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**CULTURAL RESOURCES STUDY
SUPPORTING SUPPLEMENT I TO THE FINAL
ENVIRONMENTAL IMPACT STATEMENT,
MISSISSIPPI RIVER MAIN LINE LEVEE**

FINAL REPORT
OCTOBER 2000

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13. ABSTRACT (Maximum 200 words)

Between July 1997 and January 1999, R. Christopher Goodwin & Associates, Inc., performed a cultural resources study sufficient to support the preparation of a supplement to the Final Environmental Impact Statement, Mississippi River and Tributaries, Mississippi River Levees and Channel Improvement, which was filed with the Council on Environmental Quality in 1976. This cultural resources study consisted of archival research and a synthesis of information following the general approach of devising historic contexts suitable for guiding later identification, evaluation, and mitigation actions possibly needed for 11 project items located along 15 miles of levees within Ascension, East Baton Rouge, Concordia, Iberville, Orleans, and Plaquemines Parishes, Louisiana. The 11 project items included the Fifth Louisiana District levee enlargement, the Baton Rouge Front Levee, the Reveille-Point Pleasant levee enlargement, the Carville-Marchand levee enlargement and concrete slope paving, the Hohen Solms-Moedesto levee enlargement, the Carrollton levee enlargement, the Alhambra-Hohen Solms concrete slope paving, the Jefferson Heights concrete slope paving, the New Orleans District Floodwall, the Gap Closures West Bank concrete slope paving, and the Gap Closures East Bank concrete slope paving.

The Area of Potential Effect for the purposes of this study was a two-kilometer (1.2 mi) wide corridor centered on each project item. Information on previously conducted archeological surveys, as well as previously identified archeological sites, historic standing structures, historic cemeteries and National Register of Historic Places properties, was gathered and synthesized. These data were transferred onto 7.5' USGS topographic quadrangles, as well as into a GIS database that is compatible Corps REEGIS system.

The cultural resources study resulted in the identification of a total of 47 archeological sites, 142 standing structures, four historic districts, and six historic cemeteries within the proposed project corridor associated with each of the 11 project items. Of the 47 previously identified archeological sites, a total of 25 sites (16AN3, 16EBR19, 16EBR29, 16EBR55, 16EBR58, 16EBR59, 16EBR75, 16EBR81, 16EBR90, 16EBR92, 16EBR99, 16EBR151, 16EBR155, 16IV136, 16IV140, 16IV141, 16IV147, 16IV150, 16IV151, 16OR120, 16OR121, and 16PLA8) do not possess the qualities of significance as defined by the National Register of Historic Places criteria of evaluation (36 CFR 60.4 [a-d]); no additional testing is recommended.

Of the previously identified archeological sites, a total of 11 sites (16AN20, 16AN22, 16AN51, 16AN57, 16AN58, 16AN61, 16EBR24, 16EBR25, 16EBR41, 16EBR150, and 16OR96) was assessed as potentially significant applying the National Register of Historic Places criteria of evaluation (36 CFR 60.4 [a-d]). Additional evaluation of eight of these sites (16AN20, 16AN22, 16AN51, 16AN57, 16AN58, 16EBR24, 16EBR41, and 16OR96) in the form of subsurface testing is recommended. The remainder of the potentially significant sites (16AN61, 16EBR25, and 16EBR150) should be avoided during proposed construction activities.

Of the previously identified archeological sites, five sites (16AN26, 16EBR8, 16EBR43, 16EBR79, and 16OR90) have been listed on the National Register of Historic Places. These sites should be avoided during proposed construction activities in the vicinity of the project items.

Of the previously identified archeological sites, six sites (16AN19, 16AN21, 16AN59, 16EBR44, 16EBR45, and 16IV126) have not formally been assessed. Additional evaluation of these sites in the form of subsurface testing is recommended to determine their potential for listing on the National Register of Historic Places.

In addition to the previously identified archeological sites, a total of 142 standing structures was identified during the cultural resources study. Of the 142 standing structures, a total of 139 standing structures (3-198 - 3-223, 3-225 - 3-262, 3-620 - 3-635, 24-493 24-499, 24-550 - 24-553, 24-555 - 24-556, 24-564 - 24-572, 24-576 - 24-579, 24-583 - 24-593, 24-650 - 24-655, 24-661 - 24-666 and 24-753 - 24-762) has not formally been assessed. It is recommended that these structures undergo an informal architectural survey to determine if any of them possess the qualities of significance as defined by the National Register of Historic Places criteria of evaluation (36 CFR 60.1 [a-d]). Of the remaining three structures, the Melberry Grove (3-244) and the Ashland House structures have already been listed on the National Register of Historic Places; they should be avoided during proposed construction. The National Register of Historic Places eligibility status of standing structure 24-660 was listed as unknown; it also should undergo an informal architectural survey to determine if it possesses the qualities of significance as defined by the National Register of Historic Places criteria of evaluation (36 CFR 60.1 [a-d]).

In addition to the previously identified standing structures, a total of four historic districts were identified during the course of the cultural resources study. These districts include the Spanish Town and Beaugard Historic Districts in East Baton Rouge Parish and the Uptown New Orleans and Carrollton Historic Districts in Orleans Parish. All four of these districts previously have been listed on the National Register of Historic Places; they should be avoided during proposed construction associated with the project items.

Finally, a total of six historic cemeteries (3-171, 3-172, 24-554, 24-573, and two unnamed cemeteries (one in Ascension Parish and one in Iberville Parish)) was identified during the cultural resources study. None of the cemeteries has formally been assessed applying the National Register of Historic Places criteria of evaluation (36 CFR 60.1 [a-d]). Since all of the historic cemeteries contain human remains, it is recommended that they be avoided during proposed construction activities.

14. SUBJECT TERMS

Supplementary Environmental Impact Statement
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Plaquemines Parish

Ascension Parish
East Baton Rouge Parish, Iberville Parish
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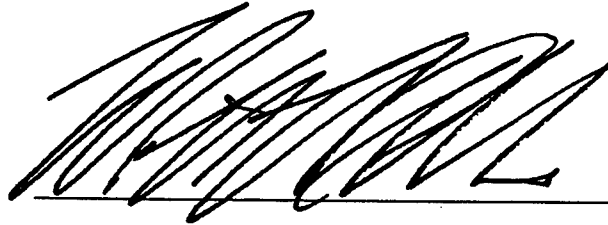
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ENVIRONMENTAL IMPACT STATEMENT, MISSISSIPPI RIVER MAIN LINE LEVEE**

FINAL REPORT

A large, stylized handwritten signature in black ink, appearing to read 'W. P. Athens', is written over a horizontal line.

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By

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October 2000

For

**U.S. Army Corps of Engineers
New Orleans District
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CHAPTER I

INTRODUCTION

This document presents the results of a comprehensive cultural resources records review that supports the Supplement I to the Final Environmental Impact Statement, Mississippi River and Tributaries, Mississippi River Levees and Channel Improvement. That document was filed with the Council on Environmental Quality in 1976. This records review was completed on behalf of the U.S. Army Corps of Engineers, New Orleans District and it included preliminary investigations of 11 levee-related project items throughout southeastern Louisiana. These project items include the Fifth Louisiana District Levee Enlargement; the Baton Rouge Front Levee; the Reveille to Point Pleasant Levee Enlargement; the Carville to Marchand Levee Enlargement and Concrete Slope Paving; the Hohen-Solms to Modesto Levee Enlargement; the Carrollton Levee Enlargement; the Alhambra to Hohen-Solms Concrete Slope Paving Project; the Jefferson Heights Concrete Slope Paving Project; the New Orleans District Floodwall; the Gap Closures West Bank Concrete Slope Paving Project; and the Gap Closures East Bank Concrete Slope Paving Project (Figures 1 - 5 [Figures 2 - 5 are oversized maps which appear at the back of this report]).

These structures were constructed as part of the Mississippi River and Tributaries Project, authorized by Congress through the Flood Control Act of 1928. The project included the development of the four major elements that comprise the main levee system. These elements included funding for levees to contain flood flows; construction of floodways for the passage of excess flows; completing channel improvement and stabilization for the channel to aid navigation

alignment, increase flood-carrying capacity, and protect the levees; and completing tributary basin improvements such as the construction of dams and reservoirs, pumping plants, auxiliary channels, and the like.

The project items listed above comprise only a small portion of the main Mississippi River levee system. The main levee system encompasses approximately 2,586 km (1,607 mi) of earthen and concrete works designed to minimize the effects of river flooding on both urban and rural areas. Of the over two thousand kilometers of earthen and concrete works comprising the main levee system, approximately 838 km (521 mi) are located within boundaries of the U.S. Army Corps of Engineers, New Orleans District. Only 24 km (15 mi) of these 838 km (521 mi), however, are covered under the current delivery order.

The Area of Potential Effect for this undertaking consisted of a 2 km (1.2 mi) wide corridor centered on the 11 existing levee alignments. The corridor stretched for at least 1 km (0.62 mi) landside of the project items and up to 1 km (0.62 mi) riverside of the project items (depending on the distance to the river from the project item at any particular point). On the riverside of the project items, only batture lands, that is seasonally rather than permanently flooded lands, were investigated. The underwater component of the Mississippi River located adjacent to or nearby the proposed project items was not investigated.

The following literature and records review was designed to collect data pertaining to all known cultural resources identified within each 2 km (1.2 mi) wide project corridor segment.

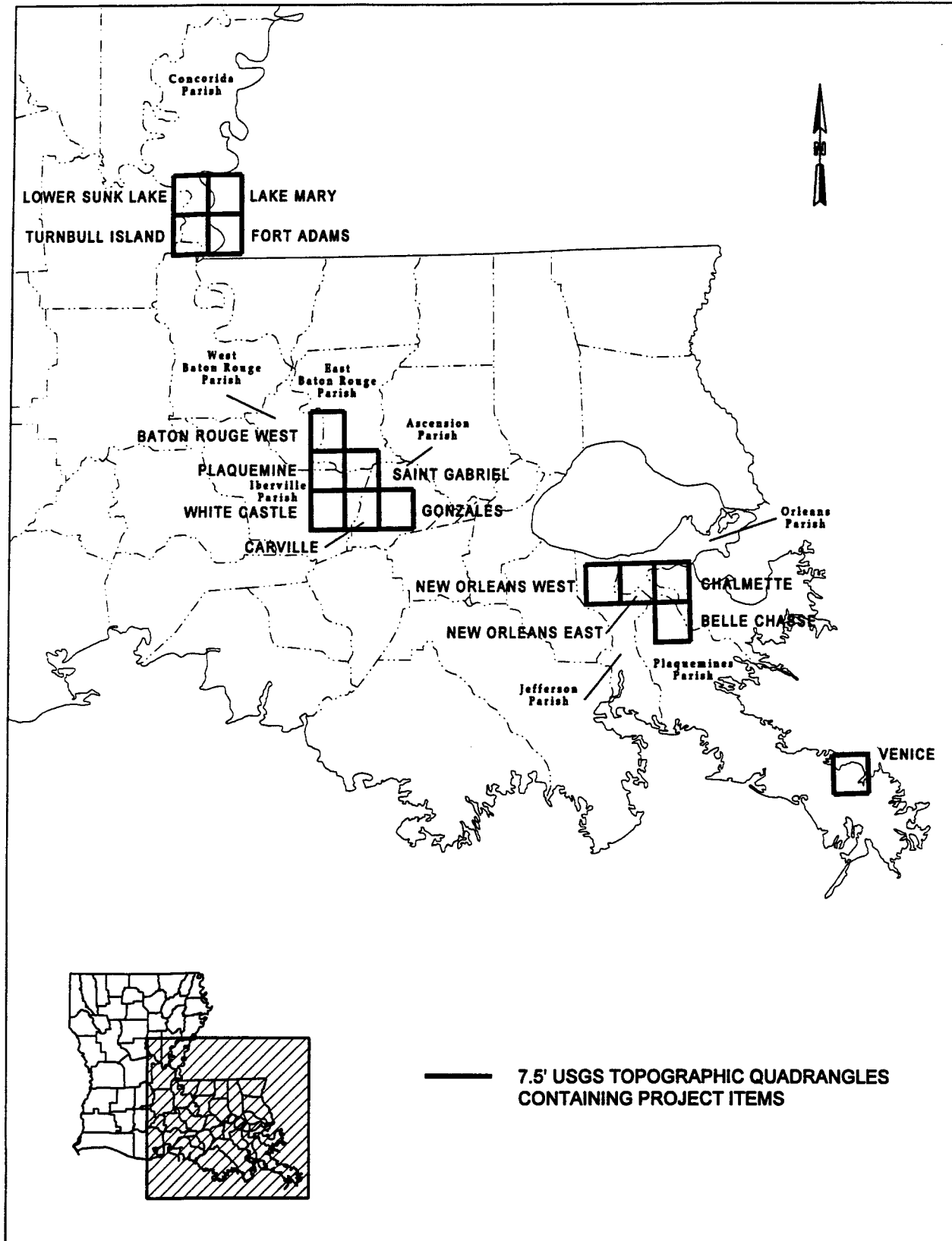


Figure 1. Map of Louisiana depicting the SEIS New Orleans Project Items.

Research focused on previously completed cultural resources surveys, recorded archeological sites, cemeteries, standing structures, and National Register of Historic Places properties situated within the overall area. Once identified, these previously cultural resources/properties were plotted on 7.5' USGS topographic quadrangles. Once plotted, all of the previously recorded archeological studies, sites, standing structures, and cemeteries were digitized and used to develop a geographic information system compatible with the U.S. Army Corps of Engineers REEGIS system.

The information presented in this document was compiled in partial fulfillment of the statutes associated with the National Environmental Policy Act of 1969 (Public Law 91-190) and the National Historic Preservation Act of 1966, as amended (Public Law 89-665). Additional investigations may be required to complete the task.

Project Results

The current study was designed to identify all previously conducted cultural resources surveys, as well as previously recorded archeological sites, standing structures, and historic cemeteries located with the two-kilometer (1.2 mi) wide area of potential effect associated with each of the 11 proposed project items. The records review identified 45 cultural resources investigation that have been conducted within the overall study area. These studies have resulted in the identification of 47 archeological sites, 142 standing structures, and 6 historic cemeteries. In addition, 4 historic districts lie within the overall study corridor (Figures 2 – 5).

At least 19 of the 47 previously recorded sites have been assessed as not significant (16EBR55, 16EBR58, 16EBR75, 16EBR81, 16EBR90 - 16ENR92, 16EBR99, 16EBR151, 16EBR155, 16IV136, 16IV140, 16IV147 - 16IV149, 16IV150, 16IV151, 16OR120, and 16OR121). These sites possess little (if any) research potential; they do not possess the qualities of significance as defined by the National Register of Historic Places criteria of evaluation

(36 CFR 60.4 [a-d]). No additional testing of these 19 sites is recommended.

In addition, a total of 12 of the identified archeological sites have previously been determined potentially significant. A total of five of these sites (16AN20, 16AN22, 16AN51, 16EBR24, and 16EBR41) appear to possess fair to good research potential; however, previously conducted fieldwork at these sites apparently was not extensive. Therefore it is recommended that these sites be subjected to additional subsurface testing to support the determination of potentially significant as defined by the National Register of Historic Places criteria of evaluation (36 CFR 60.4 [a-d]). A total of three of the 12 identified sites that have previously been determined potentially significant (16EBR25, 16EBR150, and 16OR96) are listed either as "preserved *in situ*" or as prehistoric mounds. Previous fieldwork was sufficient to support the determination of potentially significant, and these sites should be avoided during future construction along the project corridor. One of the previously identified sites (16AN61) listed as potentially significant contains human remains. It is recommended that this site be avoided during construction along the project corridor. One of the previously identified sites (16EBR59) listed as potentially significant has been destroyed. No additional testing is recommended for this site. Finally, two of the previously identified sites listed as potentially significant (16AN57 and 16AN58) were scheduled for destruction during pipeline construction in 1995.

Two of the previously identified sites (16AN57 and 16AN58) that were listed as potentially significant were determined on the basis of pedestrian survey augmented by shovel testing. Site 16AN57 consists of a historic cultural materials scatter and a concrete foundation. Site 16AN58 consists of a historic cultural materials scatter. Both sites were scheduled for destruction in 1995 to accommodate the construction of a pipeline. Since it is unknown if the pipeline was constructed, it is difficult to make comprehensive recommendations for these sites. However, if the pipeline has not been con-

structed, it is recommended that both sites be avoided during any future construction along the existing levee alignment. If avoidance is impossible, then it is recommended that additional subsurface testing be conducted at both sites.

In addition, only a single previously identified archeological site (16OR90) was listed as significant. This site consists of the ruins of the Beka Plantation, and it dates from the 19th to early 20th century. It is recommended that this site be avoided during construction along the levee corridor.

A total of four of the previously identified archeological sites (16AN26, 16EBR8, 16EBR43, and 16EBR79) already have been listed to the National Register of Historic Places. It is recommended that all of these sites be avoided during construction along the existing levee corridor.

Finally, 11 previously recorded archeological sites were identified within the project corridors; these sites have not been formally assessed. At least five of the sites (16AN19, 16AN21, 16AN59, 16EBR44, and 16EBR45) appear to possess fair to good research potential. Subsurface testing may be required to evaluate their significance applying National Register of Historic Places criteria of evaluation (36 CFR 60.4 [a-d]). At least five of the previously identified archeological sites (16AN3, 16EBR19, 16EBR29, 16IV141, and 16PL48) have been destroyed. Finally, the remaining recorded archeological site (16IV126) was described in 1976 as eroding into the Mississippi River. It is unknown if this site has since eroded into the river. If Site 16IV126 still exists, Phase II testing to relocate and evaluate its eligibility for inclusion in the National Register of Historic Places is recommended.

In addition to the 47 previously identified archeological sites, the results of this study indicate that 142 standing structures are located within the area of potential effect. The vast majority of these structures (n=140, 99 percent) have not been assessed formally. Therefore, a standing structures survey may be required to determine their eligibility for inclusion in the National Register of Historic Places. The Na-

tional Register of Historic Places eligibility of another previously identified structure (24-660) was listed as "unknown." This structure should be evaluated applying the National Register of Historic Places criteria of evaluation (36 CFR 60.4 [a-d]). Finally, a single previously recorded standing structure (3-224 [Mulberry Grove]) has been listed in the National Register of Historic Places. This structure should be avoided during construction of the proposed project items.

In addition, 4 historic districts were identified within the area of potential effect. These districts included the Spanish Town and Beauregard Historic Districts in Baton Rouge Parish, as well as the Uptown New Orleans and the Carrollton Historic Districts in Orleans Parish. These 4 historic districts are listed in the National Register of Historic Places. It is recommended that each district be avoided during construction of the proposed project items.

Finally, 6 historic cemeteries have been identified within the area of potential effect. These include the St. Mary Baptist Church Cemetery (3-171), the St. Philip Baptist Church (3-172), the Mt. Olive Baptist Church Cemetery (24-554), the St. Raphael Cemetery (24-573), and two unnamed cemeteries. None of these cemeteries has been assessed formally applying the National Register of Historic Places criteria of evaluation (36 CFR 60.4 [a-d]). Since all of these locations contain human burials, it is recommended that they be avoided during of the proposed project items. These cemeteries, as well as all of the previously identified archeological sites, standing structures, and historic districts identified as a result of this investigation, are discussed in more detail in Chapters VII and VIII.

Mr. William P. Athens, M.A., acted as Principal Investigator for this project and he supervised all aspects of this investigation. Mr. David R. George, M.A., A.B.D., served as Project Manager. Mr. Ralph B. Draughon, Jr., Ph.D. and Ms. Susan B. Smith, B.A. developed the historical contexts included in this report. Ms. Shirley J. Rambeau, A.A., and Mr. William E. Hayden, M.A. compiled the geographic information system used to portray the collected data. Mr. William B. Barr, M.A., Mr. Jeremy P. Pin-

coske, B.A., Mr. William E. Hayden, M.A., Ms. Rebecca Johnson, B.A., and Mr. Ryan Crutchfield, M.A. assisted in report writing.

Organization of the Report

The natural setting associated with each project item is presented in Chapter II. This chapter includes a review of the geomorphological development of the area, as well as a description of the climatology and the floral and faunal communities characteristic of the region. An overview of prehistoric and early historic cultural development of the area is contained in Chapter III. Chapter IV provides the history of the proposed project area, and includes both a broad regional historical perspective of lower Mississippi River Valley development, as well as more detailed histories for each of the 11 project items. Chapter V provides a review of all previous investigations completed within the two-kilometer (1.2 mi) wide associated with each of the project items. This review encom

passes all previously conducted cultural resources investigations, as well as all previously identified archeological sites and cemeteries, and known standing structures and National Register of Historic Places properties located within each study corridor. Chapter VI contains a discussion of the methods used in the literature and records review portion of this study, as well as those methods utilized to generate the geographic information system that contains the collected data. Chapter VII presents the results of the archival review. Chapter VIII contains a summary of the report and management recommendations for those cultural resources located within the two-kilometer (1.2 mi) wide survey corridor. The Scope of Services appears as Appendix I. Appendix II contains the cultural resources portion of the schema used to produce the REEGIS – compatible GIS files. An atlas of historic maps used in the historic research of the project items is enclosed as a separate attachment.

CHAPTER II

NATURAL SETTING

Introduction

This chapter provides an overview of the geology, physiography, geomorphology, flora, fauna, and climate associated with the various U.S. Army Corps of Engineers, New Orleans District project items. For ease of discussion, and because the project items are scattered across a rather large area, this chapter has been divided into several sections. The first section, geology, physiography, and geomorphology, examines the overall project area. Since geological and geomorphological events that occurred throughout the northern portion of the project area have a direct and measurable impact on past events in the southern portion of the project area, such a format seemed beneficial. In addition, this section provides both a general overview of the project area and detailed discussions of each proposed project item location.

The second portion of this chapter describes the flora, fauna, and climate of the overall project area, and it has been divided into two subsections. The first subsection describes the flora, fauna, and climate for southern and east-central portion of Louisiana. The second subsection addresses these items throughout the northeastern part of the state.

Geology, Physiography, and Geomorphology of the Project Area

In a highly dynamic natural environment like the Lower Mississippi Valley, a basic understanding of geomorphic processes and history is a fundamental part of any cultural resources investigation. Throughout prehistoric

and historic times, there has been an intimate relationship between the natural landscape and aspects of human life such as subsistence and settlement patterns. In many cases, the nature of the landscape precluded permanent habitation during certain periods of time or dictated that the artifacts or other remains left behind would not be preserved or easily recoverable. In other cases, the landscape provided a range of settlement possibilities, many of which are predictable given a knowledge of landscape dynamics and evolution. Thus, the information presented below provides a context to interpret the distribution of previously recorded archeological sites across the landscape, to assess the probability of identifying additional archeological sites in the future, and evaluate the significance of the cultural resources base associated with the proposed project area.

Administratively, the entire project area from Cairo, Illinois, to New Orleans, Louisiana, contains 94 individual project items located within the jurisdictional limits of the U.S. Army Corps of Engineers Memphis, New Orleans, and Vicksburg Districts. This report on the geomorphic setting of the project area consists of two parts. The first part involves a general and non-specific discussion of the physiography, geologic setting, geomorphic processes, depositional environments, and geologic history of the entire Lower Mississippi Valley which is contained herein. The discussion pertains equally to each of the three district areas except for discussions of the Mississippi River deltaic plain that pertain only to the New Orleans District area. The second part of this report provides separate,

shorter, and more detailed discussions of the specific project items or clusters of closely-spaced project items that share similar physiographic or geologic characteristics. The items have been given proper names and are further designated by their position by river mile above the Head of Passes (AHP) and by their position on the right or left descending bank of the river.

All discussions, both general and specific, were prepared from information contained in the published literature pertaining to the geomorphology, geologic history, and archeology of the entire area. No field reconnaissance was conducted for the purposes of these discussions. Site-specific discussions contain citations of dozens of relevant literature items whereas the general discussion relies almost exclusively on two recent syntheses of the entire valley (Autin et al. 1991; Saucier 1994). Rather than provide citations to the hundreds of literature sources on which the general discussion is based, the reader is referred to the extensive list of references contained in the two previously cited syntheses, especially the latter which was published by the U.S. Army Corps of Engineers, Mississippi River Commission.

During the course of research into the geomorphological history of the proposed U.S. Army Corps of Engineers, New Orleans District project items, numerous base maps were utilized. These maps were produced at a scale of 1:100,000 and they were created from a Geographical Information System (GIS). Each map contained a file (overlay) depicting the depositional environments with 2 km (1.2 mi) of the proposed project items (see below). This data originally was gathered and presented in a geomorphological investigation of the Lower Mississippi River Valley by Saucier (1994). This study was conducted on behalf of the U.S. Army Corps of Engineers. Due to its recent publication and applicability to the current project items, none of the geomorphological classifications made in Saucier's (1994) original publication was changed. In addition, due to the large scope of the present project, no attempt was made to refine or otherwise update those geomorphic interpretations.

Project Area Location

The project items span a longitudinal (north-south) distance of about 885 km (550 mi) and extend from extreme southeastern Missouri southward to near the mouth of the Mississippi River in southeastern Louisiana. They lie between the towns of Commerce, Missouri, at River Mile 993 AHP, to Venice, Louisiana, at River Mile 10 AHP on the Mississippi River and the project area includes several miles of the lower Ohio River above Cairo, Illinois. With only a single exception, all items are located along or in close proximity to the mainline flood control levees of the Mississippi River. Most of the project items are narrow, linear transects measuring only a few tens to hundreds of meters in width, but they may be as long as 10 or more kilometers in length. To provide a more generalized perspective and to allow for meaningful analysis, these discussions necessarily are wider in scope and encompass a number of geomorphic features that often extend for tens of kilometers away from the river.

Physiographic Setting of the Project Area

The entire project area lies within the Mississippi Valley segment of the Gulf and Atlantic Coastal Plain province of North America. More specifically, it is restricted to the alluvial valleys of the lower Mississippi and Ohio Rivers, an area generally referred to as the Lower Mississippi Valley (Figure 6). The Lower Mississippi Valley is defined as the greater Quaternary-age valley and the deposits of the Mississippi River and its principal tributaries (Saucier 1994). The valley is bordered by dissected uplands underlain by formations ranging in age from the Tertiary to the Paleozoic but these are capped with Quaternary sediments. Toward the southern end of the Lower Mississippi Valley, a young Pleistocene terrace forms the valley margins.

On the basis of geographic and topographic distinctions, the Lower Mississippi Valley has three main physiographic divisions (Figure 6) (Autin et al. 1991). The most extensive are the *Holocene alluvial valleys* of the Mississippi River and its major tributaries. A second is the *Holocene deltaic plain* situated at the mouth of

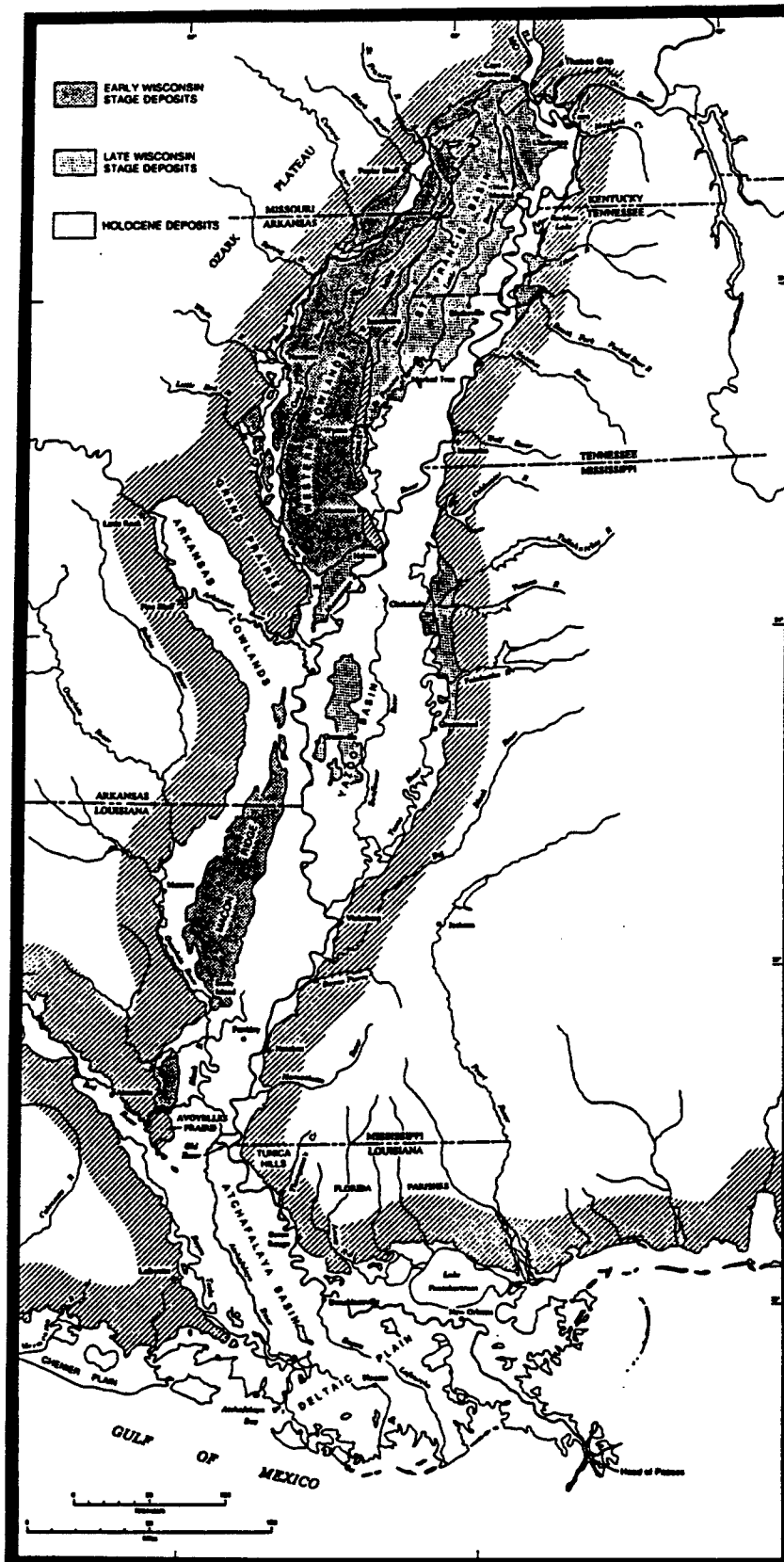


Figure 6. Location map depicting the distribution of Wisconsin(an) Stage and Holocene deposits in the Lower Mississippi Valley. From Saucier, Smith, and Autin (1996).

the alluvial valley and bordering on the Gulf of Mexico. A third division consists of *Pleistocene alluvial and deltaic landforms*, including terraces, valley trains, and blanket graveliferous deposits of the uplands. Most of the project items lie within the first two divisions.

The principal physiographic elements associated with the alluvial valley are the meander belt ridges that flank the present and several abandoned courses of the Mississippi River. These low ridges are separated by broad, relatively flat basin areas such as the St. Francis Basin of northeast Arkansas, the Yazoo Basin of northwest Mississippi, and the Tensas Basin of northeast Louisiana. Analogous physiographic elements are present in the deltaic plain. The meander belt flanking the present Mississippi River and numerous abandoned distributaries separate broad basin areas such as the Barataria, Pontchartrain, and Atchafalaya Basins of southeast and south-central Louisiana. All basin areas are of secondary importance in this discussion since nearly all of the project items lie along the meander belt of the active Mississippi River course.

The alluvial valley and deltaic plains are areas of both low relief and low elevation. In southeast Missouri, highest floodplain elevations approximate only 91 m (300 ft) above sea level (NGVD) and these decline essentially to sea level at the mouth of the river. This produces an average valley gradient of about 8.12 cm/km (5.16 in/mi) downstream to about Baton Rouge, Louisiana and progressively less to the mouth of the river. The greatest degree of regional floodplain relief occurs between natural levee crests and adjacent floodbasin (backswamp) or interdistributary wetlands and it typically measures about 4.6 to 6.1 m (15 to 20 ft). Local relief, greatest along the banks of the Mississippi River and the local drainages, is as great as 9.1 to 12.2 m (30 to 40 ft). The local relief declines to essentially nil at the mouth of the Mississippi River and it generally measures less than 3.0 m (10 ft) throughout the deltaic plain.

Drainage of local runoff typically was away from the Mississippi River toward floodbasin areas during prehistoric times, and that trend has been enhanced by the construction of

flood control levees in historic times. Only abandoned chutes, channels, and swales in the batture area (i.e., the area between the artificial levees) are directly connected to the river. Major valley tributaries such as the Arkansas, Yazoo, and Red Rivers are the only direct tributaries of the river. In the deltaic plain, the interdistributary lowlands experience tidal effects in the area between Baton Rouge and New Orleans, Louisiana, with an accompanying periodic intrusion of Gulf waters that produces brackish water conditions.

Geologic and Geomorphic Setting of the Project Area

The Mississippi Embayment, a relatively symmetrical syncline, and the northern flank of the Gulf Basin into which the embayment merges are the primary structural features of the Lower Mississippi. In the former, Paleozoic rocks are downwarped by as much as 3,048 m (10,000 ft) roughly midway between the Ouachita Mountains to the west and the Southern Appalachians to the east (Figure 7).

Because of the influence of several secondary structural features, the axis of the embayment follows a sinuous, north-south trend roughly along the eastern side of the Mississippi alluvial valley. The embayment widens noticeably in eastern Arkansas into the Desha Basin, which actually is the eastern portion of the larger Arkoma Basin. In western Mississippi, the embayment narrows and its axis swings to the southeast as a consequence of the Monroe Uplift to the west and the Jackson Dome to the east. South of these uplifts, the embayment broadens into the east-west trending Gulf Basin of south Louisiana, and the Paleozoic rocks plunge to depths as great as 6,096 m (20,000 ft) in the vicinity of Vicksburg, Mississippi, and 9,144 m (30,000 ft) in the vicinity of Baton Rouge.

The thousands of meters of sediment that fill the Embayment and the Gulf Basin were laid down mostly in the Tertiary period, during cycles of sea level regressions and transgressions, in various depositional environments ranging from terrestrial to estuarine to deltaic to shallow marine to deep marine. In general, the sedimentary sequence is unlithified with hard rock being

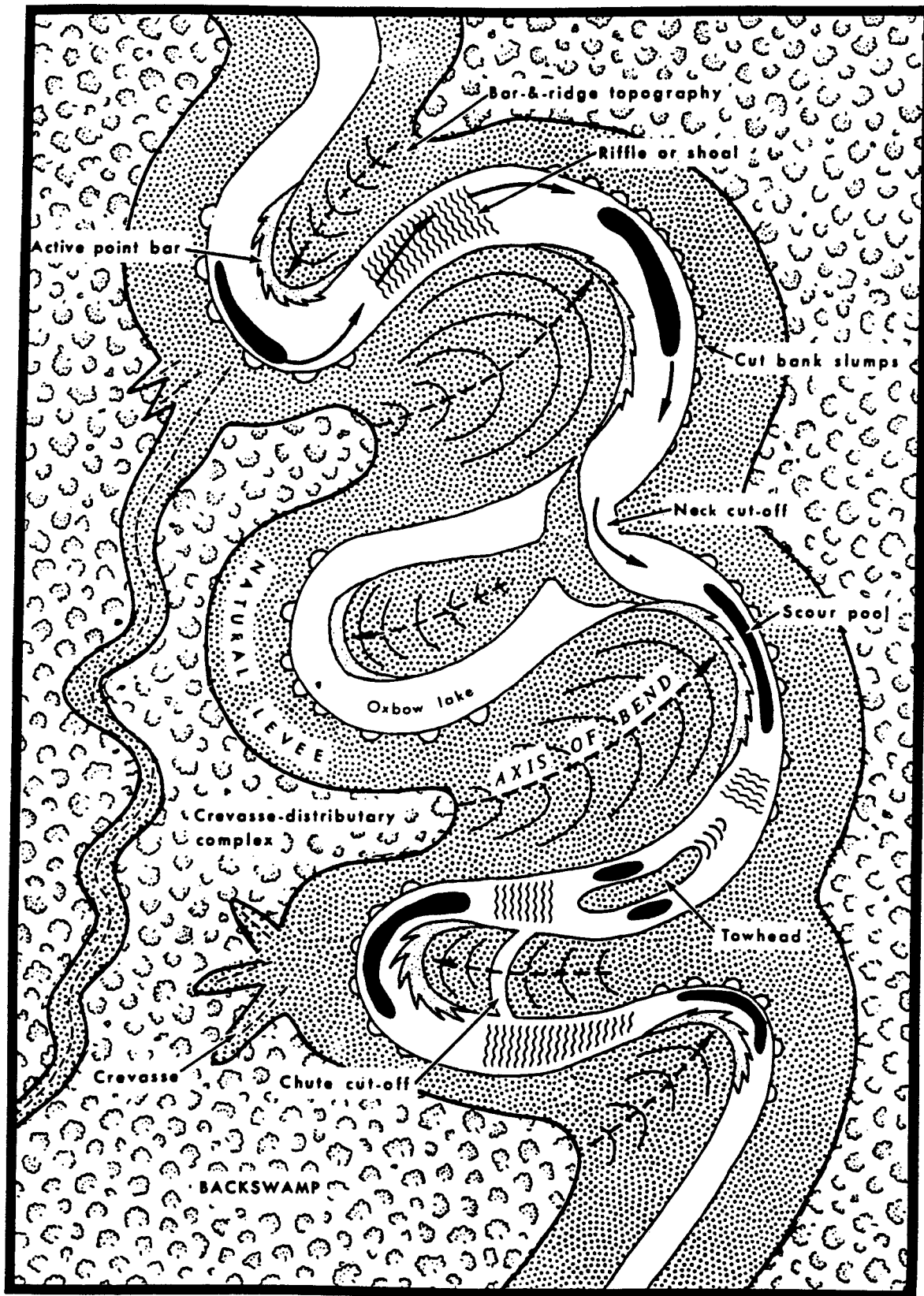


Figure 7. Major structural features of the Lower Mississippi Valley. Modified from Autin et al. (1991).

rare. The more continental deposits include particle sizes that range from clays to gravels while the more marine deposits are dominated by soft limestones and dolomites.

In the alluvial valley area, the shallowest deposits of the Embayment are of Quaternary age. They represent sediments alternately deposited and reworked during several cycles of valley filling and entrenchment. The cycles were in direct response to base level and climatic changes that accompanied the advance and retreat of continental glaciers. Beneath most of the alluvial valley area, the Quaternary alluvial deposits form a relatively thin veneer overlying an erosional unconformity. The veneer varies in thickness from about 30 to 60 m (100 to 200 ft) and it gradually thickens downvalley.

By definition, the alluvial valley ends and the deltaic plain begins approximately at the mouth of the Red River, or at the head of the Atchafalaya River. South of that point, Quaternary deposits rapidly thicken and they attain a thickness of many hundreds of meters in the Gulf Basin near the Louisiana coast. Rather than being a prism of mostly reworked alluvium, the sedimentary sequence is the product of multiple cycles of fluvial deposition (progradational and aggradational processes) and marine reworking (transgressive deposits). The cycles are in direct response to eustatic sea level variations that were on the order of 100 m (328 ft) or more.

More specifically, in the alluvial valley area, approximately the lower one-third to one-half of the Quaternary sequence is of Pleistocene age, meaning that it was deposited between about 2.0 to 2.5 million years ago and about 12,000 years ago. The remainder is of Holocene age or less than about 12,000 years old. Beneath the deltaic plain, the upper Holocene-age portion of the sedimentary sequence thickens to as much as 122 m (400 ft), but this is a much smaller percentage of the total Quaternary thickness in that area (Saucier 1994).

In addition to chronology, it is possible to subdivide the Quaternary sequence in terms of gross lithology. Throughout essentially all of the Lower Mississippi Valley, the sequence includes a fine-grained topstratum predominantly composed of a heterogeneous mixture of clays, silts, and fine sands, and a coarse-grained sub-

stratum composed of a much more uniform mass of sands and gravels (Fisk 1944). The topstratum averages less than 3 m (10 ft) in thickness north of Memphis, Tennessee, about 6 to 9 m (20 to 30 ft) between Memphis and Vicksburg, Mississippi, between 6 and 15 m (20 to 50 ft) between Vicksburg and Baton Rouge, and between 24 and 36 m (80 and 120 ft) beneath the deltaic plain.

Basically, the substratum was deposited during multiple full-glacial to waning glacial stages (the Pleistocene) when the Mississippi and Ohio Rivers transported large quantities of glacial outwash to the Gulf of Mexico and it flowed in braided regimes. In contrast, the topstratum has been deposited during the current interglacial stage (the Holocene) after glacial outwash transport ceased and while the river has been flowing in a meandering regime. North of Memphis and mainly west of the Holocene meander belt, the substratum in essence reaches the surface to form two valley trains (glacial outwash plains). Only the youngest of the two is of concern in the project area, including the lower Ohio River valley. It is a flat, poorly drained surface which, depending on location, is either a few meters higher or lower than the Holocene meander belts. The valley train drainage is basically anastomosing, being a reflection of the braided-stream network that is still evident on parts of the surface.

During the Holocene, progressive development of the alluvial valley topstratum has involved a characteristic sequence of processes and events. A crevasse during a major flood event along an existing meander belt leads to formation of a distributary channel that discharges into a floodbasin area. Under very favorable circumstances, the distributary becomes dominant and causes an upstream diversion of river flow (avulsion). The new course achieves full river discharge and it develops a new meander belt. Over time, the meander belt expands and matures to include extensive areas of point bar accretion, natural levees, and numerous abandoned channels caused by neck or chute cutoffs. Eventually, another upstream diversion takes place and flow through the meander belt declines. Upon abandonment, the abandoned course within the meander belt is characterized

by a slackwater, underfit local stream or it is occupied by a valley tributary.

Deltaic plain progradation and aggradation involve sedimentary cycles that are quite similar in some respects to those of the alluvial valley. The prism of Holocene deltaic deposits represents a series of distinctive onlapping cycles initiated by upstream diversions of Mississippi River flow, each cycle being the correlative of a discrete delta complex (Figure 8). Each cycle involves sediments laid down in multiple environments ranging from freshwater to saline in the dynamic zone of interaction where the river empties into the Gulf. A delta complex in turn involves 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. Because of the prevailing influence of subsidence and sea level rise (see next section), each lobe typically experiences a constructional or progradational phase in which fluvial processes dominate, followed by a destructional or transgressive phase where marine processes become progressively more dominant.

Geologic Controls in the Project Area

There is ample evidence that some of the secondary structural features of the alluvial valley area mentioned above have been tectonically active during the Quaternary and there is even some geodetic evidence that some have been neotectonically active (i.e., during the historic period). During the time frame that is relevant to this project (the Holocene), however, the activity has not been sufficiently great to be significant in aspects of human habitation.

Faulting is the type of tectonic activity that is most widespread throughout the Lower Mississippi area and faults that have affected Quaternary deposits are concentrated in two areas. Faults that are seismically active are primarily associated with the Reelfoot Rift in the New Madrid Seismic Zone situated north of Memphis in southeast Missouri and northeast Arkansas. In 1811-1812 and at several other dates during historic times, the zone experienced major earthquakes that caused offsets at the ground surface, as well as land doming and sinking,

landsliding and bank caving, and widespread liquefaction and fissuring. The latter effects, widespread over an area of 10,360 km² (4,000 mi²), are the most visible earthquake responses and perhaps the most devastating to the physical landscape. Paleo-liquefaction features, in the form of buried sand blows, also substantiate that there were several strong earthquakes during prehistoric times extending back at least 4,000 years. Aboriginal settlements no doubt also were indirectly affected by geomorphic changes such as changing river channel changes, land sinking, and lake formation (e.g., Reelfoot Lake), and possibly directly by the destruction of structures.

