although Paris Duvernay transported 25 laborers, many of them skilled artisans, to his concession in 1724, there was no account of them in the 1726 population tally. In 1731, the census recorded DuBuisson [sic] Monferier and his family of seven (besides himself, his wife and five children), one worker, and six black servants on the Duvernay concession. Although it was beset by administrative problems, the Paris Duvernay concession represented a successful early attempt at upriver settlement.

The European wars of the mid-eighteenth century, which culminated in the Seven Years' War (1756-63), proved disastrous for France. Financially and militarily unable to support the colony any longer, France ceded Louisiana to Spain in 1762 in the secret Treaty of Fontainebleau. It was not until 1766, however, that a Spanish governor, Don Antonio Ulloa, arrived in Louisiana to administer the Spanish territory.

The Acadians

Throughout the eighteenth century, European powers struggled for colonial dominance in the New Americas. France and Great Britain, in particular, fought over New France (Canada) and control of the Mississippi River. In 1713, France ceded "Acadie"–Nova Scotia and New Brunswick–to Britain in the Treaty of Utrecht. These lands, populated by French colonists known as Acadians, were important strategically, located half-way between Boston and the mouth of the St. Lawrence River. Britain required the Acadians to swear an oath of allegiance to the royal crown. Independent, largely Catholic, and convinced of their right to participate in the political process, the Acadians refused, and they struggled with British authorities for decades. On September 5, 1755, approximately 6,000 to 7,000 Acadians, half of the total Acadian population, were imprisoned, and shortly thereafter deported to dozens of different colonial settlements. This mass deportation became known as *Le Grand Dérangement*, The Great Deportation (Figure 9) (Brasseaux 1987:25-27; Encyclopedia of Cajun Culture 2000:1).

These emigrées anticipated a reunion with other exiled Acadian immigrants and they believed that a "New Acadia" would emerge in Louisiana. Another group of Acadian refugees already had settled a few years earlier in the Attakapas (Opelousas) region of the colony. Insufficient support from the French colonial government, however, prevented other Acadians from settling in the Attakapas region. During the Spanish reign, a second wave of Acadians arrived (between 1765 and 1770) and they were forced to settle along the lower Mississippi coast (in the vicinity of the current project area), to protect the area against Native American raids and to encourage disperse settlement (Brasseaux 1987:76-77).

In the summer of 1767, a group of 200 Acadian emigrants arrived in New Orleans. The Spanish government, recognizing the need for settlers to cultivate the land in order to establish a strong economic base in Louisiana, welcomed the Acadians to the colony. Governor Ulloa selected St. Gabriel, positioned along the east bank of modern-day Iberville Parish (just upriver from the current project area), as the primary location for the Acadian settlement. Between 1765-1769, Acadian emigrants spread downriver from this initial fort, clearing and settling both riverbanks in modern Iberville, Ascension and St. James Parishes. The Spanish government equipped settlers with enough tools, weapons, medicine, supplies, and food to tide them over until their first harvest.

In his decree of August 6, 1767, Ulloa established the guidelines for the allocation of this land to the Acadians.

> These people are to be located down river from the fort of St. Gabriel in Iberville in the direction of New Orleans, settling the shore of the river that extends toward the capital, and it is to be accomplished in the following way . . . . A stretch of land measuring no more than three thousand yards along the shore of the river downward from the fort of St. Gabriel shall be left vacant so that the Spaniards . . . who in the future shall come with a job or occupation and shall want to establish themselves there may settle on it . . . . From the place where the above mentioned distance reserved for Spaniards ends will begin the lands that are to be distributed to the Acadians, the first settlers of that shore (Chandler 1973:74)

Ulloa demonstrated great concern for the Acadians, expressing his desire that "the first settlers of that shore" be given every chance to succeed and prosper along the river.

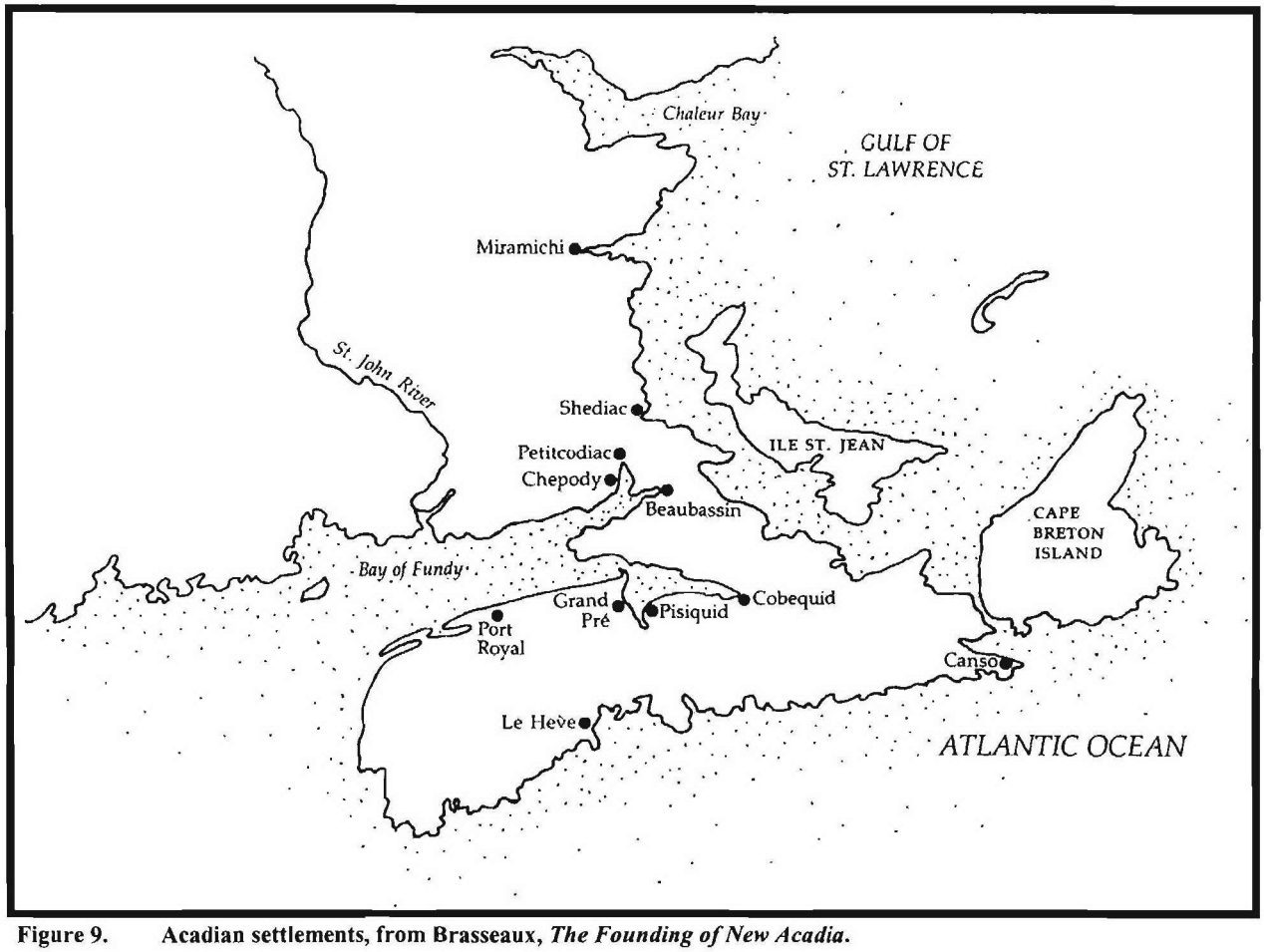

Figure 9. Acadian settlements, from Brasseaux, *The Founding of New Acadia.*

The 1765 Pittman map of the area (see Figure 8) depicts the Spanish Fort (St. Gabriel) and the "Acadian Coast." The Acadian settlement of St. Gabriel was not successful. Disease, food shortages, raids by Native Americans, and a lack of communication between French-speaking Acadians and the Spanish military contributed to its demise (Perkins 1985). However, the attendant Acadian settlements along the banks of the Mississippi River were successful, and St. James (St. Jacques de Cabannocé), Ascension and Iberville Parish came to be called the "Acadian Coast."

Census statistics from the Spanish period indicate that the Acadian Coast developed fairly rapidly. In 1770, 25 to 50 Acadian families lived near the Mississippi River in Ascension Parish. By 1777, the population of the newly-titled "Acadian Coast" numbered 786 residents; 289 of the settlers lived in what is now Ascension Parish (Brasseaux 1985:35; 1987:91, 93, 97, 106-07).

The Acadians who colonized the region settled in widely scattered communities, rather than in a town. This pattern was in keeping with their tradition, and it aided in the establishment of livestock areas, as well as the development of farm acreage. Within these scattered communities, most of these Acadian families settled on lands positioned adjacent to one another, so that extended family structures remained intact, and grew through intermarriage (Brasseaux 1987). Unlike the wealthier French European planters who bought large concessions and used large

contingencies of slaves to work their plantations, most of the immigrant Acadians were "petite habitants," or small farmers. Like the German Rhinelanders who settled the "Des Allemands," the German Coast (in the present day parishes of St. Charles and St. John the Baptist), the Acadians worked their own fields (Kniffen 1968). During this early colonial period, the Acadian settlers in Ascension Parish lived on small parcels of land, three to six arpents front, and often less than 40 arpents in depth. Hogs were the most common livestock; however, the Acadians also kept cattle, horses, and sheep (Voorhies 1973). The economy of the Acadians living in the vicinity of the Alhambra Borrow Pit probably was similar to that of both their German and Acadian neighbors.

The Louisiana Purchase and Antebellum Economic Development

As part of the negotiations leading to the 1803 Louisiana Purchase, Spain restored western Louisiana and the Isle of Orleans to France, which shortly thereafter conveyed the Louisiana Territory to the United States. On March 26, 1804, that portion of the Louisiana Purchase located below the 33rd parallel was designated the Territory of Orleans. The following year, Orleans was partitioned into 12 counties, including the counties of Iberville and Acadia, which encompassed present-day Ascension Parish and portions of neighboring parishes (Figure 10). The area containing the currently proposed project item was contained within Acadia County. In 1807, the territorial legislature reorganized the county system, further dividing the Territory of Orleans into 19 parishes. Iberville and Acadia Counties were reorganized into the parishes of Iberville, Ascension, and St. James, which encompassed the modern parishes of those denominations, as well as adjacent areas. Five years later, on April 30, 1812, the State of Louisiana was admitted to the Union (Davis 1971:157-164, 167-169, 176; Goins and Caldwell 1995:41-42; Thorndale and Dollarhide 1985).

In the 1790s and the early 1800s, the Louisiana economy underwent several major changes. Regardless of their agrarian successes, both French and Spanish colonial settlers struggled to find a staple crop to sustain the colony. The first cash crop planted in the area was indigo; it was economically important during the Spanish colonial period. Unlike failed tobacco crops, which were unsuited to the soil, planters knew indigo would grow in the marshy Louisiana land, since it grew wild throughout the colony.

Despite some early success in the indigo industry, geopolitical and technological advances contributed to its decline, and the subsequent rise of the cotton and sugar industries. Economic success, absent under the French and Spanish governments, finally was achieved by Louisianians as citizens of the United States. With the acquisition of the territory by the United States in 1803, citizens from the north began trekking southward to try their luck as planters:

> Rich and poor, slaveholder and nonslaveholder, large planter and small farmer . . . all poured into this rapidly developing region. Among the newcomers were planters with the capital necessary to undertake sugar culture and the initiative and imagination to foresee the possibilities of the development of the new industry (Sitterson 1953:23).

Other factors in the changing economy included the invention of the cotton gin and the development of a commercial process for extracting sugar from immature cane. Cotton and sugar cane cultivation rapidly replaced indigo as the crop of choice.

Changes in land use and distribution occurred very quickly. Substantial capital was required to acquire the large tracts of land, sugar mills, cotton gins, and slaves. Small farmers and landowners increasingly sold their holdings to large plantation owners and wealthy speculators (White 1944:352). When a small farm was offered for sale on the owner's death, the high valuation of the land kept prices above the reach of other small farmers (Sitterson 1953:48). Under the United States administration, backlands were offered for sale, enabling wealthy landowners to add an additional 40 arpents of land to the rear of their holdings. Furthermore, cane cultivation was only profitable on a large scale, requiring large land holdings and investments that could exceed $200,000.00 (Taylor 1976:65).

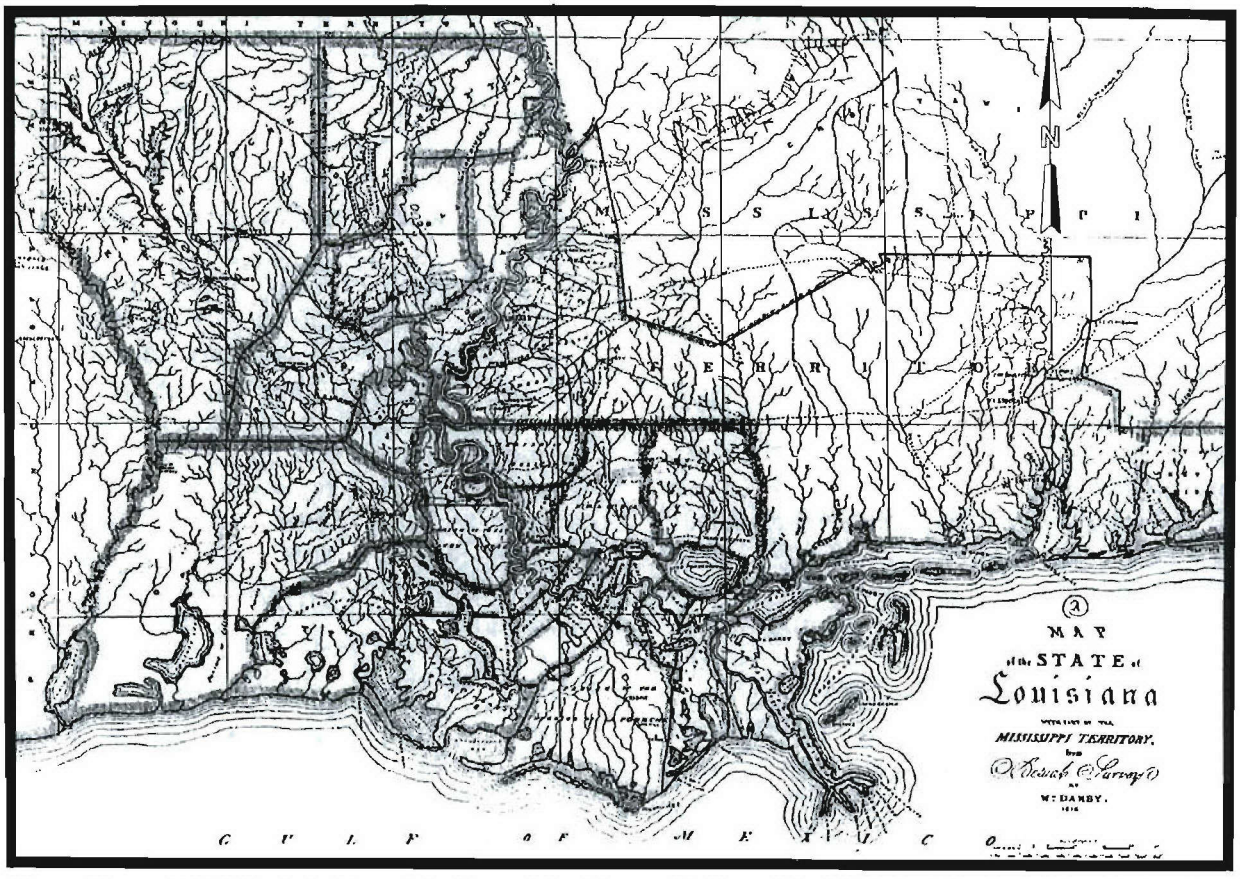

Figure 10. **[1816] Darby's *Map of the State of Louisiana, with Part of the Mississippi Territory*. Map depicts the early territorial divisions of the state.**

These factors all tended to encourage the assimilation of the smaller farms into the larger plantations.

Although the land encompassing the proposed project area was not deposited by the river until the end of the nineteenth century, the former river bank area was known in the early nineteenth century as "the old Melançon tract" (Marchand 1936:209). This moniker referred to Joseph and Jerome Melançon, who first patented the tract during the antebellum period (State Land Office, Section 4 and 5, Township 11 South, Range 14 East).

During the 1790s, Eli Whitney invented the cotton gin, significantly reducing the time and labor involved in processing the fiber. In addition, the Haitian sugar maker Morin introduced Louisiana colonists to new refining processes and equipment in 1795; this helped to make the sugar industry more profitable. Berguin-Duvallon, in his 1802 narrative on the status of agriculture in Louisiana, stated that "sugar and cotton are the staple commodities of the colony" (Davis 1806:131).

Although the best areas for cotton cultivation were along the river north of Baton Rouge and in the Attakapas and Opelousas districts, cotton was grown as far south as St. James Parish during the early nineteenth century. Berguin-Duvallon described the area at that time:

> The parish of Iberville then commences, and is bounded on the east side by the river of the same name, which, though dry a great part of the year, yet when the Mississippi is raised, it communicates with the lakes Maurepas and Pontchartrain, and through

> them with the sea; thus forming what is called the island of New Orleans. Except on the point just below Iberville [Bayou Manchac], the country from New Orleans is settled the whole way along the river, and presents a scene of uninterrupted plantations in sight of each other, whose fronts are all cleared to the Mississippi, and occupy on that river from five to twenty-five acres with a depth of forty; so that a plantation of five acres in front contains two hundred. A few sugar plantations are formed in the parish of Cabahanose, but the remainder is devoted to cotton and provisions, and the whole is an excellent soil incapable of being exhausted. The plantations are but one deep on the island of New Orleans, and on the opposite side of the river as far as the mouth of the Iberville, which is thirty-five leagues above New Orleans (Davis 1806:167-168, *sic* throughout).

The average yield of a superficial arpent of land was approximately 400 pounds of cotton, which was worth approximately $100.00 during the early nineteenth century. One skilled slave could cultivate three arpents of land planted with cotton (Robertson 1911:155).

The cultivation of sugar cane and the manufacture of cane-related products such as syrup, molasses, rum and granulated sugar began in Louisiana during the early eighteenth century. From its inception, sugar cane was considered by the French as a likely domestic cultigen for the subtropical regions of south Louisiana. Iberville himself unsuccessfully attempted to grow sugar cane at Fort de Mississippi before 1720 (Sitterson 1953:6). Subsequently, in the 1740s, the Jesuits brought cane cuttings to New Orleans from Saint Domingue. During the early 1750s, Claude Joseph Villars Dubreuil, an important builder, inventor, planter, and commander of the local militia, successfully planted Jesuit sugar cane cuttings, and he constructed his own sugar mill to experiment with the granulation of cane juice (Gardeur 1980:4; Goodwin et al. 1987:118). Dubreuil realized through his experiences that he could bring the Louisiana cane to artificial maturity. It is uncertain how Dubreuil managed to purify the cane juice and achieve granulization. It is clear, however, that Sieur Dubreuil, and the men who purchased his estate and sugar equipment after his death, Jacques Delachaise and Sieur Masan, converted the cane into raw sugar on a fairly large scale (Gardeur 1980:7; Wilson 1980:60).

After Dubreuil, other planters near New Orleans tried cultivating sugar cane as a cash crop. Their success was modest, possibly because their production was on a rather small scale. In 1785, an Isleño Spaniard named Solis, who resided in Terre aux Boeuf (lower St. Bernard Parish), imported a wooden mill from Havana, and he became the first person to convert the juice of locally grown sugar cane into molasses (Fossier 1957:47). Solis, and later Mendez, who purchased the Solis plantation, grew the cane and converted the tafia to distilled rum. It was Mendez's sugar maker, chemist Antoine Morin, who in 1795 successfully granulated sugar from Louisiana cane for Étienne de Boré (Gardeur 1980:17-22; Sitterson 1953:5). His success was significant because it demonstrated that cane production could be achieved on a rather large scale. Planters throughout Louisiana followed de Boré's example, and turned sugar cane cultivation into a large-scale investment and operation.

Cane culture underwent a series of experiments during the antebellum era of the nineteenth century. In 1817, Ribbon Cane, sometimes referred to as Black Java or Batavian Striped, was introduced to the area. The heartier Javanese Ribbon variety, however, was better suited to the south Louisiana environment. Different planting and harvest schedules were tried, but eventually, most planters began planting in January and harvesting in October. Through time, the antebellum nineteenth century sugar planters became more knowledgeable and efficient at growing cane. New techniques included digging drainage canals, rotating crops to maintain soil integrity, windrowing (making deep furrows for planting cane cuttings) to protect against severe weather, using premium cane cuttings, and spacing the cuttings further apart (Begnaud 1980:31, 32; Sitterson 1953:13-127). At the larger plantations, the narrow gauge railroad also was used to transfer the cane from the fields to the sugarhouse, and then to the riverfront for export on barges or, later, steamboats. This reduced both transportation time and cost. During the antebellum decades, the plow replaced the hoe as the implement for cane cultivation. Originally, the plow was used exclusively for preparing the soil for planting. As a cultivating tool, the plow doubled the amount of acres a field hand could cultivate (Sitterson 1953:128).

Sugar production was a complex procedure that required many specialized structures, machines, and tools. The early Louisiana sugar makers incorporated the existing milling technologies of the large sugar colonies of the French West Indies. The first Louisiana sugarhouses were round to allow draft animals to turn the rollers (Figure 11). In the early nineteenth century, most Louisiana sugarhouses were made of wood (Sitterson 1953:135), although by the Civil War, brick was the construction material of choice.

In ca. 1817, the introduction of the steam engine into southern Louisiana played a significant role in the technological advancement of the sugar cane industry. Steam-powered sugar mills changed the design of the sugarhouses from round to rectangular. While the first steam-powered sugar mills constructed in the state were expensive, they were adapted quickly; a total of 1,027 of the 1,291 sugar mills in Louisiana were steam-powered by the eve of the Civil War (Begnaud 1980:35).

In addition to the introduction of steam engines into the sugar manufacturing operation, Norbert Rillieux, a free Creole of color (and cousin of the great Impressionist painter Edgar Dégas), first patented the vacuum-pan apparatus in 1834. This invention improved the evaporation process by offering more control in the heating procedure, thereby improving the quality of the raw sugar. The vacuum-pan apparatus required substantially less fuel, cutting fuel costs by as much as 53 percent. Before the vacuum-pan apparatus, approximately 14 cords of wood per day were required to fuel the kettle furnaces (Sitterson

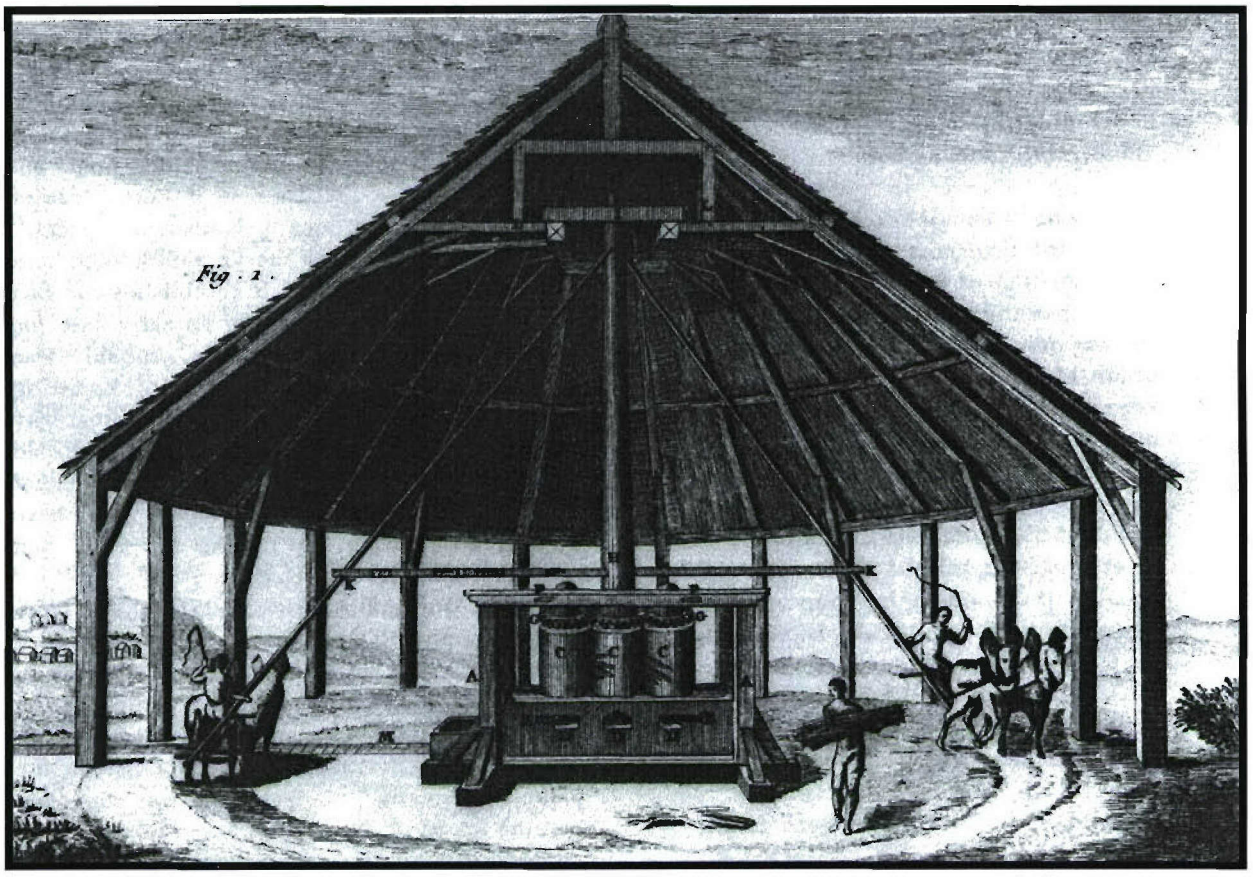

Figure 11. This engraving depicts a round, animal-powered mill from the eighteenth century, similar to early sugar mills in Louisiana. Adapted from *Green Fields: Two Hundred Years of Louisiana Sugar.*

1953:152). The multiple effects system, introduced in the 1840s, further improved the vacuum-pan apparatus, by utilizing escaping steam from one pan to supply heat for an adjoining kettle.

The landscape of the early Louisiana sugar plantations resembled that of the large French West Indian slave plantations. The Mississippi River plantations in south Louisiana, however, were arranged in a linear pattern and they extended in a perpendicular fashion back and away from the river (Kniffen 1968; Rehder 1971). The linearity was achieved from the alignment of the overseer's house and a double row of slave cabins along a centralized road that also extended back in a perpendicular manner from the river. The sugar house and outbuildings generally were located at the end of the road, usually equidistant between the levee crest and the backswamp. Thorpe (1853:746-747) explains that "[the buildings were situated] to divide up as much as possible the distance that must be traversed in hauling the wood from the "swamp," the cane from the fields, and the crop to the river for shipment." Thus, the Louisiana sugar plantation was a self-contained community. Each plantation grew its own vegetables, raised its own cattle, hogs, and chickens, brick kiln, and workshops (blacksmith, machine, and carpentry). This design plan became increasingly popular during the nineteenth century.

Thus, the early nineteenth century development of the sugar cane industry resulted in a substantial change in settlement throughout the area. The cultivation and processing of sugar cane required a substantial initial investment, large landholdings, and a large number of slaves. Consequently, most of the small farmers could not afford to invest in the construction and operation of a sugar house. Instead of competing with the larger plantations, many of the small farmers simply sold their land holdings to the large plantation owners or to wealthy immigrant speculators (Schmitz 1977:108; Taylor 1976:65; White 1944:352). The small farmers who remained in the region focused on raising cattle and pigs, and cultivating corn, potatoes, and other similar crops. Although many descendants of the original Acadians remained in the area, the nature of the farms changed dramatically with the advent of and the transition to sugar cultivation. The transformation, in essence, was from modest self-sufficient farmsteads, to large consolidated plantations (Wall et al. 1984:155-156).

Joseph Landry, an original Acadian exile who settled in land adjacent to the currently proposed project area, illustrates the change that occurred during this transitional period. Landry was only three years old when he and his family were expelled from Nova Scotia. They lived in Talbot County, Maryland for several years, and they moved to Louisiana in the 1760s. Joseph Landry was granted land that later became part of New Hope Plantation, located approximately one km [0.6 mi] downriver from the currently proposed area (Figure 12). Landry became prominent in Ascension Parish during the late eighteenth and early nineteenth centuries. He rose quickly in the militia (under both Spanish and American governments), became a Justice of the Peace (1805), and was elected to the state legislative council (1805) and to the state senate (1812). By the time of his death (1814), New Hope Plantation was producing sugar (Conrad 1988:480).