Faults that have offset Quaternary strata are present at scattered locations elsewhere in the alluvial valley area, but they were not significant to humans in prehistoric times. Besides the New Madrid zone, the next largest concentration of active faults occurs in the deltaic plain (Figure 6). In that area, at least 10 zones of deep-seated, down-to-the-coast, east-west trending normal faults constitute what is referred to as the South Louisiana Growth Faults. These faults are essentially aseismic; consequently, they have had no significant direct effects on humans and their indirect (geomorphic) effects were not significant with respect to human occupation.

Faulting in the deltaic plain area is only one of several processes that collectively constitute the phenomenon known as subsidence. The processes are integral factors in the major cyclical landscape and environmental changes that have taken place in the dynamic deltaic plain setting.

Subsidence involves five basic factors or natural processes. It can be defined simply as the relative lowering of the land surface with respect to sea level and may involve true or actual sea level rise, sinking of the basement (Paleozoic) rocks due to crustal processes, consolidation of the thousands of meters of sediments in the Gulf Basin, local consolidation of near-surface deposits due to desiccation and compaction, and tectonic activity such as faulting. All five processes have been active in the project area during the Quaternary period and they continue to be so.

The rate of the true sea level rise component of subsidence, the most important of the

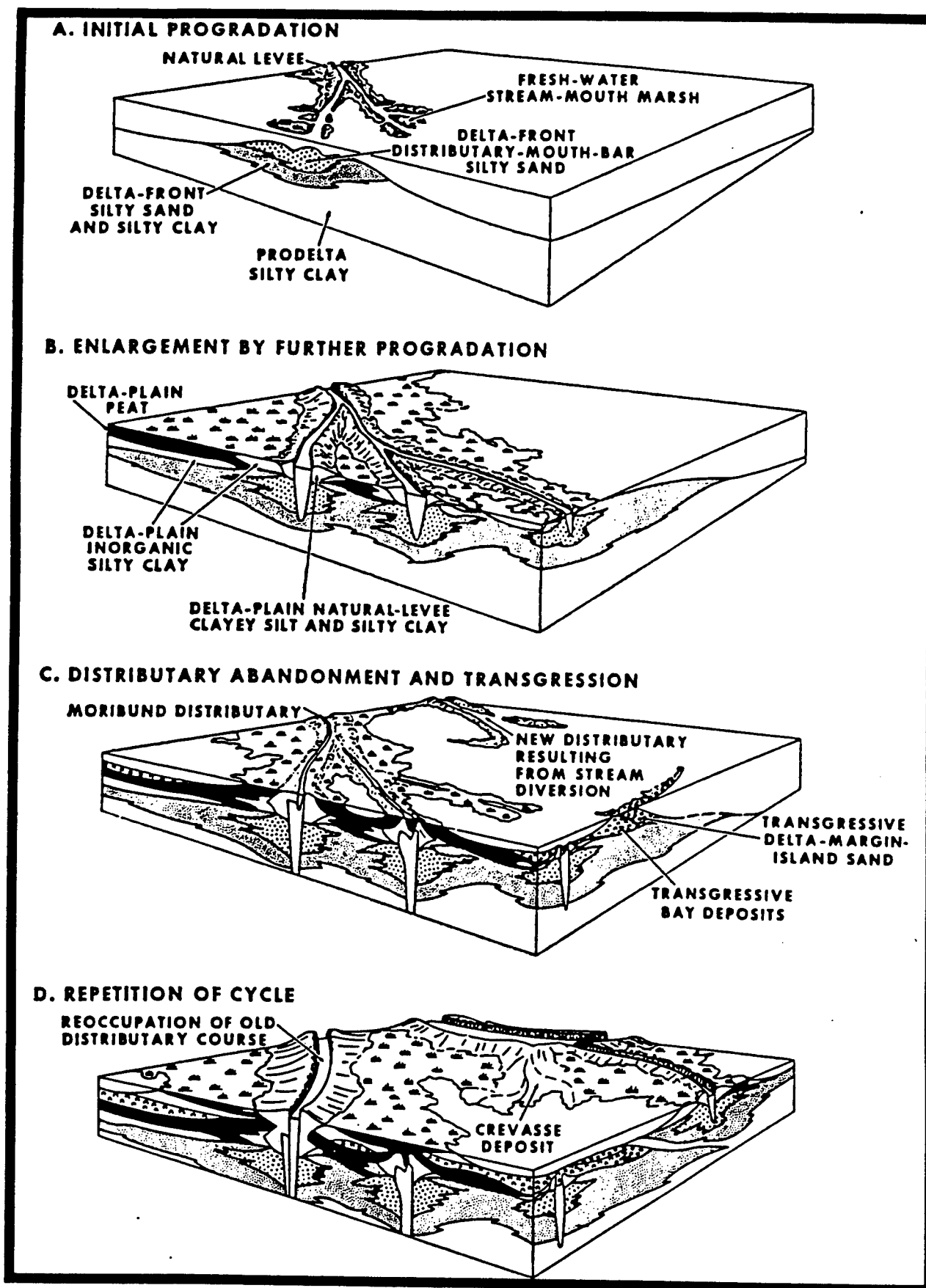


Figure 8. Idealized surface and subsurface distribution of environments of deposition at several stages in a typical delta cycle. From Frazier and Osanik (1965).

five processes, has declined during the Holocene period as the effects of the waning of the last continental glaciation (Late Wisconsinan glacial stage) have declined. Sea level rose on the order of 100 m (328 ft) or more from a glacial-maximum lowstand about 20,000 to 18,000 years ago to its approximate present level about 3,500 years ago. The rate of rise was not constant, but rather it was characterized by periods of a few centuries to a millennium or so of very rapid rise separated by essential stillstands of similar duration. For example, about 10,000 years ago, the rate of sea level rise might have been as high as 20 mm/yr (0.78 in/yr), but between 5,000 and 3,500 years ago, it is believed to have declined to 6 mm/yr (0.24 in/yr) or less. Within the last several centuries, it has probably averaged less than 1 mm/yr (0.04 in/yr). However, when other components are included, the total subsidence rate for the deltaic plain as a whole over the last several thousand years has been estimated from geological evidence at about 2.38 mm/yr (0.09 in/yr).

Subsidence rates vary widely from one portion of the deltaic plain to another and they reach their maximum values in the modern ("birdfoot") delta complex south of New Orleans where extremely soft and compressible deposits attain their maximum thickness. In that area, subsidence rates have been estimated from various lines of historical evidence at between about 5 and 30 mm/yr (0.19 and 1.18 in/yr) and they probably average about 17 to 18 mm/yr (0.67 to 0.71 in/yr). This, of course, means that land surfaces and associated objects of as little as a century ago may now be approximately 1.8 m (5.9 ft) lower than they originally were and, where river sedimentation has been active, they are likely buried beneath alluvium to that extent.

North of about Baton Rouge in the alluvial valley area, subsidence rates during the Quaternary have been negligible in comparison and they are attributable only to local consolidation of alluvial deposits. Eustatic sea level variations that have so heavily affected the deltaic plain are not believed to have directly influenced base levels north of about Natchez, Mississippi. Rather, changes in river regimes triggered by climatic variations are believed to have been principally responsible and progressive valley

aggradation has been due to shifting patterns of sedimentation rather than sea level rise.

Geomorphic Processes and Depositional Environments in the Project Area

For more than 50 years, geologic mapping of alluvial and deltaic deposits of the Lower Mississippi Valley has involved a classification scheme that utilizes environments of deposition as the main mapping units. The scheme, which includes both surficial deposits (landforms) and subsurface units, was the basis for the mapping contained in Saucier (1994), and it is used herein without modification; however, fewer mapping units are discussed. Of the 19 units utilized in the 1994 synthesis, only 9 are present within a few kilometers of the U.S. Army Corps of Engineers project items.

Eight of the mapping units discussed in this report are of Holocene age and one is of very late Pleistocene age. All are present at the surface and/or in the shallow subsurface deposits. Deeper strata or deposits, such as the Pleistocene formation beneath the deltaic plain, Tertiary formations beneath the alluvial valley, the Pleistocene substratum, and deeper deltaic facies are fundamental aspects of the area's geology and geologic history, but they are essentially irrelevant from the point of view of human habitation. Hence, they are not discussed herein other than in passing.

Brief generic descriptions are presented below for the nine mapping units. The alphanumeric designations for the units are those used in the figures accompanying the discussions of the separate project items. Figure 9 is an idealized sketch of a typical meander belt showing the relationships of six of the eight environments discussed below.

Point bar (Hpm₁ and Hpm₂)

Being by far the predominant environment in a meander belt in terms of both area and volume, the point bar environment includes materials laid down as lateral accretion on the insides of river bends as a result of meandering of a stream with a large sediment load. The deposits extend to a depth equal to the deepest portion or "thalweg" of the parent stream. Two types of deposits occur within the point bar topstratum:

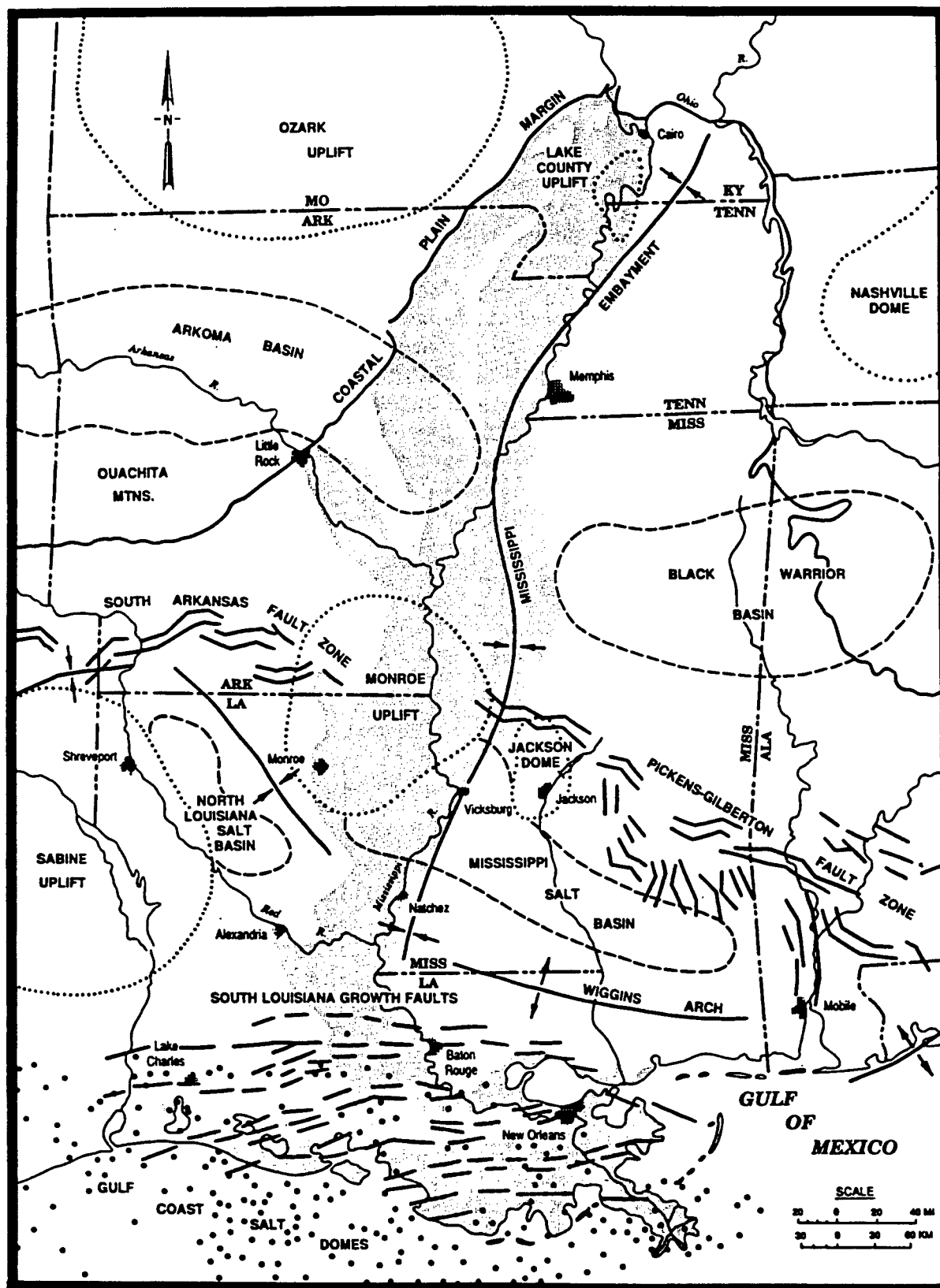


Figure 9. Primary and secondary depositional environments and related channel features of a typical meander belt. From Gagliano and van Beek (1970).

well-oxidized, brown and gray, silty and sandy sediments in elongate point bars or "ridges" that are laid down during high stages on the stream; and mostly gray, slightly oxidized, silty and clayey deposits in arcuate depressions or "swales" that are laid down during falling river stages. The ridges and swales characteristically form an alternating series (point bar accretion topography), the configuration of which conforms to the curvature of the migrating river channel and indicates the direction and extent of the meandering.

Zones of point bar accretion are most widespread and most evident because of their morphology and sediments in the alluvial valley area. Nearly continuous point bar tracts, sometimes largely uninterrupted for tens of kilometers, exhibit complex patterns of cross-cutting relationships due to the meandering of multiple river bends. The accretion topography often is subdued or even completely masked by natural levees near the active and abandoned river channels.

Note that the Hpm_1 and Hpm_2 designations shown above and on the maps of the specific project items stand for Holocene point bar accretion of the two youngest (Stages 1 and 2) of six Mississippi River meander belts. In the lower Ohio River valley, only one meander belt is recognized and it does not have an alphanumeric designation.

Natural levee (Hnl)

This environment includes the broad, low ridges which flank both sides of streams that periodically overflow their banks. The coarsest and greatest quantities of sediment, mostly silts and silty clays, are deposited closest to the stream channels; consequently, the natural levees are highest and thickest in these areas and gradually thin away from the channels. In general, the greater the distance from the stream, the greater the percentage of clays. Natural levee sediments are deposited mostly by sheet-flow; however, occasionally the flow will be concentrated and crevasse channels will form. In a small number of cases, a small crevasse channel will persist through multiple flood cycles and become an alluvial valley distributary as shown in Figure 9.

Typical natural levee deposits of the alluvial valley consist of stiff to hard, tan to grayish-brown, silty and sandy clays that are highly oxidized. They become progressively finer-grained in a downstream direction and consist of silty clays and clays in the lower deltaic plain. Natural levees occur in all of the meander belts of the Lower Mississippi Valley and along distributary systems. They are best developed along the Mississippi River and its abandoned channels where they may attain heights of 1.5 to 4.6 m (5 to 15 ft) above adjacent sloughs and backswamp areas and attain widths of several kilometers. To a large extent, the size of natural levees is directly related to the longevity of the river channel; the wider and higher levees being associated with the longer-active ones. Locally, natural levees are better developed on the outside of migrating river bends: on the inside of the bends they occur more as a thin and mostly continuous veneer of overbank sediments overlying point bar deposits. Regionally, natural levees narrow and become lower in a downstream direction until they eventually disappear at the mouth of the river.

Since natural levees provide firm soils and are the least flooded environment of the Holocene floodplain, they have been the favored (and in some cases, the only) areas for settlement in both prehistoric and historic times. They have been the locus of essentially all urban areas, most agriculture, and most trade and transportation routes until the last few decades.

It must be recognized that, under natural conditions, natural levee growth was a relatively slow and progressive process. During earlier historic times, however, and because of the construction of artificial flood control levees, crevassing due to occasional levee failures has been an important factor. Crevasses often have caused localized but intensive scouring at the point of levee break with the concurrent formation of a rapidly deposited, fan-like, splay of somewhat coarser-than-normal sediments (e.g., sandy silts rather than silty clays).

Abandoned channel (Hchm)

Abandoned channels are partially or wholly filled segments of meandering streams formed by cutoffs when the stream shortens its course.

Soon after formation, they usually are characterized by open water or "oxbow lakes." Later, they may become essentially filled and occasionally completely obscured by various meander belt deposits. The abandoned segment may represent an entire meander loop formed by a neck cutoff, or may represent only a portion of a loop formed by a chute cutoff when a stream diverts through a point bar swale during high water.

The upper portions of the arms of the loops of neck cutoffs are normally filled with a wedge of fine sand and silty sand that is deposited soon after cutoff. Later, soft, gray, high-water-content clays form a characteristic "clay plug" around the loop of the abandoned channel between the sand wedges as the oxbow lake fills with sediment. From time of cutoff to complete filling, an abandoned channel experiences a characteristic and predictable life cycle, the various stages of which produce different environmental conditions that were very important to humans during prehistoric times. Also, however, the life cycle of a cutoff is strongly influenced by the pattern of channel migration in the meander belt after cutoff takes place. If the active channel remains close to the cutoff, it may be rapidly filled and completely veneered and obscured by natural levee deposits. If the active channel rapidly moves away, the cutoff may remain indefinitely as an oxbow lake.

The frequency of cutoffs along meandering rivers is directly related to the rates and magnitudes of meandering. The frequency is also a function of the age (duration) of the meander belt - ones that have been occupied the longest generally have the greatest number of abandoned channels. Cutoff frequencies along the Mississippi River vary greatly from reach to reach because of various factors, and they decline significantly in a downstream direction. For example, cutoffs are abundant from the head of the Lower Mississippi Valley near Cairo, Illinois, downstream to about Vicksburg, Mississippi. From there to Baton Rouge, they are far less frequent, and none whatsoever are present south of Baton Rouge, Louisiana (Figure 10 [b]).

The crests of natural levee ridges immediately flanking abandoned channels in an incom-

pletely filled state were a highly favored setting for prehistoric settlement. In addition to the well-drained and arable soils of the levees, the lacustrine and wetland environments of the abandoned channel provided immediate access to potable water and abundant wildlife and fisheries resources.

It should be noted that between Memphis and Baton Rouge, there are more than a dozen abandoned channels that were formed by historic-period artificial cutoffs. These were accomplished in the early part of this century by dredging with the intent of reducing river stages and thereby facilitating flood control. These artificial cutoffs are in various stages of filling and exhibit various local environments.

Abandoned course (Hcom)

Abandoned courses are lengthy segments of rivers abandoned when streams divert to new courses across the floodplain. They generally occupy medial positions within meander belts and they vary in length from a few kilometers (but always more than one meander loop) up to hundreds of kilometers in length.

During the process of abandonment of a river course, which may take a few centuries, flow declines and the remaining channel becomes progressively more underfit. In some cases, the area between the original banklines and the surviving channel becomes filled with silty and sandy point bar-like deposits with a typical ridge and swale topography. When this occurs, the original banklines of the parent river channel may be difficult to identify. In other cases, the surviving channel continues to actively meander and it may migrate beyond the limits of the parent channel, thereby destroying segments of the abandoned course and its banklines. When a course is completely abandoned and all flow ceases, the surviving underfit stream typically functions only to accommodate local drainage and may only be a slackwater slough or bayou. Hence, the deposits of an abandoned channel may be highly analogous to point bar deposits in some reaches, but in others, they may more closely resemble those of an abandoned channel.

Five abandoned courses of the Mississippi River have been recognized and mapped in the

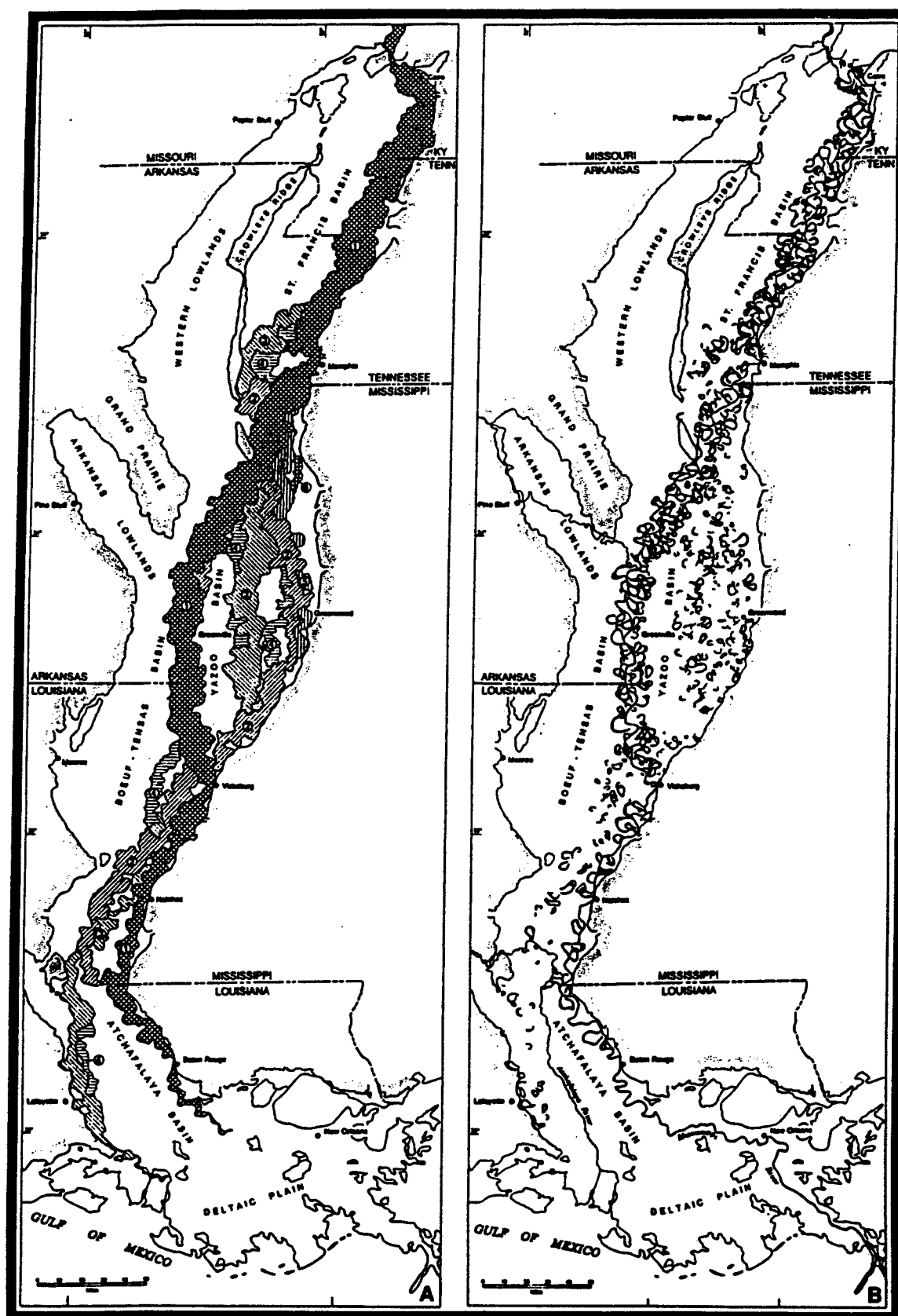


Figure 10. Configurations of Mississippi River meander belts as defined by the extent of the point bar environment (A), and distribution of neck and chute cutoffs (B). From Saucier (1994).

Lower Mississippi Valley, and identifiable segments occur south of the latitude of Dyersburg, Tennessee. They are most evident in the Yazoo Basin area of northwest Mississippi (Figure 10 [a]) where segments of varying lengths survive but also where cross-cutting relationships are complex and have been difficult to interpret. Two courses (Nos. 3 and 4, Figure 10 [a]) extend into the deltaic plain of central coastal Louisiana and constitute what is referred to as the Teche system.

Backswamp (Hb)

Broad, shallow basins beyond distal natural levees are the sites of the slow, incremental deposition (vertical accretion) of fine-grained sediments (mostly clays) during times of widespread overbank flooding. Sediment-carrying floodwater may be ponded between the natural levee ridges on separate meander belts, or between natural levee ridges and the uplands forming the valley walls. Backswamp areas typically have very low relief and a distinctive, anastomosing, and inefficient drainage system in which channels alternately serve as tributaries and distributaries at different times of the annual flood cycle.

During the early and mid Holocene, backswamp tracts were much more widespread than at present, having been truncated and eroded by the progressive development of meander belts. The surviving tracts increase progressively in extent and thickness in a downstream direction, in inverse relationship to the extent of point bar areas. Only a few small tracts occur north of Memphis while they constitute more than half of the floodplain surface at the latitude of Natchez and more than 80 percent at the latitude of Baton Rouge. By far the largest contiguous tract in the Lower Mississippi Valley occurs in the Atchafalaya Basin of Louisiana (Figure 6) in the northern part of the deltaic plain.

Backswamp deposits consist of mostly massive sequences of soft, gray to dark gray, poorly oxidized, organic rich, and very poorly drained clays and silty clays. They average about 12 m (40 ft) in thickness near Memphis, Tennessee, about 18 m (60 ft) near Natchez, Mississippi, but thereafter downvalley they in-

crease rapidly to well over 30 m (100 ft) in the southern part of the Atchafalaya Basin in Louisiana. In all cases, backswamp deposits overlie glacial outwash deposits (the substratum) or may be separated from them by backswamp-like deposits laid down by streams flowing in an anastomosing environment.

Abandoned distributary (Had)

Distributaries are the most conspicuous of the subaerial environments of the deltaic plain, being evident because of the natural levee ridges that flank the stream channels. The pattern of distributaries forms the skeletal framework of a delta lobe, with hundreds having been recognized on the ground or on aerial photos (Figure 11). They form by crevassing from the river's trunk channel or from other distributaries. As long as a distributary channel actively receives sediment, the river mouth progrades seaward at a rate directly related to the amount of discharge and sediment load, as well as the depth of the receiving water body. Distributary natural levee formation involves essentially the same fluvial processes that are involved in those in the alluvial valley area, i.e., the deposition of sediments originating from overbank flow, but there are a few differences in morphology and lithology. Because far less meandering takes place in the distributaries, the levees are more uniform in height and width. Rather than being laterally gradational with backswamp development, natural levees of the lower deltaic plain grade into and/or interfingered with interdistributary deposits and bay-sound deposits. Distributaries frequently branch or bifurcate at relatively shallow angles and small crevasse channels trending at high angles from the distributaries are uncommon.

Distributary natural levees progressively decline in height and width in a downstream direction. Large distributaries like Bayou Lafourche (Figure 11) are comparable in size to a well-developed meander belt, having levee systems that are 3.0 to 4.6 m (10 to 15 ft) higher than adjacent interdistributary basins and as wide as several kilometers. Smaller distributaries, or the distal portions of larger distributaries, may have ridges that are only a few hundred meters wide and less than 1 m (3.3 ft) high.

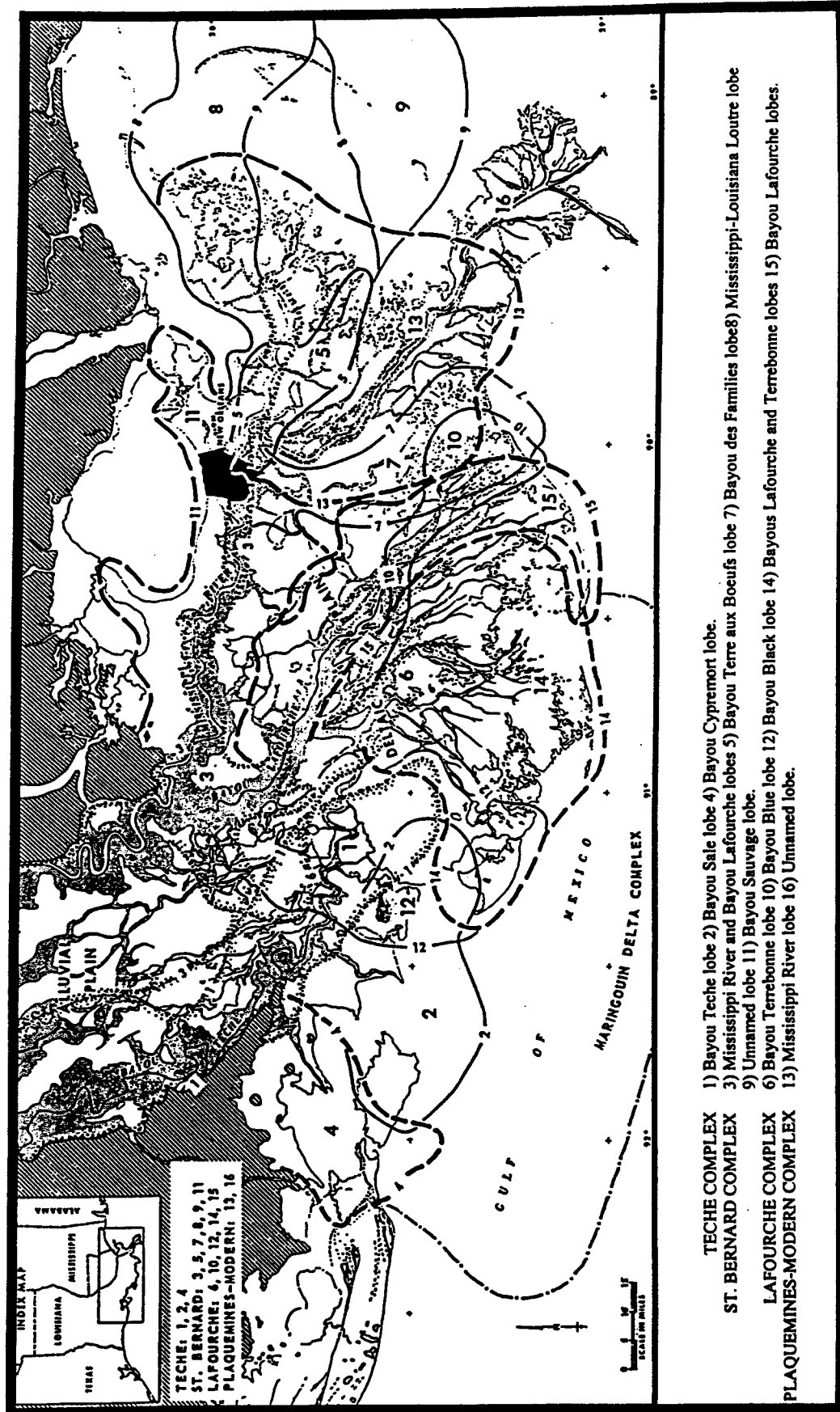


Figure 11. Delta lobes formed by the Mississippi River in the past 6,000 years. From Frazier (1967).

Abandoned distributary channels are quite analogous to abandoned courses in terms of morphology and sediment characteristics. In all cases, the surviving streams are underfit, being considerably smaller than the original channels and the former full-flow channel banklines may or may not be distinguishable because of continued natural levee growth during the process of abandonment.

Throughout the deltaic plain, distributaries of all sizes have been strongly influenced by subsidence. Natural levee margins interfinger with or have been overridden by interdistributary marsh and swamp deposits, and the distal portions of the ridges may be completely buried by such deposits. Where they still have subaerial expression, distributary natural levees were, and to a large extent still are, essentially the only areas of the deltaic plain that are suitable for permanent settlement and transportation.

Interdistributary (Hdi)

This depositional environment areally is the most extensive of the deltaic plain and consists of flat, intratidal, vegetated wetlands and shallow water bodies between distributary ridges. Elevations rarely are as high as even 1 m (3.3 ft) above sea level. The vegetation communities are mixtures of grasses, sedges, and rushes that are classified according to the salinity of the water, ranging from fresh water through brackish to saline. The freshest-water conditions occur along the flanks of distributaries and the Mississippi River trunk course, and in the farthest inland portions of interdistributary basins. Most saline conditions occur near the Gulf shoreline where the vegetated marsh is often broken by numerous shallow lakes, bays, ponds, and winding bayous.

Interdistributary wetland deposits include a mixture of dark brown to black, watery mucks overlying very soft gray clays. The environment persists because, at various times in delta lobe life cycles, there are favorable balances between inorganic sedimentation and vegetative growth (organic sedimentation) and local and regional subsidence. During times of delta lobe progradation, there is sufficient suspended sediment in the basins to promote vigorous plant growth and marshes are maintained. However, during times

of delta lobe decay, marsh accretion is insufficient to counteract subsidence effects and vegetated areas are replaced with shallow open-water bodies. Delta lobe decay is also a time of salt water intrusion into more inland areas and a consequential gradual change in vegetative community composition.

At the present time, and to a large extent due to historic-period artificial flood-control levee construction along the Mississippi River and canal dredging in the interdistributary areas, most vegetated wetlands are undergoing extensive decay (e.g., loss or change in vegetative communities, shoreline erosion, saltwater intrusion). The only deltaic plain areas that are experiencing active accretion are in the birdfoot or modern delta, but especially in the Atchafalaya Basin area where a new delta lobe is forming.

Interdistributary deposits that accumulate during the constructional (progradational) and early destructional phases of a delta lobe continue to increase in thickness under the influences of subsidence. Generally, the deposits are thickest near the centers of the basins and thin toward bordering distributaries. Throughout most of the deltaic plain, the deposits average about 3 m (9.8 ft) thick and may exceed 6 m (19.7 ft) in thickness in some areas. Extreme thicknesses of over 20 m (66 ft) occur in the lower part of the modern delta. Due to shifting patterns of sedimentation and distributary development in new lobes, some interdistributary deposits may underlie natural levees where depositional environments have changed.

Inland swamp (Hds)

As a deltaic plain depositional environment, inland swamps are very similar to (and arbitrarily delineated from) backswamp areas, forming because of poor drainage in an interior basin or depression area characterized by very low sedimentation rates. Inland swamp tracts are extremely flat, flooded during most of the year, and tidally influenced. Like backswamp areas, they are typically bounded by natural levees or low terraces. Deposits of the inland swamp environment consist of up to 6.1 m (20 ft) of organic clays and woody peats underlain by soft, gray, organic clays.

Inland swamps occur in freshwater areas at the upper ends of intertributary basins and they are differentiated on the basis of vegetation rather than soils, morphology, or causal processes. They involve a swamp forest community dominated by bald cypress (*Taxodium distichum*) and tupelo gum (*Nyssa aquatica*) that is essentially intolerant of brackish water except for very short periods of time such as during coastal storms. Typical elevations are less than 1.5 m (4.9 ft) above sea level.

Inland swamps attain their greatest areal extent during the latter stages of a delta progradation cycle when the freshwater input to intertributary basins is at a maximum. When delta lobe (or complex) deterioration begins, brackish water conditions move progressively inland, causing the swamp forest to die out and to be replaced with marsh vegetation. In the present deltaic plain, no significant areas of new inland swamp have formed during historic times. Except in the modern delta and the new Atchafalaya Basin delta lobe, tracts of dead timber standing as "ghost forests" between living swamp forest and adjacent marshes are evidence that saltwater intrusion is taking place.

Valley train (Pv₁)

This unit, of Pleistocene (Late Wisconsinan Stage) age, is not truly a single depositional environment, but rather several. In the literature, it is variously referred to as a braided-stream surface, a braided-stream terrace, or a braided-relict alluvial fan. It was laid down during the waning stage of a glacial cycle when the ancestral Mississippi and Ohio Rivers were discharging large volumes of glacial outwash and carrying large loads of sands and gravels. On a regional basis, it is apparent that the valley train was undergoing cyclical downcutting while it is active. Multiple terrace levels are present, separated by erosional scarps a few meters high. In the project area, only the lowest (Stage 1) level is present.

Depending on the extent to which a valley train has been veneered by Holocene floodbasin deposits, braided-stream channel patterns may or may not be visible on the surface. The pattern is composed of shallow channels (originally probably less than 10 m [32.8 ft] deep) separated by low, irregular braid bars and interfluvial

areas. The bars generally are composed of fine to medium sand while the upper parts of the channels are filled with silty to sandy clays. However, both environments may be veneered and subdued by a meter or two of Holocene backswamp-like clays. This veneer constitutes a thin fine-grained topstratum overlying massive sand and gravel deposits of the substratum.

Valley trains of Late Wisconsinan age are present at the surface as far south as the central Yazoo Basin (Figure 6), but they closely flank the present Mississippi and Ohio River meander belts and are they located in the vicinity of the project items only north of about Memphis, Tennessee. Throughout the Lower Mississippi Valley, the valley trains slope gulfward at a steeper gradient than the present Holocene floodplain. Consequently, south of the Yazoo Basin, the valley trains are buried by Holocene deposits and they form the uppermost portion of the substratum.

Geologic History and Chronology of the Project Area

The geological history of the Lower Mississippi Valley really began during the early Pleistocene. At that time, about 2.0 to 2.5 million years ago, the Lower Mississippi consisted only of the narrow valleys of southward draining streams of the Tertiary uplands. With onset of the first continental glaciation, however, glacial meltwater and outwash entered the valleys and widened and deepened them into the first approximation of the Lower Mississippi Valley. For much of the Quaternary, the alluvial floodplains were at an elevation up to several tens of meters higher than at present. Through cyclic downcutting and valley widening by both braided and meandering streams, some of the earlier floodplains now survive as Pleistocene terraces. The terraces, however, are manifested as continuous surfaces of considerable extent only in the southern part of the Lower Mississippi Valley generally in a coastwise belt south of Baton Rouge and north of the deltaic plain. Since they slope gulfward more steeply than the Holocene floodplain of the alluvial valley and the deltaic plain, they underlie the Holocene deltaic sedimentary prism at increasing depths toward the coast and beyond.

The most widespread of all of the terraces is the youngest and it is currently designated as the Prairie complex (formerly designated the Prairie terrace). This terrace is also the updip stratigraphic equivalent of the *shallowest* Pleistocene deposits to underlie the Holocene deltaic deposits. It is believed to have formed primarily during two interglacial stages - the Sangamonian and Middle Wisconsinan stages. It is largely composed of well-weathered deposits representing several depositional environments attributable to meandering streams, but their identification and delineation have not been possible other than at scattered small locations. The oldest parts of the Prairie complex are believed to date from the interval from about 140,000 to 100,000 years ago, while the younger parts may date from between about 60,000 and 35,000 years ago. Both intervals were times of relatively high sea level stands.

Following the Middle Wisconsinan stage, the Lower Mississippi Valley responded to onset of the Late Wisconsinan-stage glaciation (the Laurentide ice sheet of North America) and outwash deposition began. By both lateral and vertical stream erosion, the alluvial valley degraded from elevations higher than at present to ones lower than at present. Beneath much of the deltaic plain, the Prairie complex surface became an emergent, erosional landscape as sea level fell as much as 100 m (328 ft) lower than at present. This surface also was incised as small upland streams adjusted their gradients to falling base levels.

The peak of the Late Wisconsinan glaciation occurred about 20,000 to 18,000 years ago. At that time, the alluvial valley was characterized by an ancestral Mississippi River flowing in a braided regime that carried modest quantities of outwash, but at a lower floodplain level than at present. The river was deeply incised in an entrenchment beneath the Atchafalaya Basin area and southward to the Gulf shoreline which was considerably south of its present location.

Between about 20,000 to 18,000 years ago and about 12,000 years ago, the Laurentide ice sheet began rapidly waning. In the alluvial valley, that was a time of heavy outwash deposition and substantial floodplain aggradation, marking the formation of a majority of the Late Wisconsinan-stage valley trains.

Both the Mississippi and Ohio Rivers contributed outwash, but prior to about 14,700 years ago, the Ohio River flowed into the Lower Mississippi Valley via the Cache Lowland which is located about 15 km (9.3 mi) north of and parallel to its present course. Beneath the present deltaic plain area, rapidly rising sea level caused Gulf waters to transgress across the shallow Pleistocene coastal plain (Prairie complex), subjecting it to marine planation and drowning of the lower ends of entrenched local drainage. The Mississippi River still was confined to its entrenched valley and discharged into the Gulf south of the present Louisiana shoreline.

Glacial meltwater and outwash discharge to the Gulf ceased between about 12,000 and 11,500 years ago when an outlet to the sea developed along the St. Lawrence River rather than through the Lower Mississippi Valley. This resulted in a major decline in flow in the Mississippi River and attainment of its approximate present hydrologic regime. These conditions, however, did not last very long because of a temporary and short-lived closing of the St. Lawrence River. Outwash returned to the Lower Mississippi from about 11,500 to 11,000 years ago. It is believed that during that short interval, the Mississippi River diverted from its previous course southwestward past Cape Girardeau into the Morehouse Lowland to its present course through Thebes Gap (Figure 6). This also marked the formation of the Charleston Fan west of Charleston, Missouri, the very last (and brief) episode of valley trains formation in the Lower Mississippi Valley.

After about 11,000 years ago, the Mississippi River changed to a meandering or anastomosing regime and it began laying down relatively fine-grained overbank sediments from southeast Missouri to the mouth of the river. This marked the beginning of deposition of the topstratum and the first Holocene backswamp deposits of the Lower Mississippi Valley. By 10,000 years ago, the river had begun constructing its first true meander belt which is evidenced by surviving segments in the northeast Yazoo Basin south of Memphis (Figure 10 [a], No. 6). Farther south, any surviving portions of the meander belt will be deeply buried and they

have not been identified. At the mouth of the river, because sea level was still tens of meters lower than at present, any deltas the river may have formed up until about 9,000 years ago were well south of the present shoreline.

Between about 9,000 and 6,000 years ago, progressive floodplain aggradation continued and the river constructed meander belts Nos. 5 and 4, segments of which are evident in the Yazoo Basin area, in northeast Louisiana between the Memphis, Tennessee area and a point between Vicksburg and Natchez, Mississippi, and east of Lafayette in south-central Louisiana (Figure 10 [a]). From Thebes Gap south to the Memphis area, no meander belts older than the present one (No. 1) have been discerned, but this is due to the fact that the river has remained in its present course throughout the Holocene and it has reworked or obscured belts older than No. 1.

During this same three-millennia period, significant events took place at the mouth of the river. About 9,000 years ago, the first delta complex - the Outer Shoal complex - formed well offshore from central coastal Louisiana when sea level was perhaps about 15 m (49 ft) lower than at present. Apparently this complex was inundated and largely destroyed within 1,000 years by rising sea level but it was followed by a second one - the Maringouin complex - that formed about 7,000 years ago slightly farther inland and at a higher elevation (about 5 m [16.4 ft] lower than at present) (Figure 11). During this entire interval, the trunk course of the river remained along the western side of the alluvial valley along the route of the later Teche meander belt (No. 3, Figure 10 [a]). No subaerial delta lobes were present in southeast Louisiana and rising seas continued to transgress across the Prairie complex surface, approaching the New Orleans area.

Eventually the Maringouin complex experienced the same fate as the Outer Shoal complex, i.e., erosion and submergence by rising sea level. About 6,200 years ago, the Mississippi River began constructing the Teche meander belt and Teche delta complex. The complex continued to expand during the next 1,000 to 1,500 years. Upvalley, the trunk course of the Teche complex continued along the route of the

present meander belt north of Memphis but adopted still a new course through the Yazoo Basin to near Vicksburg. In southeastern Louisiana, rising seas achieved a level high enough to transgress across the Prairie complex surface to as far north as the north shore of Lake Pontchartrain (Figure 6), producing a suite of marine features in the New Orleans area such as a large barrier spit. Still no Mississippi River sediments, however, were being deposited in the area.

Beginning about 4,800 years ago, several dramatic changes began taking place in the Lower Mississippi Valley which directly impacted the project area. Triggered by an avulsion in the upper Yazoo Basin, the Mississippi River began forming a meander belt along the eastern side of the alluvial valley past Vicksburg, Natchez, and Baton Rouge and into the deltaic plain (No. 2, Figure 10 [a]). Upstream in the alluvial valley area, this meant continued aggradation of the floodplain and a much more complex geometry of alluvial features. In the deltaic plain area, it meant the first deltaic sedimentation into the New Orleans area and beyond as the early phase of the St. Bernard delta complex began forming (Figure 11). Large areas of shallow Gulf waters were rapidly transformed into interdistributary wetlands with a network of distributaries. Sea level about 4,800 years ago was close to but not yet quite to that of the present.