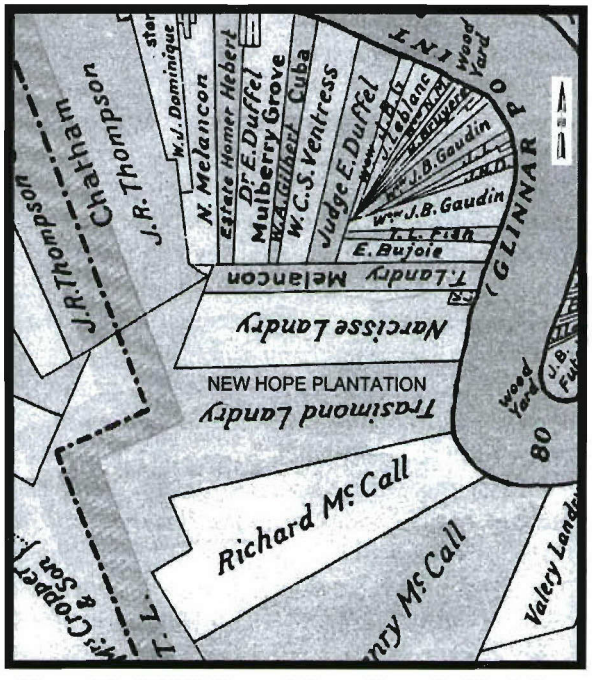

Figure 12. [1858] Excerpt from Persac's Plantations on the Mississippi River from Natchez to New Orleans (Norman's Chart), showing Joseph Landry's New Hope Plantation in the project area (Iberville Parish Court House, Plaquemine, Louisiana).

Trasimond Landry, one of Joseph's sons, also became a major planter in the vicinity of the current project during the nineteenth century. Born in 1795, Trasimond was a second lieutenant in the Seventh Regiment of the Louisiana Militia during the War of 1812. He became commander of the Ascension Militia in 1814 and during the Civil War, Trasimond served as a colonel in the militia. In 1817 he "helped form [a] family partnership to manage New Hope Plantation," and four years later he "acquired [a] share of [the] plantation" (Conrad 1988:481). Trasimond eventually owned several major sugar producing plantations, including the "Chicken Roost," which was located directly behind the Alhambra Borrow Pit project item during the antebellum period. Landry followed in his father's political footsteps, serving in the state senate (1832), and as Lieutenant Governor (1846) (Conrad 1988:481-482).

Antebellum census records reflected the dominance of the plantation economy throughout the area. By 1830, population statistics for Ascension Parish recorded approximately two slaves for each free person, a ratio that generally was maintained throughout the pre-war years. With the federal census of 1830, the parish counted a population of 5,426, i.e., 1,725 whites, 3,567 slaves, and 134 free people of color. Approximately 20 years later, the tally rose to 10,752 inhabitants, of whom 3,340 were white, 7,266 were slaves, and 146 were free people of color. Through the next decade, the Ascension Parish population increased. In 1860, the population totaled 11,484, including 3,940 whites, 7,376 slaves, and 168 free people of color (Kennedy 1864:194; Marchand 1931:79).

On the eve of the Civil War, the region encompassing the current project area housed several of the largest planters and slaveholders (50 slaves or more) in Ascension Parish. Persac depicted the general configurations of most of these properties in his 1858 map entitled *Plantations on the Mississippi River from Natchez to New Orleans* (Figure 13). The 1860 federal census confirmed the land and chattel status of several of the major planters, whose aggregate landholdings in Ascension Parish alone totaled 14,249 improved ha (35,209 improved ac), as well as 36, 637 unimproved ha (90,529 unimproved ac), and they were worked by a combined labor force of 5,593 slaves (the census recorded a total of 7,376 slaves). All of these principal landholders cultivated sugar cane; none of them planted cotton (Menn 1964:120-124). During the next few years, the ravages of the Civil War would drastically affect the economic status of most of the area planters.

The Civil War

The Civil War devastated the south Louisiana area. While there were no major Civil War campaigns conducted in the immediate project vicinity, the location of Donaldsonville at the junction of Bayou Lafourche and the Mississippi River caused it to become both a target and a fortification for the Federal Army. Outside of the Donaldsonville area, military activity in the upper Lafourche region apparently was confined to a series of skirmishes that occurred along the bayou below town and as far downstream as Thibodaux and Lafourche Crossing in 1862–1863. Across the Mississippi River, there were several encounters in the vicinity of New River Landing. This portion of Ascension Parish was occupied by Federal troops through the end of the war (Bergeron 1985:198-206; Davis 1971:253-265; Rafael 1975:41-46).

After the fall of New Orleans and Baton Rouge in the spring of 1862, a company of Texas Partisan Rangers based in the Donaldsonville area fired on the Federal transports and gunboats traveling the Mississippi River between the two occupied cities of Donaldsonville and Plaquemines that Admiral David Farragut threatened the local citizenry with bombardment "for six miles below Donaldsonville and nine miles above" if there was no stop to the sniping (Winters 1963:153). Area residents begged the partisans to discontinue firing, but to no avail. Farragut ordered the evacuation of Donaldsonville, then opened fire on the morning of August 9. The barrage was followed by a landing party that burned the town's hotels, warehouses, and other structures in the business district, as well as some of the private dwellings. Riverfront plantations on either side of the town also were shelled and burned (Bergeron 1985:199; Rafael 1975:25-26; Winters 1963:153). A few days later, the New Orleans newspapers reported that "There is nothing left of it [Donaldsonville] now but ruins and rubbish" (Davis 1971:256; Marchand 1936:154).

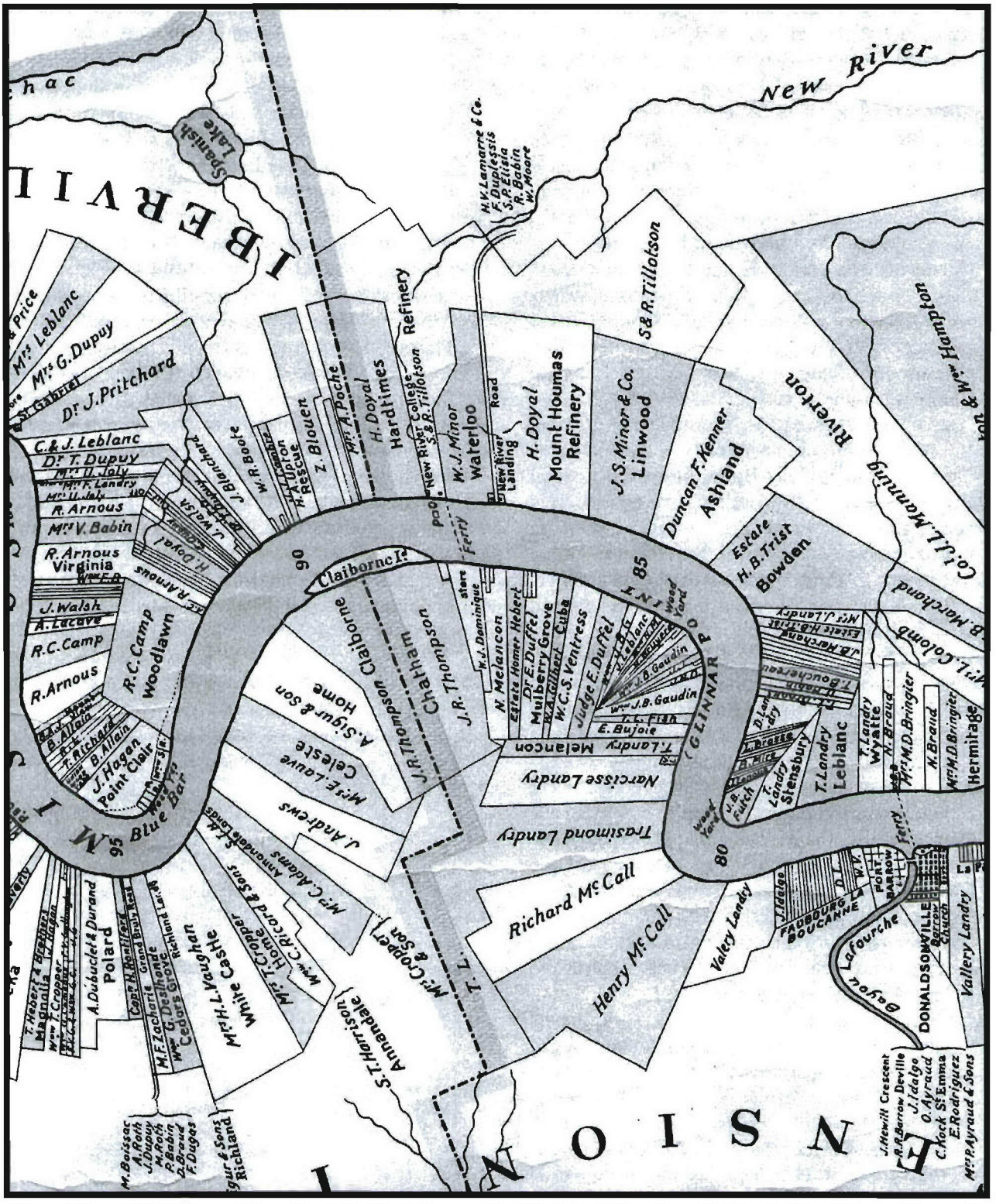

Figure 13. **[1858] Excerpt from Persac's *Plantations on the Mississippi River from Natchez to New Orleans* (Norman's Chart), showing the general vicinity of the project area as it was configured on the eve of the Civil War.**

Plans to build a Federal fortification near Donaldsonville were formulated in November of 1862. In late January of 1863, Fort Butler was completed at Port Barrow, a small community located at the head of Bayou Lafourche and opposite Donaldsonville. A contemporary account described the star-shaped fort as having "three bastions on the west side and two near the levee. On the three land sides there were high dirt emplacements, the dirt being supported by bricks and planking. All around the fort was a moat supposedly sixteen feet wide and twelve feet deep" (Casey 1983:36, 253, 348). The natural waterfront protection provided by the Mississippi River and Bayou Lafourche was supplemented "by a strong log stockade extending from the levees to the water" (Winters 1963:290).

On June 26, 1863, Confederate General Alfred Mouton commanded General Thomas Green to capture Fort Butler from the Federal forces. Green night-marched his Confederate troops from Thibodaux and camped at sunrise approximately 14 km (9 mi) from the fort. While Green's main force spent the day in rest and reconnaissance, one regiment crossed to the east bank of Bayou Lafourche, via a pontoon bridge made of sugar-coolers, to provide a diversion at Donaldsonville. Green and his Texans advanced within 2 km (1.5 mi) of Fort Butler during the night, then attacked in the early morning of June 28. Although Green had the advantage of surprise and manpower, the Confederates were stymied by an unreported ditch that fronted the inside batture of the Mississippi River levee (Green was aware of and had prepared for the 16-ft wide moat reported to encircle the fort). "At this ditch a most desperate fight ensued . . . . Our men used brick-bats upon the heads of the enemy, who returned the same" (Marchand 1936:158). The combat continued from 2 A.M. until daybreak, when three Federal gunboats began firing on the exposed Confederates. Green sent out a flag of truce and ordered his men to retire. In his report of the failed assault, General Green reported that "The fort was much stronger than it was represented to be, or than we expected to find it. Had it fallen into our hands, I am satisfied, with a little work on it, we would have held it against all the gunboats below Port Hudson" (Marchand 1936:158). According to Green, 800 of his men engaged 500 - 600 enemy troops, with 40 Confederates killed, 114 wounded, and 107 missing. Federal reports noted 180 - 225 defenders, with only 5 - 8 killed and 15 wounded, and claimed that Confederate casualties numbered 350 killed or wounded and 130 prisoners taken (Casey 1983:37; Marchand 1936:158; Winters 1963:290-291).

On the east bank of the Mississippi River, Federal troops manned a stockade on "Doyal's Plantation" (located across the river and upstream of the current project area) (Figure 14); it was positioned approximately 11 - 13 km (7 - 9 mi) northwest of Donaldsonville and Fort Butler. Although Henry R. Doyal also owned Hard Times Plantation, situated adjacent to the east bank Iberville/Ascension Parish line, the fortified property probably consisted of his downriver Mount Houmas Plantation, which was located along the east side of the New River Road and Landing between Waterloo and Linwood Plantations (Casey 1983:55). The Doyal plantation was the site of several encounters during the war.

Because Donaldsonville and New River Landing both were occupied areas, the region

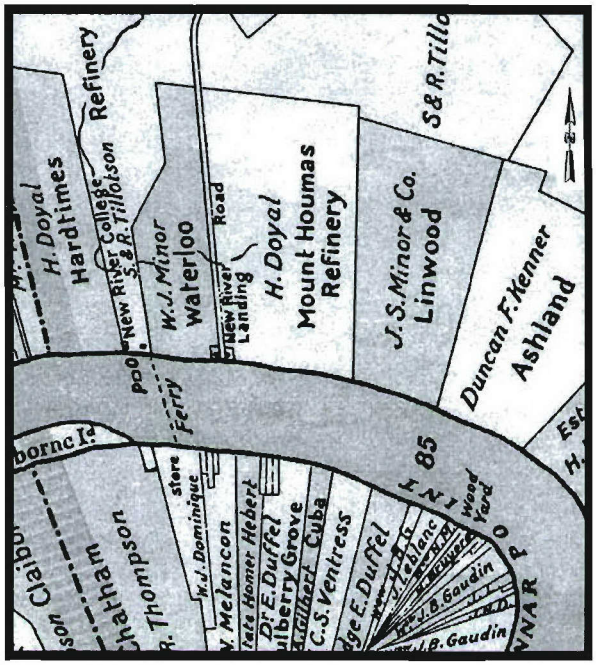

Figure 14. Doyal's Mount Houmas Plantation, from Persac's "Norman's Chart," ca. 1858.

witnessed a great deal of military traffic. Early in the war, the Linwood house was ransacked and Ashland Plantation (both located in Ascension Parish, across the river from the proposed project area) was occupied by Federal troops for four days, both episodes said to be revenge against the elusive Duncan Kenner, who was an active Confederate proponent. As late as 1865, a skirmish occurred at Dominique's Store; it was located upriver from Donaldsonville and the proposed project area (Figure 15) (Seebold 1941:140-150, 154-155; Sternberg 1996:167-168, 232). Although fighting may not have been involved in all instances, plantations along both sides of the Mississippi River certainly were traversed by both Union and Confederate forces as they moved from post to post, foraged for supplies, and scouted for the enemy.