For the next 2,000 years, conditions remained rather static in the alluvial valley, but significant changes continued to take place in the deltaic plain area. The Teche delta complex remained active until about 3,500 years ago at which time it began to decay. The St. Bernard complex remained active during the entire period with some lobes becoming inactive but new ones forming (Figure 11). It is argumentative as to when the Lafourche complex began to form, with some geologists recognizing an early phase beginning about 3,500 years ago but others recognizing only a later phase that began much later. In any event, the trunk channel of the Mississippi River continued to flow past Baton Rouge and New Orleans.

Approximately 2,800 years ago, the Mississippi River was still flowing in the only mean-

der belt it has ever occupied north of Memphis, Tennessee, but south of that location, it adopted a new course along the western side of the Yazoo Basin to near Vicksburg, Mississippi (No. 1, Figure 10 [a]). Between Vicksburg and a point about mid-way between Natchez and Baton Rouge, the river similarly adopted a new course and it rapidly began forming a major meander belt. South of Baton Rouge, it continued along the route of the former No. 2 meander belt. Thus, by this time, essentially modern meander belt conditions prevailed throughout the alluvial valley area with only continued meandering and bend cutoffs taking place and continuing to the present time.

Since approximately 2,800 years ago, the deltaic plain has witnessed the development of most if not all of the Lafourche complex, including the Bayou Lafourche distributary, and the complete abandonment of the St. Bernard complex by about 1,000 years ago. The modern or birdfoot delta of the river (the Plaquemines complex) began forming upon abandonment of the St. Bernard complex, and that portion below about Venice, Louisiana probably dates from no more than approximately 500 years ago. The Atchafalaya lobe started forming this century after the Atchafalaya Basin, serving as a sediment trap, filled sufficiently that sediments began moving into the Gulf in large volumes.

Geoarcheological Considerations in the Project Area

To repeat for emphasis some aspects of man/land relationships mentioned earlier, relative differences in elevation perhaps have been the most important landscape factor affecting human habitation through time. Without question, natural levee ridges flanking streams or water bodies and the margins of terraces or uplands that overlook the floodplain were the favored locations for permanent settlement. Potable water availability obviously was the most important factor, but water in excess was often deterministic in settlement patterns. Large areas of the alluvial valley floodplain and a vast majority of the deltaic plain were seasonally (or permanently) flooded, and afforded only temporary use for hunting, fishing, and gathering. Natural levees along meander belts and deltaic

distributaries were important to Archaic-stage Cultures, but were even more so to late Formative-stage ones. The latter often required larger tracts of infrequently flooded and arable land for large villages and agriculture.

Implications of the above-mentioned relationships are extremely important to the purposes of this report. A majority of the project items lie along or close to the highest natural levee crests, often along or close to abandoned channels or major swales in point bar areas. Therefore, there is a high probability that prehistoric sites could be close to or beneath the artificial flood-control levees. It must be remembered that many artificial levees were constructed well before systematic cultural resources surveys were conducted, so numerous site may have gone unrecorded. The levees also closely follow the routes of early historic-period roads and they were important factors in the locations of plantations.

Depositional patterns in the Lower Mississippi Valley, coupled with the effects of subsidence and sea level rise, also have strongly influenced where and when humans could have lived and subsisted. For example, no meander belts north of Memphis (or anywhere in the Lower Mississippi Valley for that matter) are old enough to have been in existence in Paleo-Indian times, but it is well established that migratory hunters of that stage frequented the Late Wisconsin-stage valley trains. In particular, sites of the Dalton Culture are widespread and could be present in the project vicinity. South of Memphis, buried Paleo-Indian sites possibly are preserved, but they lie at increasing depths downvalley on the top of the substratum or on the Prairie complex surface beneath the deltaic plain. It is highly unlikely that any of these would ever be encountered during normal construction activities.

South of Memphis in the alluvial valley, sites of the Archaic stage will be restricted to the older meander belts (Nos. 2 to 6) and the margins of older landforms. Late Archaic sites are known to exist along the margins of the Prairie complex surface in the Baton Rouge area and along the margins of the deltaic plain. In the deltaic plain proper, sites of this age are restricted to the Teche complex and the earliest

phases of the St. Bernard complex, or are present on Prairie complex terrace remnants. The possibility of buried Late Archaic sites is considered to be high, based on the significant number of sites that have already been discovered.

Between Commerce and Baton Rouge, Louisiana the present course of the Mississippi River (and hence most of the project items) is flanked by the relatively youngest deposits (and cutoffs) of the present (No. 1) meander belt. Consequently, while sites as old as the Tchula period may be present within the meander belt, none this old is likely to be located in the vicinity of the majority of the project items. The highest probability is that sites in the vicinity of the project items will be of Baytown or younger age. The ages of the oldest sites near the river decrease progressively downstream into the deltaic plain such that, south of New Orleans, none older than the late Mississippi period should be present on nearsurface deposits.

Individual Project Items Located in the U.S. Army Corps of Engineers, New Orleans District

The following sections present an overview of the geology, physiography, and geomorphology of each of the project items contained within the U.S. Army Corps of Engineers, New Orleans District. In addition, these sections present brief geoeachological interpretations of the vicinity surrounding each of the project items in light of their geology, physiography, and geomorphology.

Lower Venice Second Lift (M-10.4-R) Geology, Physiography, and Geomorphology

The Lower Venice Second Lift project item (M-10.4-R) is located on the west (right descending) bank of the Mississippi River at the head of Grand Pass (U.S. Army Corps of Engineer, Vicksburg District 1998) in Plaquemines Parish, Louisiana (Figure 2). The location is known as "The Jump" and it is the site of the Town of Venice, Louisiana.

Physiography and Geomorphology in the Vicinity of the Project Item

The Lower Venice Second Lift project item (M-10.4-R) is situated on the narrow but culturally important natural levee of the modern (No. 1) Mississippi River meander belt in the Plaquemines deltaic complex. Grand Pass is a typical Mississippi River distributary and was the main element in the historic-period delta lobe known as the West Bay complex. The natural levee measures less than 1 m (3.28 ft) above sea level and not over 1 km (0.62 mi) in width. It is bordered on the east by the river channel and to the west by interdistributary wetlands that are undergoing serious decay due to subsidence and lack of active river sedimentation. There has been essentially no lateral movement of the river channel; hence, point bar deposits are absent in the Venice area (Kolb 1962). The natural levee deposits, which vary in thickness from about 1.5 to 4.6 m (4.9 to 15.1) in this portion of the delta, overlies about 24 m (80 ft) of interdistributary deposits which grade downward into soft, clayey prodelta deposits.

Grand Pass developed as a crevasse along the Mississippi River in the nineteenth century, rapidly forming a fan-like splay of alluvium that filled a shallow bay. The sedimentary architecture of the splay or lobe has been extensively cored and studied and results have been used to develop a detailed model of cyclic deltaic sedimentation (Coleman and Gagliano 1964; Coleman 1988). The lobe underwent a brief constructional (progradational) phase and it is now in an advanced destructional (transgressive) phase. Virtually all of the vegetated wetlands of the past century have reverted to a shallow bay environment. Grand Pass is still open to the river but it does not have a significant discharge.

Geologic History and Chronology in the Vicinity of the Project Item

This portion of the Plaquemines deltaic complex probably formed between about 500 and 1,000 years ago as the Mississippi River extended its course to near the edge of the Con-

tinental Shelf and hence into relatively deep water for the first time during the Holocene. In early historic times, the complex was characterized by the main river passes, e.g. Southwest and South Passes, and their bordering natural levees, but interdistributary wetlands were sparse. In the nineteenth century, however, a series of crevasses rapidly filled shallow bays on both sides of the river, converting them into extensive tracts of fresh water marsh.

The Jump originated as a crevasse in 1839 and Grand Pass rapidly widened within a few years to about 400 m (1,312 ft) and reached a depth of 18 m (60 ft) (Russell 1936). The system obtained its maximum development about 1850, and by 1880, Grand Pass had shoaled to only a few meters. At the present time, Grand Pass still is navigable by small vessels.

Archeological Considerations

Deposits of the project item vicinity technically are old enough to have been inhabited in prehistoric times during the latest part of the Mississippian Period. It is unlikely, however, that any settlements existed this far south because of the very small size of the natural levee ridge and its proximity to the Gulf with its periodic high tides and storm surges. If sites were occupied, they will now be buried under 3 to 4 m (9.8 to 13.1 ft) of more recent natural levee deposits. The subsidence rates are sufficiently high that even historic structures built a century ago would be buried to depths of at least 1 to 2 m (3.28 to 6.6 ft) (Kolb and Van Lopik 1958).

Carrollton Levee Enlargement Borrow Pit (M-104 to 100.2-L) Geology, Physiography, and Geomorphology

The Carrollton Levee Enlargement Borrow Pit project item (M-104 to 100.2-L) is located on the west (right descending) bank of the Mississippi River about 17.5 km (10.8 mi) southeast of New Orleans in Orleans Parish, Louisiana (U.S. Army Corps of Engineers 1998: Appendix 4, Plate 43). It is situated on Twelvemile Point between River Miles 81.3 and 82.8 above Head of Passes (Plate 43) (Figure 3).

Physiography and Geomorphology in the Vicinity of the Project Item

This project item is situated on historic-period point bar accretion (Hpm₁) topography between the artificial flood-control levee and the bank of the modern river channel in Mississippi River meander belt No. 1. The topography consists of narrow, parallel ridges and swales that follow the trend of the river channel. They have been deposited by the typical lateral accretion of some clays but they consist mostly of silts and fine sands during higher river stages as the channel has migrated slowly to the southeast. Elevations of the point bar topography decrease toward the river channel but range between about sea level and 3 m (10 ft) above that datum.

Due to the young age of the deposits, a veneering of natural levee is essentially absent, although the point bar deposits are inundated during most seasonal high waters. In the subsurface, mostly silts extend to a depth of about 9 m (29.5 ft) (the topstratum) and these are underlain by mostly fine sands and silty sands (the substratum) that probably extend to a depth of about 30 m (98.4 ft) (Kolb 1962). In turn, the point bar deposits directly overlie Pleistocene-age deposits of the Prairie complex into which the modern river channel has incised within the narrow meander belt (Saucier 1963, 1994). All Holocene deltaic deposits older than the modern meander belt have been removed by migration of the river channel.

As is typical of many point bar areas, soils of the siltier and sandier ridges and the clayey swales in point bar sequences are not separately delineated because of scale limitations of the soils mapping. Rather, the zone simply is mapped as a combination of Commerce (silt loam) and Sharkey (clay) soils that are frequently flooded (Trahan 1989).

Geologic History and Chronology in the Vicinity of the Project Item

Earlier than about 4,800 years, the area of the project item was open Gulf water. The first Mississippi River sedimentation (early St. Ber-

nard complex) affected the area approximately 4,800 years ago, converting the landscape into an intratidal wetland. The first deltaic distributary in the project item area did not appear, however, until about 2,500 years ago when the Metairie Bayou lobe of the late St. Bernard complex formed (Frazier 1967). A branch of that lobe, known as Unknown Bayou, developed along a route trending from near the Vieux Carré area of New Orleans to near River Mile 78.0 and thence eastward along the route of the present river channel to the project item area and on toward the east along the route of the later Bayou LaLoutre. While a distributary capable of building a natural levee ridge of modest size, it never carried a large part of the total discharge of the river.

About 2,200 years ago (Saucier 1963), the Mississippi River abandoned the Unknown Bayou course and a new one formed from the Vieux Carré area eastward along the present river channel to the Bayou LaLoutre distributary where it entered that distributary and expanded it significantly into a major river outlet. Perhaps because of a crevasse during a major flood, about 1,300 years ago the river diverted from the Bayou LaLoutre system at the location of the project item and it began flowing upstream (its present westward direction) for a short distance in the abandoned channel to about River Mile 78.0 (English Turn Bend). At that point, it then began flowing to the south and southwest along its present route. Thus, this marked the establishment of the present river channel downstream from New Orleans.

Probably within a few hundred years after 1,300 years ago, the river expanded its channel to accommodate full river discharge. Accompanying this was the beginning of lateral channel migration, producing the zone of point bar accretion that has continued expanding on Twelvemile Point until the present time. Based on the position of the 1830 meander line that is essentially along the route of the present flood-control levee, all of the accretion in the batture zone is no more than about 170 years old.

Archeological Considerations

Archeological sites dating from the Paleo-Indian or Early Archaic stages conceivably could have been present on the buried Pleistocene surface beneath the project-item location, but they would have been destroyed either by river channel scouring or erosion during the Holocene sea level rise. During the interval from about 4,800 to about 2,500 years ago, no deltaic distributaries are believed to have been present and Archaic-stage settlements would not have been possible in interdistributary wetlands. Between about 2,500 and 1,300 years ago, prehistoric habitation of the early and middle Formative stages could have taken place along distributaries that trended through the vicinity of the project item. Beginning about 1,300 years ago, however, lateral channel migration would have progressively reworked the older deltaic deposits and destroyed any trace of prehistoric activity. No evidence of cultural activity dating from earlier than 1830 will be preserved in the immediate project-item location: even early historic sites will be situated outside of the batture area at this location.

Carrollton Levee Enlargement (M-104-100.2-L), New Orleans District Floodwall (M-102.9-L), and Jefferson Heights Levee (M-104.3-L) Geology, Physiography, and Geomorphology

These three items, involving a levee enlargement, floodwall, and concrete slope pavement, are located along the left descending bank of the Mississippi River in the Carrollton section of the City of New Orleans, Louisiana (Orleans Parish) and in adjacent Jefferson Parish (Figure 3). The items flank the river channel along its Carrollton and Greenville Bends Pass (U.S. Army Corps of Engineer, Vicksburg District 1998).

Physiography and Geomorphology in the Vicinity of the Project Items

The project items are situated along the natural levee crest of the modern Mississippi River meander belt (No. 1) in the deltaic plain.

The natural levee is essentially flat with only a slight slope away from the river. Elevations range from about 2 to 6 m (6.5 to 19.7 ft), increasing in a downstream direction due to the history of bend migration in the area.

Along the northern part of the project item reach, or downstream to about River Mile 102.7, natural levee deposits measure about 4.6 m (15 ft) in thickness and they overlie a Holocene sequence of deltaic and near-deltaic deposits laid down in prodelta, bay-sound, intradelta, and interdistributary environments (Kolb 1962). These consist of a mixture of soft to stiff clays, silty clays, and fine sands. In that area, the buried weathered horizon of the Prairie complex surface lies at a depth of about 22.8 to 24.4 m (75 to 80 ft). Along the southern part of the project item reach, sandy point bar deposits originating from lateral channel migration underlie the natural levee deposits and extend to a depth of about 45.7 m (150 ft) at which point Prairie-complex deposits are encountered (Saucier 1963, 1994).

Soils of the natural levee have been mapped as Commerce silt loam (Trahan 1989) and they support a dense urban population. These occur on the landward side of the artificial flood-control levee and probably also beneath the levee itself. On the batture side of the levee, the soils have been mapped as undifferentiated Commerce and Sharkey soils and no doubt have been altered during historic times.

Geologic History and Chronology in the Vicinity of the Project Items

Post-glacial rising seas first transgressed across the Prairie complex surface about 8,000 to 7,000 years ago, transforming the area from a terrestrial to a marine environment. Open Gulf waters south of a large barrier island (Saucier 1963) characterized the area until about 4,800 years ago. At that time, the first Mississippi River sedimentation (early St. Bernard complex) affected the area, converting the landscape into an intratidal wetland. The first deltaic distributary in the area of the proposed project items, however, did not appear until about 2,500 years ago when the Metairie Bayou/Bayou Sauvage lobe of the late St. Bernard complex formed (Frazier 1967). A distributary, originating in the vicinity of Kenner, Louisiana (about River Mile

113), trended along the approximate present course of the river past the project items and thence southward along the Bayou Barataria (or Bayou des Familles) ridge south of New Orleans (Saucier 1963).

By about 1,300 years ago, the Mississippi River had abandoned the late St. Bernard complex (including the Metairie Bayou and Bayou Barataria lobes) and had established its present route through the New Orleans area. The river channel past the project items enlarged greatly, destroying much of the earlier distributary system. With establishment of the full-flow channel, individual river bends started to increase their meander amplitude and migrate slightly in a downstream direction. This has progressively produced the appreciable zones of point bar accretion on Nine Mile Point south of the Carrollton Bend and along the south half of the project item reach.

River channel migration trends of the past millennium have continued into the historic period. The Carrollton Bend has attempted to shift eastward (downstream), prompting artificial bank stabilization in the form of the Carrollton Bend Revetment to protect the artificial levee and adjacent urban areas from erosion. In contrast, appreciable bank accretion and enlargement of the batture area has occurred along the left bank below River Mile 102 along the Greenville Bend.

Archeological Considerations

Archeological sites dating from the Paleo-Indian or Early Archaic stages conceivably could have been present on the buried Pleistocene surface beneath the project item location, but they would have been destroyed either by river channel scouring or erosion during the Holocene sea level rise. During the interval from about 4,800 to about 2,500 years ago, no deltaic distributaries are believed to have been present and Archaic Stage settlements would not have been possible in the interdistributary wetlands. Between about 2,500 and 1,300 years ago, prehistoric habitation of the early and middle Formative stages could have taken place along the distributary that trended past the project items. However, most of the natural levees of the distributary have been destroyed by sub-

sequent channel movement, and any that may have survived will be buried by later natural levee deposits to a depth of 2 to 3 m (6.5 to 9.8 ft).

Archeological sites dating from the late Formative Stage (Mississippi Period) could be present at or near the present ground surface along the natural levee crests at the project items since the levees had probably reached their approximate present height by about 1,000 to 800 years ago. Similarly, sites dating from the Protohistoric Period could be present since it is known that Native Americans frequented and inhabited the river banks in the deltaic plain area during the time of early European settlement (Giardino 1984).

Carville to Marchand Levee Enlargement and Concrete Slope Pavement & Borrow Pit (M-189 to M-181-L), Hohen-Solms to Modeste Levee Enlargement (M-185 to M-179-R), Alhambra to Hohen-Solms Concrete Slope Paving (M-191 to M-185-R) (2 items), and the Baton Rouge Front Levee (M-205 to M-198.5-R)

These items are located along both the right and left descending banks of the Mississippi River between River Miles 179 and 216 in Ascension, East Baton Rouge, and Iberville Parishes, Louisiana (Figure 4). This reach of 59.2 km (37 mi) is situated between a point about 4.5 km (2.8 mi) northwest of Donaldsonville and a point approximately 10.0 km (6.2 mi) east-northeast of Plaquemine, Louisiana (U.S. Army Corps of Engineers, Vicksburg District 1998).

Physiography and Geomorphology in the Vicinity of the Project Items

All of the project items 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. The backslope of the natural levee extends landward for several kilometers from the project items. A batture from less than 100 m (328 ft) to more than 1 km (3,281 ft) in width separates the project items from the present river channel. Along the levee crest, elevations range from slightly above to slightly below 7.6 m (25 ft) and the terrain is flat. In contrast, the batture, which represents almost entirely historic period point bar accretion with a mini-

mal natural levee veneer, measures up to 1.5 m (5 ft) higher and exhibits pronounced ridges and swales that trend parallel to the river channel.

Natural levee deposits, averaging about 4.5 m (15 ft) in thickness, overlie older Holocene *deltaic* deposits (e.g., backswamp) along less than five percent of the cumulative length of the project items (Saucier 1969, 1994). Along the remaining 95 percent, the levee deposits overlie Holocene-age point bar accretion which extends to a depth well in excess of 30 m (100 ft). Where backswamp is present, it averages about 30 m (100 ft) thick 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. In both areas, the substratum is unconformably separated from the Prairie complex deposits at a depth of about 46 to 61 m (150 to 200 ft).

Soils of the natural levee backslopes, and presumably beneath the project items *per se* have been mapped as a mixture of Commerce silt loam, Commerce silty clay loam, Vacherie silt loam, Mhoon silty clay loam, Sharkey silty clay loam, and Sharkey clay. These are somewhat poorly drained and moderately slowly permeable soils. On the point bar deposits of the batture areas, the soils have been mapped only as Convent association or loamy alluvial land and they are described as somewhat poorly drained and frequently flooded (Dance et al. 1968; Spicer, Dance, and Hargroder 1976).

Geologic History and Chronology of the Project Items

All of the project items are situated above the entrenched valley of the Mississippi River that has been incised into 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. The Mississippi River switched from a braided to a meandering or anastomosing regime at that time, marking the beginning of the accumulation of sediments in a backswamp environment. Until about 4,800 years ago, with the Mississippi River meander belt on the west side of its alluvial valley,

backswamp deposits accumulated across the entire project item area. Only minor valley tributaries may have extended themselves onto the floodplain and flowed south to the Gulf.

Beginning with an upstream diversion about 4,800 years ago, the river began enlarging a course through the general project item 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. For perhaps a thousand years, the process was relatively slow since some river flow also was being discharged through the Teche trunk channel (No. 3) into the Teche delta complex to the west. About 3,800 years ago, the Teche system became inactive and full-flow conditions developed in the channel past the Plaquemine/White Castle, Louisiana area. Certainly this significantly increased the rate of meandering and probably a majority of point bar deposits post-date that event. An exception may be a somewhat anomalous zone of point bar along the left bank between River Miles 182 and 187. The morphology of the ridges and swales and the unusual fineness of the deposits (Saucier 1969) suggest deposition by a smaller channel such as may have existed between about 4,800 and 3,800 years ago. About 3,000 to 2,800 years ago, another upstream diversion meant abandonment of the No. 2 meander belt and beginning of the No. 1 meander belt. While this had important implications upstream, it was not significant in the project area since no channel changes took place.

As pointed out above, the batture is essentially coincident with channel migration (and hence point bar accumulation) in historic times. In most of the project item area, the flood-control levee was constructed immediately adjacent to the 1830 bankline. While the battures have not been artificially modified with bank protection, point bar growth has probably effectively ceased because revetments on the opposite banks have prevented further channel migration.

Archeological Considerations

Initial human presence in the project item area probably coincided with the end of Missis-

sipi River glacial outwash deposition and the beginnings of widespread backswamp conditions. Thus, it is believed that very few opportunities for permanent settlement occurred and conditions were not suitable for Paleo-Indian subsistence. Similar conditions probably prevailed throughout the Archaic Stage as well. The first landscapes suitable for significant habitation probably materialized about 3,000 years ago when natural levees along the Mississippi River meander belt reached modest size. Any sites that may have been occupied earlier than about 1,500 years ago, however, likely will be buried by subsequent levee growth. Sites of the middle to late Formative Stage could be present at or near the surface, especially in situations where the flood-control levees lie adjacent to a cutbank and historic-period point bar accretion is absent, e.g., at the Baton Rouge Front Levee Borrow Pit.

The Baton Rouge Front Levee (M-230-L)

This single item is located along the left descending bank of the Mississippi River at River Mile 230 in East Baton Rouge Parish, Louisiana (Figure 4). More specifically, it lies within about 150 m (492 ft) of the river's edge near the intersection of 1st Street and Florida Blvd. in the heart of downtown Baton Rouge (U.S. Army Corps of Engineer, Vicksburg District 1998).

Physiography and Geomorphology in the Vicinity of the Project Item

The project item is situated in the upper part of the Mississippi River deltaic plain immediately adjacent to the edge of the Pleistocene Prairie complex (terrace). The flood-control levee occupies a narrow bench of Holocene alluvium between the river and the low terrace erosional escarpment. The levee and escarpment merge toward the north at the item location and they progressively diverge toward the south as the levee trends toward the south-southwest and the escarpment trends toward the south-southeast.

The Holocene floodplain (bench) on which the levee is constructed has an elevation ranging between about 9.1 and 10.7 m (30 and 35 ft) whereas the surface of the adjacent terrace

measures between about 15.2 and 16.7 m (50 and 55 ft). The floodplain is essentially flat while the terrace margin has been slightly dissected by surface runoff. Geologic mapping in the project item area (Saucier 1969, 1994) indicates that the floodplain is underlain by about 3 m (10 ft) of natural levee deposits which, in turn, are underlain by about 24 m (80 ft) of a "dirty" backswamp sequence. The latter consists of a mixture of Mississippi River overbank sediments (mostly clays) and slope wash from the adjacent terrace (mixed clays, silts, and fine sands). A thick mass of substratum sand and gravel underlies the backswamp sequence and it extends to the eroded Pleistocene surface that is encountered at a depth of about 91 m (300 ft) in the area.

The terrace is underlain by about 12 m (40 ft) of heavily oxidized and weathered clays and silts underlain by at least 80 m (262 ft) of sands and gravels. The particular depositional environment(s) of the sediments underlying the terrace have not been determined, but predominantly they are old fluvial deposits of the Mississippi River or smaller streams draining higher terraces to the north.

Soils of the floodplain have been mapped as loamy alluvial land and Mhoon soils (Dance et al. 1968) subject to inundation during high river stages. Considering the area is an urban landscape, all soils have been heavily disturbed and there has been some artificial filling. Loring silt loam is the dominant soil of the terrace surface and its presence suggests a thin capping of weathered and leached loess on top of the fluvial deposits.

Geologic History and Chronology of the Project Item

During the Middle Wisconsinan Stage about 60,000 to 30,000 years ago, the Prairie complex surface extended westward completely across the Mississippi alluvial valley. With onset of the subsequent Late Wisconsin glaciation and falling sea level, the river entrenched itself in excess of 30 m (98 ft) into the Prairie complex deposits and progressively widened its valley to near its present extent. In doing so, it laid down and reworked the glacial outwash that constitutes the substratum.

With waning of the Late Wisconsin glaciation about 12,000 years ago, a braided-stream regime and outwash deposition ended and an anastomosing and meandering regime and topstratum deposition began. Continued sea level rise, eventually to its present level, shallowed the river's gradient, allowing progressive valley alluviation and aggradation mainly in a backswamp environment. This continued until about 4,800 years ago, with the river being on the western side of its valley. At that time, because of an upstream diversion, the river shifted to the far eastern side of its valley and began forming a meander belt (No. 2) past Baton Rouge; however, it did so at a level slightly lower than the terrace surface. Shortly thereafter, the river channel eroded the terrace margin to where it is today.

The Mississippi River has remained in its approximate present position, evolving from the No. 2 into the No. 1 meander belt in response to upstream channel changes. With thick erosion-resistant Prairie complex deposits in the Baton Rouge area flanking the river on the east and thick clayey backswamp deposits on the west, the river has been largely unable to meander. Hence, point bar accretion is largely absent and is encountered only south of the project-item area.

Archeological Considerations

During the Paleo-Indian Stage, landscape and environmental conditions of the waning outwash deposition (uppermost substratum) beneath the Holocene floodplain would not have been conducive to either permanent habitation or site preservation. In an analogous manner, Archaic Stage settlement in the backswamp environment of the floodplain area would have been highly unlikely if not essentially impossible. On the other hand, Formative-Stage habitation theoretically could have taken place on the natural levee flanking the river because it was well developed by that time. Considered in another way, however, it is illogical that any permanent settlement would have taken place on the occasionally flooded natural levees with the much more attractive and flood-free terrace surface being immediately adjacent. It is evident that the terrace margin rather than the floodplain

has been an extremely favorable location for permanent settlements since at least the Middle Archaic Period (Saunders 1994; Weinstein 1994). Hence, it is highly unlikely that any pre-historic cultural resources exist in the immediate vicinity of the project item. The rich floral and faunal resources of the locale were probably heavily exploited but without actual habitation.

Fifth Louisiana Levee District Levee Enlargement (M-319 to M-317-R)

This project item is located along the right descending bank of the Mississippi River between River Miles 317.0 and 319.5 in the southern part of Concordia Parish, Louisiana (Figure 5). It lies immediately south of the small community of Black Hawk and its south end is about 4 km (2.5 mi) upstream from the Old River Control Structure (Low Sill Structure) (Plate 36).

Physiography and Geomorphology in the Vicinity of the Project Item

The project item is situated at the extreme southern end of the Mississippi alluvial valley only a short distance upstream from the head of the Atchafalaya River. The Atchafalaya River marks the beginning of the deltaic plain to the south. It is located in the modern (No. 1) meander belt of the Mississippi River only 8 to 10 km (5.0 to 6.2 mi) from the eastern valley wall.

The project item overlies a well-developed 4.6 to 6.1 m (15 to 20 ft) thick Mississippi River natural levee (Saucier 1969, 1994). From about River Miles 319.5 to 318.6 and from 317.8 to 317.0, the levee overlies a thick backswamp sequence with a historic-period bankline immediately to the east. However, from River Miles 318.6 to 317.8, the natural levee overlies the western edge of a zone of point bar deposits associated with a historic period river bend that migrated just beyond (west) of the project item location and eroded into the backswamp deposits.

The natural levee ridge at the project item has a mean elevation of about 16.7 m (55 ft). Longitudinally, the ridge is generally flat; however, laterally away from the flood-control levee toward the west, the surface slopes downward about 4.6 m (15 ft) within a distance of about 1

km (3,281 ft), whereas to the east, the surface drops abruptly about 3.0 m (10 ft) at the former bankline. Beneath and to the west of the flood-control levee, the soil of the natural levee is uniformly the occasionally-flooded Bruin silt loam (Martin 1988). On the point bar deposits to the east of the flood-control levee, the soils are frequently flooded and have been identified as Commerce and Bruin soils.

Holocene backswamp deposits of the project item area vary in thickness from about 15.2 to 21.3 m (50 to 70 ft). The only exception is at the extreme southern end of the project item where the deposits apparently overlie the buried meander belt of upland drainage that entered the alluvial valley and flowed south as a basin drainage feature (Saucier 1969). In that area, the backswamp deposits are only about 9.1 m (30 ft) thick. Beneath the backswamp and old meander belt deposits, the Pleistocene substratum sands and gravels vary in thickness from about 21.3 to >30.5 m (70 to >100 ft) and overlie eroded strata of Tertiary age.

Geologic History and Chronology of the Project Item

During at least five Pleistocene glacial stages, including the Late Wisconsinan, the Mississippi River incised into Tertiary strata due to a combination of regime changes and sea level effects. In all cases, it scoured the sub-alluvial surface while depositing and reworking a thick sequence of alluvium. The most recent Pleistocene alluvial deposits date to the waning of the Laurentide ice sheet between about 20,000 and 12,000 years ago. After 12,000 years ago, with the river flowing in a meandering regime, it has deposited the thick mass of fine-grained sediments in a backswamp environment.

Before about 4,800 years ago, the Mississippi River was flowing along the western side of its valley, meaning that backswamp extended uninterrupted across the project-item vicinity to the eastern valley wall. The meander belt in the vicinity was one believed to represent the combined flow of upland tributaries, e.g., the Yazoo River, that flowed southward through the valley to the Gulf. Approximately 4,800 years ago, however, the Mississippi River adopted a meander belt (No. 2) farther east near the center of

the valley, but this apparently did not preclude a backswamp environment in the project-item area. The first significant change did not take place until about 2,800 years ago when, due to an upstream diversion, the river adopted a course and began building a meander belt along its present route (No. 1).

Since 2,800 years ago, the river has widened its meander belt, creating a zone of point bar accretion and forming several cutoffs. During most of that time, the river was probably slightly farther east than at present. The pattern of historic period channels (Mississippi River Commission 1938) suggests that the river first established a position with its western bankline along the flood-control levee past the project-item area during the late 17th to early 18th century. River meandering caused the Homochitto Cutoff northeast of Black Hawk in 1776. As a consequence, an altered meandering pattern caused the river to cut slightly farther west by 1830, causing the zone of point bar that extends west of the flood-control levee as discussed above. This was a brief episode, because by the late nineteenth century, the river had meandered more than a kilometer to the east, extending the zone of point bar accretion. Since then, the river has begun a trend back toward the west, but has not approached the early eighteenth century bankline past the project item area. Construction of the Palmetto and Coochie Revetments in the 1950s has helped stabilize the river channel and prevent further westward migration.

Archeological Considerations

Evidence of Paleo-Indian and Early Archaic Cultures in the project item area would be restricted to the uppermost part of the substratum or the lower part of the backswamp sequence, both representing unfavorable environments for human habitation and/or site preservation. Middle Archaic sites could have been occupied on the buried meander belt, but its depth of burial would preclude detection and investigation. A generally hostile environment would prevail until at least 2,800 years ago when natural levees started forming on top of the thick backswamp sequence. Formative Stage Cultures could have occupied sites along the river channel after that time, but those older

than about 1,000 years likely will be buried by at least a meter. Sites between about 2,800 years ago and the historic period could be present in the vicinity but would not be highly probable along the project-item *per se* since it was probably not the river bankline until early historic times. The bankline would have been more favorable for habitation than a location on the levee backslope.

Flora, Fauna, and Climate of the Project Area

The following sections provide a description of the natural environment characteristic of the proposed U.S. Army Corps of Engineers, New Orleans District project items. It includes information on the flora, fauna, and climate of the region as it relates to the prehistoric and early historic utilization of the landscape. The data presented herein serve as a backdrop against which to evaluate cultural materials relative the evolution of the natural landscape as discussed above. While it is not feasible to cover each and every environmental zone within the project area in great detail, wide-scale climatic, faunal, and floral information is discussed. The proposed project areas have been divided into two major sections based upon similarities in floral, faunal, and climatic data; however, some of the floral and faunal species discussed below may be found in both areas. These sections are regionally based, with one comprising the southernmost and mid-latitude parishes, and the other comprising the northernmost parishes of the project area. Each section is discussed separately below.

The Southern and East-Central Louisiana Project Areas

The portions of the current project area that fall within southern and east-central Louisiana include Ascension, Iberville, East Baton Rouge, Orleans, and Plaquemines Parishes. They are discussed together due to their similarity in floral, faunal, and climatic data.

Flora

The flora of the flood plains of the Mississippi River within southern and east-central Louisiana consists of a complex mosaic of tree

species (Table 1). As defined by the Society of American Foresters (1975), the Black Willow, Cottonwood, Eastern Sycamore-Sweetgum-Elm, Sweetgum, Sweetgum-Oak, Hackberry-Elm-Ash, Overcup Oak-Bitter Pecan, and Cypress-Tupelo forest types encompass large parts of the flood plains within this segment of the Mississippi River. Of these, the Hackberry-Elm-Ash, and Eastern Sycamore-Sweetgum-Elm forest types account for over half of the forested areas. Also, scrub forms a locally significant component of the vegetation cover, particularly in recently cleared areas (Klimas 1988:22-23).

Within the older, non-swampy portions of the alluvial plain, the overstory of these forest types varies greatly in structure and composition. The overstory typically includes water tupelo (*Nyssa aquatica*), various oaks (*Quercus* sp.), hackberry (*Celtis laevigata*), boxelder (*Acer negundo*), and American sycamore (*Platanus occidentalis*). Where disturbed by logging, the overstory of the bottomland hardwood forest is dominated by ash (*Fraxinus* sp.), boxelder, hackberry, and American sycamore. Within the overstory, major sources of food for wildlife are the water tupelo, hackberry, green ash (*Fraxinus pennsylvanica*), American elm (*Ulmus americana*), red maple (*Acer rubrum* var. *drummondii*), nuttall oak (*Quercus nuttalli*), overcup oak (*Quercus lyrata*), honey locust (*Gleditsia tricanthos*), sweet gum (*Liquidambar styraciflua*), persimmon (*Diospyros virginiana*), swamp dogwood (*Cornus drummondii*), sweet pecan (*Carya illinoensis*), and red mulberry (*Morus rubra*). Specific to the southeast Louisiana portion of the project areas is Pumpkin Ash (*Fraxinus profunda*), Carolina (water) Ash (*Fraxinus caroliniana*), Black Mangrove (*Avicennia germinans*), and Dahoon Holly (*Ilex cassine*). Flora specific to east-central Louisiana include southern red cedar (*Juniperus sillicicola*), silver maple (*Acer sacharinum*), Devilwood (*Osmanthus americanus*), gum (wooly) bumelia (*Bumelia lanuginosa*), dwarf (upland) hackberry (*Celtis tenuifolia*), largeleaf holly (*Ilex montana*), common winterberry holly (*Ilex verticillata*) and pyramid magnolia (*Magnolia pyramidata*) (Petrides 1988).

The bottomland hardwood forest contains a diversity of shrubs and bushes. Some of the un-

derstory plants that represent important sources of food for wildlife are asters (*Aster* sp.), buck vine (*Amelopsis arborea*), dewberry (*Rubus* sp.), elderberry (*Sambucus canadensis*), and various maples. Significant portions of the bottomlands are dominated by water tupelo and bald cypress (*Taxodium distichum*) swamps (Gulf States Utilities Company 1974a, 1974b; Klimas 1988). Within the project area, these bottomland hardwood forests of the Mississippi River meander belts have been severely altered by modification of the floodplain for commercial development, the excavation of borrow pits, revetment construction, and modification of flood characteristics caused by the excavation of artificial levees.

Fauna

The bottomland forests of the southeast and east-central Louisiana portion of the Mississippi River support a large and varied fauna (Tables 2 - 5); they provide an excellent habitat for white-tailed deer (*Odocoileus virginianus*), swamp rabbit (*Sylvilagus aquaticus*), and squirrels. In addition, the eastern gray squirrel (*Sciurus carolinensis*), eastern fox squirrel (*Sciurus niger*), swamp rabbit, eastern cottontail (*Sylvilagus floridanus*) and black bear (*Ursus americanus*) are common. Predatory mammals found in the bottomland hardwood environments also include the red fox (*Vulpes fulva*), gray fox (*Urocyon cinereoargenteus*), raccoon (*Procyon lotor*), long-tailed weasel (*Mustela frenata*), mink (*Mustela vison*), and bobcat (*Lynx rufus*), as well as the endangered and regionally extirpated Eastern panther (*Felis concolor*) and red wolf (*Canis niger*) respectively. These species, together with raptors, are important in limiting the size of rabbit, mouse, squirrel, and bird populations. The mink, raccoon, beaver (*Castor canadensis*), and opossum (*Didelphis virginiana*) all are important fur bearers that live in the bottomland hardwood environments. Finally, other mammals found in the east-central Louisiana portion of the project area include coyote (*Canis latrans*) and pine vole (*Pitymys pinetorum*) (Burt and Grossenheider 1980).

Bottomland hardwood forests and swamps also are home to a variety of amphibians, including salamanders, toads, tree frogs, and true

Table 1. Trees found in the SEIS New Orleans District Project Area.

COMMON NAME	SCIENTIFIC NAME	SOUTHERN LA	CENTRAL LA	NORTHERN LA
Florida Maple	<i>Acer barbatum</i>		X	X
Chalk Maple	<i>Acer leucoderme</i>		X	
Ashleaf Maple (Box-Elder)	<i>Acer negundo</i>	X	X	X
Red Maple	<i>Acer rubrum</i>	X	X	X
Silver Maple	<i>Acer saccharinum</i>		X	
Red Buckeye	<i>Aesculus pavia</i>	X	X	X
Downy Juneberry	<i>Amelanchier arborea</i>		X	X
Hercules-Club	<i>Aralia spinosa</i>		X	X
Common (Tall) Pawpaw	<i>Asimina triloba</i>		X	X
Black Mangrove	<i>Avicennia germinans</i>	X		
Groundsel-Tree	<i>Baccharis halimifolia</i>		X	X
River Birch	<i>Betula nigra</i>		X	X
Gum (Woolly) Bumelia	<i>Bumelia lanuginosa</i>		X	
Buckthorn Bumelia	<i>Bumelia lycioides</i>		X	X
Ironwood	<i>Carpinus caroliniana</i>		X	X
Water Hickory (Bitter Pecan)	<i>Carya aquatica</i>	X	X	X
Bitternut Hickory	<i>Carya cordiformis</i>		X	X
Pignut Hickory	<i>Carya glabra</i>		X	X
Pecan	<i>Carya illinoensis</i>	X	X	X
Nutmeg Hickory	<i>Carya myristiciformis</i>			X
Sand (Pale) Hickory	<i>Carya pallida</i>			X
Black Hickory	<i>Carya texana</i>			X
Mockernut Hickory	<i>Carya tomentosa</i>		X	X
Allegheny (Eastern) Chinkapin	<i>Castanea pumila</i>		X	X
Southern (Lowland) Hackberry	<i>Celtis laevigata</i>	X	X	X
Dwarf (Upland) Hackberry	<i>Celtis tenuifolia</i>		X	
Buttonbush	<i>Cephalanthus occidentalis</i>	X	X	X
Redbud	<i>Cercis canadensis</i>		X	X
Fringetree	<i>Chionanthus virginicus</i>		X	
Roughleaf Dogwood	<i>Cornus drummondii</i>		X	X
Flowering Dogwood	<i>Cornus florida</i>		X	X
Stiff Dogwood	<i>Cornus stricta</i>			X
Common Persimmon	<i>Diospyros virginiana</i>	X	X	X
Southeastern Coralbean	<i>Erythrina herbacea</i>		X	X
Beech	<i>Fagus grandifolia</i>		X	X
Swamp Forestiera	<i>Forestiera acuminata</i>		X	X
Carolina (Water) Ash	<i>Fraxinus caroliniana</i>	X		
Green Ash	<i>Fraxinus pennsylvanica</i>	X	X	X
Pumpkin Ash	<i>Fraxinus profunda</i>	X		
Water Locust	<i>Gleditsia aquatica</i>		X	X
Honey Locust	<i>Gleditsia triacanthos</i>	X	X	X
Two-wing Silverbell	<i>Halesia parviflora</i>		X	X
Common Witch-Hazel	<i>Hamamelis virginiana</i>		X	X
Carolina Holly	<i>Ilex ambigua</i>		X	X
Dahoon Holly	<i>Ilex cassine</i>	X		
Possumhaw (Deciduous) Holly	<i>Ilex decidua</i>	X	X	X
Largeleaf Holly	<i>Ilex montana</i>		X	
American Holly	<i>Ilex opaca</i>	X	X	X
Common Winterberry Holly	<i>Ilex verticillata</i>		X	
Yaupon Holly	<i>Ilex vomitoria</i>		X	X
Black Walnut	<i>Juglans nigra</i>			X
Southern Redcedar	<i>Juniperus silicicola</i>		X	
Sweetgum	<i>Liquidambar styraciflua</i>	X	X	X
Tuliptree	<i>Liriodendron tulipifera</i>		X	X
Cucumber Magnolia	<i>Magnolia acuminata</i>		X	X
Southern Magnolia	<i>Magnolia grandiflora</i>		X	X
Bigleaf Magnolia	<i>Magnolia macrophylla</i>			X
Pyramid Magnolia	<i>Magnolia pyramidata</i>		X	
Sweetbay Magnolia	<i>Magnolia virginiana</i>		X	X
Red Mulberry	<i>Morus rubra</i>	X	X	X

Table 1, continued

COMMON NAME	SCIENTIFIC NAME	SOUTHERN LA	CENTRAL LA	NORTHERN LA
Southern Bayberry A121	<i>Myrica cerifera</i>	X	X	X
Water Tupelo	<i>Nyssa aquatica</i>	X	X	X
Sourgum	<i>Nyssa sylvatica</i>		X	X
Devilwood	<i>Osmanthus americanus</i>		X	
Sourwood	<i>Oxydendrum arboreum</i>		X	X
Hornbeam	<i>Ostrya virginiana</i>		X	X
Redbay	<i>Persea borbonia</i>	X	X	
Shortleaf Pine	<i>Pinus echinata</i>		X	X
Spruce Pine	<i>Pinus glabra</i>		X	X
Longleaf Pine	<i>Pinus palustris</i>		X	X
Loblolly Pine	<i>Pinus taeda</i>		X	X
Water-Elm	<i>Planera aquatica</i>		X	X
Eastern Sycamore	<i>Platanus occidentalis</i>	X	X	X
Eastern (Common) Cottonwood	<i>Populus deltoides</i>	X	X	X
Swamp Cottonwood	<i>Populus heterophylla</i>		X	X
Chickasaw Plum	<i>Prunus angustifolia</i>		X	X
Carolina Laurelcherry	<i>Prunus caroliniana</i>		X	X
Mexican Plum	<i>Prunus mexicana</i>		X	X
Wildgoose (Munson) Plum	<i>Prunus munsoniana</i>			X
Black Cherry	<i>Prunus serotina</i>		X	X
Flatwoods Plum	<i>Prunus umbellata</i>		X	X
Hoptree	<i>Ptelea trifoliata</i>		X	X
White Oak	<i>Quercus alba</i>		X	X
Durand Oak	<i>Quercus durandii</i>			X
Southern Red (Spanish) Oak	<i>Quercus falcata</i>		X	X
Cherrybark Oak	<i>Quercus falcata</i> var. <i>pagodaefolia</i>		X	X
Laurel (Darlington) Oak	<i>Quercus laurifolia</i>	X	X	X
Overcup Oak	<i>Quercus lyrata</i>	X	X	X
Blackjack Oak	<i>Quercus marilandica</i>		X	X
Basket Oak	<i>Quercus michauxii</i>	X	X	X
Chinkapin Oak	<i>Quercus muehlenbergii</i>		X	X
Water Oak	<i>Quercus nigra</i>	X	X	X
Nuttall Oak	<i>Quercus nuttallii</i>	X	X	X
Willow Oak	<i>Quercus phellos</i>	X	X	X
Northern Red Oak	<i>Quercus rubra</i>		X	X
Shumard Oak	<i>Quercus shumardii</i>		X	X
Post Oak	<i>Quercus stellata</i>		X	X
Black Oak	<i>Quercus velutina</i>		X	X
Virginia Live Oak	<i>Quercus virginiana</i>	X	X	
Carolina Buckthorn	<i>Rhamnus caroliniana</i>	X	X	X
Winged Sumac	<i>Rhus copallina</i>		X	X
Smooth Sumac	<i>Rhus glabra</i>		X	X
Dwarf Palmetto	<i>Sabal minor</i>	X	X	X
Saw-Palmetto <i>Serenoa repens</i>	<i>Sabal minor</i>	X		
Sandbar Willow	<i>Salix exigua</i>		X	X
Black Willow	<i>Salix nigra</i>	X	X	X
Common Elderberry	<i>Sambucus canadensis</i>	X	X	X
Western Soapberry	<i>Sapindus drummondii</i>		X	X
Sassafras	<i>Sassafras albidum</i>	X	X	X
Virginia Stewartia (Silky Camellia)	<i>Stewartia malachodendron</i>		X	X
American Snowbell	<i>Styrax americanus</i>	X	X	X
Bigleaf Snowbell	<i>Styrax grandifolius</i>		X	X
Sweetleaf	<i>Symplocos tinctoria</i>	X	X	
Baldcypress	<i>Taxodium distichum</i>	X	X	X
Pondcypress	<i>Taxodium distichum</i> var. <i>nutans</i>	X	X	X
Carolina Basswood	<i>Tilia caroliniana</i>		X	X
Poison-Sumac	<i>Toxicodendron vernix</i>	X	X	X
Winged Elm	<i>Ulmus alata</i>		X	X
American Elm	<i>Ulmus americanus</i>	X	X	X
Cedar Elm	<i>Ulmus crassifolia</i>	X	X	X
Slippery Elm	<i>Ulmus rubra</i>			X
Sparkleberry (Farkleberry)	<i>Vaccinium arboreum</i>		X	X

Table 1, continued

COMMON NAME	SCIENTIFIC NAME	SOUTHERN LA	CENTRAL LA	NORTHERN LA
Rusty Blackhaw	<i>Viburnum rufidulum</i>		X	X
Possumhaw Viburnum	<i>Viburnum nudum</i>			X
Southern Prickly-Ash	<i>Zanthoxylum clava-herculis</i>		X	X

Table 2. Mammals found in the SEIS New Orleans District Project Area.