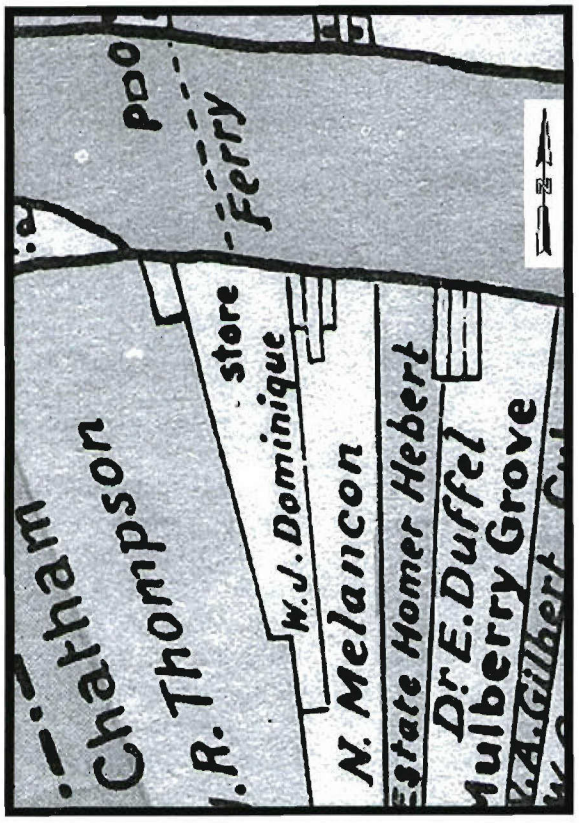

Figure 15. **W. J. Dominique's store was centrally-located, on a major river landing and ferry port. Adapted from Persac's "Norman's Chart," ca. 1858.**

Postbellum Era

The Louisiana slave-based sugar industry was thrust into turmoil by the war. Prices fell, credit was tight, and slaves fled the plantation at their earliest opportunity (Begnaud 1980:38-39; Goodwin and Yakubik 1982). As a result of these financial difficulties, many planters lost their estates in the wake of the war. After the war, industry was slow to recover from the disruption it had suffered. A pervasive lack of capital impeded the revitalization of the sugar belt. Planters could not afford to rebuild their sugar houses, nor could they repair the levees that had been neglected during the war years. Without the proper levees, many former sugar plantations were inundated during high water. Louisiana sugar cane analyst Alcée Bouchereau noted that, "changes in labor systems, bad politics and government, and fear that the (sugar) tariff would be abolished or greatly modified, preventing capital from being invested" in the sugar parishes during Reconstruction (A. Bouchereau 1889-1890:53a).

The loss of slave labor further encumbered economic recovery. Not only did former slave owners now have to pay for labor, but many former slaves migrated north. Freedmen who stayed were perceived by the white population as a political threat during and after Reconstruction. Moreover, the formation of violent, white, vigilante groups such as the Knights of the White Camelia and the Ku Klux Klan drove even more freedmen from the fields. In 1868, Louis Bouchereau noted that "not more than two out of every twenty sugar planters have a full complement of laborers" (1868-1869:viii).

These fundamental obstacles necessitated great changes in the sugar industry. Since most planters lacked both the capital and the laborers to manufacture sugar, Bouchereau proposed a new method of production in 1874; he urged planters to separate the agricultural and industrial aspects of sugar production. His proposal, the "Central Factory System," included centralized mills to serve the needs of many planters: "Let the sugar factories be established in different neighborhoods and let the producers of the cane sell it to the factory (Bouchereau and Bouchereau 1874:xii-xiii)." In this way, the increased labor costs could be absorbed. This system also allowed smaller farmers to participate in

sugar cane cultivation; impoverished farmers were able to grow small tracts of sugar cane to sell to the factory. Under the antebellum plantation system, small-scale production had been an economic impossibility.

The postbellum period also witnessed significant crop diversification. Rice cultivation became a viable alternative to the high cost of sugar cane production for many planters. In 1877, Bouchereau wrote:

> Many of the sugar plantations are planted in rice for want of the necessary means to rebuild or repair sugar houses, etc., while others are only partially cultivated owing to the encroachment of water from crevasses, and many are completely abandoned on account of overflow (A. Bouchereau 1877-1878:XX).

Rice was a more appropriate crop for the neglected postbellum plantations since river water through broken or neglected levees, although harmful to the growth of sugar cane, was necessary for rice cultivation. Rice agriculture also was much less labor-intensive than sugar cane cultivation, an added incentive to planters facing a labor shortage. In addition, rice could be planted on depleted cane fields or on low-lying acreage ill-suited to other crops (Ginn 1940:554-557, 575-576; Goodwin et al. 1990:23, 49-50; Jones et al. 1938:21-22).

By the end of the nineteenth century, sugar had regained its prominence as an agricultural staple, particularly in the River Parishes. The Central Factory System caught on and was quite successful; in 1893, Bouchereau remarked:

> Gradually the cultivation of cane and manufacture of sugar from it are becoming separate and distinct industries. Men of means invest their capital in equipping first-class factories furnished with all the modern improvements that the genius of the inventor has produced; small planters pursue the cultivation on the general lines . . . . More sugar is now produced per acre than ever before (A. Bouchereau 1893-94).

In Ascension Parish, some planters turned to rice to supplement their sugar crop, while a few switched over exclusively to rice production. Sugar, however, remained the most important industry in the region.

All over the agricultural South, the postbellum period was marked by dramatic change. The region encompassing the proposed project area was no exception. The large landholdings of the former slaveowners along the Mississippi River banks lay fallow for lack of money, seed and laborers. By the late 1860s, John Burnside had purchased Ascension Plantation from Narcisse Landry, adjacent to the current project area. Burnside also owned a successful mercantile business on Canal Street in New Orleans before the war, and he began purchasing plantations in the 1850s; he owned approximately 10 plantations before his death in 1881. His estate, which was willed to his partner in trade, Oliver Bierne, valued his holdings at over 1.25 million dollars (Conrad 1988:132).

By the 1880s, Evan Hall (located just downriver from the proposed project area), Ascension and New Hope plantations were among the major sugar producers in Ascension Parish. The Evan Hall Plantation illustrates the consolidation and modernization that was required to succeed in the post-Civil War economy. Evan Hall was large (including 648 ha [1,600 ac] under cane cultivation); by the 1880s, the McCalls, owners of the plantation, had established a system of tenant farmers to replace the loss of slave labor. The McCalls also had constructed a large, modern sugar refining facility. The refinery at Evan Hall, in 1887, produced over four million pounds of refined sugar (this was produced within two months' time). Neighboring McManor Plantation used this refinery by pumping its cane sugar through a 2.4 km (1.5 mi) long pipeline to the Evan Hall refinery for processing (Brown 1888:4).

Ascension and New Hope Plantations also boasted a large sugar refinery; it was built on the dividing line between the two plantations (by this time they both were consolidated into the Oliver Bierne estate). By 1880, the land on which the proposed project items are located was not yet extant; however, it would form over the next two decades in front of Oliver Bierne's Ascension Plantation. The large Bierne refinery, named "New Hope," processed over two million pounds of sugar each year (Brown 1888:4). In 1892, these plantations merged with several other regional plantations to form the Miles Planting and Manufacturing Company, Ltd.

Transportation

The invention of the steamboat influenced tremendously the economy of the region. The first steamboat to sail down the Mississippi River passed the proposed project area in 1812; she was the "New Orleans." In 1820, the steamer "Feliciana" is on record as carrying freight between Donaldsonville and St. Francisville. In 1835, the steamer "Revenue" advertised weekly service to Donaldsonville. While flatboats were still seen on the river, the steamers took on the vast bulk of the sugar and passenger trade (Marchand 1949:15-18). The river remained the dominant means for transporting commercial goods and agricultural products until the postbellum development of the railroad system.

In the general vicinity of the proposed project area, twentieth century land use generally was limited by the increasing reliance on the railroad system for transportation of goods to market, and riverine migration. During the postbellum period, railroad lines were constructed along both the east and west banks of the Mississippi River natural levee. Use of these railroads for the transportation of agricultural products (e.g., sugar, rice, cotton, etc.) to market proved faster and more reliable than riverine transportation. As a result, by the early twentieth century, most farms and plantations relied on the rail system for transportation as opposed to steamboats. In general, plantation owners either built new sugar houses near the railroad, or constructed rail spurs to link their sugar houses with the railroad line. As a direct result, utilization of the batture decreased considerably. While plantations formerly maintained landings on the batture, the changing transportation system alleviated the need for these plantation landings. Most of the batture reverted to largely unutilized woodland. This probably included the proposed project area, situated in the batture area. The 1913 Mississippi River Commission Chart no. 69 shows the currently proposed project area covered in "Willows."

Twentieth Century

After the turn of the century, agriculture continued to dominate the area surrounding the proposed project area. Sugar production remained the chief force behind the area economy. Consolidated management by such corporations as Evan Hall and New Hope continued to dominate the sugar industry along the rive in Ascension Parish (Louisiana Planter and Sugar Manufacturer 1924:92, 1929:49).

Land tenure within the proposed project area reflected the early twentieth century land use patterns found along the Mississippi River and throughout southern Louisiana – agricultural dominance, particularly sugar cane cultivation, with most production in the hands of a few corporations. By 1921, several of the area plantations had converted former cane fields to grain fields; however, sugar cane unquestionably remained the predominant crop, and was grown adjacent to the batture area encompassing the current project reach (Louisiana Planter and Sugar Manufacturer 1924:92, 1929:49; MRC 1921:67-68). In 1940, Ascension Parish recorded over 4,654 ha (11,500 ac) planted in sugar cane, with only 637 ha (1,575 ac) used to cultivate rice (Ascension Parish Planning Board 1947:18).

Early in this century, increased quantities of corn, fruit, and pecans were produced in the area. Cotton, grown during the early 1900s, had all but disappeared by 1940. Soybeans, initially planted with corn to replenish the soil, also became an important cash crop. Livestock breeding increased during the 1930s and 1940s; the abandoned rice fields provided good pasture lands. Agriculture remained the main occupation of the local residents, and it employed over one-half of the available work force.

Although agriculture has remained a major local force in the area through the twentieth century, the economic and physical landscape of the area adjacent to the river in Ascension Parish began to change with the evolution of the petroleum industry. Escaping natural gas had been noticed at Point Pleasant in 1898 when a ferryman there utilized a large gas seep, "with the aid of a can and jet," to light his Mississippi River night route (Grace 1946:189). By 1947, 7 oil fields in Ascension Parish produced 8,379 barrels of crude oil per day (Ascension Parish Planning Board 1947:23). The Georgia Gulf Corporation and Ashland Chemical, Inc., have facilities in the region, as well as Fina/CosMar plant (shared site of the Fina Oil and Chemical Co. and the CosMar Company); Arcadian Fertilizer, L.P.; Allied Signal, Inc., and the Geismar Complex (Draughon et al. 1995; DTC, Incorporated 1992).

Dozens of enormous factories now shadow the riverbanks, symbolizing the shift from a rural to an industrial economy. The Mississippi riverside has been transformed by the evolution of the petroleum and chemical industries in Ascension Parish.

Conclusion

Historical research pertaining to the development of the proposed project in Ascension Parish indicates that the area encompassing the proposed project items was formed from river deposition between ca. 1880-1920. This information is derived primarily from the changing banklines depicted on Mississippi River Commission maps. Although this deposition is relatively recent, the location of the project area along the west bank of the Mississippi River presents the possibility that the material culture remains of historic era settlement might yet exist. Consequently, a number of themes that are essential to understanding the historic period development and the associated archeological remains of the area have been identified. These themes include: the initial Acadian settlement of the eighteenth century and the lifestyle of subsistence farming established there; antebellum economic development, which saw the rise of sugar planting and plantation culture throughout the state and in the proposed project area; and the consolidation of small farms into large plantations, due to the exigencies of sugar cultivation. Themes relevant to the postbellum period include the movement towards rice cultivation; the shift back to sugar during the late nineteenth century; and, the gradual trend towards centralized sugar manufacture, which led to the eventual elimination of sugar processing in the vicinity of the proposed project area. This centralization enabled small farmers to stay in business and, consequently, brought about some reversal of the trend towards consolidated land holdings. Moreover, modifications in the social and labor arena helped to change the region permanently. Historically relevant evidence of material culture relating to these themes might remain, *in situ* or redeposited by the river, within the proposed project area.

CHAPTER V

PREVIOUS INVESTIGATIONS

Introduction

The area encompassing the proposed project item has been the subject of numerous cultural resources investigations. This chapter provides a review of all of the archeological investigations conducted within 8 km (5 mi) of the proposed borrow pit and access road, as well as all previously recorded archeological sites and standing structures located within 1.6 km (1 mi) of the current study area (Tables 6 - 8). These data were collected from information currently on file at the Louisiana Department of Culture, Recreation and Tourism, Office of Cultural Development, Division of Archaeology and the Louisiana State Library, Baton Rouge, Louisiana.

Previously Conducted Cultural Resource Surveys within 8 km (5 mi) of the Current Project Area

Background research resulted in the identification of 16 previously conducted cultural resources surveys within 8 km (5 mi) of the proposed project item (Table 6). These surveys are discussed in ascending order by parish, below. Those surveys that were conducted in more than one parish are reported on at the end of the section under the heading of Multiple Parishes.

Ascension Parish

During June 1976, J. Richard Shenkel conducted a Phase I cultural resources inventory of the proposed Smoke Bend Revetment project item located at River Mile 177.5 and on the right descending bank of the Mississippi River. This survey was conducted on behalf of the U.S. Army Corps of Engineers, New Orleans District (Shenkel 1976). The proposed project area measured approximately 4.4 km (2.7 mi) in length; the width of the survey area, however, was not reported. Pedestrian survey of the project area failed to identify any cultural resources. No additional testing of the proposed Smoke Bend Revetment project area was recommended.

During August 1978, Robert W. Neuman conducted a cultural resources investigation in anticipation of the proposed relocation of State Highway 70 near Pierre Part, Louisiana. The survey was conducted at the request of an unspecified party (Neuman 1978). While the exact size of the proposed project area was not specified in the report, archival research identified several shell middens within the proposed project area. Pedestrian survey, however, failed to locate any cultural resources. No additional testing of the proposed highway was recommended.