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

Table 3. Reptiles and Amphibians found in the SEIS New Orleans District Project Area.

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

Table 3, continued

COMMON NAME	SCIENTIFIC NAME	SOUTHERN LA	CENTRAL LA	NORTHERN LA
Squirrel Treefrog	<i>Hyla squirella</i>	X	X	X
Gray Treefrogs	<i>Hyla versicolor</i> and <i>Hyla chrysoscelis</i>	X	X	X
Mississippi Mud Turtle	<i>Kinosternon subrubrum hippocrepis</i>	X	X	X
Mole Kingsnake	<i>Lampropeltis calligaster rhombomaculata</i>			X
Speckled Kingsnake	<i>Lampropeltis getula holbrooki</i>	X	X	X
Louisiana Milk Snake	<i>Lampropeltis triangulum amaura</i>	X	X	X
Scarlet Kingsnake	<i>Lampropeltis triangulum elapsoides</i>		X	X
Alligator Snapping Turtle	<i>Macrolemys temminckii</i>	X	X	X
Mississippi Diamondback Terrapin	<i>Malaclemys terrapin pileata</i>	X		
Red River Mudpuppy	<i>Necturus maculosus louisianensis</i>			X
Gulf Salt Marsh Snake	<i>Nerodia clarkii clarkii</i>	X		
Mississippi Green Water Snake	<i>Nerodia cyclopion</i>	X	X	X
Yellowbelly Water Snake	<i>Nerodia erythrogaster flavigaster</i>	X	X	X
Broad-banded Water Snake	<i>Nerodia fasciata confluens</i>	X	X	X
Diamondback Water Snake	<i>Nerodia rhombifer</i>	X	X	X
Midland Water Snake	<i>Nerodia sipedon pleuralis</i>		X	
Central Newt	<i>Notophthalmus viridescens louisianensis</i>	X	X	X
Eastern Slender Glass Lizard	<i>Ophisaurus attenuatus longicaudus</i>	X	X	X
Eastern Glass Lizard	<i>Ophisaurus ventralis</i>	X	X	
Mississippi Slimy Salamander	<i>Plethodon mississippi</i>		X	X
Webster's Salamander	<i>Plethodon websteri</i>		X	
Northern Spring Peeper	<i>Pseudacris crucifer crucifer</i>	X	X	X
River Cooter	<i>Pseudemys concinna</i>	X	X	X
Upland Chorus Frog <i>m</i>	<i>Pseudacris triseriata feriaru</i>	X	X	X
Northern Crawfish Frog	<i>Rana areolata circulosa</i>			X
Bullfrog	<i>Rana catesbeiana</i>	X	X	X
Pig Frog	<i>Rana grylio</i>	X	X	
Pickerel Frog	<i>Rana palustris</i>		X	X
Southern Leopard Frog	<i>Rana utricularia</i>	X	X	X
Graham's Crayfish Snake	<i>Regina grahamii</i>	X	X	X
Delta Crayfish Snake	<i>Regina rigida deltae</i>	X	X	
Gulf Crayfish Snake	<i>Regina rigida sinicola</i>		X	X
Queen Snake	<i>Regina septevittata</i>		X	
Southern Redback	<i>Salamander Plethodon serratus</i>		X	
Eastern Spadefoot	<i>Scaphiopus holbrookii holbrookii</i>		X	X
Northern Fence Lizard	<i>Sceloporus undulatus hyacinthinus</i>			X
Southern Fence Lizard	<i>Sceloporus undulatus undulatus</i>		X	X
Ground Skink	<i>Scincella lateralis</i>	X	X	X
Six-lined Racerunner <i>Cnemidophorus</i>	<i>sexlineatus sexlineatus</i>			X
Western Lesser	<i>Siren Siren intermedia nettingi</i>	X	X	X
Western Pigmy Rattlesnake	<i>Sistrurus miliarius streckeri</i>	X	X	
Rough Green	<i>Snake Opheodrys aestivus</i>	X	X	X
Razorback Musk Turtle	<i>Sternotherus carinatus</i>		X	X
Common Musk Turtle	<i>Sternotherus odoratus</i>	X	X	X
Marsh Brown Snake	<i>Storeria dekayi limnetes</i>	X	X	
Midland Brown Snake	<i>Storeria dekayi wrightorum</i>		X	X
Florida Redbelly Snake	<i>Storeria occipitomaculata obscura</i>		X	X
Three-toed Box Turtle <i>i</i>	<i>Terrapene carolina baur</i>	X	X	X
Gulf Coast Box Turtle	<i>Terrapene carolina major</i>	X		
Gulf Coast Ribbon Snake	<i>Thamnophis proximus orarius</i>	X	X	
Western Ribbon Snake	<i>Thamnophis proximus proximus</i>		X	X
Eastern Garter Snake	<i>Thamnophis sirtalis sirtalis</i>	X	X	X
Red-eared Slider	<i>Trachemys scripta elegans</i>	X	X	X
Rough Earth Snake	<i>Virginia striatula</i>		X	
Western Earth Snake	<i>Virginia valeriae elegans</i>		X	X

Table 4. Freshwater Fishes found in the SEIS New Orleans District Project Area.

COMMON NAME	SCIENTIFIC NAME	SOUTHERN LA	CENTRAL LA	NORTHERN LA
Lake Sturgeon	<i>Acipenser fulvescens</i>			X
Alabama Shad	<i>Alosa alabamae</i>	X	X	X
Skipjack Herring	<i>Alosa chrysochloris</i>	X	X	X
Shadow Bass	<i>Ambloplites ariommus</i>	X		
Black Bullhead	<i>Ameiurus melas</i>	X	X	X
Yellow Bullhead	<i>Ameriurus natalis</i>	X	X	X
Bowfin	<i>Amia calva</i>	X	X	X
American Eel	<i>Anuilla rostrata</i>	X	X	X
Pirate Perch	<i>Aphredoderus sayanus</i>	X	X	X
Freshwater Drum	<i>Aplodinotus grunniens</i>	X	X	X
Alligator Gar	<i>Attacosteus spatula</i>	X	X	X
Central Stoneroller	<i>Campostoma anomalum</i>		X	
River Carpsucker	<i>Carpoides carpio</i>		X	X
Quillback	<i>Carpoides cyprinus</i>		X	X
Highfin Carpsucker	<i>Carpoides velifer</i>		X	X
Flier	<i>Centrarchus macropterus</i>	X	X	X
Crystal Darter	<i>Crystallaria asprella</i>			X
Blue Sucker	<i>Cycleptus elongatus</i>			X
Bluntnose Shiner	<i>Cyprinella camura</i>		X	
Red Shiner	<i>Cyprinella lutrensis</i>		X	X
Blacktail Shiner	<i>Cyprinella venusta</i>		X	X
Gizzard Shad	<i>Dorosoma cepedianum</i>	X	X	X
Threadfin Shad	<i>Dorosoma petenense</i>	X	X	X
Banded Pygmy Sunfish	<i>Elassoma zonatum</i>	X	X	X
Silverjaw Minnow	<i>Ericymba buccata</i>			X
Creek Chubsucker	<i>Erimyzon oblongus</i>	X	X	X
Lake Chubsucker	<i>Erimyzon sucetta</i>	X	X	X
Grass or Redfin Pickerel	<i>Esox americanus</i>	X	X	X
Chain Pickerel	<i>Esox niger</i>	X	X	X
Mud Darter	<i>Etheostoma asprigene</i>		X	X
Naked Sand Darter	<i>Etheostoma beani</i>		X	X
Rainbow Darter	<i>Etheostoma caeruleum</i>		X	
Bluntnose Darter	<i>Etheostoma chlorosomum</i>	X	X	X
Creole Darter	<i>Etheostoma collettei</i>			X
Swamp Darter	<i>Etheostoma gracile</i>	X	X	X
Slough Darter	<i>Etheostoma gracile</i>	X	X	X
Harlequin Darter	<i>Etheostoma histrio</i>		X	X
Brighteye Darter	<i>Etheostoma lynceum</i>		X	
Goldstripe Darter	<i>Etheostoma parvipinne</i>		X	X
Cypress Darter	<i>Etheostoma proeliare</i>	X	X	X
Speckled Darter	<i>Etheostoma stigmaeum</i>		X	X
Gulf Darter	<i>Etheostoma swaini</i>			X
Scaley Sand Darter	<i>Etheostoma vivax</i>		X	X
Redfin Darter	<i>Etheostoma whipplei</i>		X	X
Speckled Chub	<i>Extrarius aestivalis</i>	X	X	X
Western Starhead Minnow	<i>Fundulus blairae</i>	X	X	
Golden Topminnow	<i>Fundulus chrysotus</i>	X	X	X
Blackstripe Topminnow	<i>Fundulus notatus</i>		X	X
Blackspotted Topminnow	<i>Fundulus olivaceus</i>	X	X	X
Mosquito Fish	<i>Gambusia affinis</i>	X	X	
Least Killfish	<i>Heterandria formosa</i>	X		
Goldeye	<i>Hiodon alosoides</i>		X	X
Mooneye	<i>Hiodon tergisus</i>	X	X	X
Cypress Minnow	<i>Hybognathus hayi</i>		X	X
Mississippi Silvery Minnow	<i>Hybognathus nuchalis</i>	X	X	X
Pallid Shiner	<i>Hybopsis amnis</i>		X	X
Clear Chub	<i>Hybopsis winchelli</i>		X	
Northern Hog Sucker	<i>Hypentelium nigricans</i>		X	
Chestnut Lampry	<i>Ichthyomyzon castaneus</i>		X	X
Silver Lampry	<i>Ichthyomyzon unicuspis</i>			X

Table 4, continued

COMMON NAME	SCIENTIFIC NAME	SOUTHERN LA	CENTRAL LA	NORTHERN LA
Southern Brook Lamprey	<i>Ichtyomyzon gagei</i>		X	
Blue Catfish	<i>Ictalurus furcatus</i>	X	X	X
Channel Catfish	<i>Ictalurus punctatus</i>	X	X	X
Smallmouth Buffalo	<i>Ictiobus bubalus</i>	X	X	X
Bigmouth Buffalo	<i>Ictiobus cyprinellus</i>		X	X
Black Buffalo	<i>Ictiobus niger</i>	X	X	X
Brook Silverside	<i>Labidesthes sicculus</i>			X
Spotted Gar	<i>Lepisosteus oculatus</i>	X	X	X
Longnose Gar	<i>Lepisosteus osseus</i>		X	X
Shortnose Gar	<i>Lepisosteus platostomus</i>		X	X
Orangespotted Sunfish	<i>Lepomis humilis</i>		X	X
Dollar Sunfish	<i>Lepomis marginatus</i>	X	X	X
Green Sunfish	<i>Lepomis cyanellus</i>	X	X	X
Warmouth	<i>Lepomis gulosus</i>	X	X	X
Bluegill	<i>Lepomis macrochirus</i>	X	X	X
Longear Sunfish	<i>Lepomis megalotis</i>	X	X	X
Redear Sunfish	<i>Lepomis microlophus</i>	X	X	X
Spotted Sunfish	<i>Lepomis punctatus</i>	X	X	X
Bantam Sunfish	<i>Lepomis symmetricus</i>	X	X	X
Rainwater Killfish	<i>Lucania parva</i>	X	X	
Striped Shiner	<i>Luxilus chrysocephalus</i>		X	
Ribbon Shiner	<i>Lythrurus fumeus</i>		X	X
Redfin Shiner	<i>Lythrurus umbratilis</i>		X	X
Sturgeon Chub	<i>Macrhybopsis gelida</i>		X	X
Sicklefin Chub <i>i</i>	<i>Macrhybopsis meek</i>			X
Silver Chub	<i>Macrhybopsis storeriana</i>		X	X
Inland Silverside	<i>Menidia beryllina</i>	X	X	X
Spotted Bass	<i>Micropterus punctulatus</i>	X	X	X
Largemouth Bass	<i>Micropterus salmoides</i>	X	X	X
Spotted Sucker	<i>Minytrema melanops</i>	X	X	X
White Bass	<i>Morone chrysops</i>		X	X
Yellow Bass	<i>Morone mississippiensis</i>	X	X	X
Bluehead Chub	<i>Nocomis leptoccephalus</i>		X	
Ironcolor Shiner	<i>Nostropis chalybaeus</i>		X	X
Golden Shiner	<i>Notemigonus crysoleucas</i>	X	X	X
Emerald Shiner	<i>Notropis atherinoides</i>		X	X
River Shiner	<i>Notropis blenni</i>	X	X	X
Bigeye Shiner	<i>Notropis boops</i>			X
Ghost Shiner	<i>Notropis buechanani</i>		X	X
Longnose Shiner	<i>Notropis longirostris</i>		X	
Taillight Shiner	<i>Notropis maculatus</i>			X
Chub Shiner	<i>Notropis potteri</i>		X	
Silverband Shiner	<i>Notropis shumardi</i>	X	X	
Weed Shiner	<i>Notropis texanus</i>	X	X	X
Mimic Shiner	<i>Notropis volucellus</i>		X	X
Tadpole Madtom	<i>Noturus gyrinus</i>	X	X	X
Speckled Madtom	<i>Noturus leptacanthus</i>		X	
Brindled Madtom	<i>Noturus miurus</i>		X	X
Freckled Madtom	<i>Noturus nocturnus</i>		X	X
Brown Madtom	<i>Noturus phaeus</i>		X	
Pugnose Minnow	<i>Opsopoeodus emiliae</i>	X	X	X
Logperch	<i>Percina caprodes</i>	X	X	X
Blackside Darter	<i>Percina maculata</i>		X	X
Saddleback Darter	<i>Percina ouachitae</i>	X	X	X
Dusky Darter	<i>Percina sciera</i>	X	X	X
River Darter	<i>Percina shumardi</i>			X
Southern Redbelly Dace	<i>Phoxinus erythrogaster</i>		X	X
Bluntnose Minnow	<i>Pimephales notatus</i>		X	X
Fathead Minnow	<i>Pimephales promelas</i>			X
Bullhead Minnow	<i>Pimephales vigilax</i>	X	X	X
Flathead Chub	<i>Platygobio gracilis</i>		X	X
Sailfin Molly	<i>Poecilia latipinna</i>	X	X	

Table 4, continued

COMMON NAME	SCIENTIFIC NAME	SOUTHERN LA	CENTRAL LA	NORTHERN LA
Paddlefish	<i>Polyodon spathula</i>	X	X	X
White Crappie	<i>Pomoxis annularis</i>	X	X	X
Black Crappie	<i>Pomoxis nigromaculatus</i>	X	X	X
Fathead Catfish	<i>Pylodictis olivaris</i>		X	X
Pallid Sturgeon	<i>Scaphirhynchus albus</i>	X	X	X
Shovelnose Sturgeon	<i>Scaphirhynchus platyrhynchus</i>	X	X	X
Creek Chub	<i>Semotilus atromaculatus</i>		X	X
Sauger	<i>Stizostedion canadense</i>		X	X

Table 5. Birds found in the SEIS New Orleans District Project Area.

COMMON NAME	SCIENTIFIC NAME	SOUTHERN LA	CENTRAL LA	NORTHERN LA
Winter Season				
Sharp-skinned Hawk	<i>Accipiter striatus</i>	X	X	X
Spotted Sandpiper	<i>Actitis macularia</i>	X	X	
Western Grebe	<i>Aechmophorus occidentalis</i>	X	X	
Sharp-tailed Sparrow	<i>Ammodramus caudacutus</i>	X		
Henslow's Sparrow	<i>Ammodramus henslowii</i>	X	X	X
Le Conte's Sparrow	<i>Ammodramus leconteii</i>	X	X	X
Grasshopper sparrow	<i>Ammodramus savannarum</i>	X	X	X
Northern Pintail	<i>Anas acuta</i>	X	X	X
Northern Shoveler	<i>Anas clypeata</i>	X	X	X
Blue-winged Teal	<i>Anas discors</i>	X		
American Wegeon	<i>Anas penelope</i>	X	X	
Mallard	<i>Anas platyrhynchos</i>	X	X	X
American Black Duck	<i>Anas rubripes</i>			X
Gadwall	<i>Anas strepera</i>	X	X	X
Grester White-fronted Goose	<i>Anser albifrons</i>	X		
American Pipit	<i>Anthus rubescens</i>	X	X	X
Sprague's Pipit	<i>Anthus spragueii</i>			X
Ruddy Turnstone	<i>Arenaria interpres</i>	X	X	
Short-eared Owl	<i>Asio flammeus</i>	X	X	X
Long-eared Owl	<i>Asio otus</i>			X
Lesser Scaup	<i>Aythya affinia</i>	X	X	X
Redhead	<i>Aythya americana</i>	X	X	X
Ringed-neck Duck	<i>Aythya collaris</i>	X	X	X
Canvasback	<i>Aythya valisineria</i>	X	X	X
Cedar Waxwing	<i>Bombycilla cedrorum</i>	X	X	X
American Bittern	<i>Botaurus lentiginosus</i>	X	X	
Canada Goose	<i>Branta canadensis</i>	X	X	X
Buffelhead	<i>Bucephala albeola</i>	X	X	X
Common Goldeneye	<i>Bucephala clangula</i>	X	X	X
Sanderling	<i>Calidris alba</i>	X	X	
Dunlin	<i>Calidris alpina</i>	X	X	
Red Knot	<i>Calidris canutus</i>	X	X	
Western Sandpiper	<i>Calidris mauri</i>	X	X	
Least Sandpiper	<i>Calidris minutilla</i>	X	X	
Whip-poor-will	<i>Caprimulgus vociferus</i>	X		
Pine Siskin	<i>Carduelis pinus</i>	X	X	X
American Goldenfinch	<i>Carduelis tristis</i>	X	X	X
Purple Finch	<i>Carpodacus purpureus</i>	X	X	X
Hermit Thrush	<i>Catharus guttatus</i>	X	X	X
Brown Creeper	<i>Certhia americana</i>	X	X	X
Semipalmated Plover	<i>Charadrius semipalmatus</i>	X	X	
Snow Goose	<i>Chen caerulescens</i>	X	X	
Lark Sparrow	<i>Chondestes grammacus</i>	X	X	
Northern Harrier	<i>Circus cyaneus</i>	X	X	X
Marsh Wren	<i>Cistothorus palustris</i>		X	X
Evening Grosbeak	<i>Coccothraustes vespertinus</i>			X
Yellow Rail	<i>Coturnicops noveboracensis</i>	X	X	

Table 5, continued

COMMON NAME	SCIENTIFIC NAME	SOUTHERN LA	CENTRAL LA	NORTHERN LA
Double	<i>Crested Cormorant</i>		X	X
Yellow-rumped Warbler	<i>Dendroica coronata</i>	X	X	X
Palm Warbler	<i>Dendroica palmarum</i>	X		
Gray Catbird	<i>Dumetella carolinensis</i>		X	
Horned Lark	<i>Eremophila alpestris</i>	X		
Rusty Blackbird	<i>Euphagus carolinus</i>	X	X	X
Brewer's Blackbird	<i>Euphagus cyanocephalus</i>	X	X	X
Merlin	<i>Falco columbarius</i>	X	X	X
Peregrine Falcon	<i>Falco peregrinus</i>	X	X	
Common Snipe	<i>Gallinago gallinago</i>	X	X	X
Common Loon	<i>Gavia immer</i>	X	X	
Bald Eagle	<i>Haliaeetus leucocephalus</i>	X	X	X
Dark-eyed Junco	<i>Junco hyemalis</i>	X	X	X
Herring Gull	<i>Larus argentatus</i>	X	X	X
Ring-billed Gull	<i>Larus delawarensis</i>	X	X	X
Bonaparte's Gull	<i>Larus ridibundus</i>	X		
Short-billed Dowitcher	<i>Limnodromus griseus</i>	X	X	
Long-billed Dowitcher	<i>Limnodromus scolopaceus</i>	X	X	
Marbled Godwit	<i>Limosa fedoa</i>	X	X	
Hooded Merganser	<i>Lophodytes cucullatus</i>	X	X	
Swamp Sparrow	<i>Melospiza georgiana</i>	X	X	X
Lincoln's Sparrow	<i>Melospiza lincolni</i>	X	X	X
Song Sparrow	<i>Melospiza melodia</i>	X	X	X
Common Merganser	<i>Mergus merganser</i>	X	X	X
Red-breasted Merganser	<i>Mergus serrator</i>	X		
Black-and-white Warbler	<i>Mniotilta varia</i>	X	X	
Whimbrel	<i>Numenius phaeopus</i>	X	X	
Ruddy Duck	<i>Oxyura jamaicensis</i>	X	X	X
Savannah Sparrow	<i>Passerculus sandwichensis</i>	X	X	X
Fox Sparrow	<i>Passerella iliaca</i>		X	X
American White Pelican	<i>Pelecanus erythrorhynchos</i>	X	X	
Anhinga <i>Anhinga anhinga</i>	<i>Phalacrocorax auritus</i>	X		
Black-bellied Plover	<i>Pluvialis squatarola</i>	X		
Horned Grebe	<i>Podiceps auritus</i>	X		
Eared Grebe	<i>Podiceps nigricollis</i>	X	X	X
Blue-gray Gnatcatcher	<i>Poliophtila caerulea</i>	X		
Vesper Sparrow	<i>Poocetes gramineus</i>	X	X	X
Sora	<i>Porzana carolina</i>	X	X	X
Virginia Rail	<i>Rallus limicola</i>	X	X	
American Avocet	<i>Recurvirostra americana</i>	X		
Ruby-crowned Kinglet	<i>Regulus calendula</i>	X	X	X
Golden-crowned Kinglet	<i>Regulus satrapa</i>		X	X
Eastern Phoebe	<i>Sayornis phoebe</i>	X	X	
American Woodcock	<i>Scolopax minor</i>	X		
Red-breasted Nuthatch	<i>Sitta canadensis</i>		X	X
Yellow-bellied Sapsucker	<i>Sphyrapicus varius</i>	X	X	X
Chipping Sparrow	<i>Spizella passerina</i>	X		
Field Sparrow	<i>Spizella pusilla</i>	X		
Western Meadowlark	<i>Sturnella neglecta</i>	X	X	X
Tree Swallow	<i>Tachycineta bicolor</i>	X		
Green Winged	<i>Teal Anas crecca</i>	X	X	X
Bewick's Wren	<i>Thryomanes bewickii</i>	X	X	X
Lesser Yellowlegs	<i>Tringa flavipes</i>	X	X	
Greater Yellowlegs	<i>Tringa melanoleuca</i>	X	X	
House Wren	<i>Troglodytes troglodytes</i>	X	X	X
Oranged-crowned Warbler	<i>Vermivora celata</i>	X	X	X
Solitary Vireo	<i>Vireo solitarius</i>	X	X	
White-winged Dove	<i>Zenaida asiatica</i>	X		
White-throated Sparrow	<i>Zonotrichia albicollis</i>	X	X	X
White-crowned Sparrow	<i>Zonotrichia leucophrys</i>	X	X	X
Summer and Spring Seasons				
Purple Martin	<i>Progne subis</i>	X	X	X

Table 5, continued

COMMON NAME	SCIENTIFIC NAME	SOUTHERN LA	CENTRAL LA	NORTHERN LA
Roseate Spoonbill	<i>Ajaia ajaia</i>	X	X	
Anhinga	<i>Anhinga anhinga</i>		X	X
Ruby-throated Hummingbird	<i>Archilochus colubris</i>	X	X	X
Broad-winged Hawk	<i>Buteo platypterus</i>	X	X	X
Green-backed Heron	<i>Butorides striatus</i>		X	X
Chuck-will's-widow	<i>Caprimulgus carolinensis</i>	X	X	X
Great Egret	<i>Casmerodius Albus</i>			X
Chimney Swift	<i>Chaetura pelagica</i>	X	X	X
Wilson's Plover	<i>Charadrius wilsonia</i>	X	X	
Lark Sparrow	<i>Chondestes grammacus</i>			X
Common Nighthawk	<i>Chordeiles minor</i>	X	X	X
Yellow-billed Cookoo	<i>Coccyzus americanus</i>	X	X	X
Eastern Wood-Pewee	<i>Contopus virens</i>	X	X	X
Fish Crow	<i>Corvus ossifragus</i>			X
Cerulean Warbler	<i>Dendroica cerulea</i>			X
Prarie Warbler	<i>Dendroica discolor</i>			X
Yellow-throated Warbler	<i>Dendroica dominica</i>	X	X	X
Gray Catbird	<i>Dumetella carolinensis</i>			X
Little Blue Heron	<i>Egretta caerulea</i>			X
Reddish Egret	<i>Egretta rufescens</i>		X	
Snowy Egret	<i>Egretta thula</i>			X
American Swallow-tailed Kite	<i>Elanoides forficatus</i>	X	X	X
Acadian Flycatcher	<i>Empidonax virens</i>	X	X	X
Common Moorhen	<i>Gallinula chloropus</i>			X
Blue Grosbeak	<i>Guiraca caerulea</i>	X	X	X
Worm-eating Warbler	<i>Helmitheros vermivorus</i>			X
Black-necked Stilt	<i>Himantopus mexicanus</i>		X	
Barn Swallow	<i>Hirundo rustica</i>	X	X	X
Wood Thrush	<i>Hylocichla mustelina</i>		X	X
Yellow-breasted Chat	<i>Icteria virens</i>	X	X	X
Northern Oriole	<i>Icterus galbula</i>			X
Orchard Oriole	<i>Icterus spurius</i>	X	X	X
Mississippi Kite	<i>Ictinia mississippiensis</i>	X	X	X
Least Bittern	<i>Ixobrychus exilis</i>	X	X	X
Swainson's Warbler	<i>Limnithypis swainsonii</i>	X	X	X
Black-and-white Warbler	<i>Mniotilta varia</i>			X
Wood Stork	<i>Mycteria americana</i>		X	X
Great Crested Flycatcher	<i>Myiarchus crinitus</i>	X	X	X
Yellow-crowned Night-Heron	<i>Nyctanassa violacea</i>			X
Black-crowned Night-Heron	<i>Nycticorax nycticorax</i>			X
Kentucky Warbler	<i>Oporornis formosus</i>	X	X	X
Osprey	<i>Pandion Haliaetus</i>	X		
Northern Parula	<i>Parula americana</i>	X	X	X
Painted Bunting	<i>Passerina ciris</i>	X	X	X
Indigo Bunting	<i>Passerina cyanea</i>	X	X	X
Summer Tanager	<i>Piranga rubra</i>	X	X	X
Glossy Ibis	<i>Plegadis falcinellus</i>		X	X
White-faced Ibis <i>Plegadis chihi</i>	<i>Plegadis falcinellus</i>	X	X	X
Blue-gray Gnatcatcher	<i>Polioptila caerulea</i>			X
Purple Gallinule	<i>Porphyryla martinica</i>	X	X	X
Prothonotary Warbler	<i>Proronotaria citrea</i>	X	X	X
Louisiana Waterthrush	<i>Seiurus motacilla</i>			X
American Redstart	<i>Setophaga ruticilla</i>			X
Dickcissel	<i>Spiza americana</i>		X	X
Northern Rough-winged Swallow	<i>Stelgidopteryx serripennis</i>	X	X	X
Least Tern	<i>Sterna antillarum</i>	X	X	X
American Robin	<i>Turdus migratorius</i>	X		
Eastern Kingbird	<i>Tyrannus tyrannus</i>	X	X	X
Bell's Vireo	<i>Vireo bellii</i>			X
Yellow-throated Vireo	<i>Vireo flavifrons</i>	X	X	X
Warbling Vireo	<i>Vireo gilvus</i>	X	X	X
White-eyed Vireo	<i>Vireo griseus</i>			X

Table 5, continued

COMMON NAME	SCIENTIFIC NAME	SOUTHERN LA	CENTRAL LA	NORTHERN LA
Red-eyed Vireo	<i>Vireo olivaceus</i>	X	X	X
Hooded Warbler	<i>Wilsonia citrina</i>	X	X	X
Year Round Presence				
Anhinga	<i>Anhinga anhinga</i>	X		
Coopers Hawk	<i>Accipiter cooperii</i>	X	X	X
Red-winged Blackbird	<i>Agelaius phoeniceus</i>	X	X	X
Bachman's Sparrow	<i>Aimophila aestivalis</i>	X	X	X
Wood Duck	<i>Aix sponsa</i>	X	X	X
Seaside Sparrow	<i>Ammodramus maritimus</i>	X		
Mottled Duck	<i>Anas fulvigula</i>	X		
Great Blue Heron	<i>Ardea herodias</i>	X	X	X
American Bittern	<i>Botaurus lentiginosus</i>			X
Great Horned Owl	<i>Bubo virginianus</i>	X	X	X
Cattle Egret	<i>Bubulcus ibis</i>	X	X	X
Red-tailed Hawk	<i>Buteo jamaicensis</i>	X	X	X
Red-shouldered Hawk	<i>Buteo platypterus</i>	X	X	X
Green-backed Heron	<i>Butorides striatus</i>	X		
Northern Cardinal	<i>Cardinalis cardinalis</i>	X	X	X
Great Egret	<i>Casmerodius albus</i>	X	X	
Turkey Vulture	<i>Cathartes aura</i>	X	X	X
Willet	<i>Catoptrophorus semipalmatus</i>	X	X	
Belted Kingfisher	<i>Ceryle alcyon</i>	X	X	X
Snowy Plover	<i>Charadrius alexandrinus</i>	X		
Piping Plover	<i>Charadrius melodus</i>	X		
Killdeer	<i>Charadrius vociferus</i>	X	X	X
Marsh Wren	<i>Cistothorus palustris</i>	X		
Northern Flicker	<i>Colaptes auratus</i>	X	X	X
Northern Bobwhite	<i>Colinus virginianus</i>	X	X	X
Rock Dove	<i>Columbia livia</i>	X		X
Common Ground-Dove	<i>Columbina passerina</i>	X	X	
Black Vulture	<i>Coragyps atratus</i>	X	X	X
American Crow	<i>Corvus brachyrhynchos</i>	X	X	X
Fish Crow	<i>Corvus ossifragus</i>	X	X	
Blue Jay	<i>Cyanocitta cristata</i>	X	X	X
Pine Warbler	<i>Dendroica pinus</i>	X	X	X
Pileated Woodpecker	<i>Dryocopus pileatus</i>	X	X	X
Little Blue Heron	<i>Egretta caerulea</i>	X	X	
Reddish Egret	<i>Egretta rufescens</i>	X		
Snowy Egret	<i>Egretta Thula</i>	X	X	
Tricolored Heron	<i>Egretta tricolor</i>	X		
Horned Lark	<i>Eremophila alpestris</i>		X	X
White Ibis	<i>Eudocimus albus</i>	X	X	
American Kestrel	<i>Falco sparverius</i>	X	X	X
American Coot	<i>Fulica americana</i>	X	X	X
Common Morehen	<i>Gallinula chloropus</i>	X	X	
Common Yellowthroat	<i>Geothlypis trichas</i>	X	X	X
Sandhill Crane	<i>Grus canadensis</i>	X		
American Oystercatcher	<i>Haematopus palliatus</i>	X		
Black-necked Stilt	<i>Himantopus mexicanus</i>	X		
Loggerhead Shrike	<i>Lanius ludovicianus</i>	X	X	X
Laughing Gull	<i>Larus atricilla</i>	X	X	
Black Rail	<i>Laterallus jamaicensis</i>	X		
Red-bellied Woodpecker	<i>Melanerpes carolinus</i>	X	X	X
Red-headed Woodpecker	<i>Melanerpes erythrocephalus</i>	X	X	X
Wild Turkey	<i>Meleagris gallopavo</i>	X	X	X
Northern Mockingbird	<i>Mimus polyglotos</i>	X	X	X
Brown-headed Cowbird	<i>Molothrus ater</i>	X	X	X
Wood Stork	<i>Mycteria americana</i>	X		
Yellow-crowned Night-Heron	<i>Nyctanassa violacea</i>	X	X	
Black-crowned Night-Heron	<i>Nycticorax nycticorax</i>	X	X	
Eastern Screech-Owl	<i>Otus asio</i>	X	X	X
Tufted Titmouse	<i>Parus bicolor</i>	X	X	X

Table 5, continued

COMMON NAME	SCIENTIFIC NAME	SOUTHERN LA	CENTRAL LA	NORTHERN LA
Carolina Chickadee	<i>Parus carolinensis</i>	X	X	X
House Sparrow	<i>Passer domesticus</i>	X	X	X
Brown Pelican	<i>Pelecanus occidentalis</i>	X		
Double Crested Cormorant	<i>Phalacrocorax auritus</i>	X		
Red-cocaded Woodpecker	<i>Picoides borealis</i>	X	X	X
Downy Woodpecker	<i>Picoides pubescens</i>	X	X	X
Hairy Woodpecker	<i>Picoides villosus</i>	X	X	X
Rufous-sided Towhee	<i>Pipilo erythrophthalmus</i>	X	X	X
Glossy Ibis	<i>Plegadis falcinellus</i>	X		
Pied-billed Grebe	<i>Podilymbus podiceps</i>	X	X	X
Blue-gray Gnatcatcher	<i>Poliptila caerulea</i>		X	
Boat-tailed Grackle	<i>Quiscalus major</i>	X		
Great-tailed Grackle	<i>Quiscalus mexicanus</i>		X	
Common Grackle	<i>Quiscalus quiscula</i>	X	X	X
King Rail	<i>Rallus elegans</i>	X	X	X
Clapper Rail	<i>Rallus longirostris</i>	X	X	
Black Skimmer	<i>Rynchops niger</i>	X		
Eastern Phoebe	<i>Sayornis phoebe</i>			X
American Woodcock	<i>Scolopax minor</i>		X	X
Eastern Bluebird	<i>Sialia sialis</i>	X	X	X
White-breasted Nuthatch	<i>Sitta carolinensis</i>	X	X	X
Brown-headed Nuthatch	<i>Sitta pusilla</i>		X	X
Chipping Sparrow	<i>Spizella passerina</i>		X	X
Field Sparrow	<i>Spizella pusilla</i>		X	X
Caspian Tern	<i>Sterna Caspia</i>	X		
Forster's Tern	<i>Sterna forsteri</i>	X	X	
Royal Tern	<i>Sterna maxima</i>	X		
Gull-billed Tern	<i>Sterna nilotica</i>	X	X	
Sandwich Tern	<i>Sterna sandvicensis</i>	X		
Eastern Meadowlark	<i>Sturnella magna</i>	X	X	X
European Starling (Introduced)	<i>Sturnus vulgaris</i>	X	X	X
Carolina Wren	<i>Thryothorus ludovicianus</i>	X	X	X
Brown Thrasher	<i>Toxostoma rufum</i>	X	X	X
American Robin	<i>Turdus migratorius</i>		X	X
Barn Owl	<i>Tyto alba</i>	X	X	X
White-eyed Vireo	<i>Vireo griseus</i>	X	X	
Mourning Dove	<i>Zenaida macroura</i>	X	X	X

frogs (Table 3). These amphibians typically require very moist soils, temporary pools, or permanent ponds. Amphibians specific to the southeast portion of Louisiana include greenhouse frog (*Eleutherodactylus planirostris planirostris*) and the Puerto Rican coqui (*Eleutherodactylus coqui*), both of which were introduced. The southern toad (*Bufo terrestris*), pine woods treefrog (*Hyla femoralis*), and barking treefrog (*Hyla gratiosa*) are specific to the east-central portion of Louisiana (Conant and Collins 1991). The numerous reptiles found within the bottomland hardwood forests consist not only of the American alligator (*Alligator mississippiensis*), but also of 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 include 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 1981).

The Mississippi River is home to a number of fresh water fish species, including the shovelnose sturgeon (*Scaphirhynchus platyrhynchus*), alligator gar (*Attactosteus spatula*) large mouth bass (*Micropterus salmoides*) and bluegill (*Lepomis macrochirus*) (Table 4). Specific to southeast Louisiana are the least killfish (*Heterandria formosa*) and the shadow bass (*Ambloplites ariommus*). The southern brook lamprey (*Ichthyomyzon gagei*), bluehead chub

(*Nocomis leptcephalus*), central stoneroller (*Campostoma anomalum*), striped shiner (*Luxilus shrysocephalus*), chub shiner (*Notropis potteri*), speckled madtom (*Noturus leptacanthus*) and the rainbow darter (*Etheostoma caeruleum*) also are found in the east-central Louisiana region (Page and Buff 1991)

Finally, over one hundred species of birds either are permanent or transient residents of the bottomland hardwood forests (Table 5). These 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). Year round resident birds specific to the southeast Louisiana portion of the project area include the brown pelican (*Pelecanus occidentalis*), green-backed heron (*Butorides striatus*), reddish egret (*Egretta rufescens*), wood stork (*Mycteria americana*), American oystercatcher (*Haematopus mexicanus*), royal tern (*Sterna maxima*), marsh wren (*Cistothorus palustris*) and seaside sparrow (*Ammodramus maritimus*). This area also provides a winter habitat for the horned grebe (*Podiceps auritus*), anhinga (*Anhinga anhinga*), grester white-fronted goose (*Anser albifrons*), blue winged teal (*Anas discors*), red-breasted merganser (*Mergus serrator*) and whip-poor-will (*Caprimulgus vociferus*).

In the summer and spring, the osprey (*Pandion haliaetus*) and the American robin (*Turdus migratorius*) may be found in the area. Year round residents of the east-central Louisiana portion of the project area include the blue-gray gnatcatcher (*polioptila caerulea*) and the great-tailed grackle (*Quiscalus mexicanus*). This area also provides a winter habitat for the double crested cormorant (*phalacrocorax auritus*) and the gray catbird (*Dumetella carolinensis*). In the summer and spring, Reddish egret (*Egretta rufescens*), roseate spoonbill (*ajaja ajaja*), black-necked stilt (*Himantopus mexicanus*), and wood thrush (*Hylocichla mustelina*) settle in the area (Scott 1987).

Climate

The summers in east-central Louisiana are long, hot, and humid. Typically, hot and humid weather lasts from May through September because warm, moist maritime air masses origi-

nating in the Gulf of Mexico dominate regional climate patterns. July and August are the hottest summer months; data collected at the Baton Rouge Municipal Airport between 1931 and 1960 indicate that both months maintain average daily maximum temperatures of 33° C (91° F) and an average daily minimum temperatures of 22° C (72° F). Thunderstorms are the primary cause of precipitation during the summer; precipitation occurs either as brief heavy showers or gentle rains. June is the second driest month of the year, with an average monthly precipitation of 10.4 cm (4.1 in). During late summer, infrequent tropical disturbances also are a source of precipitation (Dance et al. 1968; Schumacher et al. 1988).

The fall season generally lasts from late September to early November. Fall weather is dominated by humid, mild, and sunny days interrupted by infrequent cold fronts that bring brief intervals of cooler and drier weather. During the fall, precipitation results from infrequent squall lines associated with cold or warm fronts, as well as from occasional tropical storms. October is the driest month of the year with an average monthly precipitation of 6.4 cm (2.5 in) (Dance et al. 1968; Schumacher et al. 1988).

The winter season generally lasts from the middle of November to the end of February. Winters are usually mild; an average of 16 days each year have minimum temperatures of 0° C (32° F) or less. January is the coldest month, with an average daily maximum temperature of 17° C (63° F) and an average daily minimum temperature of 6° C (42° F). Typically, moist tropical air from the south alternates with dry polar air from the north. Extremely cold weather seldom lasts more than three or four consecutive days. During the winter, precipitation is associated with cold fronts. Infrequently, these fronts stall in the Baton Rouge area and cause prolonged rains. Snow is uncommon; only an inch or two falls during some years, usually in February (Dance et al. 1968; Schumacher et al. 1988).

The Northeast Louisiana Project Areas

This area also is discussed as a unit since it displays similarities in flora, fauna, and climate. Project items located in this part of the state are

situated in East Carroll, Concordia, Madison, and Tensas Parishes, Louisiana. These topics are discussed separately below.