Prior to May 1980, Gregory J. DuCote conducted a cultural resources survey of the Bayou Lafourche bridge and approaches on Louisiana Highway 943 in Ascension Parish, Louisiana. The survey was undertaken at the request of the Federal Highway Administration and the Louisiana Department of Transportation and Development (DuCote 1980). The proposed project corridor extended from the intersection of Louisiana Highway 943 and Louisiana Highway 1, across the Bayou Lafourche bridge, where it terminated at the intersection of Louisiana Highway 308 and Louisiana Highway 1. Intensive pedestrian survey augmented by shovel testing throughout the Area of Potential Effect failed to produce any cultural resources. No additional testing of the proposed Bayou Lafourche Bridge project corridor was recommended.

During June of 1980, Coastal Environments, Inc., completed an archeological recon-

Table 6. Previously conducted surveys within 8 km (5 mi) of the proposed project area.

FIELD DATE	REPORT NUMBER	TITLE/AUTHOR	PROJECT DESCRIPTION	RESULTS AND RECOMMENDATIONS
Ascension Parish				
1976	22-155	*Cultural Resource Survey of the Proposed Smoke Bend Revetment, Ascension Parish, Louisiana* (Shenkel 1976)	Pedestrian Survey	No sites or cultural material identified; no additional testing was recommended.
1978	22-515	*A Cultural Resources Survey of the Relocation of Highway 70 Near Pierre Part* (Neuman 1978)	Records review and pedestrian survey	No sites or cultural material identified; no additional testing was recommended.
ca. 1980	22-609	*Cultural Resources Survey of Bayou LaFourche Bridge and Approaches - Ascension Parish* (Ducote 1980)	Records review, pedestrian survey, and shovel testing	No sites were identified; no additional testing was recommended.
1980	22-1198	*Cultural Resources Reconnaissance within the City of Donaldsonville, Louisiana* (Castille 1980)	Records review and windshield survey	The author took note of possible NRHP eligible properties and districts within the city of Donaldsonville; however, no specific recommendations concerning additional recordation or testing were noted.
1992	22-1625	*Cultural Resources Survey of Two Ascension Parish Revetments, Mississippi River M-179.1 to 173.0* (Hinks et al. 1994)	Records review, pedestrian survey, systematic shovel testing, and limited auger testing	Identified Site 16AN54 which consisted of postbellum and early 20th century artifact scatters associated with the town of Darrow, LA. The site was assessed as potentially significant; additional testing was recommended if the site were to be impacted.
1993-1994	22-1779	*Cultural Resources Investigations for Item M-178.0 to 173.2-R, Mississippi River Levees, Louisiana* (Vigander et al. 1994)	Records review, pedestrian survey, auger testing, and limited shovel testing	No sites were identified; no additional testing was recommended.
Iberville Parish				
1981	22-421	*Cultural Resource Survey Maynard Oil Company Well Site and Access Road Iberville Parish, Louisiana* (Goodwin et al. 1981)	Records review, pedestrian survey, and shovel testing	No sites or cultural materials were identified; no additional testing was recommended.
Multiple Parishes				
1978	22-421	*Archeological /Historical Survey: Shell Pipeline's Proposed Geismar-Napoleonville Pipeline* (McIntire 1978)	Records review, pedestrian survey, and shovel and auger testing	No sites or cultural remains were located; no additional testing was recommended..
ca. 1985	22-1041	*A Cultural Resource Survey of the Proposed Shell Pipeline Between Station 9030+7 and Station 9863+45, Iberville and Ascension Parishes, Louisiana* (Bryant 1985)	Records review and pedestrian survey	Two small historic period materials scatters were identified. The areas were assessed as not significant and no additional testing is recommended.
1985	22-1075	*Cultural Resources Survey of a Proposed Pipeline Right-of-Way in Parts of Iberville, Ascension, and Assumption Parishes, Louisiana* (Shuman and Jones 1985)	Records review, windshield survey, boat survey, pedestrian survey, and shovel testing	Relocated Sites 16IV6 and 16IV26, as well as identifying Site 16AS44 – 16AS46 and Loci X16AN-J and X16IV-H. Of these, only Site 16IV6 was assessed as potentially significant; however, the authors noted that it would not be impacted by proposed construction and no additional testing was recommended. The remaining sites and loci were assessed as not significant and no additional testing was recommended.
1988	22-1306	*Archaeological and Historical Investigations of Four Proposed Revetment Areas Located Along The Mississippi River in Southeast Louisiana* (Kelley 1988)	Records review, pedestrian survey, and shovel and auger testing	A total of 13 historical sites were identified (Sites 16EBR40, 16EBR56, 16EBR70, 16EBR71, 16AN6, and 16AN42-49). Only Site 16AN43 was assessed as potentially significant; additional testing was recommended at that site.
1995	22-1926	*A Cultural Resources Survey From Sorrento, Louisiana to Mont Belvieu, Texas* (Skinner et al. 1995)	Pedestrian and boat survey and shovel testing	No cultural materials or sites were identified; no additional testing was recommended.

Table 6, continued

FIELD DATE	REPORT NUMBER	TITLE/AUTHOR	PROJECT DESCRIPTION	RESULTS AND RECOMMENDATIONS
1997	22-2148	*Phase I Cultural Resources Survey and Inventory of the Proposed Ridgeline Gas Distribution Acadian Extension 6.625 in O.D. Pipeline Project, Ascension and t. James Parishes, Louisiana* (Davies et al. 1998)	Pedestrian survey and shovel testing	Two historical Sites, 16AN67 and 16AN25, were identified as well as two cultural resources loci. The sites were assessed as not significant and no additional testing was recommended.
1997	22-2117	*Phase I Survey of the Napoleonville to Tebone Pipeline, Assumption, Iberville, and Ascension Parishes, Louisiana* (Skinner et al. 1997)	Records review, pedestrian survey, and shovel testing	No sites were identified; no additional testing was recommended.
1999	22-2307	*Phase I Cultural Resources Survey and Archeological Inventory of the Alhambra to Hohen-Solms and Holen-Solms to Modeste Project Items, Ascension and Iberville Parishes, Louisiana* (George et al. 2000)	Records review, pedestrian survey, and mechanical excavation	Identified archeological Sites 16AN68 – 16AN70 and 16IV48 – 16IV52. Of these, Sites 16AN69, 16AN70, 16IV49, and 16IV50 were assessed as potentially significant and avoidance was recommended. If the sites could not be avoided, additional testing was recommended. In addition, Sites 16IV51 and 16IV52 were assessed as potentially significant and additional testing was recommended. The remaining sites were assessed as not significant and no additional testing was recommended.
2000	22-2398	*Intensive Cultural Resources Survey, Proposed Enterprise Products Company Pipeline, Ascension, Assumption, and Iberville Parishes, Louisiana* (Smith et al. 2001)	Records review, vehicular survey, pedestrian survey, and shovel testing	Identified archeological Sites 16AS104 – 16AS106, as well as relocating previously recorded Site 16AN59. In addition, two loci (F-3 and G-1) were noted, as were 10 historic standing structures (ESI-1 to ESI-10). Of these, Site 16AN59 was assessed as potentially significant and avoidance during construction was recommended. If the site could not be avoided, additional testing was recommended. Sites 16AS105 and 16AS106 were assessed as not significant, as was the portion of Site 16AS104 which was positioned within the proposed APE; no additional testing of these sites was recommended. Finally, Structure ESI-8 was assessed as potentially significant; however, it was positioned beyond the proposed APE and no additional recordation was recommended.

Table 7. Previously identified sites within 1.6 km (1 mi) of the currently proposed project area.

SITE NUMBER	UTM	USGS 7.5' QUAD	SITE DESCRIPTION	CULTURAL AFFILIATION	FIELD METHODS	NRHP ELIGIBILITY	RECORDED BY
Ascension Parish							
16AN20	Zone 15, 3335250N, 689300E	Carville, La	New Hope Plantation	19th and 20th centuries	Not reported	Potentially significant	Castille 1977
16AN21	Zone 15, 3335990N, 689700E	Carville, La	Ascension Plantation	19th century	Visual reconnaissance	Not assessed	Castille 1977
16AN22	Zone 15, 3336500N, 690300E	Carville, La	Historic period residential structure	Late 19th and early 20th centuries	Not reported	Potentially significant	Castille 1977

Table 8. Previously identified standing structures within 1.6 km (1 mi.) of the currently proposed project area.

STRUCTURE NO.	UTM	USGS 7.5' QUAD	CONSTRUCTION DATE	TYPE	STYLE	NRHP ELIGIBILITY	RECORDED BY
Ascension Parish							
3-254	N3337245.29, E691350.41	Carville	ca. 1910	Residential	Shotgun	Not Assessed	Nakagawa 1984
3-255	N3337257.38, E691311.76	Carville	ca. 1900	Residential	Creole with Corbelled Chimney	Not Assessed	Nakagawa 1984
3-256	N3337258.16, E691397.64	Carville	ca. 1900	Residential	Not Reported	Not Assessed	Nakagawa 1984
3-257	N3337267.13, E691274.68	Carville	ca. 1900	Residential	Shotgun	Not Assessed	Nakagawa 1984
3-258	N3337315.88, E691163.42	Carville	ca. 1910	Residential	Shotgun	Not Assessed	Nakagawa 1984
3-259	N3337303.40, E691080.27	Carville	ca 1920	Residential	Not Reported	Not Assessed	Nakagawa 1984
3-260	N3336979.61, E691148.19	Carville	ca. 1910	Residential	Not Reported	Not Assessed	Nakagawa 1984
3-261	N3336617.01, E690659.96	Carville	ca. 1900	Residential	Not Reported	Not Assessed	Nakagawa 1984
3-262	N3336378.65, E690273.31	Carville	ca. 1900	Residential	Not Reported	Not Assessed	Nakagawa 1984

naissance survey of a portion of the city of Donaldsonville, Louisiana (Castille 1980). The survey, which was conducted on behalf of the City of Donaldsonville, consisted of an area that measured 80 city blocks in size. Castille (1980) stated that the survey attempted to identify the potential for cultural resources within the study area. Archival research augmented by a vehicular survey resulted in the identification of unspecified structures and districts which were potentially eligible for nomination to the National Register of Historic Places. None of these structures or districts were specifically assessed applying the National Register of Historic Places criteria for evaluation (36 CFR 60.4 [a-d]), and no recommendations concerning additional testing were reported.

During July 1992, R. Christopher Goodwin & Associates, Inc., conducted a Phase I cultural resources survey of the Smoke Bend and St. Elmo Revetments, at the request of the U.S. Army Corps of Engineers, New Orleans District (Hinks et al. 1994). The Smoke Bend Revetment project area was located along the right descending bank of the Mississippi River between River Miles 179.1 - 178.5-R, while the St. Elmo Revetment project item was positioned along the left descending bank of the Mississippi River between River Miles 176.2 - 175.3-L. Fieldwork included pedestrian survey augmented by the systematic excavation of shovel and auger tests throughout the project area. Survey within the proposed St. Elmo Revetment project item resulted in the identification of Site 16AN54. No cultural resources were identified within the proposed Smoke Bend Revetment project area and no additional testing of this revetment was recommended.

Site 16AN54, 25 x 350 m (82 x 1148 ft) in area, was described as the archeological remains associated with the town of Darrow, Louisiana. Hinks et al. (1994) reported that a three block portion of the town had been razed, prior to the construction of the U.S. Darrowville levee setback. The excavation of two 1 x 1 m (3.3 x 3.3 ft) units resulted in the collection of a variety of historic period cultural material dating from the late nineteenth - early twentieth century. Hinks et al. (1994) reported that the cultural deposits appeared to be intact and that they were covered by approximately 45 cm (17.7 in) of modern alluvium. Site 16AN54 was assessed as potentially significant. Since the site would not be impacted by the then-proposed construction pro-

ject, no additional testing of the site was recommended. Site 16AN54 is located outside of the currently proposed project area.

During 1993 and 1994, Earth Search, Inc., conducted a Phase I cultural resources inventory between River Mile 178.0 and 173.2 along the right descending bank of the Mississippi River. The survey was conducted on behalf of the U.S. Army Corps of Engineers, New Orleans District prior to proposed construction of the Philadelphia Point to Donaldsonville Levee Enlargement (Vigander et al. 1994). Prior to survey, a records review was undertaken to identify the archeological site potential of the project area. This review resulted in the identification of two areas, totaling 104.8 ac (42.4 ha), considered to have a high potential for containing prehistoric and/or historic period cultural resources.

The first of these areas was located between Levee Stations 0+00 and 50+68. Pedestrian survey and the excavation of both auger and shovel tests throughout this area failed to produce any cultural material or evidence of intact cultural deposits. No additional testing of the area was recommended. The second high probability area fell between Levee Stations 6168+00 and 6188+00. Pedestrian survey augmented by the excavation of 19 auger tests failed to identify any cultural material or evidence of significant archeological resources. No additional testing of the proposed Philadelphia Point to Donaldsonville Levee Enlargement project corridor was recommended.

Iberville Parish

During July 1981, Southern Archaeological Research, Inc., conducted a Phase I cultural resources survey of the proposed Maynard Oil Company well site and access roadway in Iberville Parish, Louisiana. The survey was undertaken at the request of Maynard Oil Company, of Dallas, Texas (Goodwin et al. 1981). The project area encompassed approximately 4.8 acres and it was located 1.0 km (0.62 mi) west of the Iberville-Ascension Parish line. Archival research was conducted to assess the potential of the project area to contain archeological sites. Pedestrian survey augmented by systematic shovel testing failed to produce any cultural remains within the project area. No additional testing of the Maynard Oil Company well site project area was recommended.

Multiple Parishes

During August 1978, William McIntire conducted a Phase I cultural resources survey and archeological inventory of the proposed Geismar-Napoleonville Pipeline corridor on behalf of the Shell Oil Company (McIntire 1978). The survey area extended for an unreported length, however, it extended from near Geismar to Napoleonville a distance of approximantely 18.6 km (30 mi). Archival research augmented by pedestrian survey, as well as shovel and auger testing failed to produce any cultural materials. No additional testing of the proposed pipeline corridor was recommended.

Prior to July 1985, Coastal Environments, Inc., conducted a Phase I cultural resources inventory of a proposed pipeline right-of-way located within portions of Ascension and Iberville Parishes, Louisiana. The survey was conducted at the request of the Shell Pipeline Corporation, in Baton Rouge, Louisiana (Bryant 1985). The proposed corridor measured approximately 17.7 km (11 mi) in length and approximately 30.5 m (100 ft) in width. Pedestrian survey augmented by shovel testing resulted in the identification of two historic period loci (X16IV-F and X16IV-G). Locus X16IV-F was described as surface scatter, and it produced three historic ceramic sherds and an unspecified number of brick fragments; it measured approximately 30.5 m (100 ft) in diameter. Locus X16IV-F was assessed as not significant applying the National Register of Historic Places criteria for evaluation (36 CFR 60.4 [a-d]), and no additional testing of the site area was recommended.