Flora

At least two major forest types line the Mississippi River in northeast Louisiana. They include bottomland Oak-Gum-Cypress and upland Oak-Hickory (Brown 1972; Brown and Kirkman 1990; Nelson and Zillgitt 1969; Thorne and Curry 1983). Each of these general forest types contains numerous combinations of overstory and understory species depending on localized soil types, moisture levels and duration, and successional stages (Table 1).

On the east bank of the Mississippi River, the Oak-Gum-Cypress forest dominates and it is constricted by the surrounding bluffs/terraces. The Oak-Gum-Cypress forest spreads out further along the western side of the river. The flood plain is associated with at least five distinct forest types "determined by the relative elevation and liability to prolonged overflow" (Moore 1989:7). Certain species (sweetgum and green ash) thrive in the drier, ridge soils, whereas others (baldcypress and water tupelo) prefer the wetter areas.

The Oak-Gum-Cypress forest is a mixed bottomland forest in which at least half of the overstory is composed of one or more of the following species: the red oak group (willow oak [*Quercus phellos*], nuttall oak [*Quercus texana*], water oak [*Quercus nigra*]) the white oak group (overcup oak), blackgum, sweetgum, baldcypress, and water tupelo (Nelson and Zillgitt 1969). Secondary species of the Oak-Gum-Cypress forest include: swamp red maple, green ash, American elm, water-elm (*Planera aquatica*), swamp-privet (*Forestiera acuminata*), water hickory (*Carya aquatica*), and nutmeg hickory (*Carya myristicaeformis*).

Species commonly associated with the Oak-Gum-Cypress forest include cottonwood (*Populus deltoides*), swamp cottonwood (*Populus heterophylla*), black willow (*Salix nigra*), hackberry (*Celtis occidentalis*), eastern sycamore (*Platanus occidentalis*), honey locust (*Gleditsia tricanthos*), water locust (*Gleditsia aquatica*), dwarf palmetto (*Sabal minor*), pecan

(*Carya illinoensis*), and mayhaw (*Crataegus opaca*). Flora specific to the northeast Louisiana portion of the project area include possumhaw viburnum (*Viburnum nudum*), stiff dogwood (*Cornus stricta*), black walnut (*Juglans nigra*), nutmeg hickory (*Carya myristiciformis*), sand (pale) hickory (*Carya pallida*), black hickory (*Carya texana*), durand oak (*Quercus durandii*), slippery elm (*Ulmus rubra*), wildgoose (munson) plum (*Prunus munsoniana*) and bigleaf magnolia (*Magnolia macrophylla*) (Petrides 1988).

The herbaceous species associated with Oak-Gum-Cypress forests are extremely varied according to numerous bottomland microhabitats. Breaks in the forest cover would have contained large stands of cane (*Arundinaria gigantea* and *Arundinaria tecta*) (Thorne and Curry 1983). Some of the more visually striking herbaceous species in the bottomlands include fragrant ladies tresses (*Spiranthes odorata*), swamp lilly (*Crinum americanum*), pickerelweed (*Pontederia cordata*), irises (*Iris* spp.), and white water lilly (*Nymphaea odorata*) (Brown 1972).

The Oak-Hickory forest components occur in the uplands and drier ridges surrounding the Mississippi River (Brown 1972; Brown and Kirkman 1990; Nelson and Zillgitt 1969; Thorne and Curry 1983). To the east of the present Mississippi River channel, the uplands often are situated very close to the river due to the constricted floodplain. The western floodplain is broader and the upland Oak-Hickory component is therefore positioned much further away from the Mississippi River channel. The narrowing of the eastern flood plain is important because it brings the upland forest species close to the river.

At least 50 percent of the overstory species in an upland Oak-Hickory forest are comprised of oaks or hickories, while cedars and southern pines make up less than 25 percent of the stands. Other species included in the Oak-Hickory forests are white oak, cherrybark oak (*Quercus falcata* var. *pagodifolia* var. *leucophylla*), swamp chestnut oak (*Quercus mixhauxii*), sugar maple, red-bud (*Cercis canadensis*), black cherry (*Prunus serotina*), tulip-tree (*Liriodendron tu-*

lipifera), beech, and rough dogwood (*Cornus drummondii*) (Nelson and Zillgitt 1969). Understory herbaceous species include ladies slipper (*Cypripedium calceolus*), crane-fly orchid (*Tipularia discolor*), Indian pipe (*Monotropa uniflora*), mayapple (*Podophyllum peltatum*), and trilliums (*Trillium* spp.) (Brown 1972).

Fauna

The Mississippi bottomland and surrounding upland forests in the project area support a wide variety of fish, mammal, and bird species (Gulf States Utilities Company 1974a, 1974b; Lowery 1974a, 1974b; Martin 1988; Thorne and Curry 1983). It is important to note that all of these species are not always common or concentrated at any given time; for example white-tailed deer are easiest to cull during the fall rut, but they may be dispersed throughout the rest of the year.

Game animals present in the bottomlands include white-tailed deer, gray squirrel, fox squirrel, eastern cottontail, swamp rabbit, black bear, opossum, and wild turkey. Mink, raccoon, opossum, gray fox, and black bear were hunted for their furs, and venison was probably the largest terrestrial source of protein. Many of these species move between the bottomlands and uplands with great frequency, and they exploit the various seasonal resources that the environments have to offer. Some of the game species, such as raccoons and black bears, also were predatory, and helped control the populations of the smaller species. Other predatory species include bobcats (*Felis rufus*), gray fox, and mink. Mammals specific to northeast Louisiana include the little brown myotis (*Myotis lucifugus*), silver-haired bat (*Lasionycteris noctivagans*), and the eastern chipmunk (*Tamias striatus*) (Burt and Grossenheider 1980) (Table 2).

Over 20 species of amphibians and reptiles inhabit the Mississippi River and other wetlands of the Mississippi bottomlands in northeast Louisiana (Table 3) (Conner 1977; Gulf States Utilities Company 1974a, 1974b; Thorne and Curry 1983). These amphibians typically require very moist soils, temporary pools, or permanent ponds. The Northern crawfish toad (*Rana*

areolata circulosus) is specific to the northeast portion of the state (Conant and Collins 1991). The numerous reptiles found within the bottomland hardwood forests consist not only of the American alligator (*Alligator mississippiensis*), but also of a number of iguanids, skinks, lizards, snakes, pit vipers, and turtles. Like the amphibians, most of the reptiles prefer either moist or aquatic habitats. Reptile species such as common snapping turtles (*Chelydra serpentina*) and alligator snapping turtles (*Macrochelys termmincki*) are common to the area. Specific to northeast Louisiana are Western spiny softshell turtle (*Apalone spinifer hartwegi*), Northern fence lizard (*Sceloporus undulatus hyacinthinus*), six-lined racerunner (*Cnemidophorus sexlineatus sexlineatus*), mole kingsnake (*Lampropeltis calligaster rhombomaculata*), and Northern scarlet snake (*Cemophora coccinea copei*) (Conant and Collins 1991).

Some of the more important Mississippi game fish include white bass (*Morone chrysops*), yellow bass (*Morone mississippiensis*), carp (*Cyprinus carpio*), blue catfish (*Ictalurus furcatus*), channel catfish (*Ictalurus punctatus*), flathead catfish (*Pylodictis olivaris*), white crappie (*Promoxis annularis*), freshwater drum (*Aplodinotus grunniens*), garfish (*Lepisosteus* spp.), sauger (*Stizostedion canadensis*), shads (*Dorosoma* spp.), and suckers (various genera of *Catostomidae*) (Table 4). Specific to the northeastern Mississippi River are the silver lampry (*Ichthyomyzon unicuspis*), lake sturgeon (*Acipenser fulvescens*), sicklefin chub (*Macrhybopsis meeki*), fathead minnow (*Pimephales promelas*), bigeye shiner (*Notropis boops*), tail-light shiner (*Notropis maculatus*), silverjaw minnow (*Ericymba buccata*), blue sucker (*Cycleptus elongatus*), brook silverside (*Labidesthes sicculus*), river darter (*Percina shumardi*) and the creole darter (*Etheostoma collettei*) (Page and Buff 1991).

The numerous species of birds found in northeast Louisiana represent either permanent or transient residents associated with the bottomland hardwood forests (Table 5). The American bittern (*Botaurus lentiginosus*) is a year round resident of this area. Northeast Louisiana also provides a winter habitat for the mallard

(*Anas platyrhynchos*), long-eared owl (*Asio otus*), American pipit (*Anthus rubescens*), and evening grosbeak (*Coccothraustes vespertinus*).

In the summer and spring, black-crowned night-heron (*Nycticorax nycticorax*), yellow-crowned night-heron (*Nyctanassa violacea*), snowy egret (*Egretta thula*), great egret (*Casmerodius albus*), common moorhen (*Gallinula chloropus*), fish crow (*Corvus ossifragus*), blue-gray gnatcatcher (*Poliophtila caerulea*), gray catbird (*Dumetella carolinensis*), white-eyed vireo (*Vireo griseus*), Bell's Vireo (*Vireo bellii*), black and white warbler (*Mniotilta varia*), cerulean warbler (*Dendroica cerulea*), prairie warbler (*Dendroica discolor*), worm-eating warbler (*Helmitheros vermivorus*), Louisiana waterthrush (*Seiurus motacilla*), American redstart (*Setophaga ruticilla*), lark sparrow (*Chondestes grammacus*) and orchard oriole (*Icterus spurius*) may be found (Scott 1987).

Climate

The Mississippi Alluvial Valley has a humid-subtropical climate typified by long, hot summers and brief, mild winters. The region enjoys an average of 252 frost-free days per year, and the growing season lasts in excess of seven months. At this latitude, daily temperatures of 27° C (81° F) are expected during the summer months, and an average daily temperature of 11° C (51° F) is anticipated throughout the winter months. Precipitation is heavy, and rainfall regularly exceeds 130 cm (51 in) per annum; seasonal flooding is very common (Nelson and Zillgitt 1969). Storms that cause the most flooding are associated with frontal movements from the northwest that stall over the Gulf of Mexico. June and September tend to be the driest months of the year, while March is generally the wettest month.

The summers (May-September) are long, hot, and humid and they are dominated by warm, moist maritime air masses originating in the Gulf of Mexico. July is the hottest month of the year, with an average daily maximum temperature 33.1 C of (91.6 F). The primary cause of precipitation during the summer is thunderstorms. During the late summer, infrequent tropical disturbances including hurricane rem-

nants may occur. June is the driest month of the year, with precipitation averaging only 7.42 cm (2.92 in) (Martin 1988; Schumacher et al. 1988).

The fall season lasts from late September through early November, and it is characterized by humid, mild, and sunny days interrupted by infrequent cold fronts that bring cooler and drier weather to the area. Fall precipitation results from infrequent squall lines associated with fronts and from occasional tropical storms. October is the second driest month with an average monthly precipitation of 8.66 cm (3.41 in) (Martin 1988; Schumacher et al. 1988).

The winters are cool, with occasional incursions of cold air from the north. The squalls and showers associated with these infrequent cold fronts are the cause of winter rainfall in the project areas. December is the wettest month with monthly precipitation averaging 16.8 cm (6.62 in). January is the coolest month with an average daily temperature of 8.4° C (47.1° F). The lowest recorded temperature (1965 - 1979) was -10.5° C (13° F), which occurred on January 11, 1977 (Martin 1988).

Ethnographic Use of Plants Native to the Project Areas

The plants in the proposed project area were utilized by prehistoric and historic residents for a variety of subsistence and technological purposes. The availability of these resources varies by physiographic region, but many species were fairly widespread along the waterways. The following discussion focuses on ubiquitous species and their importance to local populations.

Hickory nuts were an important source of food for prehistoric Native American populations throughout the eastern United States. They were crushed and added to boiling water to produce a rich milky liquid (hickory milk) with high oil and protein content (Swanton 1946:273). Hickory nutshell represents a major component of Archaic and Woodland period paleoethnobotanical assemblages (Asch and Asch 1985; Chapman and Shea 1981; Johannesen 1984). In the American Bottom area, hickory nut use decreased during the Emergent Mississippian period, but remained an important

part of Eastern Woodland subsistence patterns until contact with Europeans (Johannessen 1984).

Acorn use in the eastern United States began during the Archaic period (Chapman and Shea 1981) and continued, at a low rate, until the Late Woodland period. There is evidence that some Southeastern groups intensified acorn use during the Mississippian period (Scarry 1986). Scarry (1986) suggests that acorns may have been used later in prehistory as a lysine supplement to complement the lysine-poor maize diet. At contact, several Native American groups consumed acorn nutmeats that had been leached in water to remove the toxic tannins. These nutmeats then were ground and used as flour for breads (Gilmore 1977; Swanton 1946:273, 279). Another use of acorn nutmeat was for oil, which was used for cooking and personal adornment (Swanton 1946:277).

The seeds of several, locally available, weedy plants were collected and processed as grains. Grains generally are assumed to be a major source of carbohydrates, but many of the wild grains were rich in oils and proteins. Grains also are important because they can be dried and stored for extended periods of time. Some of the more common wild grain sources include bluestem grass (*Andropogon gerardii*), sedges (*Cyperus* sp.), sunflower (*Helianthus annuus*), marsh elder (*Iva annua*), panic grass, and dropseed (Erichsen-Brown 1979; Hall 1976; Kindscher 1987, King 1984; Yanovsky 1936). Various wild members of the pea family such as partridge pea, redbud, locusts, lupine, water tupelo, sour gum, and snoutbeans were good sources of protein when added to other foods. In addition, there is paleoethnobotanical evidence that goosefoot (*Chenopodium berlandieri* ssp. *jonesianum*), marsh elder, sunflower, maygrass (*Phalaris caroliniana*), and knotweed (*Polygonum erectum*) were cultivated or even domesticated in the Eastern Woodlands (Asch and Asch 1985; Chapman and Shea 1981; Ford 1985; Fritz 1990).

Some of the locally available fleshy fruits, such as persimmon, red mulberries, black cherries, wild plums, sumac berries, tangleberries, sparkleberries, deerberries, muscadine grapes, and other wild grapes, originate from arboreal or

shrubby sources. Brambles (including blackberries and raspberries), prickly pears, and ground cherries are common fruits from herbaceous plants. While these fruits were not major subsistence items (Erichsen-Brown 1979; Hall 1976; Kindscher 1987), they were good sources of sugar, vitamins, and minerals. Native Americans dried some fruits for winter use, but most were consumed fresh.

Root foods are underrepresented in the paleoethnobotanical record, but are noted as important subsistence items in early historical records of Native Americans (Swanton 1946). Roots of agave, sedges, comfort root, candyrout, and camas may have all been utilized (Erichsen-Brown 1979; Hall 1976; Kindscher 1987, King 1984; Yanovsky 1936). Roots were important subsistence items because many could be gathered in the late fall and winter when other plant foods were unavailable. In addition, roots were dried and stored for later use.

Arboreal and herbaceous species also were used for numerous technological purposes by southeastern Native Americans (Swanton 1946). Oak, hickory, and other hardwoods were preferred for firewood and raw materials for construction. Pestles and mortars also were made of hardwoods, especially hickory. Canoes were carved from light-weight woods such as cypress. Spoons from yellow-poplar, oak-splint baskets, and numerous other household items were produced from trees and tree products. Saw palmetto leaves were used for construction, thatching, and basketry production (Swanton 1946:246). Vining species such as morning glory and grape also were used for basketry. Numerous herbaceous and arboreal species were used as dye sources (Swanton 1946).

Several of these arboreal species were economically important during the historic period as well. For example, blackgum wood is very difficult to split and it has been used to make mauls, implement handles, and floors (Brown and Kirkman 1990:212). Sweetgum is one of the most valuable hardwoods in the south, due to the sheer volume of timber produced. The bald cypress is highly resistant to decay and it therefore often is used for "construction timbers, docks, boats, and exterior siding" (Brown and Kirkman 1990:57).

In addition, a number of the red and white oak species were recognized for their strong, fine woods. They have been used for timbers, furniture construction, flooring, and, in the case of white oak, even as whiskey barrels. American elm often was steamed and bent into forms for barrel and wheel hoops, veneer, and baskets (Brown and Kirkman 1990:124). Beech was an important hardwood source for toys, furniture, wooden cook ware, barrels for beer aging, and charcoal production (Brown and Kirkland 1990:91). Black Cherry (*Prunus serotina*) was widely used for furniture production; in addi-

tion, its inner bark was a component in early cough medicines, and the fruits, while fairly bitter, were consumed in the form of preserves and fermented beverages (Brown and Kirkman 1990). Herbaceous species, such as the young shoots of cane (*Arundenaria gigantea* and *Arundenaria tecta*) were used by early historic settlers as fodder for their hogs. In addition, cane was also an important source of raw materials for basketry, fishing poles, and for cane bottomed chairs (Thorne and Curry 1983:49-72; King 1982:14-15).

CHAPTER III

PREHISTORIC SETTING

Introduction

This chapter presents an overview of the prehistory of Louisiana. While the individual SEIS project items are restricted to a 2.0 km (1.2 mi) wide corridor centered on the proposed levee segments and floodwalls along the Mississippi River, a broader state-wide prehistory is presented to better interpret the prehistoric cultural resources within the SEIS project areas. Specific project items included in the larger SEIS project area include borrow pit locations, concrete slope paving, and a floodwall. The borrow pit locations include the Fifth Louisiana District levee enlargement, the Baton Rouge Front Levee, the Reveille to Point Pleasant enlargement, The Carville to Marchand enlargement, and the Hohen-Solms to Modesto enlargement, the Carrollton levee enlargement. The concrete slope paving (CSP) locations include Alhambra to Hohen-Solms CSP, Jefferson Heights CSP, Gap Closures West Bank CSP, and Gap Closures East Bank CSP. The only floodwall included in the SEIS New Orleans District project items is the New Orleans District Floodwall.

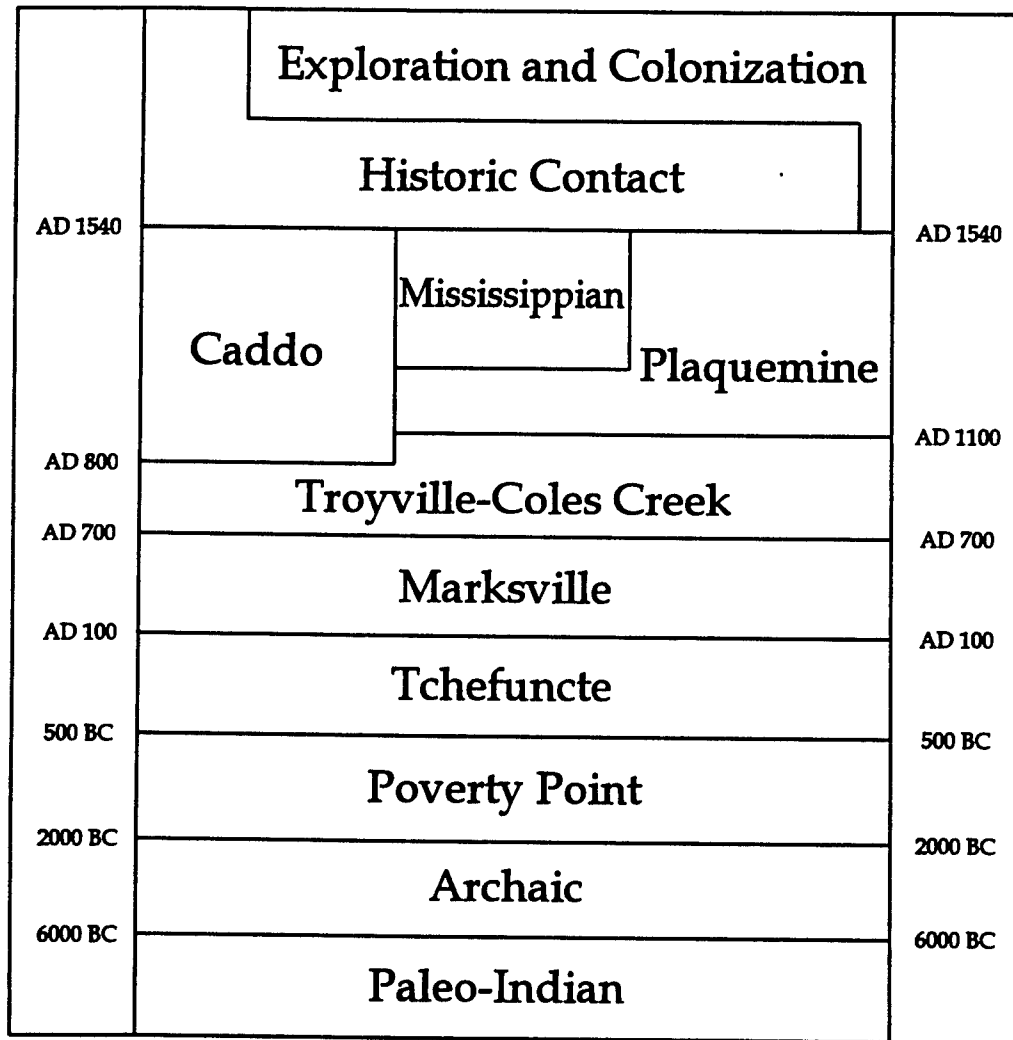
The prehistory of Louisiana extends from ca. 12,000 B.C. - A.D. 1700 and it can be divided into four general archeological stages (Figure 12). These four stages (Paleo-Indian, Archaic, Woodland, and Mississippian) represent developmental segments characterized by dominant patterns of settlement, subsistence, and technology (Kreiger 1953; Willey and Phillips 1958). Each stage consists of a sequence of chronologically defined periods that may be subdivided into phases based on sets of artifacts and other cultural traits characteristic of a particular

geographic region (e.g., Jenkins 1979; Walthall 1980). Current research defines ten cultural units to describe the prehistoric sequence of Louisiana: Paleo-Indian, Archaic, Poverty Point, Tchefuncte, Marksville, Troyville-Coles Creek, Plaquemine, Mississippian, Caddo, and Historical Contact (Smith et al. 1983). The current project items also lie within the Southeastern Culture Area of the United States (Muller 1983). As a result, cultural characteristics found within the proposed project areas resemble those manifested in the Lower Mississippi Valley and along the northern coast of the Gulf of Mexico, as well as in other parts of the region.

In 1983, the Louisiana Division of Archaeology, in an effort to provide "a framework for the identification and preservation of significant archaeological sites in Louisiana," divided the state into six "Management Units" (Smith et al. 1983) (Figure 13). These units were defined on the basis of similarities in topography, cultural history and land use patterns (Smith et al. 1983:19). Portions of Management Units II, IV, V, and VI are encompassed by the overall project area.

Management Unit II is located in the northeast portion of the state, and it encompasses approximately 5,200,585 ac (2,104,677 ha). This unit includes Avoyelles, Caldwell, Catahoula, Concordia, East Carroll, Franklin, LaSalle, Madison, Morehouse, Ouachita, Richland, Tensas, and West Carroll Parishes (Figure 13). Management Unit II is bordered to the east by the Mississippi River and bisected by the Ouachita River in the west. A number of rivers are present in this management unit, including the Tensas River and the Black River. The unit

Cultural Units



Adapted from Smith 1983

Figure 12. Prehistoric and Protohistoric Cultural Units of Louisiana (adapted from Smith et al. 1983).

is characterized geologically by a fluvial valley bordered by higher elevations, such as the Bastrop Hills, Macon Ridge, and Sicily Island (Smith 1983:43). Still within the Coastal Plain, this area is defined locally as the Tensas Basin. Vegetation in the unit consists of longleaf and shortleaf pine interspersed with various oak species.

Management Unit IV encompasses approximately 3,209,271 ac (1,298,791 ha); it is located in the southeast portion of the state. This unit includes the parishes of East Baton Rouge, East Feliciana, Livingston, Saint Helena, Saint Tammany, Tangipahoa, Washington, and West Feliciana (Figure 13). Management Unit IV is bounded to the west by the Mississippi River and to the south by Lake Pontchartrain. Interior waterways consist of the Pearl, Amite, and Tangipahoa Rivers. The unit is characterized geologically as a "rolling Pleistocene terrace" bordered by alluvial floodplains (Smith 1983:77). Still within the Coastal Plain, this area is defined locally as the Pine Hills; it also is a part of the broad pine belt that crosses the southeastern United States. Vegetation in the unit consists of longleaf and shortleaf pine interspersed with various species of oak.

Management Unit V is located in the southeast portion of the state, and it encompasses approximately 10,000,699 ac (4,047,283 ha). This unit includes Ascension, Assumption, Iberville, Jefferson, LaFourche, Orleans, Plaquemine, Pointe Coupe, Saint Bernard, Saint Charles, Saint James, Saint John the Baptist, Terrebonne, and West Baton Rouge, Parishes, Louisiana (Figure 13). Over 55 percent of the acreage in Management Unit V is inundated and approximately 28 percent of this percentage has been defined as wetland. The unit is characterized as a "low-lying swampland, [with] natural and man-made river levees and coastal marsh" (Smith 1983:93). Management Unit V is bounded to the west by the Mississippi River, to the southwest by Atchafalaya Bay, and to the southeast by Breton Sound. The unit is characterized as geologically "dynamic and complex" (Smith 1983:93). Deltic formation began along this portion of the coast approximately 5,000 years ago. Vegetation in this unit consists of various species of marsh grass interspersed with scrub oak and various hardwoods.

Management Unit VI is composed of all river bottoms within the state of Louisiana and it encompasses approximately 8,264,313 ac (3,344,568 ha). This includes all rivers, lakes, bayous, reservoirs, bays, and estuaries, as well as approximately 1,239 km (770 mi) of coastline. Exact figures for the states underwater cultural resources are not available, but historical evidence concerning shipwrecks alone suggests that approximately 793 "sinkings are documented for part of the Mississippi River from Baton Rouge to the delta from 1814 to 1979," and 188 sinkings in the Red River (Smith et al. 1983:115). In addition, some 750 to 900 pre-nineteenth century ships are estimated to have been lost along the Gulf Coast between the Florida Keys to the Rio Grande (Smith et al. 1983:116).

Paleo-Indian Stage (ca. 10,000 – 8000 B.C.)

It generally is accepted that initial human occupation of the southeastern United States occurred sometime between 10,000 and 12,000 years ago. This first archeological culture is named "Clovis," after the type site in New Mexico. In the western United States, Clovis sites appear to fall within a relatively narrow time range, i.e., between 10,900 and 11,200 B.P. (Haynes 1991). Evidence for earlier "pre-Clovis" occupations continues to be debated, and no pre-Clovis sites have been documented convincingly in North America.

Paleo-Indian sites are recognized by a distinctive assemblage of stone tools that include fluted and unfluted bifacial projectile points (such as Clovis, Cumberland, Coldwater, Suwannee, Simpson, and Redstone), unifacial end- and side-scrapers, bifacial cleavers, core handaxes, graters, spokeshaves, and knives. Paleo-Indian stone tools exhibit a high level of craftsmanship, including the application of fine parallel flaking, fluting, thinning, and grinding. Paleo-Indian and Transitional Paleo-Indian/Early Archaic projectile point types recovered in Louisiana include Clovis, Dalton, Meserve, Plainview, and Scottsbluff (Neuman 1984:66-69). As yet, no evidence of Paleo-Indian bone tool technology has been recovered in Louisiana. Excavations at the Harney Flats Site (8HI507) in Hillsborough county, Florida, however, have yielded information concerning

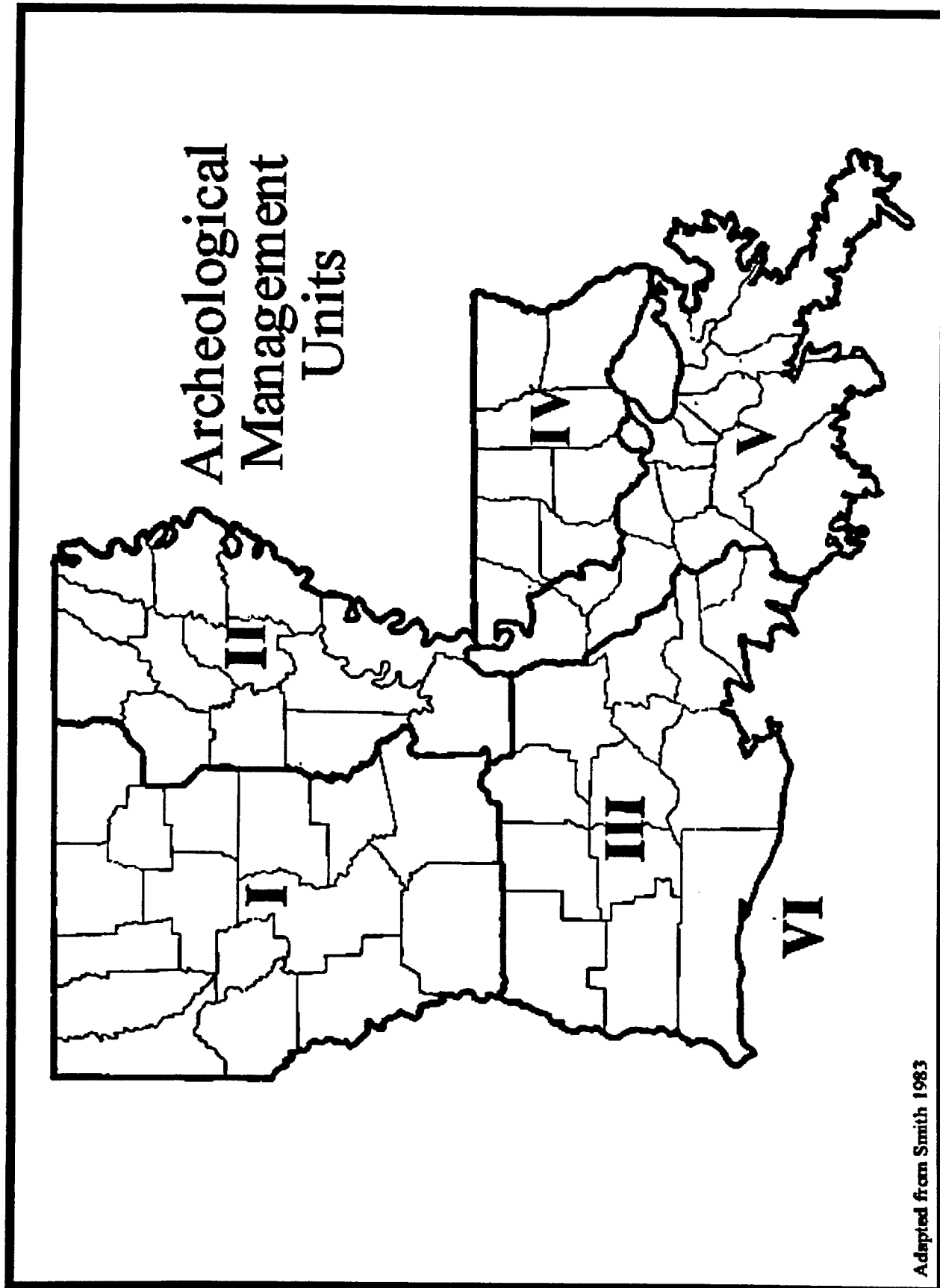


Figure 13. Archeological Management Units of Louisiana (adapted from Smith et al. 1983).

this technology. Bone tools recovered from Harney Flats included bone pins and bone and ivory foreshafts (Daniel and Wisenbaker 1989:338).

Paleo-Indian populations are thought to have been highly mobile hunter-gatherers who resided in small bands or in extended family groups. Although it was once thought that Paleo-Indians were specialized big game hunters, this view seems less tenable as additional information becomes available from a larger sampling of Paleo-Indian sites. Ample evidence exists for the exploitation of large mammals including mammoth, mastodon, bison, caribou, and elk at sites in the western and northern United States. Since similar tool types occur at sites in the West and the Southeast, it traditionally has been assumed that the subsistence strategies were similar. It appears, however, that kill sites are rare in the southeast (Webb et al. 1983). Kill sites have yet to be documented in Louisiana (Smith et al. 1983:132). The paucity of kill sites in the Southeast suggests that big game hunting may not have been the dominant adaptive strategy in this region. In addition, there are environmental differences between the West and the Southeast that probably affected the availability of big game species. Nevertheless, some evidence does exist for the exploitation of late Pleistocene megafauna.

Excavations at the Kimmswick Site (23JE334) in southeastern Missouri produced Clovis projectile points in direct association with disarticulated mastodon bones (Graham et al. 1981). Paleo-Indian tools also have been recovered in direct association with mastodon bones identified near Nashville, Tennessee at the Coats-Hines Site (40WM31). A total of 34 chert artifacts were recovered within the thoracic cavity of a mastodon (Breitburg et al. 1996). These artifacts consisted of 10 formal tools and tool fragments (one bifacial knife, two graters, one prismatic blade, two unifacial side scrapers, and two scrapers/cores) and 24 resharpening flakes. In addition, two locations in south central Louisiana, Avery Island (Salt Mine Valley; Site 16IB23) and the Trappey Mastodon Site (16LY63) in Lafayette yielded the remains of Pleistocene fauna; however, neither site yielded a clear Paleo-Indian/Megafauna relationship (Gagliano 1964; Gibson and Miller 1973; Neuman 1984). The presence of artifacts in associa-

tion with Pleistocene megafauna indicates that large animals did comprise at least a portion of the Paleo-Indian subsistence regime in this region (Graham et al. 1981).

Although there are limited data available to reconstruct Paleo-Indian diets, subsistence throughout the southeast is believed to have encompassed a broad spectrum of resources, including fish, fowl, deer, small mammals, nuts, and gathered plants (Smith 1986:9-10; Steponaitis 1986:369; Walthall 1980:36). Perhaps the best data collected on subsistence during the Paleo-Indian Stage were recovered from the Little Salt Spring Site in Florida. Subsistence remains had been preserved by a freshwater cenote at the site. Faunal materials recovered from Little Salt Spring Site included giant land tortoise (*Geochelone crassiscutata*), large box turtle (*Terrapene carolina putnami*), freshwater mussel (*Unio merus obesus*), rattlesnake (*Crotalus adamanteus*), and white-tailed deer (*Odocoileus virginianus*) (Clausen et al. 1979).

The exception to this generalized subsistence system may have been the Folsom Culture. The Folsom Culture has been interpreted as a primarily big game hunting culture focused on the use of bison. In fact, Folsom artifacts have been associated consistently with bison kill sites on the Great Plains. The lack of faunal evidence in association with Folsom finds in east Texas and Louisiana, primarily attributed to the highly acidic nature of the soils and the moist climate, precludes insights into the subsistence strategies in that area. The Folsom Culture, however, may represent an adaptation to a specialized hunting strategy associated with the cyclical migration of large herds of bison (Story et al. 1990:189).

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 (Anderson and Sassaman 1996; Mason 1962). In the Lower Mississippi Valley, Paleo-Indian projectile points/knives have been recovered along valley margins, but only occasionally 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). In Louisiana, projectile points are found most commonly in the Tertiary and Quaternary

uplands. Interestingly, most of these points are manufactured from Texas cherts or Arkansas novaculite (Neuman 1984:68). While Paleo-Indian projectile points have been recovered within the Mississippi alluvial valley, they occur only on the remnants of older landforms (Conaway 1988). Only a handful of intact, stratified Paleo-Indian sites have been excavated in Louisiana.

Paleo-Indian and Early Archaic occupation of the Lower Mississippi Valley are best documented from Maçon Ridge (Management Unit II), a relict Pleistocene braid plain in northeast Louisiana (Saucier 1981). Hillman (1985, 1990) collected information concerning 121 sites on the Maçon Ridge where over a thousand Paleo-Indian and "epipaleoindian" (Gibson 1982) projectile points/knives have been collected, including 272 Dalton-Meserve, 39 Hardin, and over 400 San Patrice types. He concluded that Early and Middle Paleo-Indian occupation of Maçon Ridge apparently was sporadic or seasonal, possibly due to the somewhat inhospitable conditions caused by the excessive accumulation of wind-blown dust across open grasslands during the formation of the loess hills. The distribution of recorded sites suggests that Maçon Ridge was occupied more intensely during the Late Paleo-Indian and Early Archaic Periods. The Late Paleo-Indian Period sites consist of hunting camps and base camps normally located very close to streams, ponds, or sloughs, on landforms generally elevated no more than 1 m (3.3 ft) above the water source. Settlement of areas adjacent to the waterways may reflect the intensive use of the wooded fringes situated along the waterways rather than the exploitation of the open grasslands.

The previously mentioned Avery Island Site (16IB3), situated near Banana Bayou, is the only substantial Early Paleo-Indian site that has been identified in the southeastern portion of the state. It is located on the Avery Island salt dome, near the coast of central Louisiana. Although the site produced the remains of Pleistocene fauna intermingled with and/or above lithic artifacts and basketry remains, no diagnostic artifacts were recovered from this component (Gagliano 1970; Neuman 1984). Consequently, the relationship of the faunal remains to the artifacts is unclear.

Prior to the Transitional Paleo-Indian/Early Archaic Period, the Plano Culture developed throughout the area extending from Louisiana to Wyoming. The Plano Culture continued the tradition of hunting Bison that began with the Folsom Culture, but the associated tool kits changed (Gunn and Kerr 1984:205-207). Small, fluted Folsom projectile points and beaked scrapers were replaced by large, collateral flaked, stemmed and lanceolate projectile points, beveled knives, and transverse end-scrapers. Diagnostic artifacts of the Plano Culture include Agate Basin, Angostura, Scottsbluff (previously called Yuma points), and Eden projectile point types, and Cody knives.

Plano encampments were located nearer to water, and thus farther from hunting areas than preceding Folsom encampments. A high concentration of Plano points has been found in the uplands of west-central and northwest Louisiana between the Red and Sabine Rivers and in adjacent areas in Texas (Gunn and Kerr 1984:220-221; Story et al. 1990:205-210). Hillman (1990:207) also identified six Scottsbluff projectile points from Maçon Ridge in northeast Louisiana. Plano artifacts are rarely recovered east of the Mississippi River and they tend to be restricted to the Plains and woodland fringes. No *in situ* Plano site has been excavated in Louisiana to date.

Management Unit I and Management Unit II contain the majority of all known Paleo-Indian sites and components recorded in Louisiana (Smith et al. 1983: 26, 46, 63, 79, 96), although most of these represent isolated surface finds. Saucier (1994) reports that "about 85 percent of all Paleo-Indian sites in northeastern Louisiana greater than 10,000 years old [older than 8000 B.C.] are located on Maçon Ridge and none are found in the [more recent] Holocene alluvial valley of the Mississippi and Ouachita rivers" (Saucier 1994:129). Similarly, Paleo-Indian remains are not frequently recovered along the floodplains and channel margins of the Red River and its tributaries. The land adjacent to the river has been reworked as a result of lateral channel migration since the close of the Paleo-Indian Stage, which probably accounts for the lack of Paleo-Indian remains recovered in this area (Neitzel and Perry 1977). Consequently, Paleo-Indian sites have low archeological visi-

bility because few surfaces dating from this stage have survived.

Archaic Stage (ca. 8000 – 500 B.C.)

The term "Archaic" first was developed in the second quarter of the twentieth century as a descriptor for the transitional pre-ceramic cultures that followed the Paleo-Indian Stage. The Archaic Stage is divided into three subdivisions or periods: Early Archaic, Middle Archaic, and Late Archaic. A warming trend and a drier climate at the end of the Pleistocene, accompanied by a rise in sea level, may have spurred a combination of technological and social developments that are now associated with the initiation of the Archaic Stage (Willey and Phillips 1958). This economic shift has been correlated with highly diverse localized resource and food procurement strategies (Haag 1991). Caldwell (1958) termed this hunting and gathering specialization as "primary forest efficiency." Brain (1971) modified this phrase to "primary riverine efficiency" to reflect the concentration of settlements in southeastern riverine and coastal environments.

Archaic populations apparently exploited a greater variety of terrestrial and marine species than their Paleo-Indian predecessors. This stage is characterized by seasonal mobility within a home range that exploited nuts, fruits, fish, game, shellfish, and other natural resources (Muller 1978). Macrobands formed during the spring and summer months, while in the winter months, smaller microbands exploited upland ranges (Jenkins 1974; Muller 1978). Many populations with successful strategies during the Archaic sequence went on to develop the first semi-permanent settlements in the region (Neitzel and Perry 1977). Burial sites dating from the Archaic Stage have been found at numerous locales, suggesting a change in religious practices from earlier periods (Neuman 1984; Walthall 1980). The increased number of sites dating from the Archaic Stage suggests an increase in population throughout the southeast.

The Paleo-Indian to Archaic transition also was accompanied by changes 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, 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 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 stone flaked artifact types included adzes, scrapers, and choppers. During the latter half of the Archaic Stage, granitic rock, chert, jasper, sandstone, slate, steatite, and scoria were ground and polished into a variety of stone ornaments and tools that included beads, gorgets, bowls, and celts/axes. Archaic projectile point types found throughout Louisiana include Carrollton, Delhi, Elam, Ensor, Evans, Frio, Gary, Hall, Kent, Kirk, Macon, Marcos, Marshall, Morhiss, Morrow Mountain, Pontchartrain, Trinity, Tortugas, Wells, and Williams. Stone vessels made from steatite and fiber-tempered pottery also characterize the Late Archaic.

In Louisiana, Archaic sites are much more common than Paleo-Indian sites. Archaic sites have been recorded in Management Units I, II, III, and IV. In the northwest portion of the state relatively little systematic survey and excavation has been conducted on Archaic sites. The limited work within this region has concentrated on the west-central uplands of the state and in northeastern Texas (Anderson and Hanson 1988; Cantley and Kern 1984; Cantley et al. 1993; Gunderjan and Morehead 1983; Gunn and Brown 1982; Servello 1982; Smith 1975; Webb et al. 1969). In the southeast portion of Louisiana, Archaic Period sites typically are found along the boundary of Quaternary and Tertiary areas with relatively flat or undulating bluff tops overlooking floodplains, on the Prairie terraces, and relict levees (Gagliano 1963). Although Archaic style projectile points commonly are found throughout the state, few discrete, intact archaeological deposits dating from the Archaic Period have been excavated systematically, analyzed, and comprehensively reported in Louisiana (Neuman 1984).

Early Archaic Period (8000 – 6000 B.C.)

In the southeast, the Early Archaic Period is considered to begin by ca. 8050 – 6050 B.C., but because of the regional variation and the tempo-

ral overlapping of stages, the assignment of Late Paleo-Indian and Early Archaic Period artifacts to correct temporal stages is complex. As noted above, Gibson (1982) used "epipaleoindian" as a term for this transition, and Hillman (1985) included Dalton, Hardin, and San Patrice projectile points types in his review of the transitional period at Maçon Ridge.

Dalton projectile points/knives temporally succeed Clovis projectile points. In Arkansas and Missouri, Dalton projectile points/knives have been dated between ca. 8550 and 7950 B.C. (Goodyear 1982:382). At the Stanfield-Worley Bluff Shelter (1CT125) in northwestern Alabama, the Dalton zone dates from ca. 7750 – 7050 B.C. (DeJarnette et al. 1962; Griffin 1974). Dalton projectile points/knives also have been found in Horizon 11 at the Koster Site (11GE4) in southern Illinois, which dates from approximately 6750 – 6500 B.C. This date suggests that Dalton points/knives may extend later in time than initially presumed.

Dalton projectile points/knives sometimes are recovered with bifacially chipped stone adzes that may represent 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), located in West Virginia, and from Early Archaic sites in the Little Tennessee River Valley (Smith 1986:14). Based on the ages of underlying geological deposits, the distribution of Dalton projectile points/knives and other artifacts associated with the Dalton Culture usually are restricted to northern Louisiana.

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). Previously ascribed to the area encompassing northwest Louisiana, northeast Texas, and southwest Arkansas, later investigations have extended the geographic range of San Patrice tool forms to include an area from central Texas to southwest Alabama and from southern Louisiana to central Arkansas (Brain 1983:32; Cantley and Kern 1984).

The San Patrice Culture is believed to represent a local adaptation of hunter/gatherers within restricted ranges. A hallmark of San

Patrice is the almost exclusive use of local lithic materials for the production of tools. Tool assemblages include San Patrice and Keithville projectile points/knives, hafted scrapers, Albany side scrapers, unifacial scrapers, burins, and engravers (Webb et al. 1971). Initially, the San Patrice projectile point/knife type consisted of varieties Hope and St. John, but more recently other varieties have been added to the assemblage in Louisiana, Mississippi, and Alabama (Brain 1983). On Maçon Ridge, Hillman (1985) reported that in addition to the Hope and St. John varieties, the San Patrice projectile point/knife variety (var.) Keithville also was present. Archeological investigations in the western part of the state at Fort Polk have produced a number of San Patrice projectile point/knives of differing types, including one that contained a combination of Dalton/San Patrice/Holland stylistic affinities (Largent et al. 1992; Williams et al. 1996). Reliable radiocarbon dates for these types are virtually nonexistent, but estimates based on morphology and stratigraphic context suggest a period of production and use of these points from ca. 8050 – 6050 B.C. (Brain 1983:25; Story et al. 1990:202; Turner and Hester 1985:147; Webb 1981). Ensor (1986) suggests 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), however, suggest that both Dalton and San Patrice types independently evolved from the earlier fluted point traditions.

Throughout the Early Archaic, the subsistence pattern probably resembled that of the preceding Paleo-Indian Stage. Early Archaic peoples likely traveled seasonally in small groups between a series of base camps and extractive sites, hunting deer and collecting edible plants (Chapman and Shea 1981; Lentz 1986; Parmalee 1962; Parmalee et al. 1976).

Tools associated with food processing, including manos, milling stones, and nutting stones, first appear in Early Archaic Period sites. Commonly utilized plant foods, such as walnuts and hickory nuts, could be hulled and eaten without cooking or additional processing (Larson 1980). Herbaceous seeds, which became an important food source during the latter parts of the Archaic Stage, generally were absent from

the diet during the Early Archaic Period (Chapman 1977; Lentz 1986). Living floors associated with hearths, shallow pit features, and milling tools are known from the Early and Middle Archaic sites, but there is little evidence suggestive of below-ground food storage or of substantial habitation structures (Steponaitis 1986:371).

Much of our knowledge regarding Paleo-Indian and Archaic lifeways is limited by preservation problems. Lithic tools often are the only artifacts that survive, and they provide only limited information about a narrow range of human activities (i.e., manufacture and maintenance of tools, processing of meat and hides, and working of wood and bone). Although they rarely are preserved in the archeological record, clothing, baskets, and other artifacts made of perishable materials such as bone, wood, antler, shell, hair, hide, plant fiber, and feathers were no doubt an important part of the Archaic cultural tradition. Impressions of woven mats and net bags preserved in fired clay hearths from Kirk strata at the Icehouse Bottom Site (40MR23) in Eastern Tennessee provide rare insights into the richness of the Early Archaic material culture (Chapman and Adavasio 1977).

The Early Archaic Cultures immediately preceding San Patrice are little understood in Louisiana. So far, diagnostic projectile points/knives dating from the Early Archaic Period, including Cache River, Calf Creek, Kirk, and Palmer, have been recovered only from questionable contexts and in limited numbers. Large Early Archaic sites, such as those identified in Florida, Georgia, Alabama, Tennessee, and the Carolinas, have yet to be recorded in Louisiana. Gagliano's (1963:12) survey of "pre-ceramic" sites in southern Louisiana found that Kirk Serrated projectile points/knives were relatively common for the southeastern portion of the state, however, no cultural phases have been assigned to either the central or western portions of the state.

Middle Archaic Period (6000 – 4000 B.C.)

During the Middle Archaic Period, three interrelated events occurred that helped shape subsequent prehistoric cultural traditions. First, the effects of continental glaciation subsided, resulting in a warmer and drier climate in which modern climatic and environmental conditions

prevailed. Second, technological improvements were made, particularly with respect to ground-stone, bone, and antler tool production. Finally, sociopolitical organization changed in some areas; an increased number of ranked societies and related social developments appeared.

The Middle Archaic Period throughout the southeastern United States is marked by several technological advances and by changes in subsistence patterns. Middle Archaic projectile points tend to be stemmed rather than notched types. In addition, the Middle Archaic is represented by projectile points/knives that include Evans, Morrow Mountain, Johnson, Edgewood, and possibly Calcasieu types (Campbell et al. 1990:96; Green 1991; Perino 1985:195). Excavations at Site 16VN791, located in Vernon Parish, Louisiana (i.e., Management Unit I) produced evidence of a long tradition of corner notched projectile points/knives dating from the late Middle Archaic. It has been suggested that these points, and others in the region, were derived from types originating in central Louisiana (Campbell et al. 1990).

Other technological innovations include the appearance of ground, pecked, and polished stone tools and the use of celts and grooved axes for heavy woodworking, possibly including the manufacture of dugout canoes. The *atlatl*, or spear thrower, first appeared during the Middle Archaic, as indicated by bone *atlatl* hooks and the appearance of ground stone bannerstones that apparently were attached to the spear thrower and may have served as *atlatl* counterweights or as fetishes.

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

Acorns and hickory nuts continued to be the most heavily utilized plant foods. Remains of squash (*Curcubita pepo*) and bottle gourds (*Lagenaria siceraria*) appear for the first time during the Middle Archaic. The earliest occurrence of the bottle gourd dates from 5340 ± 120

radiocarbon years B.C. at the Windover Site (8BR246) in Florida (Doran et al. 1990). "Squash" rind dating from 5050 B.C. from the Napoleon Hollow (11PK500) and Koster (11GE4) sites in west-central Illinois initially identified as the cultivar *C. pepo*, now is thought to be representative 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. These gourds probably were collected primarily for use as containers rather than as sources of food. Stronger evidence for the domestication of squash gourds occurs after 2350 B.C., i.e., during the Late Archaic (Smith 1987).

In many areas, a major exception to this apparent continuity in earlier subsistence practices was a significant increase in the utilization of fish and shellfish. The rising importance of aquatic resources can be seen in the development of the extensive shell middens found along many of the southeastern rivers. Shell middens first appear between 4550 and 4050 B.C. during the Hypsithermal (Altiethermal) climatic episode, when rivers entered a phase of aggradation and low flow. These climatic changes promoted the development of oxbow lakes and shallow water shoal habitats favorable for mollusk growth and shellfish collection (Stein 1982). Mollusks can be collected efficiently in bulk and appear to represent the economic focus for semi-sedentary Archaic Stage occupations for many parts of the southeastern United States (Russo et al. 1992).

Extensive, deep shell midden sites presumably represent seasonal reoccupation of favored locations by small social groups with band-type socio-political organization. Large cemeteries at some Middle Archaic sites, such as Carlestown Annis (15BT5) in Kentucky and Little Salt Spring (8SO18) in Florida, represent interments made over long periods of time by groups who seasonally returned to these specific locations (Clausen et al. 1979). Increasing population during the Middle Archaic also may have led to more circumscribed territories, which is evidenced by the repeated occupation of favored locations and increased emphasis on locally available raw materials utilized in stone tool manufacture.

Recent research has demonstrated that earthwork and mound construction occurred at

least in isolated instances during the Middle Archaic Period (Saunders 1994, 1996, 1997; Saunders et al. 1992, 1997). At present, a total of four possible Middle Archaic mound sites are known in northeast Louisiana (Management Unit II), and these include Hedgepeth Mounds (Site 16LI7), Watson Brake Mounds (Site 16OU175), Frenchman's Bend Mounds (Site 16OU259), and Hillman's Mound (Site 16MA201). Of the four, the Watson Brake mound group (Site 16OU175) is the largest and the most securely dated at 5400 years B.P. (ca. 3450 B.C.) (Saunders et al. 1997:1797). The site consists of 11 mounds and connecting ridges constructed on a terrace above the Ouachita River flood plain. The civic structures at Watson Brake (Site 16OU175), and several other Middle Archaic sites, suggest that hunter-gatherer groups were capable of tasks that required relatively complex social organization and semi-sedentary living. For example, Griffin wrote:

From our knowledge of the general cultural stage of these early Archaic people we may assume that they lived in groups or bands of closely related people who probably reckoned descent through the father and were probably patrilocal... They probably lived in bands of twenty or thirty or perhaps a few more, ranging over a fairly specific hunting territory (1952:354).

Permanent habitation floodplain sites dating from the Middle Archaic Period are rare in Southern Louisiana (Management Unit V). Only one Middle Archaic Period phase currently is recognized in coastal Louisiana. The Banana Bayou Phase, identified in the Petit Anse region along the central part of the Gulf coast, is represented by the artifact assemblage observed by Gagliano (1964) at Avery Island, near Banana Bayou (Neuman 1984).

Late Archaic Period (4000 – 500 B.C.)

For most of eastern North America, the Late Archaic represents the first cultural adaptation to an essentially modern environment. By 4000 years ago, the current bay tree-bald cypress, southern pine, southern pine-bald cypress, and oak-southern pine forests were established along both the Gulf and Atlantic Coastal plains (Delcourt and Delcourt 1981). The population

structure and boundaries of those forest communities may have varied as a result of subsequent climatic changes, but they remained similar to their modern counterparts.

Shorelines along the Atlantic and the Gulf still were stabilizing from approximately 3000 to 1000 B.C. The distribution of occupation surfaces of Late Archaic sites suggests sea levels generally were 1 to 2 m (3.3 to 6.6 ft) below present levels (DePratter and Howard 1980; Griffin and Smith 1954). DePratter and Howard (1980:33-34) also note that coastal conditions in many areas were not conducive to the development of oyster beds until Late Archaic times. Oyster beds and related resources, especially fish, were a significant factor in the structure of Late Archaic settlement along the Atlantic and eastern Gulf coasts. Many Late Archaic sites were associated with lower estuaries and upper bays, reflecting a subsistence regime that focused on the use of fish and shellfish. Furthermore, DePratter and Howard (1980:7) list three Late Archaic site types along the Atlantic Coast: circular shell rings/mounds, linear shell middens, and non-shell sites.

In the eastern United States, the Late Archaic subsistence economy focused on a few resources, including deer, mussels, and nuts. Jenkins (1979) recognized a seasonal procurement strategy in place in Middle Tennessee during the Late Archaic. During the spring, macrobands formed to exploit forested riverine areas. Archeological investigations of Late Archaic shell middens and mounds indicate a reliance on shellfish, fish, and riverine fauna and flora. During late fall and winter, Late Archaic peoples split into microbands and subsisted on harvested/stored nut foods and faunal species commonly found in the upland areas.

During the Late Archaic, the southeast also witnessed the beginnings of indigenous plant domestication. Species domesticated at this time included squash (*Curcubita pepo*), sunflower (*Helianthus annuus*), marshelder (*Iva annua*), and goosefoot (*Chenopodium berlandieri* ssp. *Jonesianum*) (Smith 1992). Although not found in the vicinity of the Louisiana project areas, the remains of domesticated squash, gourds and sunflower have been recovered from parts of Kentucky, Tennessee, north Alabama, and other regions of the Mid-South. While domesticated

plants often imply the existence of a more sedentary lifestyle, the seasonal exploitation of resources was still an important element of the Late Archaic subsistence system.

The latter part of the Archaic marked the beginning of trade networks inferred from the presence of exotic items such as those recovered from the burials at the Indian Knoll Site (15OH2) in Kentucky (Muller 1986). Although there is limited evidence for the proposed emergence of mortuary ceremonialism at this time, there is evidence for widespread trade in shell, copper, slate, greenstone, and jasper ornaments, including carved stone zoomorphic locust beads (Blitz 1993; Brose 1979; Smith 1986:31; Steponaitis 1986:374). Sites associated with this cultural period typically are found along the boundary of Quaternary and Tertiary areas with relatively flat or undulating bluff tops that overlook the floodplains. Within the Coastal Zone, Late Archaic sites appear on the Prairie terraces and relict levees (Gagliano 1963).

The Late Archaic Period represents a time of population growth, evidenced by an increasing number of sites found throughout the United States (Griffin 1978). Stone vessels made from steatite, occasional fiber-tempered pottery, and groundstone artifacts characterize Late Archaic material culture. Late Archaic projectile point/knife types found throughout Louisiana include corner-notched and stemmed forms.

Late Archaic style projectile points/knives commonly are found throughout the state; however, few of Louisiana's discrete, intact archeological deposits dating from the Late Archaic have been excavated systematically, analyzed, and comprehensively reported (Neuman 1984). Those few sites that have been studied in the west-central and northern part of the state have yielded projectile points/knives that include Gary, Kent, Palmillas, Carrollton, Marcos, Bulverde, Ensor, Ellis, Epps, Macon, Yarbrough, Motley, Pontchartrain, Delhi, and Sinner types. Groundstone objects recovered from these sites include celts/axes, plummets, and steatite bowl fragments (Campbell et al. 1990; Smith 1975).

A total of three Late Archaic cultural phases, the generally contemporaneous Pearl River, Copell, and Bayou Blue Phases, have been identified for coastal Louisiana. The Pearl River Phase is found in the eastern part of the

state and frequently is associated with either fresh or brackish water shell middens. The Copell Phase has been identified in the Petit Anse region of south central Louisiana. The Bayou Blue Phase was after the Bayou Blue Site (16AL1) in southwest Louisiana. The site is an earthen midden situated on a natural levee that overlooks a relict channel of Bayou Blue in Allen Parish.

Poverty Point Culture (ca. 2000 – 500 B.C.)

Poverty Point represents a transitional culture that originated ca. 2000 B.C., but did not develop fully until much later. As a result, the Poverty Point sphere of influence probably did not arrive in south central or southwest Louisiana until ca. 1500 B.C. (Gibson 1979, 1994a; Neuman 1984; Pertula and Bruseth 1994). The Poverty Point Culture exhibits several characteristics of a complex society, i.e., massive public architecture and long-distance trade, while maintaining a hunting and foraging economy. "Archaeological evidence of the Poverty Point Culture derives from at least seven, and possibly 10, isolated localities in the Lower Mississippi River Valley" (Gibson 1974:9). In Louisiana, these clusters consist of: Maçon Ridge-Joes Bayou (Poverty Point Cluster), the Neimeyer-Dare group, and the Beau Rivage cluster (Gibson 1974:9). A total of four groups have been identified in Mississippi: the Savory cluster, the Jaketown cluster, the Teoc Creek cluster, and the Claiborne group (Gibson 1974:9). These clusters may have been responsible for regulating the flow of exotic goods to the Poverty Point type site, (16WC5) located in northeast Louisiana.

Both the Poverty Point Site (16WC5), and the neighboring Jackson Place Mounds (Site 16WC6) are situated adjacent to Bayou Maçon and near several major rivers, including the Mississippi, Tensas, Ouachita, and Boeuf. This riverine location was ideal for engaging in the exchange of goods from other regions (Jeter and Jackson 1994:142; Muller 1978; Neitzel and Perry 1977) and for cultural diffusion. Evidence of long distance trade at Poverty Point includes ceramic artifacts similar to those 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, 1994a; Jeter and Jackson 1994; Lehmann 1982:11-18; Phillips 1996; Webb 1982:13-14). The Poverty Point Culture was one of the earliest socially and politically complex societies to develop in the eastern United States (Gibson 1985a; Muller 1978).

The Poverty Point Site (16WC5) is distinguished primarily by its large earthworks and its complex microlithic industry. The earthworks include six segmented, concentric ridges, 15 to 46 m (50 to 150 ft) wide and approximately 1 to 2 m (3.3 to 6.6 ft) high, that form five sides of an octagon; as well as several earthen mounds scattered throughout the immediate site area. The largest mound, Mound A, may be a large bird effigy (Webb 1982). At the time of its construction, Poverty Point was the largest earthwork in the Americas.

The material culture of Poverty Point society was highly distinctive and differentiates these sites from other Late Archaic Period sites. Typical Poverty Point Period projectile points include Carrollton, Delhi, Epps, Gary, Kent, Motley, and Pontchartrain (Smith et al. 1983:152; Webb 1982:22,47). Although first made during the Archaic Stage, these stemmed projectile point types frequently were manufactured from either novaculite or gray flint during Poverty Point times (Gibson 1994). The presence of exotic lithic materials may be an indicator of a Poverty Point Period site; these lithic materials include: "dark midwestern flint", Dover chert, Ozark chert, novaculite, magnetite, hematite, limonite, steatite, slate, quartz, galena, red jasper, and several others (Gibson 1974:9).

Materials associated with Poverty Point Culture also consist of *atlatl* weights, plummets, two hole gorgets, red jasper beads and owl pendants, thin micro flints/blades, Jaketown Perforators, baked clay cooking balls in dozens of geometrical shapes, clay figurines/fetishes, copper objects, and food storage and preparation containers. Container types include sandstone and steatite vessels, basketry, and untempered ceramic materials. Most ceramic vessels were sand tempered, although a minority of grit tempered, clay tempered, and untempered sherds and vessels have been recovered. After about 1350 B.C., fiber tempered pottery appears (Jenkins 1982:55). Webb (1982) also reported the recovery of seed processing implements, pol-

ished stone hoe blades, nutting stones, and milling stones.

Little is known of the general everyday lifestyles of the people of this culture, and it is believed that patterns of hunting and gathering established during the Archaic Stage were practiced by Poverty Point people (Connaway et al. 1977; Webb 1982). Although gourd and squash were present and may have been cultivated (as suggested by the presence of chipped stone hoes with polish), it appears that maize agriculture was never a part of Poverty Point food production (Smith 1986:35). Starchy and oily seeds were rare in flotation samples from the J. W. Copes Site (16MA47) and they may have been of only limited significance (Fritz and Kidder 1993:6). Preferred resources appear to have been deer, pecan nuts (*Carya illinoensis*), and catfish (Jackson 1986).

Although earthen ovens have been identified, baked clay balls (Poverty Point Objects [PPO]) and stone/ceramic containers may have provided technological means for increasing the efficiency and caloric return of previously utilized resources such as pecans. Experiments show that boiling is a significantly more efficient means of extracting food value from *Carya* nuts than hand cracking because more nutmeat and oil are recovered (Munson 1988).

Brain (1971) perceives Poverty Point as a bottomland occurrence, while Webb (1982) suggests that Poverty Point sites typically are found in four locations. These locations include the Quaternary terraces or older land masses that overlook major stream courses, major river levees along active or relict river channels, river-lake junctions, and coastal estuaries or older land surfaces located within a coastal marsh area. Poverty Point sites appear to be located in areas ideal for exploiting forest-edge resources and for transporting exotic materials. Sites range in size from large ceremonial centers to more frequently identified hamlets or foraging stations. Earthworks or shell middens occur on several of the larger Poverty Point Culture sites, either as mounds or in circular patterns.

In southeast Louisiana, small shell middens located along the shoreline of Lake Pontchartrain exhibit Poverty Point traits and suggest specialized seasonal adaptations to marsh environments. Sites identified in this area represent

two phases of Poverty Point Culture: the Bayou Jasmine Phase and the Garcia Phase. Bayou Jasmine Phase sites are located on the western shore of the lake as well as along the natural levee ridges of the Mississippi River distributaries. Garcia Phase sites are located along the eastern shore of Lake Pontchartrain. The Garcia Site (16OR34), the type site for the Garcia Phase, contained a beach deposit of Rangia shells and midden debris. Radiocarbon dates from Bayou Jasmine Phase components cluster around 3450 B.P., while Garcia Phase sites date about 1000 years later (Gagliano 1963; Gagliano and Saucier 1963). Bayou Jasmine Phase sites, such as the type site located along the western shore of the lake, exhibit Poverty Point traits exclusively (Duhe 1976). In contrast, Garcia Phase sites, i.e., those found along the eastern shore, contain both bone tool and microlithic industries (Gagliano and Saucier 1963).

Phillips (1970) identified a Poverty Point Phase that he labeled Rabbit Island. Sites associated with the Rabbit Island Phase are situated in the Teche-Mississippi region of coastal Louisiana, and artifacts recovered from the type site include non-local lithic materials, microlithics, and baked clay objects (Gagliano 1963). Subsequently, Gibson (1975) applied the name Beau Rivage to four Poverty Point Culture sites (16LY5, 16LY6, 16LY13, and 16SL2) that he investigated along the Vermilion River. Beau Rivage is taken from the type site (16LY5) located within the Lafayette corporate limits. Sites of this phase are established in a different geographic setting than sites of the Rabbit Island Phase; they are found to the northwest of the previously recorded Rabbit Island sites and they occupy the edge of the prairie terrace that overlooks the alluvial plain (Gibson 1980). A typical Beau Rivage artifact assemblage includes Poverty Point ceramic objects (clay balls and figurines) and lithic materials, but also is comprised of decorative rectangular or circular ceramic objects that have not yet been recovered at more inland Poverty Point locations. Diagnostic projectile points/knives have included, among others, examples of Gary, Wells, Evans, Elam, Sinner, Ellis, Delhi, Marshall, and Palmillas points. These lithic projectile points/knives are characteristically shorter and more narrow than those found at other Poverty Point sites.

Beau Rivage and Rabbit Island Phase sites apparently represent geographically distinct examples of Poverty Point Culture in south central Louisiana. While Gibson (1975) dates the Beau Rivage Phase from ca. 1500 – 650 B.C., no dates have been suggested for the Rabbit Island Phase. Additional research is required to provide solid chronological information and to determine the relationship between the two phases.

Management Unit II and Management Unit III contain the majority of all known Poverty Point sites and components recorded in Louisiana (Smith et al. 1983: 26, 46, 63, 79, 96). Sites in northeast Louisiana (Management Unit I) generally lack the characteristic clay balls and large earthworks of the type site, suggesting that Poverty Point Culture only marginally influenced indigenous cultures this area. Poverty Point diagnostics, including steatite vessel fragments, hematite plummets, jasper beads, and Delhi and Motley projectile points have been recovered from various sites in southwestern Arkansas, northeastern Texas, and northwestern Louisiana. Some archeologists have suggested that the early inhabitants of the Red River Valley participated in a Poverty Point trade network, but did not share Poverty Point Culture (Hemmings 1982). This seems to be a tenable hypothesis considering the persistence of Late Archaic tool assemblages in northwestern Louisiana, and the overall distribution of sites exhibiting strong Poverty Point characteristics. Saunders (1997:14) reported that 104 Poverty Point sites had been identified in Management Unit II and were on file at the Louisiana State Historic Preservation Office. Of the 104 sites, over 41 percent (n=43) have been recorded on loess ridges including Maçon Ridge and the Bastrop Hills.

Woodland Stage (1000 B.C. – A.D. 1100)

Despite the many innovations introduced during Poverty Point times, this culture typically is portrayed either as a Late Archaic Period or a pre-Woodland Stage transitional manifestation. The emergence of the Woodland Stage in Louisiana was characterized by a combination of horticulture, the introduction of the bow and arrow, and the widespread use of ceramic containers. The Woodland Stage includes three periods: Early Woodland, Middle Woodland, and Late

Woodland. In Louisiana, the Early Woodland Period (ca. 500 B.C. – A.D. 0) 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 was later dominated by the Coles Creek Culture. A discussion of each of these cultures is presented below.

Tchefuncte Culture (ca. 500 B.C. – A.D. 1)

Tchefuncte Culture is characterized by the first widespread use of pottery and a hunting and gathering tradition that maintained a Late Archaic-like tool inventory (Byrd 1994; Neuman 1984; Shenkel 1981:23). The culture first was identified at the type site (16ST1) located on the north shore of Lake Pontchartrain (Management Unit IV) in southeast Louisiana (Ford and Quimby 1945; Weinstein and Rivet 1978), but it was thought to represent the migration of a populace indigenous to the southwest Louisiana coast and to the central portion of the Vermilion River in south-central Louisiana (Management Unit III). Later, the archeological sites attributable to the Tchefuncte Culture also were located by Ford and Quimby (1945) during Works Progress Administration (WPA) excavations at Big Oak Island (16OR6) and Little Woods Midden (16OR1-5), situated on the southeastern edge of the lake in Orleans Parish.

Tchefuncte-like ceramics now have been found in 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). In coastal Louisiana, five phases have been designated for the Tchefuncte Period. From west to east, these are the Sabine Lake Phase bordering Sabine Lake in southeast Texas and southwest Louisiana; the Grand Lake Phase, in the Grand Lake and Vermilion Bay area; the Lafayette Phase, on the west side of the Atchafalaya basin (west of the Vermilion River); the Beau Mire Phase, below Baton Rouge in the Ascension Parish area; and the Pontchartrain Phase, encompassing Lake Maurepas and Lake Pontchartrain in the Pontchartrain Basin (Weinstein 1986:108).

For the purpose of this review, a date range extending from ca. 500 B.C. to A.D. 300 for the Tchefuncte Culture will be used; however, research suggests that dates for the Tchefuncte differ widely from region to region and occasionally within the same region (Webb et al. 1969:96; Weinstein 1986). Most scholars agree that Tchefuncte dates from as early as 700 B.C. in the south and that it diffuses to the north, where it is known as Tchula, and terminates sometime around A.D. 100 (Gibson and Shenkel 1988:14; Perrault and Weinstein 1994:48-49; Shenkel 1974:47; Toth 1988:19). There is, however, evidence that suggests that coastal Tchefuncte sites were in existence until ca. A.D. 300 (Byrd 1994:23; Neuman 1984:135). If these dates are correct, it implies that the last remaining coastal Tchefuncte communities were coeval with Marksville Culture (Toth 1988:27-28).

Tchefuncte ceramics usually are characterized by a soft, chalky paste and a laminated appearance. They were fired at a low temperature and tempered with either sand or clay (Phillips 1970). Vessel forms consist of bowls, cylindrical and shouldered jars, and globular pots that sometimes exhibit podal supports. Although many vessels are plain, some are decorated with punctations, incisions, simple stamping, drag and jab, and rocker stamping. Punctated types usually are more numerous than stamped types, but parallel and zoned banding, stippled triangles, chevrons, and nested diamonds also represent popular motifs. During the later portion of the Tchefuncte Period, red filming was used to decorate some vessels (Perrault and Weinstein 1994:46-47; Speaker et al. 1986:38; Phillips 1970).

For the most part, the stone and bone tool subassemblages remained nearly unchanged from the preceding Poverty Point Culture. Stone tools included boat stones, grooved plummets, chipped celts, and sandstone saws. Bone tools included awls, fish hooks, socketed antler points, and ornaments. In addition, some tools such as chisels, containers, punches, and ornamental artifacts were manufactured from shell. Projectile points/knives characteristic of Tchefuncte Culture include Gary, Ellis, Delhi, Motley, Pontchartrain, Macon, and Epps (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.

Tchefuncte sites generally are classified either as coastal middens, inland villages, or hamlets. Settlement usually occurred along the slack-water environments of slow, secondary streams that drained bottomlands, floodplain lakes, and littoral zones (Neuman 1984; Toth 1988:21-23). Tchefuncte burials and artifacts suggest an egalitarian social organization. The population probably operated at the band level, with as many as 25 to 50 individuals per band. The widespread distribution of similar ceramic types and motifs implies a patrilocal residence pattern with exogamous band marriage (Speaker et al. 1986:39). Social organization probably remained focused within macrobands.

Shell midden sites and their associated faunal remains are well known for Tchefuncte Culture and document the wide variety of food resources utilized during this period. Recovered faunal remains include deer, opossum, muskrat, raccoon, otter, bear, fox, dog, ocelot, wildcat, alligator, bird, fish, shellfish (freshwater and marine), and turtle (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) notes that the remains of crustaceans such as crabs, shrimp, and crawfish do not appear within the Tchefuncte middens. The absence of such readily available food sources probably reflects their relatively low caloric value. The preponderance of freshwater fish remains at coastal southeastern Louisiana sites such as Big Oak Island (16OR6) and Little Oak Island (16OR7) indicates a reliance on aquatic resources (Shenkel and Gibson 1974).

Examination of faunal and floral remains from Morton Shell Mound (16IB3), a coastal Tchefuncte shell midden in Iberia Parish (Management Unit III), suggests that some coastal sites were occupied on a seasonal basis, usually in the summer and autumn, and possibly during the spring (Byrd 1994:103). However, McGimsey (1997:11) notes that year round occupations have been demonstrated for coastal sites and postulates that year round occupations were possible at a majority of the riverine sites in Management Unit III (Byrd 1974; Neuman 1984:122). Tchefuncte sites are most commonly dis-

covered in Management Units II, III, IV, and V. Evidence for the Tchefuncte Culture in Management Unit I is sparse and suggests a persistence of Late Archaic life-ways in the uplands surrounding the Red River.

Marksville Culture (ca. A.D. 1 – 400)

Marksville Culture, named for the Marksville Site (16AV1) in Avoyelles Parish (i.e., Management Unit II), perceived as a localized version of the elaborate midwestern Hopewell Culture, the traits of which diffused down the Mississippi River from Illinois (Toth 1988:29-73). Complex geometric earthworks, conical burial mounds for the elite, and unique mortuary ritual systems suggest that the Marksville Culture possessed a more highly organized social structure than their Tchefuncte predecessors. Some items, such as intricately decorated ceramic vessels, were manufactured primarily for inclusion in burials. Burial items frequently consisted of pearl beads, carved stone effigy pipes, copper ear spools, copper tubes, galena beads, and carved coal objects. Toward the end of the Marksville Period, Hopewellian influences declined and mortuary practices became less complex (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 Marksville and Hopewell Cultures (Toth 1988:45-50). Additional Marksville traits include a chipped stone assemblage of knives, scrapers, celts, drills, ground stone *atlatl* weights and plummets, bone awls and fishhooks, baked clay balls, and medium to large stemmed projectile points dominated by the Gary type.

Exotic artifacts, commonly found at Marksville sites, suggest extensive trade networks and possibly a ranked, non-egalitarian society. Some commonly recovered exotic items include copper earspools, panpipes, platform pipes, figurines, and beads (Toth 1988:50-73; Neuman 1984). The utilitarian material culture, however, remained essentially unchanged, and reflected an overall continuity in subsistence systems from earlier times (Toth 1988:211).

Marksville peoples probably used a hunting, fishing, and gathering subsistence strategy

much like those adopted by prehistoric groups in earlier periods. Gagliano (1979) suggests that food procurement activities were a cyclical/seasonal activity that revolved around two or more shifting camps. In the southeastern part of the state, shellfish collecting stations on natural levees and lower terraces around Lake Pontchartrain and Lake Maurepas were occupied and utilized during the summer months. During the winter months, semi-permanent hunting/gathering camps on the prairie terrace were occupied. This subsistence technique reflects the seasonal fission and fusion pattern that probably originated during the Archaic Stage.

Evidence suggests an increased focus on the use of oily seeds (marshelder, sunflower, squash) and starchy seeds (*Chenopodium*, wild bean, maygrass, knotweed, little barley) (Fritz and Kidder 1993:7; Smith 1986:51). At the Reno Brake Site (16TE93) in Tensas Parish, Kidder and Fritz (1993) recovered deer, squirrel, rabbit, bird, and fish remains, as well as acorns, persimmons, palmettos, grapes, blackberries, and very minor amounts of *Chenopodium* and marshelder. Although maize has been identified and dated from a Middle Woodland context at sites in Tennessee and Ohio (Ford 1987), it does not appear to have been of economic significance until much later, i.e., during Mississippian times (Fritz and Kidder 1993:7; Kidder and Fritz 1993:294; Smith 1986:50-51).

Few sites with strong Marksville cultural period affiliations are recognized in Management Unit I. The Fredericks Mound and Village Site (16NA2) near Black Lake in Natchitoches Parish, Louisiana probably was inhabited between A.D. 100 and 600 and is representative of intrusive Marksville and later Troyville Cultures into the area (Webb and Gregory 1986). The Coral Snake Site (16SA48) (McClurkan et al. 1966) in Sabine Parish, Louisiana represents a regional adaptation to a forest economy during Marksville times. The presence of Gary points and sand paste pottery suggests that this site was a local manifestation of the Hopewell-Marksville interaction sphere (Shafer 1975). The geographic distribution of these sites indicates that contact between the Lower Mississippi River Valley and the middle reaches of the Red River was restricted, possibly because of environmental constraints (e.g., the beginning of the

Great Raft). It appears that Marksville Culture did not substantially influence prehistoric cultural development upriver from the Natchitoches Parish region.

Late Marksville in northeastern Louisiana (Management Unit II) may be assigned to the subperiod referred to as the Issaquena Phase (Jeter et al. 1989). This culture variant was defined by Greengo (1964) and Phillips (1970) based on their excavations at the Manny Site (22IS506), which is located in the lower Yazoo Basin. Although this phase designation is based on a substantial amount of excavated data, Williams and Brain (1983:360) still consider the Issaquena Phase to be poorly understood. In fact, Gibson and Shenkel (1988:7) consider Issaquena to be Late Woodland and not part of Marksville at all. The Issaquena Phase, located in the lower Yazoo Basin generally dates from approximately A.D. 200 to 500, and it is characterized by the ceramic types Marksville Stamped var. Manny, Marksville Incised var. Yokena, Churupa Punctated var. Churupa, and Baytown Plain var. Sartartia and other related types of the "Sartartia set" (Greengo 1964; Phillips 1970; Williams and Brain 1983:314). Although mounds are present at the Manny Site, they appear to have been constructed during the later occupations.

In general, Marksville Period sites are located throughout Louisiana. The majority of Marksville Period sites and components have been noted in Management Unit II and the remainder are found in Management Units I, III, IV, and V. According to recent work by Saunders (1997) Management Unit II currently contains a total of 203 Marksville sites. Nearly half of these locations (n=99) are situated on the Mississippi River floodplain and nearly 36 percent (n=73) have been identified on the loess ridges (Saunders 1997:17).

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

The Troyville Culture, labeled Baytown elsewhere, was named after the mostly destroyed Troyville mound group (Site 16CT7) located in Jonesville, Catahoula Parish, Louisiana. Troyville represents a transition from the Middle to Late Woodland that culminated in the Coles Creek Culture (Gibson 1984). Though distinct, these two cultures share a sufficient number of

traits to prompt many researchers to combine them as a single prehistoric cultural unit (Belmont 1967). According to Neuman (1984:169), 23 14C dates for 14 Troyville-Coles Creek sites in Louisiana place the beginning of Troyville Culture at A.D. 395. Kidder (1988:57) places the beginning of the Coles Creek Culture at some time between ca. A.D. 700 and A.D. 800. The continuing developments of agriculture and the refinement of the bow and arrow during this time (reflected by Alba, Catahoula, Friley, Hayes, and Livermore projectile point types), radically altered subsequent prehistoric lifeways. Bean and squash agriculture may have become widespread during the Troyville Period based on the appearance of large ceramic vessels in the archeological record. This shift in subsistence practices probably fostered the development of more complex settlement patterns and social organization.

Only two Troyville phases (Whitehall and Roanoke) have been described in the coastal region of Louisiana. These contemporaneous phases are separated only by their physical/geographic distance (Jeter et al. 1989). The Whitehall Phase of eastern Louisiana was defined by Phillips (1970). The Roanoke Phase of western Louisiana was defined more recently by Bonnin and Weinstein (1978) based on information gathered during excavation of the Strohe site (16JD10).

The Late Woodland Coles Creek Culture emerged from Troyville around A.D. 750 and represented an era of considerable economic and social change in the Lower Mississippi Valley. Communities became larger and more socially and politically complex by the end of the Coles Creek Period. Large-scale mound construction became more common, and near the end of the period there is evidence for the resumption of long-distance trade on a scale not seen since Poverty Point times. These changes imply that a chiefdom-like society was re-emerging in the Lower Mississippi Valley (Muller 1978). The trade and 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 currently is recognized as the Plaquemine Culture at sometime around A.D. 1200 (Jeter et al. 1989; Williams and Brain 1983).

Ceramics of the Troyville/Coles Creek Period are distinguished by their grog and grog/sand tempers, as opposed to the chalky, sand tempered paste of the previous ceramic series. Decorative motifs include cord marking, red filming, and simplified zoned rocker-stamping, as well as decorations with incised lines and curvilinear lines. As noted by McIntire (1958), the Coles Creek peoples continued to use the earlier Troyville wares, with only minor elaborations. For instance, the Churupa Punctated and the Mazique Incised designs that first appear during the Troyville Culture continued to be used by Coles Creek and later Plaquemine pottery makers (McIntire 1958). Similarly, French Fork Incised, which formed the basis for many Troyville classifications, also continued to be used well into the Coles Creek Period (Phillips 1970).

The Coles Creek Period can be distinguished by the introduction of a new ceramic complex that included larger vessels and a wider range of decorative motifs, usually positioned on the upper half of the vessel (Neuman 1984). Coles Creek Incised, Beldeau Incised, and Pontchartrain Check Stamped forms characterize the period (Phillips 1970; Weinstein et al. 1979). A 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 suggest external cultural influences. French Fork Incised motifs and decorative techniques, for example, almost exactly mimic Weeden Island Incised and Weeden Island Punctated ceramics from the northwest Florida Gulf Coast (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 Weeden Island III in northwest Florida (Brown 1982:31).

Coles Creek Period sites tend to be 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 desirable settlement locations (Neuman 1984). Most large Coles Creek sites contain one or more pyramidal mounds. Coles Creek mounds typically are larger, and exhibit more building episodes than the earlier Marksville burial mounds. Burials occasionally are located in Coles Creek mound, but the primary function of the mounds appears to have been ceremonial in nature. At some Coles Creek sites, mounds are connected by low, narrow causeways. Plazas occasionally are associated with multiple mound sites (Gibson 1985b). The sophistication of Coles Creek mound systems suggests a more complex social structure. A centralized authority and a sizable labor force must have existed to build, maintain, and utilize these mounds. The centralized authority may have been of a special religious class and resided in the large ceremonial centers, while the general population occupied the surrounding region (Gibson 1985b; Neuman 1984; Smith et al. 1983).

In general, small Coles Creek sites consist of hamlets and shell middens, but normally do not contain mounds. Coles Creek shell middens are found most commonly in the coastal region where they occupy higher portions of natural levees (Springer 1974).

Recent work has dispelled the old theory that an intensification of agriculture, particularly maize and squash, created the stable subsistence base from which the Coles Creek Culture arose and flourished. Although Coles Creek populations exhibit tooth decay rates consistent with a diet based on starchy plant foods such as maize. Limited archeobotanical evidence recovered from midden deposits, however, suggests that consumption of some other starchy foods must have caused the dental problems experienced by Coles Creek peoples because only small amounts of maize were identified (Kidder 1992; Steponaitis 1986). While researchers speculate that the use of cultigens as a dietary supplement, especially squash species, occurred in conjunction with the incipient Coles Creek Culture, evidence of dependence on domesticated plants has been lacking at early Coles Creek and related Plum Bayou sites (Kidder and Fritz 1993; Kidder 1992). The preponderance of evidence now

available indicates that 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). Thus, while maize existed during the Coles Creek Period, it was not the economic basis of the society.

Some sites in the Petite Anse region, e.g., the Morgan Site (16VM9), have produced limited amounts of wild plant species (Brown 1981; Fuller and Fuller 1987), which suggests that subsistence in the coastal region of Louisiana apparently was based on the exploitation of available aquatic and/or terrestrial animal resources. Excavations by Goodwin and Associates, Inc., (1986) at Site 16CM61, a Rangia shell midden in the western part of the state, indicated patterns of seasonal exploitation for both marine mollusks and fish. In addition, Springer (1979) documented a variety of faunal material including mammals, birds, reptiles, and fish that originated from a Coles Creek component at the Pierre Clement Site (16CM47) in Cameron Parish.

Earlier assumptions concerning the nature and extent of social and political differentiation during the Coles Creek Period also must be re-examined. Square-sided, flat-topped mounds, believed to have served as platform bases for elite structures, first appeared in the area during the Coles Creek Period. However, evidence for the elite residential or mortuary structures associated with earthen mounds remains elusive prior to A.D. 1000 (Kidder and Fritz 1993; Smith 1986; Steponaitis 1986). The form of the platform mounds and their arrangement around plazas is indicative of a possible Mesoamerican influence (Willey and Phillips 1958; Williams and Brain 1983).

In the central and western areas of coastal Louisiana, early, middle, and late (transitional) phases have been defined for the Coles Creek cultural period (Brown 1984; Weinstein 1979 and 1986:108; Ryan et al. 1996:Figure 3; Jeter et al. 1989). In the Petite Anse region, these include the White Lake Phase (ca. A.D. 700 - 900); the Morgan Phase (ca. A.D. 900 - 1000); and the Three Bayou Phase (ca. A.D. 1000 - 1200). The Coles Creek Phases of southwest Louisiana are nearly contemporaneous, and con-

sist of the Welsh (ca. A.D. 700 - 850), the Jeff Davis Phase (ca. 850 - 1000), and the Holly Beach Phases (ca. A.D. 1000 - 1200).

Troyville-Coles Creek Period sites are found throughout Louisiana. A large portion of the sites and components have been identified in Management Unit II. For example, Saunders (1997) has identified 135 sites attributed to Troyville Culture and 318 sites assigned to the Coles Creek Culture in Management Unit II. The remainder of these sites (n=379) are found in Management Units I, III, IV, and V (Smith et al. 1983: 26, 46, 63, 79, 96).

In Management Unit I, the classic Coles Creek ceramics, truncated pyramidal mounds, and large cemeteries "are virtually absent on the Red [River] until one passes Shreveport" (Gregory et al. 1979:54). South of Shreveport, small hamlets are the most common type of Coles Creek settlement. Within the Lower Ouachita Valley region of Louisiana (Management Unit II), early, middle, and late phases tentatively have been proposed for the Troyville - Coles Creek cultural period (Gibson 1985a; Jeter et al. 1989:167, Table 5). In this marginal region, these subperiods include the Crawford Phase (ca. A.D. 400 - 750); the Pritchard Landing Phase (ca. A.D. 750 - 900); and the Routon Phase (ca. A.D. 900 - 1050 or perhaps later). A transitional phase (ca. A.D. 1050 - 1200) also has been reported in the Lower Ouachita Valley; however it is yet to be named. Jeter et al. (1989:146-167) presented two middle to late Troyville phases (Indian Bayou and Marsden) and four Coles Creek phases (Sundown, Ballina, Balmoral, and Preston) along the Tensas region. Troyville - Coles Creek components have been reported at the Jackson Place Mounds (Site 16WC6) and at Poverty Point (Site 16WC5), but these components are not well documented

Mississippian Stage (ca. A.D. 1000 - 1700)

The Mississippian Stage represents a cultural climax in population growth and social and political organization for those cultures that occupied the southeastern United States (Phillips 1970; Williams and Brain 1983). In the Lower Mississippi Valley, the beginning of the Mississippian Stage is represented by the incorporation of traits such as shell tempered ceramics, trian-

gular arrow points, copper-sheathed wooden earspools, and maize/beans/squash agriculture (Williams and Brain 1983). Formalized site plans, consisting of large sub-structure "temple mounds" and plazas, have been noted 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 coastal region of Louisiana, the Mississippian Culture is characterized by both the Plaquemine or Emergent Mississippian Period (A.D. 1200 - 1450) and the Late Mississippian Period (A.D. 1450 - 1700). However, it is likely that in some parts of the region either Plaquemine Culture or a hybrid of that culture was in existence until European contact (Jeter et al. 1989).