Locus X16IV-G was characterized as a surface scatter of brick that measured approximately 3 x 3 m (10 x 10 ft) in area. In addition to the brick, 1 historic ceramic sherd and 1 glass bottle neck shard also were recovered from Locus X16IV-G. The locus was assessed as not significant applying the above-mentioned criteria for evaluation (36 CFR 60.4 [a-d]), and no additional testing of the locus was recommended. Of the two loci identified by Bryant (1985), only loci X16IV-F was located within the vicinity of the current project reach.

Surveys Unlimited Research Associates of Baton Rouge, Louisiana, conducted a Phase I cultural resources survey and archeological inventory during December of 1985 of a proposed natural gas pipeline corridor which was positioned within portions of Ascension, Assumption, and Iberville Parishes, Louisiana (Shuman and Jones 1985). The proposed right-of-way measured 18.3 m (60 ft) in width by 35.4 km (22 mi) in length. A windshield and boat survey augmented by pedestrian survey and shovel testing resulted in the identification of archeological Sites 16AS44 – 16AS46, as well as the relocation of previously recorded Sites 16IV6 and 16IV26. In addition, two loci (X16AN-J and X16IV-H) were noted; however, no site numbers were assigned.

Of these, Shuman and Jones (1985) described Sites 16AS44 – 16AS46 and Locus X16IV-H as historic artifact scatters, while Locus X16AN-J reportedly consisted of both prehistoric and historic materials. Previously recorded Site 16IV6 was described as a prehistoric mound and artifact scatter. In addition, historic artifacts also were noted at the site. Finally, the authors suggested that previously recorded Site 16IV26, which was originally thought to represent a prehistoric mound, was in fact a naturally occurring feature. Only Site 16IV6 was assessed as potentially significant applying the National Register of Historic Places criteria for evaluation (36 CFR 60.4 [a-d]); however, the site was located beyond the proposed Area of Potential Effect, and thus, no additional testing was recommended. The remaining sites and loci were assessed as not significant applying the previously cited criteria and no additional testing was recommended. None of these cultural resources were located within 1.6 km (1 mi) of the current project area.

During April and June 1988, Coastal Environments, Inc., conducted a Phase I cultural resources survey of four proposed revetment areas located along the Mississippi River in southeastern Louisiana. This investigation was undertaken at the request of the U.S. Army Corps of Engineers, New Orleans District (Kelley 1988). The first revetment area, Arrow Bend, was situated along the left descending bank of the Mississippi River in West Feliciana Parish. Manchac, the second revetment area, was located on the left descending bank in East Baton Rouge Parish. The two other project items included the Marchand Project Item, located on the left descending bank, and the Aben Project Item, situated on the right descending bank of the river in Ascension Parish. Pedestrian survey augmented by systematic shovel and auger testing throughout the Area of Potential Effect resulted in the identification of 13 historic sites. None of the identified sites were located within the Arrow Bend Revetment area.

Sites 16EBR70 and 16EBR71 were located within the Manchac revetment project area. Site 16EBR70 consisted of a concrete machinery foundation of undetermined age. Due to the fact that the foundation lacked associated cultural deposits and it was not *in situ*, Site 16EBR70 was assessed as not significant and no additional testing of the site was recommended. Site 16EBR71 consisted of a late eighteenth to early nineteenth century sheet midden and associated surface scatter. It lacked integrity and it too was assessed as not significant applying the National Register of Historic Places criteria for evaluation (36 CFR 60.4 [a-d]); no additional testing of Site 16EBR71 was recommended. Sites 16EBR40 and 16EBR56 also were located within the Manchac revetment area. Site 16EBR40 was described as a disturbed shell deposit that was possibly prehistoric in origin; it was assessed as not significant and no additional testing of the site was recommended. Site 16EBR56 was described as the location of a twentieth century church that was recorded from documentary evidence alone; its location at the time of survey was described as within a borrow pit. Site 16EBR56 has been destroyed previously by borrow pit excavation and it was described as not significant. No additional testing of this site was recommended.

In addition, six sites were located within the Marchand Revetment area (Sites 16AN45-16AN49 and 16AN6). Each of these sites was described as a sheet midden associated with a group of houses that represented the remains of a late nineteenth to early twentieth century community. All of the sites were assessed as not significant applying the National Register of Historic Places criteria for evaluation (36 CFR 60.4 [a-d]), and no further testing was recommended for any of these sites.

The three remaining sites (16AN42-16AN44) were identified within the Aben Revetment project item. Site 16AN42 was characterized as a large multi-component historic site. Associated rice irrigation structures were identified in two areas of the site and an in situ concrete foundation of undetermined age was recorded in another area of the site. There also were several surface scatters of late nineteenth century cultural material identified within the site. Despite the presence of an extensive archeological deposit, Site 16AN42 was determined to have limited research potential and it was assessed as not significant applying the National Register of Historic Places criteria for evaluation (36 CFR 60.4 [a-d]). No further testing of Site 16AN42 was recommended.

Site 16AN43 was described as the remains of a late nineteenth century sawmill associated with the Stella Plantation. The structural remains of the sawmill appeared to be intact and associated cultural deposits were identified during survey. Site 16AN43 was assessed as potentially significant applying the National Register of Historic Places criteria for evaluation (36 CFR 60.4 [a-d]), and Phase II testing of the site was recommended.

Finally, Site 16AN44 consisted of an *in situ* late nineteenth century machinery foundation. Despite archeological investigation of the site, no associated cultural material was recovered. Site 16AN44 was assessed as not significant applying the National Register of Historic Places criteria for evaluation (36 CFR 60.4 [a-d]), and no additional testing of this site was recommended.

During September and October 1995, AR Consultants of Dallas, Texas conducted a Phase I cultural resources inventory of a proposed pipeline right-of-way that extended from Sorrento, Louisiana to Mont Belvieu, Texas on behalf of the Concha Chemical Pipeline Company (Skinner et al. 1995). Within the Louisiana portion of the study area, the proposed project route passed through portions of Ascension, Iberville, St. Martin, Lafayette, Acadia, Jefferson Davis, and Calcasieu Parishes. The majority of the proposed pipeline corridor was located within existing rights-of-way, but Skinner et al. (1995) reported that an additional 18.3 m (60 ft) of new right-of-way was required for construction of the pipeline. That additional right-of-way also was included in the survey. Pedestrian survey augmented by shovel testing failed to identify any cultural resources. No additional testing of the proposed pipeline right-of-way was recommended.

During September 1997, R. Christopher Goodwin and Associates, Inc., conducted a Phase I cultural resources survey and archeological inventory of the proposed Bridgeline Gas Distribution Acadian Extension in O.D. Pipeline project corridor in Ascension and St. James Parishes, Louisiana. This investigation was undertaken at the request of Bridgeline Gas Distribution, of St. Rose, Louisiana (Davies et al. 1998). The project corridor encompassed approximately 66.9 ha (165.31 ac) of land. Pedestrian survey and systematic shovel testing produced evidence of three archeological loci, A2-1, A2-2, A2-3, and one archeological site (16AN67). Davies et al. (1998) reported that Loci A2-2 and A2-3 were associated with the Palo Alto Plantation (Site 16AN25) and that their boundaries extended both to the south and to the west of the site. The larger of these two loci, Locus A2-3, had been impacted heavily and it possessed no intact cultural deposits. Locus A2-1 was described as a scatter of modern remains and one historic period artifact. Site 16AN67 was characterized as a previously disturbed artifact scatter situated on the eastern side of the Bayou La-Fourche. Each of the two loci and Site 16AN67 were assessed as not significant applying the National Register of Historic Places criteria for evaluation (36 CFR 60.4 [a-d]), no further testing of the proposed Bridgeline Gas Distribution project corridor or the identified cultural resources was recommended.

In November 1997, AR Consultants conducted a Phase I cultural resources survey of the proposed Napoleonville to Tebone Pipeline route within Assumption, Iberville, and Ascension Parishes, Louisiana. This survey was conducted for Shell Western Exploration & Production, Inc. (Skinner et al. 1997). The survey corridor encompassed approximately 26 ha (63 ac) of land and it extended from Grand Bayou to Southwood, Louisiana. Pedestrian survey augmented by systematic shovel testing failed to

identify any cultural resources within the proposed pipeline right-of-way. No additional testing of the proposed Napoleonville-Tebone Pipeline corridor was recommended.

During July, August, and September of 1999, R. Christopher Goodwin & Associates, Inc. of New Orleans, Louisiana, completed a Phase I cultural resources survey of the Alhambra to Hohen-Solms and Hohen-Solms to Modeste Project Items in Ascension and Iberville Parishes, Louisiana (George et al. 2000). This survey was performed on behalf of the U.S. Army Corps of Engineers, New Orleans District, New Orleans, Louisiana. The Areas of Potential Effect consisted of that portion of the batture that lies between the extant flood control structure and a series of borrow pits excavated to construct the present levee. This area measured approximately 10 to 15 m (32.8 to 49.2 ft) in width. The Alhambra to Hohen-Solms Project Item measures approximately 4,300 m (14,107.6 ft) in length and it extended from a point west of the town of Cannonburg to a point east of the town of Hohen-Solms, i.e., from River Mile 191 to 185-R. The Hohen-Solms Project Item measured approximately 5,100 m (16,732.3 ft) in length and it extended from a point east of the town of Hohen-Solms to a point south of the town of Philadelphia Point, i.e., from River Mile 185 to 179-R.

Prior to fieldwork, the proposed project items were stratified into 14 survey segments, each of which was characterized as possessing high, moderate, or low probability for containing intact cultural deposits. Areas characterized as having a low potential for containing intact cultural deposits were subjected to pedestrian survey only. In areas designated as having a high probability for possessing intact cultural deposits, backhoe trenches were excavated at 30 m (98.4 ft) intervals. In moderate probability areas, backhoe trenches were spaced at 50 m (164 ft) intervals. All backhoe trenches were excavated to a depth of 200 cmbs (78.7 inbs), to sterile clay or clay-like subsoil, or until excessive amounts of groundwater impeded further excavations. A total of 14 ha (34.8 ac) of land were examined for cultural resources as a result of this investigation.

This investigation resulted in the identification and recordation of eight archeological sites (Sites 16AN68 -16AN70 in Ascension Parish and Sites 16IV48 - 16IV52 in Iberville Parish). The results of survey indicated that Sites 16IV49 and 16IV50 retained intact cultural deposits that possessed good research potential. These sites are located within the Areas of Potential Effect associated with the Alhambra to Hohen-Solms project item and they contained domestic cultural deposits dating from the nineteenth to early twentieth century. Site 16IV49 also was composed partially of the remains of the Braziel Baptist Church and cemetery complex. While the church was moved to its present location prior to new levee construction in 1932, it appears, based on the preliminary results of this Phase I cultural resources survey and archeological inventory, that the entire cemetery likely was not relocated at that time; thus, human interments remained within the Area of Potential Effect. Both of these sites were assessed as eligible under criterion (d) of the National Register of Historic Places criteria for evaluation (36 CFR 60.4[a-d]). Avoidance of or mitigation of Sites 16IV49 and 16IV50 was recommended prior to the initiation of the proposed concrete slope paving project.

The remaining three sites identified within Iberville Parish, Louisiana also were identified within the Areas of Potential Effect associated with the Alhambra to Hohen-Solms project item (Sites 16IV48, 16IV51, and 16IV52). Fieldwork conducted at these sites indicated that they may have possessed intact cultural deposits as well as research potential. Site 16IV48 consisted of a domestic occupation dating from the nineteenth to early twentieth century. In addition, Site 16IV51 possessed domestic cultural deposits dating from the late eighteenth to early twentieth century, while Site 16IV52 retained domestic cultural deposits dating from the early nineteenth to early twentieth century. Site 16IV48 did not retain the qualities of significance because it lacked intact cultural features and had little, if any, research potential, Sites 16IV51 and 16IV52 possessed the qualities of significance as defined by National Register of Historic Places criteria for evaluation (36 CFR 60.4

[a-d]). Thus, Phase II National Register eligibility testing of Sites 16IV51 and 16IV52 was recommended. Additional testing has been completed at both of these sites; however, no reports regarding this testing are currently on file.

Finally, Site 16AN68 also was identified and recorded during Phase I cultural resources survey and archeological inventory of the Hohen-Solms to Modeste project item in Ascension Parish, Louisiana. Site 16AN68 may possess intact cultural deposits; however, it does not contain intact cultural features and it retains little, if any, research potential. It was determined in consultation with the Division of Archaeology, Department of Culture, Recreation, and Tourism, that Site 16AN68 does not retain the qualities of significance as defined by the National Register of Historic Places criteria for evaluation (36 CFR 60.4 [a-d]). No additional testing of Site 16AN68 is recommended. Mitigations of Sites 16AN69, 16AN70, 16IV49, and 16IV50 have been conducted, but the resulting reports have not been submitted to the appropriate state agencies.

Earth Search, Inc., of New Orleans, Louisiana, completed a Phase I cultural resources survey and archeological inventory during November and December of 2000 of portions of the proposed Enterprise Products Company pipeline right-of-way situated within Ascension, Assumption, and Iberville Parishes, Louisiana (Smith et al. 2001). The survey was completed on behalf of Mustang Engineering, Inc., of Houston, Texas, and it consisted of 24.1 km (15 mi) of discontinuous pipeline corridor. While the overall width of the survey corridor was not noted, Smith et al. (2001) stated that a total of 86.6 ha (214 ac) were subjected to cultural resources survey. Vehicular survey, pedestrian survey, and shovel testing resulted in the identification of archeological Sites 16AS104, 16AS105, and 16AS106, as well as relocating previously recorded Site 16AN59. Additionally, two loci (F-3 and G-1) which were not assigned site numbers were noted, as were 10 historic standing structures (ESI-1 to ESI-10).

Smith et al. (2001) stated that Sites 16AS104 – 16AS106, as well as both Locus F-3 and Locus G-1 consisted of historic artifact scatters, while relocated Site 16AN59 was described as the remains of the quarters complex of Bowden Plantation. This portion of Site 16AN59 was assessed as potentially significant applying the National Register of Historic Places criteria for evaluation (36 CFR 60.4 [a-d]) and avoidance of that area was recommended. If the quarters complex portion of Site 16AN59 could not be avoided, the authors recommended that Phase II testing be conducted. The remaining archeological sites and loci were assessed as not significant applying the above-referenced criteria for evaluation and no additional testing of these cultural resources was recommended. Only one (ESI-8) of the 10 noted built resources was assessed as potentially significant applying the National Register of Historic Places criteria for evaluation (36 CFR 60.4 [a-d]); however, it was positioned beyond the Area of Potential Effect and no additional recordation was recommended. The remaining structures were assessed as not significant applying the National Register of Historic Places criteria for evaluation (36 CFR 60.4 [a-d]) and no additional recordation was recommended. None of these resources are positioned within 1.6 km (1 mi) of the current study area.