Emergent Mississippian Period (A.D. 1200 - 1450/1700)

The Emergent Mississippian Period Plaquemine Culture appears to represent a transitional phase from the Coles Creek Culture to a pure Mississippian Culture (Kidder 1988). Interaction with the emerging Mississippian Cultures of the Middle Mississippi Valley probably exerted enough influence during the latter part of the Coles Creek Period to initiate the cultural change that eventually became the Plaquemine Culture. The Medora Site (16WBR1), described by Quimby (1951) and considered to be the type site, typifies Plaquemine Culture. Plaquemine peoples continued the settlement patterns, economic organization, and religious practices established during the Coles Creek Period; however, agriculture, sociopolitical structure, and religious ceremonialism intensified, suggesting a complex social hierarchy. Plaquemine sites typically are characterized either as ceremonial sites, with multiple mounds surrounding a central plaza, or as dispersed villages and hamlets (Neuman 1984; Smith et al. 1983).

Plaquemine lithic assemblages are quite similar to those of the preceding Troyville-Coles Creek cultural complex and they are dominated by the same small projectile point types (Smith et al. 1983). In addition, Plaquemine ceramics are derived from the Coles Creek tradition, but display distinctive features that mark the emergence of a new cultural tradition. In addition to

incising and punctuating their ceramics, Plaquemine craftsmen also brushed and engraved decorations on their vessels (Phillips 1970). Plaquemine Brushed appears to have been the most widespread ceramic type. Plaquemine ceramic types included Leland Incised, Hardy Incised, L'Eau Noire Incised, Anna Burnished Plain, and Addis Plain.

In the past, the cultural achievements of the Plaquemine Period were thought to have been supported by the intensive cultivation of maize. During the early part of this period, subsistence patterns may have shifted to agriculture that was supplemented by native plants and animals, but evidence of intensive agriculture has yet to be documented (Kidder and Fritz 1993:9).

Gregory (1969) indicates that Plaquemine site locations demonstrate a propensity towards lowland areas including swamps and marshes; however, Neuman (1984) reports that Plaquemine Culture sites in the upper Tensas basin were located most frequently on well-drained natural levees characterized by sandy soils. In general, coastal sites tend to be smaller and less elaborate and it is suggested that coastal shell middens are a product of early Plaquemine activities (Davis et al. 1979; Brown et al. 1979). The presence of these sites may indicate the persistence of previously established seasonal food procurement strategies and probably are related to continued transhumance activities. Kidder (1988) asserts that the Plaquemine Culture had evolved into a true Mississippian Culture by ca. A.D. 1450.

In the Petite Anse region of south Louisiana, Brown (1985) states that coastal Plaquemine populations were descended from incipient Coles Creek peoples and contends that there is ample evidence of continuance between the two cultures (Phillips 1970, Hally 1972, Jeter et al. 1989, and others). Under this scheme, the transitional Coles Creek Three Bayou Phase (ca. A.D. 1000 - 1200) is supplanted by the ensuing Burk Hill Phase (ca. A.D. 1200 - 1600). This phase includes sites along Vermilion Bay, and around the Five Islands (Brown 1985). In southwest Louisiana, the Bayou Chene Phase (ca. A.D. 1200 - 1700) has been suggested by Weinstein (1985) as a localized expression of Plaquemine/Mississippian development. The

Bayou Chene Phase is based on the interaction of Transitional Coles Creek/Plaquemine peoples with those of a more localized tradition that likely originated as a result of migrations or diffusion from southeast Texas.

Plaquemine sites and components have been identified throughout Louisiana. Nevertheless, these sites tend to be located more commonly in Management Units II, III, and V. Management Units I and IV contain substantially fewer Plaquemine sites and components.

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

During the Late Mississippian Period, several traits that are distinctive of the Mississippian Stage were wide-spread across most of the southeast. These diagnostic traits include well-designed, carefully laid-out mound groups, a wide distribution of sites and trade networks, shell tempered ceramics, and a revival in ceremonial burial of the dead (Griffin 1990:7-9). In coastal Louisiana, Late Mississippian Culture probably is related to the Pensacola variant. It is Knight's (1984) contention that displaced Mississippian populations from the central Gulf Coast, i.e., the Mobile Bay area and the Alabama/Tombigbee river systems, resettled in coastal Louisiana. Additionally, Brown and Brown (1978) have recovered Yazoo River Basin-like pottery from Avery Island, one of the salt domes in the Petite Anse region.

Mississippian subsistence was based on the cultivation of maize, beans, squash, and pumpkins; the collection of local plants, nuts, and seeds; and the fishing and hunting of local animals. Large Mississippian sites were located on fertile bottomlands of major river valleys; which usually are composed of 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 elite residences. A highly organized and complex social system undoubtedly existed to plan and maintain these communities.

Ceramic types frequently were characterized by shell tempering, an innovation that enabled potters to create larger vessels (Brain 1971; Steponaitis 1983). Ceramic vessels included such forms as globular jars, plates, bot-

ties, pots, and salt pans. The loop handle has been noted on many Mississippian vessels. Although utilitarian plainware was common, decorative techniques included engraving, negative painting, and incising. In addition, modelled animal heads and anthropomorphic images also adorned ceramic vessels. Other Mississippian artifacts included chipped and groundstone tools; shell items such as hairpins, beads, and gorgets; and mica and copper items. Chipped and ground stone tools and projectile point styles, such as Alba and Bassett, were common.

Mississippian Culture had a weak presence in south central and southwestern Louisiana, where only two Mississippian or Mississippian-like phases have been recognized. The first, Petite Anse (ca. A.D. 1600 - 1700), has been used to describe Mississippian peoples/traders from the lower Yazoo river basin who traveled to the Petite Anse region (Avery Island) to procure salt (Brown and Brown 1979). The second, in southwest Louisiana, is the Little Pecan Phase (ca. A.D. 1650/1700 - 1750); it is associated with the historic Attakapa, and represents a synthesis of ceramic types that originate from the Lower Mississippi Valley, Louisiana, and Texas (Jeter et al. 1989, Frank 1976). In northwestern Louisiana, however, the influence of Plaquemine and Mississippian Cultures was overshadowed by the emerging Caddoan tradition, which had ties with the Cahokia Culture of the American Bottom (Brown et al. 1990:274).

The majority of Late Mississippian sites are located only in Management Units II and V. The remaining sites and components are dispersed throughout Management Units I, III, and IV.

Protohistoric Period in Louisiana

An understanding of protohistoric and historic Native American Cultures of the southeastern United States is limited by our frequent inability to recognize the ancestral cultures from which these historic groups were derived. This partially is due to the waning influence of Mississippian, Caddo, and, to a lesser degree, Plaquemine Culture, but primarily 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; Wolf 1982).

Northern Louisiana

Caddo V (A.D. 1700 - 1835) encompasses the Glendora Focus and the period of historic contact in northern Louisiana. During this period in northern Louisiana, Caddoan-speaking groups included the Kadodachado, Doustioni, Natchitoches, Yatasi, Ouachita, and Adaes. These groups were discovered inhabiting the area around Campti, Mansfield, Robeline, Shreveport, and Natchitoches in northwest Louisiana and near Monroe in northeast Louisiana at the time of European Contact (Kniffen et al. 1987:47, 75, 91; Swanton 1946; Swanton 1953:196-197, 204-207). Historic accounts described Caddo villages as dispersed hamlets, each consisting of one or two circular houses constructed of vertically set posts covered with grass and platformed storage structures (Swanton 1946:419, 640).

De Soto, in 1541, was the first European to encounter the Caddo. The Caddo first came into contact with the French when Henry de Tonti visited the area in 1690. Ten years later, in 1700, Bienville courted the Caddo at Natchitoches to form an alliance. Two years later, in 1702, the Caddo asked Saint-Denis to help them relocate because devastating floods had destroyed their crops. Saint-Denis obliged and allowed the Caddo to settle near the Acolapissa on the north side of Lake Pontchartrain. In 1714, the Caddo moved back to the Red River near the French trading post at Natchitoches. Subsequently, the Acolapissa attacked the Caddo. Saint-Denis built Fort Jean Baptiste at Natchitoches to protect the Caddo and French interests in the area. Relations continued to be good between the Caddo and French. In 1731, the Caddo assisted the French in attacking the Natchez (Swanton 1946:99, 161).

In 1803, influence in the area shifted when France to the United States. The following year, President Thomas Jefferson appointed Dr. John Sibley as "surgeon's" mate for the soldiers at Natchitoches. Soon afterward, Sibley was given the position of Indian Agent in order to learn more about the Indians in the area. Sibley wrote

several journals on the Caddo Indians, including *Historical Sketches and A Report from Natchitoches in 1807*, detailing the activities, names, and locations of various tribes in the Red River region (Sibley 1807). The Yattassees and Adaes were two groups listed as living on the Red River above Natchitoches. The Yattassees, or Yatasi, and the Adaes, were located in the Red River Valley, near Shreveport, along Bayou Pierre on a prairie near Mansfield, and along the Sabine River near Logansport (Kniffen et al. 1987:47, 75, 91; Swanton 1953:196-197, 204-207).

The Adai, or Adaes, apparently were members of a Caddoan tribe for which the Spanish established the mission Los Adaes in the 1720s. The mission and presidio, located approximately fifteen miles west of Natchitoches, became the capital of the Spanish province of Texas (Gregory et al. 1979:8; Swanton 1946:83-84). Archeological investigations of Los Adaes have revealed that contact with the European settlers and explorers brought changes to the Caddo culture. Gregory et al. (1979; 1984; 1985) found that European faunal and floral species dominated the diet. He also determined that ceramic bottle forms decreased dramatically, while brimmed bowls, "... apparently inspired by their European counterparts ..." were common in the assemblage (Gregory et al. 1984:36). Few lithic artifacts were recovered at Los Adaes, perhaps indicating the use of glass and metal by the Indians instead of lithic materials. In addition, personal adornment gained a new status as the Spanish at Los Adaes, and the nearby French from Natchitoches, introduced trade beads to the Caddo (Gregory et al. 1979:80).

Northwest Louisiana experienced an influx of Southeastern tribes that were forced from their traditional lands. Swanton (1946:80) notes that the Alabama, Biloxi, Choctaw, Kosati, Pascagoula, and Seminole were among the groups that settled in Louisiana. Recent investigations at the Zimmerman Hill Site (16RA335), an Apalachee-Taensas village, revealed that migrant tribes utilized domestic animals, but still relied on local wild game and fish as a substantial part of their diet (Hunter 1990:110-112). The Apalachee-Taensas ceramics were adapted to European vessel forms and no evidence was

found to suggest that Caddoan ceramic designs or vessel forms were adopted by these immigrant tribes. The presence of European artifacts at the site, as well as ethnographic information, confirms the interaction of these people with Spanish and French settlers and traders in the area (Hunter 1990; Swanton 1946, 1953).

Other Caddoan tribes from northeastern Texas and southwestern Arkansas included the Kadohadacho, Petite Caddo, Nasoni, Nanatsoho, and Upper Natchitoches (Webb and Gregory 1986). By the late 1700s, Osage raids had resulted in the absorption of the Upper Natchitoches, Nanatsoho, and Nasoni by the Kadohadacho, who in turn moved into the vicinity of Caddo Prairie and Caddo Lake to avoid Osage incursions (Kniffen et al. 1987:91; Webb and Gregory 1986). By 1834, the Caddoan tribes had become so consolidated that the American agents treated them as though they were a single group (Webb and Gregory 1986). In 1835, the Caddo ceded their land to the United States and moved to the Brazos River in Texas (Webb and Gregory 1986).

Southeast Louisiana

Three major Native American linguistic groups occupied southeastern Louisiana at the time of European contact: Muskogean, Siouan, and Tunican. Muskogeans generally were concentrated in the Pearl River and Lake Pontchartrain regions, although they were found throughout the area; Muskogean speakers settled southeastern Louisiana and included the Acolapissa, the Choctaw, and the Pensacola. Siouan speakers, such as the Biloxi, inhabited the Pearl River area. The Tunica moved south from northwest Mississippi in 1706, and settled near the confluence of the Mississippi and Red rivers. By 1800, the Tunica relocated to the Avoyelles Prairie around Marksville (Smith et al. 1983). Disease and disruptive migrations, attributed to colonial expansion, accounted for the disintegration of aboriginal populations in the area. The Choctaw continued to occupy the St. Tammany Parish region, just south of Washington Parish, into the twentieth century (Bushnell 1909).

A number of other Muskogean speaking peoples settled the coastal portion of southeastern Louisiana prior to contact, including the

Houma, Bayougoula, Acolapissa, Mugulasha, Tangipahoa, Washa, and Chawasha. In 1700, approximately 3,400 members of these culture groups were recorded. The Houma were the most prominent of these coastal southeastern Louisiana tribes. This tribe originated in western Mississippi and settled along the bayous and marshes of Orleans Parish prior to continuing southwest into Terrebonne Parish. The Bayougoula peoples lived near Plaquemine in Iberville Parish and the Acolapissa settled near the mouth of the Pearl River. The remaining tribes inhabiting coastal southeastern Louisiana during contact, were relatively small, with a subsistence strategy based on agriculture, hunting, and fishing.

The region encompassing these early Native American settlements was extremely geologically dynamic. Although there is ample evidence of settlement within this region, large settlements were uncommon due to the propensity of flooding along the rivers and bayous (Smith 1983:97). Eventually, this problem would drive most Native Americans north and west to more desirable locations.

Conclusions

Prehistoric sites within the proposed SEIS project areas are unlikely to contain any intact cultural materials dating from the Paleo-Indian or Archaic Stages since the Mississippi River channel has changed course so many times throughout the Holocene Period. Instead, the remains of these cultures are found within the geologically stable west and central portions of the state. Within the northwestern portion of the state, Paleo-Indian and Early Archaic sites occur primarily along undisturbed Pleistocene ridge tops. In the southeastern portion of the state, they are found along relatively flat or undulating bluff tops overlooking floodplains and appear on the geologically unaltered prairie terraces.

The first groups that are found along the rivers and levees are those associated with Poverty Point Cultures. Settlements dating from the Poverty Point to the Contact Period were located along lake margins, especially at intersections with bayous or rivers; major natural river levees; active or relict river channels; or coastal marshes. Throughout much of the prehistory of

Louisiana, a settlement and subsistence pattern of seasonal fission and fusion was maintained to efficiently exploit locally available natural resources. It was not until the latest stages of prehistory that maize-based agriculture had a measurable impact on Native American settlement

and subsistence practices. In addition, many of the adaptive strategies employed by prehistoric Native Americans still were entrenched firmly in cultural adaptations during the protohistoric period.

CHAPTER IV

THE MISSISSIPPI RIVER IN HISTORICAL PERSPECTIVE

Introduction

This chapter presents a summary of information on the history of the Mississippi River Valley Region from Illinois to New Orleans. It begins with the time of European contact in the region and it extends into the twentieth century. This chapter provides a broad contextual framework for understanding the history of the current project area. The discussion incorporates both a regional and local approach to documenting the history of the Mississippi River Valley as it applies to the current investigation. A regional historical focus is used to document important historical issues and events that occurred as region-wide phenomena throughout the region. In addition, local, more detailed historical overviews are provided for each of the parishes associated with the 11 proposed project items. Background research was completed using a variety of historical, archival, and cartographic data. Secondary records, mainly state histories, were used in conjunction with the primary source data to create a historical synthesis of the overall project area.

A Regional History of the Mississippi River

During the seventeenth and eighteenth centuries, imperial expansionists in France, Britain, and Spain contended with each other for control of the river; after 1776 the fledgling United States joined in the struggle. The river served as a coveted prize during the American Revolution, the War of 1812, and most especially the Civil War, when the Con-

federacy attempted unsuccessfully to establish its sovereignty over the Mississippi and its outlet to the Gulf of Mexico.

As an artery of American commerce, the river fostered economic development through the centuries. All sorts of vessels including canoes and pirogues, keelboats and flatboats, steamboats and barges, diesel towboats and oil freighters, have plied the muddy waterway. Commerce on the river has not been free of peril. Numerous shipwrecks and fatalities have been recorded from accidents that have occurred up and down the river.

The importance of the Mississippi River is not confined to geographical, military, political, and economic matters. Such offerings as Mark Twain's novel, *Huckleberry Finn*, and Oscar Hammerstein II's lyrics to "Ol' Man River" have transformed the river into an icon of American culture. Much has been written about the river; a Mississippi of literature has flowed from pens and presses for several centuries. To summarize this extensive outpouring in one chapter or even one volume presents many difficulties.

The first section of this chapter discusses specific historical events and/or persons to generate a broad and very general chronological narrative. This section emphasizes such episodes as De Soto's travels, the New Madrid Earthquake of 1811, the Civil War, and the Great Flood of 1927. Proposed project items within the U.S. Army Corps of Engineers, New Orleans District are in

corporated into the narrative; each project item is fitted into place based on its associated historic context.

The European Discovery of the Mississippi River

Some scholars contend that the honor of discovering the Mississippi River should belong to the Spanish explorer Álvarez de Piñeda. In 1519, while sailing along the coastline of the Gulf of Mexico, his fleet was swept by a strong current from a river he named, from a distance, Río del Espíritu Santo. While Piñeda did not attempt to enter the river, which looked treacherous, he did note its existence in his log (Weddle 1985:100-104). Historians have debated for many years the exact nature of this discovery. Some authorities argue that he sighted the mouth of the Mississippi River others argue he recorded the entrance to Mobile Bay (Davis 1971:27).

Survivors of the Pánfilo de Narváez expedition passed by the mouth of the Mississippi during the autumn of 1528. After their expedition to Florida failed, the explorers tried to reach Mexico utilizing a small fleet of improvised boats. The mouth of the Mississippi proved a formidable obstacle. The explorers could not enter the river because of its strong current and sailing westward around the mouth of the river proved to be difficult, indeed. Only one boat reached Galveston Island, where the Spaniards encountered additional perils from the Native Americans who inhabited the area. Alvar Nunez Cabeza de Vaca, one of two survivors to reach safety in Mexico City, included an account of the mouth of the Mississippi in his chronicle of the ill-fated expedition (Weddle 1985:193-196).

The De Soto Expedition, 1539-1543

Hernando De Soto's expedition of 1539-1543 provided the first explicit descriptions of the Mississippi River. After participating in the Spanish conquest of Central and South America, De Soto and his men sought precious metals and other treasure in "La Florida," which on Spanish maps encompassed most of the North American continent. His expedition of more than 600 Spaniards sailed from Cuba to Tampa Bay in 1539 and three members of the expedition left chronicles of their journey. A fourth contemporary account was based on interviews with the survivors of the ex-

pedition. In spite of this documentation, historians continue to debate de Soto's exact route throughout the area.

The most painstaking effort at establishing the precise route was sponsored by the United States government under President Roosevelt's New Deal. To prepare for the four-hundredth anniversary of the De Soto landing in Florida (and to give employment to scholars during the Great Depression), the U.S. Congress created the U.S. de Soto Expedition Commission in 1935. Chaired by John R. Swanton of the Smithsonian Institution, the Commission tried to recreate De Soto's route through the wilderness. The Commission reported its findings in 1939 (Hudson et al. 1989:80). The de Soto Commission's conclusions remained unchallenged until Professor Charles Hudson, an archeologist at the University of Georgia, began to dispute the Commission's findings. By 1989, Hudson and his associates had redrawn de Soto's entire route (Hudson et al. 1989:77-98; Hudson 1994:74-103).

For the sake of discussion, this section utilizes the route has established by Hudson, but the narrative also includes three locations derived from the de Soto Commission's version of the explorer's itinerary: 1) the point where the expedition discovered the Mississippi; 2) the site where the expedition landed on the west bank after crossing the great river; and finally, 3) the location of De Soto's death and burial. This section does not incorporate the Commission's version of De Soto's peregrinations to the west of the river; the Commission itself could not agree about certain aspects of De Soto's route through the present state of Arkansas (Hanson and Moneyhon 1989:21).

According to Professor Hudson, in December 1540 the expedition crossed the Tombigbee River, which the Native Americans of the area called the River of the Chicaça (i.e., the Chickasaw), into the present state of Mississippi. Professor Hudson argues that the expedition then proceeded on a probable northwestward course near the modern Mississippi towns of Houston, Pontotoc, New Albany, and Holly Springs en route to the Mississippi River. As an indication that the explorers did not consider the river to be too significant, none of the four contemporary chronicles of the expedition notes the day on which the expedition first sighted the Mississippi River. The

party reached the river some time between May 8 and May 21, 1541 (Hudson 1994:91). By Hudson's calculations, the expedition viewed the river from the vicinity of Lake Cormorant in present day De Soto County, Mississippi, which lies in the extreme northwestern corner of the state, i.e., a few kilometers below Memphis, Tennessee.

The United States De Soto Commission in 1938 argued that De Soto reached and crossed the Mississippi River at a lower point, i.e., at Sunflower Landing, now known as De Soto Landing, in Bolivar County, Mississippi. They note that on June 19, 1541 the first contingent of the De Soto expedition crossed the river. The Spaniards then found themselves in the territory of the chieftain of Aquixo, which, according to Hudson, was located in the vicinity of present day Horseshoe Lake in Crittenden County, Arkansas (Hudson 1994:91). The United States De Soto Commission adjudged that De Soto crossed the river into the Old Town Bend area of Arkansas, far below the point Hudson suggested.

On June 21 the De Soto expedition set out towards the northwest. The explorers then built a bridge to cross a waterway (perhaps the waterway now known as Fifteenmile Bayou). The expedition passed near Simsboro, and De Soto reached his destination, the main town of Casqui, on June 24. Hudson believes this village was located at the Parkin archeological site, near modern day Parkin, Arkansas.

De Soto next visited Pacaha, located (by Hudson's interpretation) in Crittenden County, Arkansas. From thence the Spanish expedition descended the St. Francis River to present day Lee County, Arkansas, where they visited a series of towns known to the Native Americans as Quigu-ate. Believing that the gold they sought was located in the mountains rather than close to the river, the expedition in August 1541 departed Lee County to seek treasure in the West.

After a futile search for treasure beyond the Mississippi, the expedition returned to the vicinity of the river in March 1542. They stopped at Guachoya, a palisaded Native American village that, according to Hudson, was situated south of the Arkansas River and east of the present village of McArthur, Desha County, Arkansas. Hudson believes that near Guachoya a no longer extant channel connected the Bayou Macon with the Mississippi River.

Profoundly discouraged by reports from troops he sent on reconnaissance to locate treasure, De Soto died of a fever on May 21, 1542. His men first buried him at Guachoya, but to prevent the natives from desecrating his corpse, they reburied him in the Mississippi River. By tradition, the burial party set out from De Soto Landing.

According to the United States de Soto Commission, the expedition had moved into present day Louisiana by the time its leader had expired. The Commission placed Guachoya on the west bank of the Mississippi opposite and just upriver from Natchez (Hudson 1989:82). This interpretation strongly supports the tradition that the explorer was buried in Lake Concordia, a bed abandoned by the river a few centuries ago (Bragg 1977:184).

After De Soto's death, Luys de Moscoso de Alvarado assumed command of the expedition, which turned to the west in search of an overland route to New Spain (Mexico). The explorers ventured far from the Mississippi River, but they did not find the route they desired. The expedition returned to the Mississippi River and spent the winter of 1542-1543 at the Native American village of Aminoya, where they constructed boats to descend the Mississippi. According to Hudson, Aminoya was situated either at Deerfield or Old Town in Phillips County, Arkansas.

The expedition completed building its boats in June 1543 and they started down the river on July 2. That night they moored just below the mouth of the Arkansas River. The next day they descended the river to the Native American village of Huhasene, which Hudson argues was located north and west of present day Winterville, Mississippi.

The explorers sailed down the river through Louisiana and they reached the mouth of the Mississippi on July 18. Their perilous journey across the Gulf of Mexico then began. On September 10, 1543 the survivors of the great *entrada* reached what is now the state of Vera Cruz in Mexico. About half the original members of the expedition survived their trek of 5,633 km (3,500 mi) trek through North America and their voyage across the Gulf of Mexico.

Further Exploration of the Mississippi River

The French in Canada contributed importantly to the exploration of the Mississippi River.

Father Jacques Marquette, a Jesuit missionary, and Louis Jolliet, a trader, provided the first detailed account of this exploration of the river in 1673. In an effort to define a new northwest passage to the Pacific Ocean, the explorers gave up exploring the river once they determined that the Mississippi flowed towards the Gulf of Mexico; the two men did not pursue their search below the mouth of the Arkansas River (Morris 1953:61). The two explorers also are credited with the discovery of the present state of Missouri; they noted the Missouri River in their journals but they did not ascend it (Rafferty 1981:30).

A French expedition under the leadership of René Robert Cavelier, Sieur de la Salle, next explored the lower Mississippi River. Also coming from Canada, La Salle descended the river to its mouth and he sighted the Gulf of Mexico in early April 1682. He and his men made camp roughly three leagues from the mouth of the river in the approximate vicinity of what is now Venice, Louisiana, and near the Lower Venice Second Lift Project Item proposed by the U.S Army Corps of Engineers, New Orleans District. La Salle and his men explored the various passes for the next few days. With assurances from the Native American tribes that no other European power had "descended or ascended the River Colbert [Mississippi]," La Salle claimed all lands drained by the great river for Louis XIV, King of France. In the vicinity of the project area, La Salle erected along the river bank a cross inscribed with the coat of arms of France. A leaden plate was imbedded in a tree trunk. According to a historian of Plaquemines Parish:

Two hundred years later a hunter would unearth a sheet of metal bearing three rows of inscription. Friends would look at the sheet and shake their heads in mystification . . . After a few years the man would fashion bullets from the plaque and use them to hunt deer and alligator . . . (Buras 1996:14).

When he returned two years later with a group of colonists across the Gulf of Mexico, La Salle could not find the mouth of the river. He had incorrectly recorded its position and as a result, the expedition continued on to the Texas coast

where La Salle was murdered by his own men (Davis 1971:28-29; French 1875:17-27).

The Explorations of the Brothers Le Moyne

The French renewed their explorations in 1698. Pierre le Moyne, Sieur de Iberville, and his brother, Jean Baptiste le Moyne, Sieur de Bienville, sailed from France with a command of four ships and about 200 settlers. Establishing Fort Maurepas on Biloxi Bay as a base of operations, they began a series of intensive explorations. Iberville rediscovered the mouth of the Mississippi River in 1699. In the same year he explored Manchac Pass, the current location of the proposed Baton Rouge Front Levee borrow pit.

The Manchac Pass offered an alternative to the slow, treacherous, and difficult navigation through the mouth of the Mississippi. Through Manchac Pass, the Iberville River, named for its discoverer, connected the Mississippi River through Lakes Maurepas and Pontchartrain to the Gulf of Mexico. Unfortunately for the French, the so-called Iberville River was not a river at all; the slow moving stream only carried water over its first 8.1 or 9.7 km (5 or 6 mi) only when the Mississippi was high enough to flow through a crevasse in the natural levee. The inadequacies of the Iberville River created an obstacle to the development of this alternate route from the Mississippi River through Pass Manchac to the Gulf (Dalrymple 1978:12).

The establishment of New Orleans, ca. 1718, led to an increase in water traffic between the new city and the French ports of Biloxi and Mobile. Nevertheless, some vessels sailed through the mouth of the Mississippi; however, many took the shorter, safer route from New Orleans, down Bayou St. John, across Lake Pontchartrain, and through the Rigolets instead. By this route, the wayfarers passed the future site of the New Orleans District Floodwall project item. This route bypassed the sand and mud bars found at the entrance of the river, obstacles that could sometimes delayed a ship for a month or more. The route through Lake Pontchartrain could be utilized by a substantial number of vessels and the lake served as a pathway of communication between the Gulf

and New Orleans throughout the early eighteenth century (Giraud 1974:155-156; Surrey 1916:33).

The Bienville Grant and the Tchoupitoulas Settlement

After he founded the city of New Orleans, ca. 1718, Jean Baptiste le Moyne, the Sieur de Bienville, obtained for himself on March 27, 1719 a grant to an immense tract of land that included the present location of Carrollton and much of Carrollton Levee Enlargement project item (Mahé 1976:11). Bienville's grant extended for 12.9 km (8 mi) upriver from what is now Bienville Street in the Vieux Carré to about Monticello Avenue, the boundary between Orleans and Jefferson Parishes, Louisiana. Almost simultaneously in 1719, John Law's Company of the West began granting to European investors and a handful of Canadians land situated immediately upriver from Bienville's holdings. Usually known as the Chapitoulas or Tchoupitoulas settlement, the early eighteenth century concessions extended along the so-called east side of the Mississippi River from what is now Monticello Avenue to the Kenner city limits (Bezou 1973:x). The Chapitoulas concessions also included a portion of the Carrollton Levee Enlargement project item and all of the Jefferson Heights project item (Swanson 1976:65, 69; Wilson 1987:6, 225).

The Results of the French and Indian War, 1763

As a result of the French and Indian War, the French were expelled from the continent of North America. The Spanish obtained the former French territory west of the Mississippi as well as the Isle of New Orleans, with the Manchac Pass and Lakes Maurepas and Pontchartrain marking its northern boundary. The British assumed control of the former Spanish Florida colony and of all territory east of the Mississippi above the Isle of Orleans.

Baton Rouge, Louisiana 1763-1803

From 1763 to 1812, not quite half a century, no less than five flags flew over Baton Rouge and the Baton Rouge Front Levee project item. The area passed from France to Britain in 1763, from Britain to Spain in 1779, and from Spain to the

West Florida Republic in September 1810. After 74 days the United States annexed the West Florida Republic in December of 1810.

During the American Revolution, i.e., in 1779, the British built on the bluff at Baton Rouge a dirt stronghold, Fort New Richmond. They surrounded it with 3 ac (1.21 ha) of sharp pointed cypress stakes, called *cheval de frise* or palisades, to deter attacks. Overlooking the waterfront, the earthen fort stood just south of the present day Pentagon Barracks about where Boyd Avenue or Spanish Town Road intersects Lafayette Street in downtown Baton Rouge (Casey 1983:16). The fort, which is no longer standing, was located within what is now the proposed Baton Rouge Front Levee project item.

Soon after its construction, a Spanish army from New Orleans besieged the fort. Led by Don Bernardo de Gálvez, the Spaniards advanced towards the British stronghold along the slope between the bluff and the river. Gálvez mounted six cannon atop an Indian mound situated approximately 914 m (1,000 yd) south of the fort, near the present intersection of North Boulevard and Lafayette Street, i.e., to the south of the proposed Baton Rouge Front Levee project item. After three hours of continuous bombardment, the British surrendered the fort on September 22, 1779. (Casey 1983:17; Carleton 1981:20).

The treaty that ended the war in 1783 confirmed Spain's title to Baton Rouge and its fortifications. The population of the village expanded under Spanish rule and by the beginning of the nineteenth century, the inhabitants of Baton Rouge included doctors, lawyers, an interpreter, merchants, surveyors, tailors, carpenters, masons, tanners, butchers, blacksmiths, bakers, gunsmiths, and a lone priest. Public worship by non-Catholics, however, was forbidden (Meyers 1976:64-65;56-57).

Other Spanish Outposts and Settlements Along the River, 1763-1803

When all the colony of Louisiana on the west bank of the Mississippi came under the dominion of Spain in 1763, the Spanish permitted the establishment of various settlements up the river from their colonial capital of New Orleans. Few of these Spanish settlements survive today. The con-

stantly changing course of the Mississippi River has destroyed many of these early settlements. A sample of these settlements are described below:

Vidalia

Vidalia, in Concordia Parish, Louisiana, is credited with being the first settlement founded on the western bank of the Mississippi between Pointe Coupée and the mouth of the Arkansas River. In 1767 Spanish Governor Antonio de Ulloa established a post, Fort San Luis de Natchez, near the present town of Vidalia; the fort was constructed to counteract British influence at Natchez, just across the river. The Spanish discontinued the post in 1769. By 1798, when Natchez had come under American control, the Spanish government made a grant to Don José Vidal for the establishment of another fort opposite Natchez. In 1800 Vidal erected a small fort he called the Post of Concordia (Casey 1983:239-240). The village that grew up slowly around the post eventually took the name Vidalia when Vidal authorized land for its public buildings (Louisiana Writers' Project 1971:459). The changing course of the Mississippi River, however, has swept away much of the older portions of the town (Bragg 1977:188).

New Madrid

Another late eighteenth century settlement, New Madrid, was situated in Spanish territory on the west bank of the Mississippi River. The community now lies in New Madrid County, Missouri. New Madrid traces its origin to a fur trading post established during the American Revolution by François and Joseph Le Sieur, Canadian trappers, under the employ of Gabriel Cerré of St. Louis. Located near a village of the Delaware tribe, the trading post was known as "L'Anse à la Graisse" or Greasy Bend. With the close of the American Revolution, the United States confirmed title to the eastern bank of the Mississippi opposite Greasy Bend. In an effort to prevent further American expansion, the Spanish initially agreed to the elaborate plans of Colonel George Morgan, an American Revolutionary War veteran, to establish a buffer colony to be called New Madrid along the west bank of the river. Morgan's rectangular plan and survey of the prospective city extended for 6.4 km (4 mi) along the river bank. Unfortunately for Morgan, however, the Spanish Governor of Louisiana, Esteban Miró, withdrew

his support for this ambitious scheme. Although the Governor confirmed the land grants Morgan had made, he appointed a Spanish commandant, rather than Morgan, to supervise the community. With Morgan's extensive plans shelved, New Madrid persisted as a sleepy Spanish agricultural village and trading post until the Louisiana Purchase of 1803 (Missouri Writers' Project 1941:457-458).

The Louisiana Purchase, 1803

Although France ceded to Spain the colony of Louisiana (encompassing the Isle of Orleans and all the project items on the west bank of the Mississippi River) in 1763, Napoleon secretly forced Spain to return the territory to France in 1800. Learning of the secret transfer, the United States government was alarmed that strident French expansionists would replace the moribund Spanish empire in North America and that French possession of New Orleans would close the Mississippi to western commerce. President Thomas Jefferson sent James Monroe as a special emissary to Paris in an attempt to purchase New Orleans and to guarantee free navigation of the Mississippi River. Even before Monroe arrived, Napoleon had abandoned his plans for North America; the Emperor decided to sell outright the entire territory. Although Monroe's instructions did not cover such a contingency, he and Robert R. Livingston negotiated the purchase treaty, which did not define exactly the boundaries of the territory, but it did, nonetheless, clearly include New Orleans and all the project items situated on the west bank of the river. Ultimately the territory encompassed by the treaty measured 214,435 km² (828,000 mi²); the acquisition in effect doubled the size of the United States. The United States paid 15 million dollars for the Louisiana territory; this single purchase generally is considered to be the most significant real estate purchase ever made in the history of the world (Morris 1953:132-133).

Baton Rouge, 1803-1819

Although the United States acquired New Orleans and the vast territory situated west of the Mississippi River through the Louisiana Purchase (1803), Baton Rouge remained in Spanish hands. Nevertheless, as barge traffic increased along the river, more Americans began visiting the town. One such visitor from the United States, Fortescue

Cuming, described Baton Rouge in 1809. Although a few frame structures of "tolerable" construction stood on the bluff, he observed "a dirty little town of 60 cabins crouded [sic] together in a narrow street on the river bank, penned in between the Mississippi and a low steep hill . . ." (Cuming 1904:340)

Although still manned by Spanish soldiers, the town's fort (located at the site of the current Baton Rouge Front Levee project item), like the Spanish empire it represented, had fallen into decay (Chambers 1925:1:471). Recognizing the weakness of the Spanish defenses, American-born rebels within the province schemed to seize Baton Rouge for the United States. Before dawn on September 23, 1810, approximately 75 American conspirators approached the fort on horseback from the river; in dense fog they rode single file up a cow path through a gap in the cypress palisades.

At daybreak, the horseman slipped into the fort undetected, assembled in military formation on the parade grounds, and surprised the Spaniards. When a few Spanish guards fired at the Americans from the blockhouse, the invaders struck the building with a fusillade of musket fire. A Spanish lieutenant and a private were killed; four other Spaniards were wounded. The Americans seized the entire fort with no casualties (Arthur 1935:110). They then lowered the Spanish banner and replaced it with the fourth flag to fly over Baton Rouge, a single white star on a field of blue (Meyers 1976:96). Calling themselves the West Florida Republic, the rebels promptly asked for annexation to the United States. The American government quickly passed the enabling legislation, and on December 7, 1810, the insurgents raised the Stars and Stripes, the fifth banner over Baton Rouge (Meyers 1976:114).

At the close of the War of 1812, Congress established a U.S. Army post and arsenal at Baton Rouge in 1816. Dirt from the ramparts of the abandoned fort of 1779 was used to fill in the ravines on the newly established military grounds (Casey 1983:18). Construction of the five-sided Pentagon Barracks, one of the city's most important surviving landmarks, began in 1819. The barracks are located just upriver from the Baton Rouge Front Levee project item. Only four of the buildings remain. The poorly constructed fifth

structure partially collapsed in 1821 and it was demolished in 1828 (Casey 1983:13).

Outlaws Along the Mississippi River

In the late eighteenth and early nineteenth centuries, when Spanish control of the river was weakening and American authority had not yet been established firmly, outlaws preyed on commerce along the river. These criminals once constituted a real deterrence to river traffic, but their misdeeds have been exaggerated and obscured by more than a century of folk tales and legends. At this late date it is difficult to discriminate between fact and fiction.

Bunch Bend and Stack Island

Local tradition indicates that a Captain Bunch led a gang of outlaws at Bunch's Bend, now in East Carroll Parish, Louisiana. As the robbers preyed on flatboats descending the river, they were joined by other criminals who had been driven out of Kentucky and Missouri. Stack Island served as the lair for some of these outlaws.

These criminals represented perils to navigation. Flatboatmen first had to navigate successfully the treacherous bends in the river, including one called Devil's Elbow; secondly, the boatmen had to elude the outlaws of Bunch's Bend. The passage proved so difficult that when boatmen safely reached a lake along the Louisiana shore they considered it an act of Providence. According to tradition, Lake Providence and the community along its shore derive their name from this circumstance (Louisiana Writers' Project 1971:576-577; Nash 1993:59; Bragg 1977:143). The brigands eventually were dispersed by Kentucky flatboatmen rather than by law enforcement officials. By 1812, the area had been cleared of these hoodlums.

John Murrell and His Gang

John Murrell, perhaps the most notorious outlaw along the lower Mississippi River during the antebellum era, had his hideout at Stuart's Island on Lake Chicot in modern Chicot County, Arkansas. Murrell claimed that his mother "learnt me and all her children to steal so soon as we could walk" (Arkansas Writers' Project 1941:282). A criminal of considerable diversity, he not only engaged in robbing banks, stores, and

the United States mail, but also in river piracy, counterfeiting, and kidnapping. He had a flamboyant reputation and attracted scores of followers. His band was sometimes estimated at 1,000. In 1834, he finally was captured in Tennessee, where his enemies confidently expected that he would be hung. Instead, he was sentenced to prison, from which he triumphantly emerged after 10 years. He died of natural causes soon after regaining his freedom. In the meantime, his stronghold on Stuart's Island was attacked and destroyed by the indignant citizens of Chicot County, who left not a trace of the outlaw's hideout behind (Arkansas Writers' Project 1941:282).

The New Madrid Earthquake of 1811-1812

Although the epicenter of the earthquake was located at New Madrid, this shattering cataclysm severely affected many sites throughout the Mississippi and Ohio valleys and beyond. The first shock, which lasted four minutes, struck Louisville, on the Ohio River, at 2 p.m. on December 16, 1811. Although in early afternoon, the tremor was accompanied by thunder, complete darkness, and sulfuric vapor, as if in fulfillment of Biblical prophecy. In the following weeks the community experienced 87 shocks and tremors continued into March 1812. In response to manifestations of what appeared to be divine disapproval, public morals in Louisville noticeably improved (Kentucky Writers' Project 1939:180).

If the citizens of Louisville were dismayed by the earthquake, the settlers who lived along the Mississippi River found it even more frightening. An eyewitness recalled:

The agitation which convulsed the earth, and the waters of the mighty Mississippi, filled every living creature with horror . . . A loud roaring and hissing was heard, like the escape of steam from a boiler, accompanied by the most violent agitation of the shores, and tremendous boiling up of the waters of the Mississippi in huge swells . . . The earth on the shores opened in wide fissures, and closing again, threw the water, sand, and mud, in huge jets, higher than the tops of the trees . . . the river rose in a few minutes five or six feet . . . Numerous boats were wrecked on the snags and . . . sulphureted gases that were discharged during the shocks, tainted the air with the noxious effluvia (Arkansas Writers' Project 1941:293).

The New Madrid earthquake was felt as far away as northern Louisiana, where it even effected the flow and the predictability of the mighty Mississippi River.

Reelfoot Lake

The New Madrid Earthquake, which shook the greater part of a continent, had a pronounced effect on northwestern Tennessee and southwestern Kentucky. Lofty bluffs once lined the east bank of the Mississippi River in this area, but between December 16, 1811 and March 15, 1812, the earthquake swept these bluffs into the stream and leveled the countryside. The ground sank, and the Mississippi River reversed its current. A torrent of water inundated a valley 32 km (20 mi) in length to form Reelfoot Lake (Tennessee Writers' Project 1939:427-428). The lake once covered "a submerged forest that lifts skeleton arms above the surface of the water" (Kentucky Writers' Project 1939:328). The spectral tree trunks have since disappeared from view.

Logging Along the Mississippi River

Logging has been an important enterprise along the shore of the Mississippi River throughout its history. Today, reforestation attempts have been initiated to repair some of the damage that the lumber industry inflicted on the environment.

Cypress Point

Early in the eighteenth century the French colonists in Louisiana discovered the value of the bald cypress; they used the bark for roofing and sawed the huge trees into planks to be exported from the colony. By 1758, the slow-growing cypress had become so scarce that the price of the lumber had tripled.

Although the French depleted the cypress timber in the lower reaches of the Mississippi River, cypress still abounded upriver. In particular, unscrupulous exploiters found a rich forest of cypress located on government-owned land at Cypress Point in what is now Desha County, Arkansas. Early nineteenth century commentators such as Zadok Cramer (author of *The Navigator*) deplored the theft of this timber from Cypress Point and its effects on the environment. Another

commentator and pioneer environmentalist, John James Audubon, noted a logger who had made \$6,000.00 by floating a log raft downriver to New Orleans. According to Audubon, the entrepreneur made his money entirely from "logs stolen from the Government's land" (Bragg 1977:122). Although cypress forests of immense size and beauty once occupied Cypress Point, only the name of the point remains to remind travelers of its former importance.

The Lumber Industry in the Mississippi Delta

Although the Mississippi Delta produced cotton as its principal crop, timber provided an important source of additional wealth in the late nineteenth and early twentieth centuries. By 1890, Memphis claimed to be the largest market for hardwood timber in the world (Smith 1988:209). Most of these hardwoods originated in the Mississippi Delta where northern and foreign companies purchased, at little expense, timber rights to huge tracts. The lumber companies viewed the Delta as a region to exploit, while the planters within the Mississippi Delta considered the removal of the forest a cheap way to clear their lands. The ecology of the region suffered as a result.

Most of the hardwood forests of the Delta were exhausted by the 1930s, but the Crown-Zellerbach Paper Corporation began a reforestation program in Issaquena County, Mississippi in the 1960s; the company converted 15,000 ac (6,070 ha) of former cropland to cottonwood tree plantations. In 1967, 145,000 ac (58,681 ha), representing more than half of Issaquena County, were classified as forest land (Issaquena County Rural Development Committee 1967).

Lost Landmarks along the Mississippi River

The river's varying, erratic course has caused the rise and fall of various landmarks along its ever-changing banks. For example, Mark Twain described with wit and poignance the lost town of Napoleon, Arkansas, which once stood at the mouth of the Arkansas River. Twain wrote:

It was an astonishing thing to see the Mississippi rolling . . . straight over the spot where I used to see a good big self-complacent town twenty years ago. Town that was county-seat of a great and important county; town with a big United States marine hospital; town of innumerable fights - an inquest every day; town where I had used to know the prettiest

girl, and the most accomplished, in the whole Mississippi valley . . . a town no more - swallowed up, vanished, gone to feed the fishes . . . (Arkansas Writers' Project 1941:281, quoting Mark Twain).