Previously Recorded Archeological Sites within 1.6 km (1 mi) of the Proposed Project Area

A review of the Louisiana site files located at the Louisiana Department of Culture, Recreation and Tourism, Office of Cultural Development, Division of Archaeology, Baton Rouge, Louisiana resulted in the identification of three previously recorded archeological sites within 1.6 km (1mi) of the proposed project area (Table 7). All of these sites are situated within Ascension Parish, Louisiana, and they are discussed below in ascending order.

Sites 16AN20 - 16AN22 were recorded in Ascension Parish by Castille in 1977. Site 16AN20 was identified within Sections 10 and 11 of Township 11S, Range 14E and it was described as the remains of New Hope Plantation. Castille reported that the site dated from the nineteenth and twentieth centuries and it consisted of the big house, the overseer's house, and six workers dwellings. Information contained on the State of Louisiana Site Record Form suggested that the site had good archeological po-

tential and that the big house was in excellent condition. Site 16AN20 was assessed as potentially significant applying the National Register of Historic Places criteria for evaluation (36 CFR 60.4 [a-d]); however, no recommendations concerning additional testing of the site were reported.

Site 16AN21 was identified within Section 9 of Township 11S, Range 14E and it was described as the location of the nineteenth century Ascension Plantation. Castille noted on the State of Louisiana Site Record Form, however, that all attempts to locate structures associated with the plantation were unsuccessful. Site 16AN21 was not assessed applying the National Register of Historic Places criteria for evaluation (36 CFR 60.4 [a-d]) and no recommendations concerning additional testing of the site area were provided on the submitted site form.

Site 16AN22 was identified within Sections 3 and 4 of Township 11S, Range 14E and it was described as containing two structures possibly associated with Delicia or Arlington Plantations. The site apparently dated from the late nineteenth to the early twentieth century, and Castille assessed the site as potentially significant applying the National Register of Historic Places criteria for evaluation (36 CFR 60.4 [a-d]). No recommendations concerning additional testing of Site 16AN22 were provided on the submitted State of Louisiana Site Record Form.

Previously Recorded Standing Structures within 1.6 km (1 mi) of the Proposed Project Area

A review of the standing structure files located at the Louisiana Department of Culture, Recreation and Tourism, Office of Cultural Development, Division of Historic Preservation, and the Louisiana State Library, Baton Rouge, Louisiana, resulted in the identification of nine (3-254 to 3-262) previously recorded standing structures within 1.6 km (1 mi) of the proposed project area (Table 8). These structures all are positioned within Ascension Parish and they are discussed below.

Tadashi Nakagawa recorded structures 3-254 through 3-262 in 1984. All of these structures were described as residential buildings ranging in date from ca. 1900 to ca. 1920. Building styles included Shotgun (Structures 3-254, 3-257, and 3-258) and Creole (Structure 3-255). The majority (n=5 [Structures 3-256 and 3-259 – 3-262]) of the structures, however, had no listing for style. None of the structures was assessed applying the National Register of Historic Places criteria for evaluation (36 CFR 60.4 [a-d]), and no recommendations concerning additional recordation of the structures were noted by Nakagawa on the examined structure recordation forms.

CHAPTER VI

RESEARCH DESIGN AND FIELD METHODOLOGY

Introduction

This chapter describes the research design and field methodologies used to complete the current Phase I cultural resources survey and archeological inventory of the proposed borrow pit and access road in Ascension Parish, Louisiana (Figure 1). It also includes information pertaining to the curation of all records, photographs, and field notes generated as a result of this investigation.

Project Description

As part of the ongoing proposed Hohen-Solms to Modeste Levee Enlargement Project, the U.S. Army Corps of Engineers, New Orleans District plans to excavate a proposed borrow pit measuring 75 x 150 m (246 x 492 ft) in size to assist in enlarging and stabilizing the extant levee prior to the addition of concrete facing (Figure 16). The borrow pit is located along the right-descending bank of the Mississippi River in Ascension Parish, Louisiana in the vicinity of River Mile 181 (Figure 2). The District will access the borrow pit area from the extant flood control structure using a proposed access road that will extend from the existing levee to the eastern margin of the proposed borrow pit. According to current construction plans, the proposed access road will measure approximately 165 m (541 ft) in length by 15 m (49 ft) in width (Figure 16). This chapter summarizes the research design and field methodology used during the current undertaking.

Research Design

The current investigation incorporated background research across a broadly defined study area as well as Phase I cultural resources survey and archeological inventory of the project area, situated on the west bank of the Mississippi River. Background research was undertaken to collect data on the natural, prehistoric, and historic settings of the project area. In addition, all previously conducted archeological surveys within 8 km (5 mi) of the proposed project area, as well as the distribution of previously identified archeological sites, historic standing structures, and previously recorded standing structures located within 1.6 km (1 mi) of the proposed project areas were identified. Following the completion of the background research, a comprehensive cultural resources survey of the project area was undertaken. This Phase I cultural resources survey and archeological inventory of the proposed borrow pit and an associated access road was designed to identify and to evaluate all cultural resources (archeological sites, cultural resources loci, standing structures, cemeteries, and traditional cultural properties) situated within the Areas of Potential Effect.

Maps used in the background review and subsequent stratification of the project reach included the Mississippi River Commission 1884 map series, Charts 68 and 69; the Mississippi River Commission 1896 map series, Sheet 26; the Mississippi River Commission 1907 map series, Sheet 25; and the Mississippi River

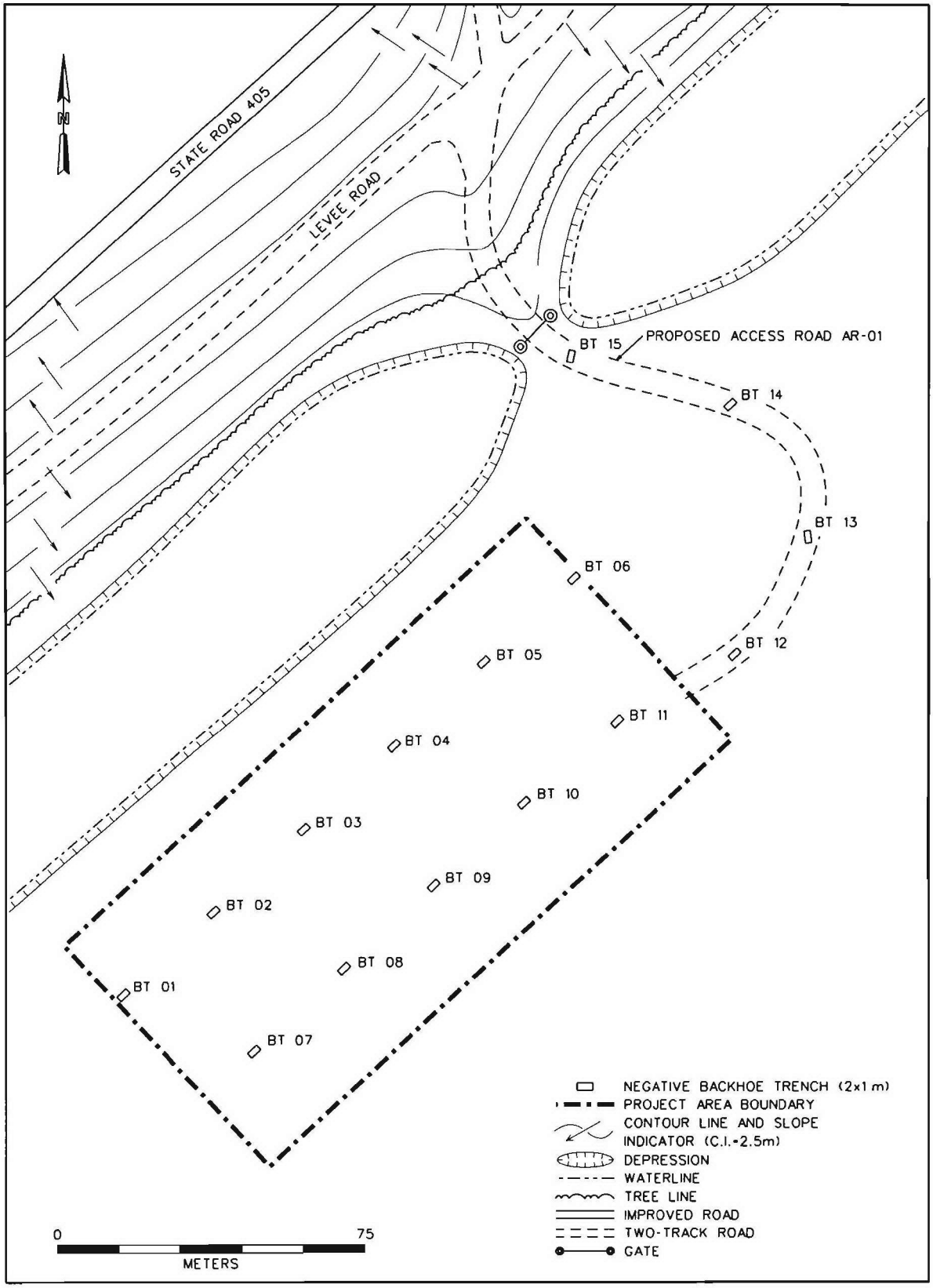

Figure 16. **Plan view depicting the location and sizes of the proposed project items, as well as the positioning of the excavated backhoe trenches.**

Commission 1921 map series, Charts 68 and 69. Prior to undertaking fieldwork, personnel from R. Christopher Goodwin & Associates, Inc., also identified all previously recorded archeological sites situated within or near to the Areas of Potential Effect. Researchers utilized information from the State of Louisiana site file and detailed historic period map analysis to plot previously recorded sites near the project area and to delineate areas with high probability for containing historic period deposits.

This analysis identified three plantations, previously recorded as archeological sites, within 1.6 km (1.0 mi) of the proposed project reach. These three sites (16AN20, 16AN21, and 16AN22) date from the late nineteenth to early twentieth centuries. Site 16AN20 was recorded as the remains of the New Hope Plantation, Site 16AN21 was identified as the probable remains of Ascension Plantation, and Site 16AN22 could possibly be associated with the Delicia or Arlington Plantations. While none of the previously recorded sites extended into the proposed Areas of Potential Effect, the proximity of their location was taken into account when determining probability areas for this project. Detailed information regarding each of these sites was presented in Chapter V of this document.

In addition to site location in relation to the Areas of Potential Effect, geomorphic processes and depositional environments of the Mississippi River also were taken into consideration. Historic period bankline locations were digitized from the Mississippi River Commission 1884, 1921, and 1965 map series. Modern bankline positions were copied from the 1996 digitized USGS 7.5' series topographic Carville, Louisiana quadrangle. For the Areas of Potential Effect, comparisons of the historic and modern bank lines of the Mississippi River indicate that the current batture area is a result of post-1884 accretion. Therefore, it was anticipated that only sites dating from the late nineteenth through twentieth centuries might be encountered; it was not anticipated that intact prehistoric sites would be identified.

For this project, the Areas of Potential Effect has a moderate-high probability for containing intact archeological deposits dating from the late nineteenth through early twentieth centuries. Although the boundaries of three previously recorded archeological sites discussed above do not extend into the Areas of Potential Effect, their proximity suggests the potential for encountering historic materials related to these sites. Furthermore, documented Mississippi River bank line accretion indicates that the Area of Potential Effect is positioned on sediments deposited during the occupation of the above referenced sites. Finally, given the previous findings of the initial Phase I survey and archeological inventory of the Alhambra to Hohen-Solms and Hohen-Solms to Modeste Project Items, the Areas of Potential Effect was surveyed as moderate-to-high probability.

Field Methodology

The field methods used to complete this investigation were designed to provide complete and thorough coverage of the entire project area. Fieldwork consisted of pedestrian survey augmented with the systematic excavation of backhoe trenches throughout the limits of each project item. In addition, this work included an architectural evaluation of all standing structures older than 50 years in age identified during survey of the project area. No cultural resources or historic period standing structures, however, were identified during this investigation.

Pedestrian Survey

Systematic visual examination of the Areas of Potential Effect was accomplished through pedestrian survey. The proposed borrow pit project item was visually inspected along parallel survey transects spaced at 15 m (49.2 ft) intervals. The access road project item was visually inspected from its origin at the extant levee to the edge of the proposed borrow pit. This was accomplished using two parallel transects located 5 m (16.4 ft) to either side of the centerline of the proposed access road.

Backhoe Trenching

Backhoe trenching was utilized to test for the presence of deeply buried, intact cultural deposits within portions of the study area, as well as to provide an overview of the stratigraphic sequence. Backhoe trenches, measuring approximately 1 x 2 m (3.3 x 6.6 ft) in size, were excavated to a depth of approximately 2 mbs (6.6 ftbs) below surface or until excessive

amounts of water impeded the excavation process. These trenches were excavated in 20 cm (7.9 in) levels within natural strata. Screening of backhoe trench fill was not attempted; rather monitoring of the test trench excavation and the visual examination of the resultant spoil piles was undertaken. Once excavated, all backhoe units were profiled, with the vertical locations of all strata breaks and cultural materials plotted accordingly. Profiling proceeded from the surface of each backhoe trench; for safety reasons, personnel from R. Christopher Goodwin & Associates, Inc. did not enter any of the excavated backhoe trenches. In addition, the profiles of all backhoe trenches were photographed. All backhoe trenches were backfilled immediately upon completion of the archeological recordation process.

During this investigation, 15 backhoe trenches (approximately 30 linear meters [98.4 linear feet]) were excavated throughout the Area of Potential Effect (Table 9). Within the borrow pit project item, backhoe trenches were excavated at 30 m (98.4 ft) intervals along two parallel transects spaced 30 m (98.4 ft) apart. The transects and the trenches were oriented parallel to the extant levee. A total of 11 backhoe trenches were excavated successfully during Phase I cultural resources survey and archeological inventory of the proposed borrow pit area. An additional 4 backhoe trenches were excavated along a single transect that corresponded with the centerline of the proposed access road.

Architectural Review and Standing Structures Recordation

As a part of this Phase I assessment, survey crews also were instructed to record all historic period standing structures encountered during cultural resources survey and inventory of the proposed borrow pit and associated access road. Since the proposed construction has the potential to disturb or destroy historic properties, the purpose of architectural recordation was to: (1) collect reconnaissance-level architectural survey data for each building older than 50 years of age located within the Areas of Potential Effect; (2) apply the National Register of Historic Places criteria for evaluation (36 CFR 60.4 [a-d]) to each recorded resource to identify potential historic properties; and, (3) apply the Advisory Council on Historic Preservation's Criteria of Effect to each historic property to anticipate the effects of each undertaking.

Table 9. Summary of backhoe trenches excavated during Phase I cultural resources survey and archeological inventory of the proposed borrow pit and access road.

BACKHOE TRENCH	PROJECT ITEM	TRENCH DEPTH	CULTURAL MATERIAL IDENTIFIED
01	Borrow Pit	2.00 m (6.6 ft)	None
02	Borrow Pit	1.60 m (5.2 ft)	None
03	Borrow Pit	1.15 m (3.8 ft)	None
04	Borrow Pit	1.38 m (4.5 ft)	Modern wire nails; not collected
05	Borrow Pit	1.80 m (5.9 ft)	None
06	Borrow Pit	1.65 m (5.4 ft)	None
07	Borrow Pit	1.12 m (3.7 ft)	None
08	Borrow Pit	1.20 m (3.9 ft)	None
09	Borrow Pit	1.32 m (4.3 ft)	None
10	Borrow Pit	1.24 m (4.1 ft)	None
11	Borrow Pit	2.00 m (6.6 ft)	None
12	Access Road	2.00 m (6.6 ft)	None
13	Access Road	2.00 m (6.6 ft)	None
14	Access Road	2.00 m (6.6 ft)	Modern ceramic on surface; not collected
15	Access Road	2.00 m (6.6 ft)	Modern bolts and screws; not collected

Since it was possible that visual effects of construction and maintenance might extend beyond the physical impacts of construction, this facet of the study area was expanded by 50 m (164 ft) along the outside edges of each proposed project item, to account for any possible effect within the viewshed of an identified property. Architectural investigations were undertaken in accordance with guidelines established in *National Register Bulletin 24: Guidelines for Local Surveys: A Basis for Preservation Planning* (National Park Service 1995).

Curation

Following acceptance of the final report, all archeological materials, records, photographs, and field notes will be curated with the:

State of Louisiana
Department of Culture, Recreation, and Tourism
Division of Archaeology
P.O. Box 44247
Baton Rouge, Louisiana 70804-4247
Telephone (504) 342-8170

in the Curation Facility located at:

Galvez Building, Room B-023
602 N. Fifth Street
Baton Rouge, LA 70802
Telephone (504) 342-4475

CHAPTER VII

RESULTS OF THE INVESTIGATION

Introduction

During July of 2003 R. Christopher Goodwin & Associates, Inc., completed a Phase I cultural resources survey and archeological inventory of a proposed borrow pit and associated access road in Ascension Parish, Louisiana on behalf of the U.S. Army Corps of Engineers, New Orleans District (Figure 1). This project is associated with the previously surveyed Hohen-Solms to Modeste Levee Enlargement Project in Ascension Parish, Louisiana. The newly proposed project items are situated in an area deemed to have a moderate to high potential for containing intact cultural deposits, as determined during the previous cultural resources investigation entitled *Phase I Cultural Resources Survey and Archeological Inventory of the Alhambra to Hohen-Solms and Hohen-Solms to Modeste Project Items, Ascension and Iberville Parishes, Louisiana* (George et al. 2000). As detailed in the Scope of Work for this project, the U.S. Army Corps of Engineers, New Orleans District plans to excavate a borrow pit in the vicinity of Mississippi River Mile 181. The proposed borrow pit, as well as an access road will be used to access the borrow pit area from the extant flood control structure, is situated within the batture of the Mississippi River. As described in the previous chapter, fieldwork for this project consisted of pedestrian survey augmented by systematic backhoe trenching throughout the proposed project items. The Areas of Potential Effect associated with this project consisted of a borrow pit area measuring 75 x 150 m (246.0 x 492.1 ft) in size and an access road measuring 165 m (541 ft) in length by 15 m (49 ft) in width. A total of 1.4 ha (3.4 ac) was examined as a result of this investigation (i.e., the borrow pit and access road project items combined).

Results of Field Investigations

During survey, 15 of 15 planned backhoe trenches were excavated successfully within the Areas of Potential Effect (Figure 16). As a result of this undertaking, only modern (i.e., post 1950) cultural material was identified. This material was noted and observed in the field, but not collected. Despite the intensive field effort, no historic or prehistoric cultural material or cultural features were identified as a result of this investigation. In addition, no historic standing structures, i.e., those 50 years in age or older, were recorded during survey. The following discussion describes the results of the Phase I cultural resources survey and archeological inventory of the proposed borrow pit and associated access road.

Borrow Pit

The proposed borrow pit was located in an unnumbered section near Section 5 of Township 11S, Range 14E in Ascension Parish, Louisiana (Figure 2). Elevations throughout the proposed project item approximated 7.62 m (25 ft) NGVD. The area was bounded to the north by the access road, to the east by the Mississippi River, to the south by secondary growth, and to the west by an extant borrow pit and levee (Figure 17). At the time of survey, the proposed borrow pit was covered by grass and secondary growth vegetation.

Systematic visual examination of the borrow pit project item was accomplished through pedestrian survey. The Area of Potential Effect was inspected visually along parallel survey tran-

Figure 17. **Overview photo of the proposed borrow pit project item facing southeast.**

sects. Visibility was poor in the area of the proposed borrow pit due to the presence of grass and secondary growth. Pedestrian survey in this area failed to encounter any cultural material or features on the ground surface.

During Phase I cultural resources survey and archeological inventory, 11 of 11 (100 percent) planned backhoe trenches were excavated successfully within the borrow pit project item (Figure 16). The backhoe trenches excavated within the borrow pit project item exhibited variable profiles. The majority of the backhoe trenches (n=6) exhibited only a single stratum in profile. In these cases, Stratum I typically was characterized as a layer of dark grayish brown (2.5Y 4/2) clay that ranged in depth from 0 to 180 cmbs (0 to 70.8 inbs) (Figures 18 and 19). Although the five remaining trenches each exhibited two strata in profile, each stratigraphic profile was unique. In general, however, Stratum I described above was overlain by a mottled silty clay soil horizon that ranged in colors from a very dark brown (10YR 2/2) to a very dark grayish brown (2.5Y 3/2). This upper mottled horizon ranged in depth from 0 to 80 cmbs (0 to 31.5 inbs); the uniform soil horizon described as Stratum I above continued from the base of the mottled horizon to a maximum excavated depth of 200 cmbs (78.7 inbs). These trenches document that the area has been disturbed in the past.

Phase I cultural resources survey and archeological inventory of the proposed borrow pit project item resulted in the identification of modern (i.e., post 1950) cultural material. The identified artifacts consisted of three wire nails that originated from the uppermost portion of Stratum I in Backhoe Trench 4. All of this material, which originated from a clearly disturbed stratum represented by mottled soil deposits, was modern in origin; thus, none of wire nails were collected. Aside from the modern (i.e., post 1950) cultural material discussed above, the current Phase I cultural resources survey and archeological inventory of the borrow pit area failed to result in the identification of any historic or prehistoric cultural material or intact cultural deposits. In addition, visual reconnaissance of those areas situated within and immediately adjacent to the proposed borrow pit did not result in the identification of any historic stand-

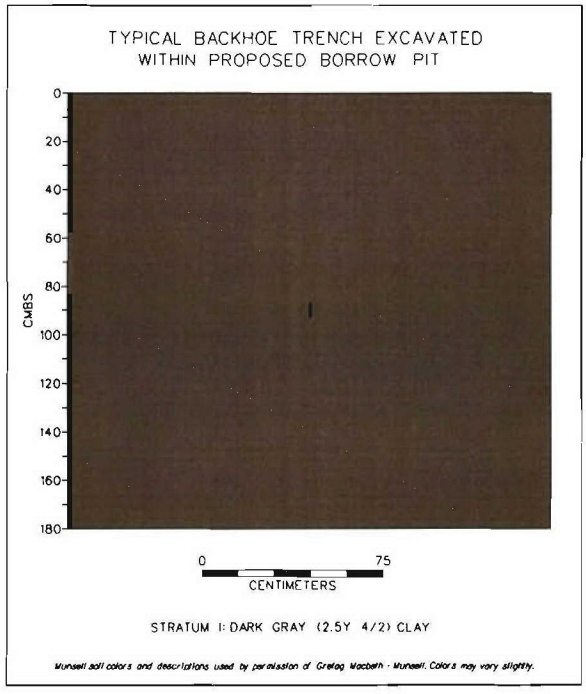

Figure 18. **Typical backhoe trench profile excavated within the borrow pit project item.**

Figure 19. **Photo of a typical backhoe trench excavated within the borrow pit project item.**

ing structures, i.e., those 50 years in age or older. Consequently, no additional testing of this project item is recommended.

Access Road

The proposed access road also was located in an unnumbered section near Sections 3 and 4 of Township 11S, Range 14E in Ascension Parish, Louisiana (Figure 2). It measured 165 m (541 ft) in length by 15 m (49 ft) in width. The proposed road extended in an easterly direction from the borrow pit project item, turned north, and terminated at a gate leading to the extant levee (Figure 16). Elevations along the proposed access road ranged from 7.6 to 9.1 m (25 to 30 ft) NGVD. At the time of survey, the proposed access road was described as an improved dirt road with some gravel.

The access road project item was inspected visually from the levee gate to the proposed borrow pit project area along parallel transects situated to either side of the proposed centerline. Pedestrian survey resulted in the identification of a modern refuse pile adjacent to the western edge of the access road and in the vicinity of Backhoe Trench 15 (Figure 16). It consisted of plastic jugs, small appliances, and miscellaneous discarded materials.

A total of 4 of 4 (100 percent) planned backhoe trenches were excavated successfully along the proposed access road project item as a result of this investigation (Figure 16). A typical backhoe trench excavated along the access road extended to a depth of 200 cmbs (78.8 inbs) and it exhibited two strata in profile (Figures 20 and 21). Stratum I consisted of a layer of dark gray (2.5Y 4/1) clay mottled with brown (10YR 5/3) clay that extended from 0 to 80 cmbs (0 to 31.5 inbs). Stratum II was characterized as a deposit of gray (2.5Y 5/1) silty clay mottled with olive brown (2.5Y 4/3) silty clay; it ranged in depth from 80 to 200 cmbs (31.5 to 78.7 inbs).

During survey, a single modern terracotta flowerpot sherd was recovered from the surface

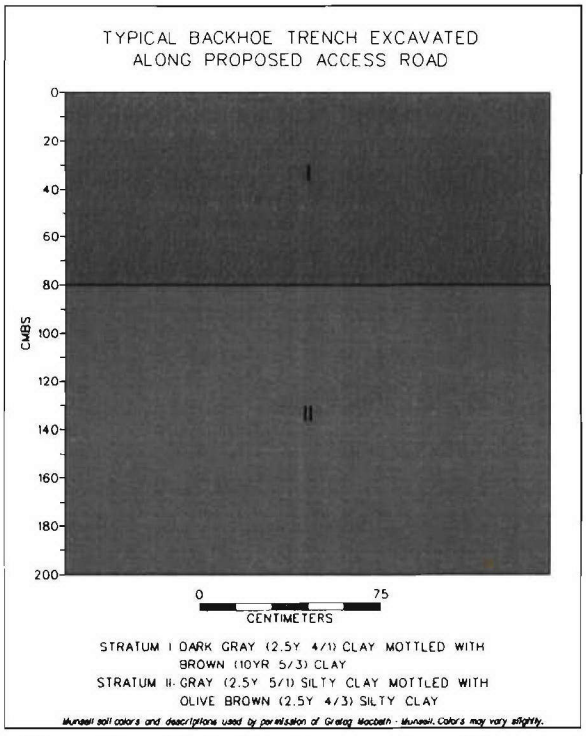

Figure 20. Typical backhoe trench profile excavated within the access road project item.

Figure 21. **Photo of a typical backhoe trench excavated within the access road project item.**

adjacent to Backhoe Trench 14. In addition, 8 iron bolts and screws were noted within the upper 35 cm (13.8 in) of Stratum I during the excavation of Trench 15. All of this material, which originated from the surface or clearly disturbed strata represented by mottled soil deposits, was modern in origin; thus, these items were discarded in the field. Aside from the modern items discussed above, the current Phase I cultural resources survey and archeological inventory failed to result in the identification of any historic or prehistoric cultural material of cultural features. In addition, visual reconnaissance of those areas situated within and immediately adjacent to the proposed access road did not result in the identification of any historic standing structures. Therefore, no additional testing of the proposed access road is recommended.

CHAPTER VIII

SUMMARY AND MANAGEMENT RECOMMENDATIONS

A Phase I cultural resources survey and archeological inventory of the proposed borrow pit and associated access road in Ascension Parish, Louisiana was undertaken in July of 2003 by R. Christopher Goodwin & Associates, Inc., on behalf of the U.S. Army Corps of Engineers, New Orleans District as part of their efforts to maintain and improve flood control structures along that portion of the Mississippi River. The proposed borrow pit, as well as an access road that will be used to access the borrow pit area from the extant flood control structure, will be situated along the right descending bank of the Mississippi River and in the vicinity of River Mile 181.0. Fieldwork for this project included pedestrian survey augmented by systematic backhoe trench excavations throughout the proposed project areas. Backhoe trenching was conducted at 30 m (98.4 ft) intervals along two transects spaced 30 m (98.4 ft) apart within the borrow pit project item boundaries and along a single linear transect during survey of the proposed access road. The proposed borrow pit project item measured approximately 150 m (492 ft) in length by 75 m (240 ft) in width, while the associated access road measured 165 m (541 ft) in length by 15 m (49 ft) in width. Fieldwork also included an architectural survey to identify and record any historic standing structures older than 50 years in age situated within or immediately adjacent to the limits of the proposed project items.

During Phase I cultural resources survey and archeological inventory of the proposed borrow pit and access road project items, only modern (i.e., post 1950) cultural material consisting of 3 wire nails, several modern bolts/screws, and a single terracotta flowerpot sherd. This material was noted and observed in the field, but not collected. Despite the intensive field effort, no historic cultural material or cultural features were identified as a result of this investigation. In addition, no historic standing structures, i.e., those 50 years in age or older, were recorded during survey. In summary, no significant or potentially significant cultural resources were identified within the limits of the proposed project borrow pit or associated access road. No additional testing of the proposed project items is recommended.

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