Twain's epitaph for Napoleon could apply to numerous other lost landmarks that once stood up and down the river. Spanish Moss Bend provides one such example.

Spanish Moss Bend

Spanish Moss Bend was once a busy and picturesque agricultural community that got its name from the large amounts of Spanish moss suspended from tall cypress trees that lined the banks of the Mississippi River. As he descended the Mississippi in 1801, Zadok Cramer described "this beautiful right hand bend . . ." He wrote:

In this bend the *Spanish Moss* or *Tillandsea*, makes its first appearance on the Mississippi. This singular vegetable is also called *Spanish Beard* . . . It suspends itself in loose drapery from the tall majestic cypress trees . . . It is found highly useful, and I believe equal to hair, for mattresses (Leahy 1931:187).

Unfortunately, Spanish Moss Bend, like many other towns situated on the banks of the Mississippi River in the late 18th and early 19th centuries, was destroyed as the Mississippi once again changed its course. The Tarpley Cutoff removed Spanish Moss Bend from the river in 1935.

Trotter's Landing

Trotter's Landing in nearby Tunica County, Mississippi also suffered economic and social changes as a result of the Mississippi River changing course. During the nineteenth century, Trotter's Landing was situated on the river and was a busy rivertown where agricultural products were produced and transported downriver. Eventually, however, the river changed course, moving further away from the town, thus limiting access to transportation routes. Today, Trotter's Landing lies inland at some distance from the river.

Concordia Cemetery

The Concordia Cemetery alone survives from the community of Concordia, which the river swept away. The cemetery now is incorporated into the outskirts of Gunnison in Bolivar County, Mississippi. Inscriptions on the graves indicate

that the lost town of Concordia had a well-deserved reputation for violence. Many of the inscriptions bear the epitaph: "Killed in Concordia" (Mississippi Writers' Project 1988:349). Also in Bolivar County, three cemeteries alone survive from the former plantation community of Eutaw. These cemeteries are situated *beside* the Mississippi River, but many persons lie buried in watery graves *within* the river.

The Mississippi River as a Graveyard

A survey of cemeteries should not obscure the fact that the river itself served as a graveyard. All up and down the river, a variety of serious accidents some with many fatalities, have occurred. Those described below represent only a small sampling of the ships lost up and down the Mississippi River. They were chosen because they are among the best documented.

The Wreck of the *Pennsylvania*

The *Pennsylvania*, a steamer, exploded near the town of Austin, Mississippi during a severe flood in 1858. The wreck drifted upriver by Austin and lodged near the foot of Ship Island. Like Austin, Ship Island now is landlocked completely. The *Pennsylvania* carried nearly 400 passengers, many of them German immigrants. About 160 persons died in the accident. Among the fatalities was the boat's clerk, Henry Clemens. His brother, Sam Clemens, served as the *Pennsylvania's* cub pilot, but due to a last minute change of plans, Sam remained in New Orleans. Had he shared his brother's cabin, Sam Clemens might have shared his brother's fate; eventually, under the pen name of Mark Twain, he would delight the world with chronicles of the Mississippi River and with numerous other literary productions.

Wrecks at Osceola

At Osceola, Arkansas, an 1874 report recorded three wrecks still lying in the channel. The *Carolina* had run on a snag in 1841. A total of 34 people died as a result of this tragedy. The *Tara* and the *Telegraph* also had sunk trying to navigate around the snags and bars of Plum Point Reach. Plum Point Reach was mentioned as one of the most hazardous areas of navigation within the lower river (Bragg 1977:54-55). This area of the river has claimed numerous boats and as a result

caused much pain and suffering throughout its history.

The Wreck on Island 93

Island 93 once lay in the river near Mayersville, Mississippi; it now has been added to the eastern bank just below the town. In 1852 the sidewheel steamer *Western World* collided with the *H.R.W. Hill*. A total of 12 persons died as a result of this accident. Despite the violent collision of the two steamers, the *Western World* continued to drift for some time. Eventually, the steamer took on too much water and it sank at Island 93. The former Island 93 lies just outside the levee below Mayersville, Mississippi.

Wrecks at Kentucky Bend

Kentucky Bend lies nowhere near Kentucky; this bend in the Mississippi River is situated between Chicot County, Arkansas and Washington County, Mississippi. In February 1846 a southbound steamer called the *Saladin* stopped at Kentucky Bend to disembark a passenger. In the meantime, a northbound steamboat, the *Congress*, hurtled through the darkness into the bend. The two vessels collided, and the *Congress* sank within five minutes of making contact. Approximately 20 people died in the accident.

Approximately five years later, on May 2, 1851, the steamer *Webster* burst into flames at the head of Kentucky Bend. Stirred by the wind, the fire spread so rapidly that the vessel could not safely reach the shoreline. One passenger, who jumped overboard and watched the proceedings while clinging to a snag, reported the incident to a Vicksburg newspaper. The witness later recalled:

Gracefully the burning boat, now completely on her own course, bore away with her the load of agitated victims, the flames bursting from her in every part, and through which, with a despairing scream, passenger after passenger plunged or was precipitated into the river (Bragg 1977:136137).

The vessel was considered a total loss, and between 40 to 60 persons lost their lives in the accident.

Wrecks at Black Hawk Point

A shipwreck gave Black Hawk Point in Concordia Parish, Louisiana its name. The steamer *Black Hawk* exploded at this location on Decem-

ber 27, 1837. The steamer was transporting passengers, a full complement of army officers, and U.S. government funds (intended for a payroll). The leaking ship drifted downstream as the fire blazed. Approximately 30 people died in the accident. Everyone on board lost personal property, and most of the government's payroll was claimed by the Mississippi River.

In March 1854, another steamer, the *John L. Avery*, sunk at the same location after running into a snag. The steamer was loaded with freight, including hogsheads of sugar. The hogsheads of sugar, tightly packed along the decks of the steamer, hemmed in the passengers. As the ship began to sink, the passengers, mostly Irish immigrants hemmed in by hogheads of sugar, could not escape. An estimated 80 to 90 of these hapless passengers died in the accident (Bragg 1977:193). The Fifth Levee District Levee Enlargement and Borrow Pit now stands at this location.

Plantation Agriculture Along the Mississippi River

Plantation agriculture is characterized by substantial land holdings and the production of a staple crop by the use of controlled labor. Slaves constituted the work force along the lower Mississippi River during the antebellum era; after the Civil War and emancipation, sharecroppers and tenant farmers tilled the fields. Plantation agriculture was the heart and soul of most southern states, including Louisiana, through the early part of the twentieth century. Principal cash crops grown in Louisiana included cotton and sugar cane; subsistence crops included corn, wheat, peas, beans, and Irish potatoes.

Earliest Settlement of the Mississippi Delta

No location along the Mississippi River is identified more closely with plantation agriculture than the Mississippi Delta region. The Mississippi Delta was first settled in Washington County, Mississippi, in the vicinity of Lake Washington, which is considered one of the most beautiful lakes in the Delta. The plantation system quickly developed beside the lake; slave labor was employed in the production of cotton, the staple crop associated with most southern plantations at this time.

Deerfield and Refuge Plantations, Washington County, Mississippi

Mississippi Chart No. 40, Mississippi River Commission, 1879-1880 and 1913-1915 indicate that these two plantations were once great cotton producers. Refuge was located on the river; Deerfield was situated on Lake Lee and used the Refuge Landing on the Mississippi. Before 1858, the sites of the future Refuge and Deerfield plantations were located in Arkansas. In 1858, however, the Mississippi took a shortcut that has been called the American Cutoff. The river abandoned its old channel, which became Lake Lee. When the river cut a new channel in 1858, the first steamboat to try to navigate the cutoff had a cub pilot named Samuel Clemens. He recalled in *Life on the Mississippi* that his steamship could not navigate the strong current when the cutoff first occurred, but a day or two later steamboats were passing through the cutoff with ease (Bragg 1977:136).

Longwood Plantation

The original tract of 22,000 ac (8,903 ha) at the Longwood Plantation was bought from the government in 1822. Ben Smith, a planter, constructed the house located on the site 10 years later. Since its construction, the plantation house has been moved twice away from the river, first in 1854 and then again in 1885. In the latter year, a Native American mound was utilized as the third site of the house. In addition, four rooms were added to the house in 1848 and four more in 1870 (Mississippi Writers' Project 1988:354). Longwood Plantation relied on the cultivation of cotton for its major source of income.

Plantations at Tallula and Fitler's Bend [Magna Vista]

Plantations at Tallula and Fitler's Bend extend through an isolated corner of the Mississippi Delta. From its earliest settlement, ca. 1831, to the present this region has seen relatively little change. Large cotton plantations, manned by slave labor, were established along this stretch of the river early in the nineteenth century; the postbellum tenant/sharecropper system and twentieth century agricultural mechanization have converted the individual fiefdoms into consolidated planting

operations. Cotton, soybean, and timber constitute the primary crops today. The vicinity has been so altered by changes in the course of the river that few historic structures or artifacts remain.

Delta Planter's Company at Deeson, Mississippi

Large quantities of foreign capital were invested in the Mississippi Delta after the Civil War. Dutch investors purchased and maintained the Delta Planter's Company in Deeson, Mississippi. The 8,800 ac (3,561 ha) Delta Planter's Company holding later was purchased and managed in the 1930s by Oscar Johnston, a native Mississippian and entrepreneur. Johnston also managed the 38,000 ac (15,379 ha) of the Delta and Pine Land Co. Plantation, owned by investors in Manchester, England (Mississippi Writers' Program 1988:349-350). Both were large-scale cotton producers.

Absentee Ownership: Blackhawk Plantation

The Nabobs of Natchez, the affluent planters who made their home in that community, owned many plantations away from the town. Many of these plantations were located in Concordia Parish, Louisiana, where the Fifth Louisiana Levee Enlargement and Borrow Pit now is situated. Blackhawk Plantation serves as an example of a plantation in Concordia that was owned by a succession of prominent citizens of Natchez. As previously mentioned, the plantation and Black Hawk Point derived its name from a steamboat accident that occurred there in 1837.

Another example of an absentee landowner was William St. John Elliot. Elliot made his home at D'Evereux, a mansion that still stands in Natchez, but he made his living from plantations far afield. He also served as President of the Natchez Protection Insurance Company. At his death in 1854 he owned three plantations on the west bank of the river in Concordia Parish, including Black Hawk Plantation, Ballymagan Plantation, and Withlacoochee Plantations. Blackhawk encompassed 2,909 ac (1,177 ha) valued at \$34,829.50, Ballymagan measured 3,163 ac (1,280 ha), valued at \$31,664.00, and Withlacoochee covered 1,500 ac (607 ha), valued at \$9,706.00. Elliot's widow inherited the properties, which by 1860 included 177 slaves (Hinks et al. 1993:40). Mrs. Elliot had to sell the three plantations at the end of the Civil War, when she and

most of her fellow Southerners were experiencing hard times.

The Concordia plantations struggled throughout the remainder of the nineteenth century, but early in the twentieth century they once more were acquired by affluent absentee owners living in Natchez. The Britton and Koontz Bank and the Learned family of Natchez obtained the properties collectively known as Black Hawk. One of the richest families in the city, the Learneds had many economic interests, including cypress lumbering. The family was involved in ownership of Black Hawk until 1973, by which time the plantation included 2,200 head of cattle. Cotton production and timber remain an important source of income at the site (Hinks et al. 1993:40-47).

Seizing Command of the River in Wartime, 1861

Alone among the states containing project items, Illinois did not permit slavery at the time of the Civil War. Missouri and Kentucky contained many slaveholders and southern sympathizers, but these states remained in the Union during the conflict. Seceding early in 1861, Mississippi and Louisiana participated in organizing a new provisional government, the Confederacy. When Confederate forces fired on Fort Sumter in the harbor of Charleston, South Carolina, in April 1861, President Abraham Lincoln called for volunteers to suppress the rebellion. Faced with a choice of joining the seceded states or subduing them, Arkansas and Tennessee decided to join the Confederacy.

Threatened by the authority of the United States on the Mississippi River, the secessionist movement began during the winter of 1860-1861. In particular, when Louisiana left the Union in January 1861, the mouth of the Mississippi River suddenly came under the control of a foreign power. Federal officials responded strongly to this challenge by asserting their authority, whenever possible, along vital stretches of the river.

Birds Point

Birds Point, Missouri, occupied such a pressure point; it was located just below Cairo Point, Illinois, at the junction of the Ohio and Mississippi Rivers. Abram Bird from Virginia had

cleared a patch of forest at the site in 1798. He had then built a warehouse to provision flatboatmen for their long trip downriver to New Orleans. The Bird family had occupied the point ever since.

Nevertheless, Federal authorities in 1861 suspected the Birds of secessionist leanings. Although Missouri remained in the Union, many of its citizens held strong sympathy for the South. Federal troops arrested John A. Bird and confiscated the ferry (the *Manchester*) he operated across the Mississippi River. U.S. troops then occupied Bird's house and plantation. Minor skirmishes, much exaggerated by the participants, occurred at the point during the Civil War, but the United States retained control of this important location (Missouri Writers' Project 1941:424; Bragg 1977:3-4). The John A. Bird house, built in 1822, was recorded as a Missouri landmark in 1941 (Missouri Writers' Project 1941:424).

The Mississippi River in the Civil War

When the southern states threatened to secede in 1850 over the admission of California to the Union as a free state, Senator Henry Clay of Kentucky warned Southerners that peaceable secession would never be permitted. The United States, he said, would never allow the mouth of the Mississippi River to fall into the hands of a foreign power. Although Southerners accepted Clay's Compromise of 1850, they forgot his warning. Approximately 10 years later they learned that Clay had assessed the situation with prescient accuracy.

At the outbreak of war in 1861, northern leaders disagreed about a sweeping military strategy. Nevertheless, all agreed that the reestablishment of Federal control over the Mississippi River must and should be a paramount military aim of the United States (McPherson 1988:333-338).

The Fall of New Orleans and the Surrender of Baton Rouge

New Orleans, the largest city in the Confederacy, remained under the rebel flag for only a year before the community was restored to the Union. In April 1862, Commodore (later Admiral) David Farragut successfully led a Union fleet through a barrage at Fort Jackson and Fort St. Philip, each located approximately 120.7 km (75 mi) below the city. On April 25, the Federal fleet steamed into New Orleans where mobs on the

levee were burning cotton and cursing the Yankees. A 17 year old New Orleans boy, George Washington Cable, recalled:

... the crowds on the levee howled and screamed with rage. The swarming decks answered never a word; but one old tar on the *Hartford* [Farragut's flagship], standing with lanyard in hand beside a great pivot-gun, so plain to view that you could see him smile, silently patted its big black breach and blandly grinned (McPherson 1988:420, quoting George Washington Cable).

Although the mayor of New Orleans declined to surrender, Farragut on April 29 sent in the marines to raise the United States flag over all public buildings. On May 1, General Benjamin Butler with his troops entered the city and initiated his businesslike rule over New Orleans and all the project items located in the general vicinity, including the New Orleans District Floodwall, the Carrollton Levee Enlargement, the Jefferson Heights, and the Carrollton Levee Enlargement Borrow Pit project items (McPherson 1988:420-421).

Duncan Kenner's Escape

After New Orleans fell to Union forces in 1862, Federal authorities attempted to arrest Duncan Kenner, a prominent member of the Confederate Congress and one of the richest and most influential of Louisianans. Kenner was in residence at his Ashland Plantation, a large plantation situated on the east bank of the Mississippi River in Ascension Parish. When Federal troops impressed a steamboat into service and arrived by night at Ashland Landing to seize Kenner, the steamboat captain disobeyed orders and blew his whistle to warn Kenner of the enemy's approach. Kenner fled upriver, first to Waterloo Plantation, the residence of a kinsman, Stephen Minor. According to a reminiscence of Kenner's daughter:

Waterloo was reached, and might have been considered a safe refuge for the night, but my father and Stephen [Minor], after some discussion, thought best to make assurance doubly sure. The carriage was ordered, and Anthony [a faithful slave] summoned to drive it . . . The carriage was driven to Indian Camp, the plantation and residence of old General Camp, who was a staunch friend. He also helped my father on his way to safety by sending him in a skiff across the river to the house of another friend [probably John Andrews of Belle

Grove], and the latter sent him further on and more into the interior, where gunboats could not penetrate (Seebold 1941:I:146).

Ashland (now Belle Helene) and Waterloo plantations are located within the purview of the Carville to Marchand Levee Enlargement and Concrete Slope Pavement and Borrow project item, which extends upriver into a portion of Indian Camp Plantation (later nucleus of the Louisiana Leper Colony and the Hansen's Disease Control Center at Carville).

The Surrender of Baton Rouge

A detachment from the Federal fleet arrived in Baton Rouge on May 7, 1862. On May 9, a Federal landing party seized control of the arsenal and the barracks, which were situated adjacent to the Baton Rouge Front Levee project item. The Confederates offered no resistance. To add to local troubles, on May 18, 1862 a crevasse or serious break in the levee occurred 3.2 km (2 mi) downstream from Baton Rouge. Just as panicky refugees discovered all the southbound roads from town were flooded, Flag Officer David Farragut, the main Federal fleet, and troop transports carrying 1,500 soldiers dropped anchor off the waterfront.

On May 28, 1862 zealous Confederate guerrillas fired buckshot from a group of shanties situated along the wharves and they injured three Federal sailors. Farragut was incensed. He bombarded the Baton Rouge waterfront with his cannon, and this led to the death of a few women who were fleeing through the streets. The cannon fire damaged the Capitol, the Harney House Hotel, and St. Joseph's Roman Catholic Church, the town's largest house of worship. Further strife was averted when several prominent local citizens rowed out to Farragut's flagship and convinced him to end the shelling. The next day, May 29, Baton Rouge surrendered.

Incidents in the Vicksburg Campaign

In 1862 and 1863, the Federal troops and ships made plans to besiege the Confederate stronghold at Vicksburg, the last bastion that the Confederacy. President Abraham Lincoln in 1862 was intrigued with a plan to dig a canal across Young's Point that would serve as a cutoff and

reroute the river, leaving Vicksburg, quite literally, high and dry.

The Federal forces before Vicksburg had a frustrating summer in 1862. Farragut found the Confederate fortress impregnable to naval assault alone. Furthermore, the Confederates had managed to build an ironclad, the *Arkansas*, that effectively harassed the Federal fleet. Finally, the construction of the canal across Young's Point was encountering serious obstacles.

Soldiers, sailors, and runaway slaves all were working to excavate the canal, but they were being decimated by typhoid, dysentery, and malaria. Furthermore, the river was not cooperating with the effort. Summer drought lowered the water level and this not only made the idea of a cutoff less feasible it also threatened to ground Farragut's ships. Angry and dismayed, Farragut headed back down river and gave up the 1862 assault on Vicksburg.

Late in 1862 Vicksburg experienced a second assault. A Federal fleet arrived at Milliken's Bend on Christmas Day. Late in the month, General William Tecumseh Sherman led his Federal troops through very difficult terrain to the Yazoo River in an attempt to breach the upriver Confederate defenses of Vicksburg. Sherman's waterlogged and weary troops were repulsed by the heavy losses inflicted by an entrenched and much smaller group of Confederates. Sherman withdrew to Milliken's Bend once more (McPherson 1988:577-579).

In January 1863, General U.S. Grant arrived in the Willow Point-Youngs Point vicinity. To his dismay, he had inherited the scheme to construct the canal across Young's Point, the feature that so intrigued President Lincoln. Grant set his men to work on the cutoff and on March 6, 1863 he reported to the Secretary of War that the canal was nearing completion. The next day the Mississippi River washed over the dam situated at the upper end of the canal, and the digging never resumed.

General Grant, who had never believed in the scheme, regarded the various debacles at the canal as "providential failures" (Bragg 1977:156, quoting U.S. Grant). He could now abandon the canal and undertake a land route that would lead him to Vicksburg and to military glory. He gathered all his troops at Milliken's Bend and he led them down the west bank of the river to a point below

Vicksburg for a new assault on the Confederate fortress.

General Grant's Route To Vicksburg

Thwarted in his initial attempts to attack Vicksburg, Grant embarked on a risky plan (McPherson 1982:312). Starting out from a point on the Louisiana side of the river above Vicksburg, he marched his army downriver along the west bank to a point below Vicksburg. Leaving his communications and supplies behind, he was determined to approach the fortress at Vicksburg from a new angle. Along the way his troops raided plantations at will and confiscated anything useful from the plantation that fell in their path.

En route, Grant's army passed by Hurricane Island at Davis Bend, the location of Jefferson Davis' Brierfield plantation house. Federal troops confiscated most of the Confederate President's belongings and they scattered some of them about the grounds. General William T. Sherman was amused to find in front of the plantation house a volume on the U.S. Constitution that contained Davis' ownership signature.

According to local tradition, Winter Quarters Plantation on Lake St. Joseph was saved from destruction by Julia Nutt, the widow of Dr. Haller Nutt. In 1860, Dr. Nutt's considerable properties extended from Adams County, Mississippi to the coastal regions of Louisiana. He owned 21 plantations, 800 slaves, and 42,947 ac (17,381 ha) (Wayne 1983:9-10). The Nutt family's chief residence was situated at Longwood Plantation in Natchez, where they had started construction on an octagonal-shaped mansion. The construction of this Moorish style mansion was interrupted, however, by the events of the Civil War. The structure, still incomplete, is owned today by the Pilgrimage Garden Club of Natchez (Kempe 1979:1:51-52).

When Mrs. Nutt realized the Union threat to her property at Winter Quarters, she rode out to meet General Grant. She supposedly made a deal with the General to feed and shelter his troops in return for sparing her plantation. Although the Federals burned 14 plantation houses in the neighborhood, the soldiers in fact spared the main dwelling house at Winter Quarters, where they stayed overnight before crossing the river. Nevertheless, the Federals seized all the plantation's

livestock and they burned ca. 5,000 bales of cotton, the plantation's cotton gins, and a sawmill (Fontenot and Ziegler 1987:88-93).

General Grant camped overnight at Winter Quarters Plantation. He at first intended to transport his army across the river at Hard Times Landing, situated just above Coffee's Point, but Grant recognized that the Confederate forces located across the river at Grand Gulf posed a serious threat to his men. Instead he chose an embarkation point he identified as De Shroon's, a spot situated downriver from Hard Times Landing.

The jumping-off point Grant chose has various spellings. In Mississippi, the name is spelled Disharoon (Kempe 1979:78). Probably the most reliable source, Cayton's *Landings*, identified the landing as Disheroon (Cayton 1881:13). Nevertheless, Grant's *Memoirs* identifies this point De Shroon's Landing (Grant 1990:319,321), and so it has been recorded in the histories of the Vicksburg campaign.

Grant planned to cross from De Shroon's to a landing situated about 14.5 km (9 mi) downriver near Rodney, Mississippi, but a local African-American informed him that "a good landing would be found at Bruinsburg, a few miles north of Rodney" (Grant 1887:318). Acting on this information, Grant ferried 22,690 men from De Shroon to Bruinsburg on April 30, 1863. They landed unopposed and were able to march inland to Port Gibson. The crossing at Coffee Point was one of the largest amphibious assault in American history, to be eclipsed only by the D-Day invasion of 1944 (Hicken 1966:155). Recalling his elation at crossing the river, Grant many years later wrote:

When this [crossing] was effected I felt a degree of relief scarcely ever equaled since. Vicksburg was not yet taken it is true, nor were its defenders demoralized by any of our previous moves. I was now in the enemy's country, with a vast river and the stronghold of Vicksburg between me and my base of supplies. But I was on dry ground on the same side of the river with the enemy. All the campaigns, labors, hardships, and exposures from the month of December previous to this time that had been made and endured, were for the accomplishment of this one object (Grant 1887:321).

Grant eventually pressed onward to victory across the river.

Incidents at Louisiana Bend, Ashton Landing, and Carolina Landing

Although a few major battles occurred on the Mississippi River during the Civil War, the military action generally consisted of minor skirmishes, hit and run attacks, and depredations. For example, Federal forces cut the levees at Louisiana Bend in 1863; three breaks in the levee remained unprepared seven years after the Civil War ended.

When the Confederate fortress at Vicksburg fell on July 4, 1863, President Abraham Lincoln declared that the Mississippi River once more flowed "unvexed" to the sea. Lincoln's statement, however, was not entirely accurate and small groups of Confederate soldiers continued to harass Federal ships utilizing the river. For example, on Sunday morning July 24, 1864 a Federal transport, the *Clarabel*, was traveling northward with 400 artillerymen from a Michigan regiment onboard. When Confederate soldiers fired on the vessel from Ashton Landing (positioned just above the Louisiana state line on the Arkansas side of the river), about 13 of the soldiers on the transport were injured. The vessel limped upriver and out of range of the confederates; it then turned into Carolina landing, in Issaquena County, Mississippi. While the *Clarabel* was trying to repair the holes in its hull, the Rebels relocated their artillery and they began shelling the vessel. An exploding shell set the *Clarabel* on fire. Although the vessel was destroyed, the soldiers on board escaped capture by fleeing on foot from the scene (Bragg 1977:141).

Gaines Landing, Arkansas, as a Confederate Base

A small rivertown, Gaines Landing in Chicot County, Arkansas, was used by Confederate forces to harass the Federal vessels traveling on the Mississippi during the Civil War. The Federal troops burned the village in retaliation. Nevertheless, Confederates continued to operate in the ruins of the little town and later a Confederate cavalry unit from Texas attacked the *Delta*, a Union transport. The Texans damaged the vessel so badly that the crew had to abandon ship.

In 1864, the Confederates moved a battery of 10 guns to Gaines Landing in order to harass the Federals more effectively. The Confederate artillery unit attacked 21 Federal vessels. The Confed-

erate officer in charge reported his score as: five disabled; five damaged; two sunk; two burned; and two captured. The remaining five vessels, presumably, escaped unharmed.

Once more, Federal troops drove the Confederates out of their position at Gaines Landing, but once more the Rebels returned. On August 14, 1864, Confederate forces made a surprise attack on the *Empress*, an unarmed commercial steamer. The vessel received 63 hits, and the captain was killed. Although the passengers begged to surrender, the officers and crew refused. Fortunately for the passengers, a Federal gunboat, the *Romeo*, came to the aid of the *Empress* and it towed her to safety. Thereafter, a garrison of United States cavalry, artillery, and African-American infantrymen were stationed at Gaines Landing to prevent its use by the Confederacy.

Battle of Ditch Bayou

Sunnyside Plantation was established in the 1830s by Abner Johnson, one of the early settlers of Chicot County, Arkansas. During the Civil War Confederate troops, operating in the vicinity of Sunnyside, harassed the Federal vessels sailing on the Mississippi River. To stop the harassment and punish the Rebels, General A. J. Smith with 10,000 Federal troops in 50 boats disembarked at Sunnyside Landing in the late evening of July 6, 1864. Outnumbered and short of ammunition, the 500 Confederates under General John S. Marmaduke made a brief stand against the Federals at Ditch Bayou but they soon withdrew. In order to eradicate the Confederates' food supply, the Federals destroyed all the cattle in the vicinity. Since the local newspaper favored the Confederacy, the Union forces demolished the newspaper office and threw the printing press into the lake.

Refugee Camp on Island 102

As the Civil War progressed, a large number of slaves fled from their plantations to refugee camps and to join the Union Army. Providing food and shelter for these refugees, called Contrabands, presented a problem for the Federal troops. As a partial solution, military authorities set up refugee camps. One such camp was located on Island 102, in Warren County, Mississippi. Government agents and teachers supervised the project and they proposed to teach the freedmen to be self-supporting.

Already enmeshed in red tape, the experimental project faltered when Confederate forces were rumored to be in the vicinity. Fearing reenslavement, many Contrabands fled the island. Those who remained were set to work for a northern speculator who was attempting to grow cotton on a confiscated plantation. Just as in slavery, families were separated, and the Contrabands labored unhappily in the cotton fields. The project proved to be so troublesome that the Federal Government quietly abandoned the program (and the Contrabands) (Bragg 1977:152).

Emancipation and Reconstruction

At the close of the Civil War (1865), 27 states approved the Thirteenth Amendment to the United States Constitution, which abolished slavery in the United States. Slaveholders received no compensation for the loss of their investment in human bondage. Combined with the losses incurred in fighting the rebellion, planters in the former Confederate states encountered severe financial problems as peace returned.

A Republican Congress imposed Reconstruction measures on those states that had seceded from the Union, including Louisiana, Mississippi, Arkansas, and Tennessee. Large numbers of Confederate supporters were required to take a loyalty oath to the United States in order to resume their citizenship. Reconstruction measures also enfranchised former slaves and allowed them to hold public office.

Few former slaves, however, actually held public posts during Reconstruction. One African-American, Théophile Allain, proved to be an exception. He was born of a slave mother and a white father, Sosthène Allain, a planter who lived near Baton Rouge. A successful businessman, the younger Allain served in the Louisiana legislature during Reconstruction and the years thereafter (1872-1890). He helped to establish Southern University in 1880; a state-supported institution, it offered segregated higher education for blacks. Allain also established the community of Soulouque, which he named for Faustin Soulouque, the deposed Emperor of Haiti. The village of Soulouque is situated along the Reveille to Point Pleasant Levee Enlargement and Concrete Slope Pavement & Borrow Pit in Iberville Parish, Louisiana. Besides serving in the upper house of the state legislature, Allain also acted as postmaster in

Soulouque when a post office was established there in 1876. No structures from the original community of Soulouque survive today (Sternberg 1996:216; Vincent 1976; Leeper 1976; Louisiana Writers' Project 1971:536).

John Reuss, Hohen-Solms, and Germania Plantation

Johann (John) Reuss migrated to Louisiana from the German principality of Hohenzollern in the middle of the nineteenth century. He named his new home on the west bank of the Mississippi River after his German birthplace, but the Hohenzollern name was corrupted in common parlance to Hohen-Solms. The community Reuss founded is associated with two project items: the Alhambra to Hohen-Solms Concrete Slope Pavement and the Hohen-Solms to Modeste Levee Enlargement and Concrete Slope Pavement and Borrow Pit.

By Reuss's German standards, Louisiana's agricultural practices were lethargic. He emerged in importance after the Civil War, when he showed his fellow planters how to make a success of agriculture without utilizing slavery. Although the emancipation of the slaves had disrupted the agricultural labor force, Reuss bought in Iberville and Ascension Parishes numerous small holdings that he combined into Germania Plantation, which stretched up and down both the aforementioned project items. A son of Johann, George Reuss eventually purchased across the river Duncan Kenner's Ashland Plantation, which he renamed Belle Helene, in honor of his daughter. Johann Reuss and his family were engaged primarily in large scale cane cultivation and sugar production (Sternberg 1996:231-233; Louisiana Writers' Project 1971:538; Bragg 1977:220-221).

The Floods of 1912 and 1913

Throughout its history, the Mississippi River has witnessed several devastating floods, effecting a large portion of the North American continent. During the flood of 1912 a levee broke at Lake Beulah in Bolivar County, Mississippi. The Beulah Crevasse sent floodwaters pouring over almost 1,000,000 ac (404,700 ha) in the Mississippi Delta. Several workers on the levee lost their lives, and about 20,000 residents had to flee the deluge.

While volunteers labored to strengthen the levee in January 1913, the river overtopped it again, this time driving 10,000 people from their homes. The Illinois Central Railroad assumed the task of closing off the crevasse in the Beulah Levee. The railroad had to race with time since the floodwaters of 1913 were gathering force upriver. The rail company laid a temporary track, sent in carloads of rocks, and dumped them at the levee, while workers struggled heroically to repair the breach. The effort succeeded; the Beulah Levee withstood the main force of the ferocious flood of 1913 (Bragg 1977:116). Despite the effort at Beulah Levee, the floods of 1912 and 1913 seriously effected life along the Mississippi River as far south as Louisiana.

The Flood of 1927

The Mississippi River flood of 1927 had severe consequences throughout the Mississippi Valley. Heavy rain fell on the area drained by the Mississippi River and its tributaries in the winter of 1926. In the spring of 1927 the continuing rainfall combined with melted ice and snow continued to surge downstream, batter the levees, and flow over these protective barriers. The flood caused damages of 240 million dollars, killed 246 people, and threatened the homes and farms of 800,000 Americans who lived throughout the Mississippi Valley.

Dozens of serious crevasses occurred. In Arkansas, the Laconia Circle Levee, which protected 18,000 acres of agricultural land, failed. Much of Desha County was flooded, including the communities of Knowlton (for which the Knowlton Seepage Berm project item later was named), Deerfield, Mozart, and Arkansas City. The township of Mississippi, Arkansas, lay under 4.0 m (13 ft) of water.

According to the Red Cross, the flood destroyed all the crops in Desha County and it damaged, partially or completely, 750 homes, 231 outbuildings, and 106 barns. Farmers of Desha County lost 1,204 heads of cattle as well as thousands of hogs and domestic fowl. The flood also exterminated wildlife in the vicinity, ravaged railroad tracks and trestles, swept away bridges, and it contaminated the local water supply (Merritt 1977).

Arkansas City, the one-time seat of government in Desha County, has been flooded so often that a guidebook says that the business houses "... look mildewed" (Arkansas Writers' Project 1941:281). During the Flood of 1927 Arkansas City was inundated with 3.1 m (10 ft) of water; 2,000 residents had to be rescued from the rooftops on which they were perched (Bragg 1977:125).

An especially serious crevasse occurred at Dorena, Missouri, on April 16, 1927. Just before dawn John Clift went out to inspect the levee; he found a small stream pouring through the base of the embankment. He ran for help, but the community could not respond in time. A whole section of the levee collapsed, and the flood waters rushed across the landscape. A schoolhouse, 24.1 km (15 mi) inland, was destroyed by the Dorena Crevasse. The crevasse also inundated New Madrid. By April 29 the water level registered 0.46 m (1.5 ft) higher inside the city's levee than outside the supposedly protective structure.

Birds Point-New Madrid Floodway, 1933

As an aftermath to the flood of 1927 that devastated much of the Mississippi Valley, the U.S. Army Corps of Engineers constructed the Birds Point-New Madrid Floodway. Completed in 1933, the floodway is located on the Missouri side of the river below Cairo Point, Illinois. With the capacity to divert water from the main channel of the river at a rate of about 550,000 cubic feet per second, the floodway is designed to prevent the river from overtopping levees and floodwalls in the vicinity of Cairo, Illinois.

Louisiana Parish Histories

The remainder of this chapter is devoted to a presentation of more detailed histories of the parishes contained in the U.S. Army Corps of Engineers, New Orleans District. Parish history discussions highlight major economic trends in each of the parishes, with specific examples of historic events, persons, or places to demonstrate their significance. In general, topics covered include local economy, the Antebellum Period, the Civil War, the Postbellum period, industrial developments, local attractions, and the modern era. Early exploration and settlement of the parishes is not

covered below because these events have been outlined in previous sections of this chapter.

Ascension Parish, Louisiana

All or portions of three project items extend along the Mississippi River as it runs through western Ascension Parish. On the west bank of the river is the lower 2 km (1.2 mi) mile section of the Alhambra to Hohen-Solms Concrete Slope Pavement project item. It adjoins the 8 km (5 mi) downriver stretch of the Hohen-Solms to Modeste Levee Enlargement and Concrete Slope Pavement and Borrow Pit project item. Across the river from these items is the Carville to Marchand Levee Enlargement and Concrete Slope Pavement project item, the lower 12 km (7.5 mi) of which traverses the east bank of the Mississippi River through western Ascension Parish. Historically, this area has been agricultural, with the project reach crossing several major sugar plantations. Much of the area remains planted in sugar cane today; however, most of the east bank project area has become industrialized in recent years. This chapter presents an overview of the history of western Ascension Parish, with an emphasis placed on the project vicinity.

Antebellum Era

During the early nineteenth century, the economy of southern Louisiana changed drastically with the development of sugar cane agriculture. The cultivation and processing of this new cash crop was prohibitively expensive for the small farmers who originally settled the region. Rather than compete, many of these early claimants sold their properties to large landholders who began amassing their plantation acreage ca. the 1820s (Dinn 1988:89; Hinks et al. 1994a:30).

Antebellum census records reflect the dominance of the plantation economy in the project region. By 1830, population statistics for Ascension Parish counted approximately two slaves for each freeman, a ratio that generally was maintained throughout the pre-war years. With the federal census of 1830, the parish contained a population of 5,426 - 1,725 whites, 3,567 slaves, and 134 free men of color. Some 20 years later, the tally rose to 10,752 inhabitants, of whom there were 3,340 whites, 7,266 slaves, and 146 free men of color. Through the

next decade, the Ascension Parish statistics increased to an overall count in 1860 of 11,484, including 3,940 whites, 7,376 slaves, and 168 free men of color (Kennedy 1864b:194; Marchand 1931:79).

The project area within Ascension Parish included many of the major sugar plantations of the region. Among these nineteenth century properties were Chatham Plantation, along the Alhambra to Hohen-Solms project item, and Mulberry Grove, Cuba, Woodstock, Pellico, Melancon, Ascension, and New Hope Plantations, all reaching the riverfront within the Hohen-Solms to Modeste project item. The latter project item also included the front acreage of McManor Plantation within its 2 km (1.2 mi) wide research corridor. Across the river were Hard Times, Waterloo, Mount Houmas, Linwood, Ashland, and Bowden Plantations. These properties extended along the Carville to Marchand project item (Figure 14). A sample listing of some of the project corridor landowners reads like a "Who's Who" among leading antebellum figures - Henry Johnson (Chatham), U.S. senator 1818-1824 and Louisiana governor 1824-1828; Dr. Edward Duffel (Mulberry Grove and Woodstock), Ascension Parish judge; Trasimond Landry (New Hope), lieutenant governor of Louisiana 1846-1849; Richard McCall (McManor), prominent planter and son of Henry McCall, who was co-organizer of the Planters' Sugar Refining Co. (and other later-established planter associations); Henry R. Doyal (Mount Houmas), important regional planter and sugar refiner; Duncan Farrar Kenner (Ashland and Bowden), state legislator and diplomat; and various members of the eminent Kenner, Minor, and Trist families (Waterloo, Linwood, and Bowden) (Arthur and Kernion 1931:157-160; Calhoun 1995:473, 476; Conrad 1988:459, 481-482; Heitmann 1987; Marchand 1936:141; Seebold 1941:139-140; Sternberg 1996:231-235, 166-171).

On the eve of the Civil War, several of the project area landowners were among 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 *Plantations on the Mississippi River from Natchez to New Orleans* (Figure 14). The 1860 federal census confirmed the land and chattel

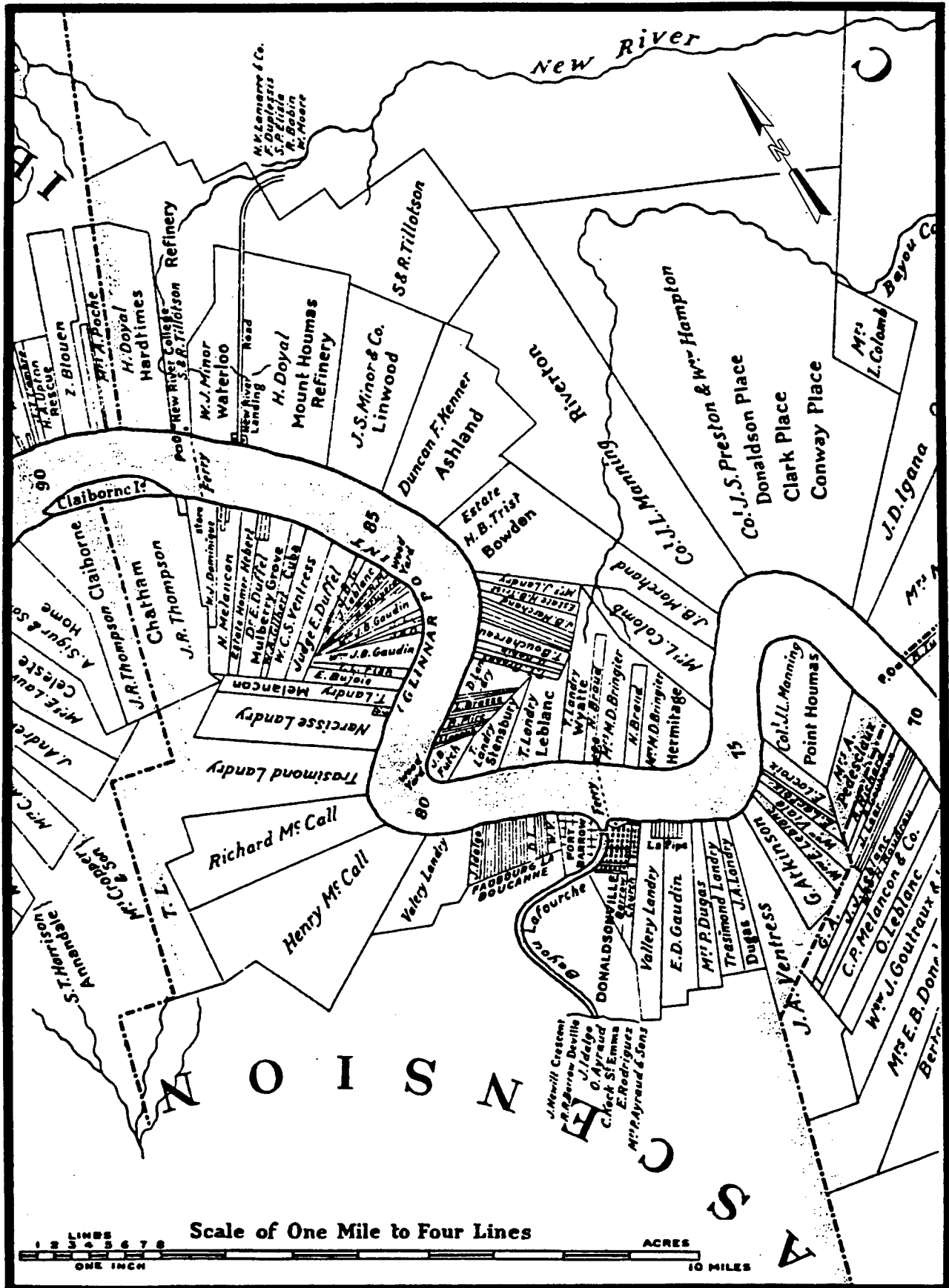


Figure 14. [1858] Excerpt from Persac's *Plantations on the Mississippi River from Natchez to New Orleans* (Norman's Chart), in reference to the Ascension Parish project items. Excerpt depicts plantations in the project vicinity, Ascension Parish.

status of several of the major planters, whose aggregate Ascension Parish landholdings totaled 35,209 improved acres (14,249 improved ha), as well as 90,529 unimproved acres (36,637 unimproved ha), and were worked by a combined labor force of 5,593 slaves (out of the census total of 7,376). Almost all of these principal landholders cultivated sugar cane. Only one, Dr. Edward Duffel, planted cotton, from which he derived a small yield of 20 bales (Menn 1964:120-124). During the next few years, the economic ravages of the Civil War changed the status of most of these planters.

The Civil War

There were no major Civil War campaigns conducted in the project area in Ascension Parish; however, Donaldsonville's location at the junction of Bayou Lafourche and the Mississippi River made it both a target and fortification for the Federals. Outside of the Donaldsonville area, military activity in the upper Lafourche region apparently was confined to a series of skirmishes 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; Raphael 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 vicinity fired so incessantly on Federal transports and gunboats traveling the Mississippi River between the two occupied cities 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 torched the town's hotels, warehouses, and other structures in the business district, as well as some private dwellings. Riverfront plantations on either side of town also were shelled and burned (Bergeron 1985:199; Raphael 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).

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 at the head of Bayou Lafourche opposite Donaldsonville (about 6 - 7 km [4 mi] downriver from the Hohen-Solms to Modeste project item). 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, General Alfred Mouton commanded General Thomas Green to capture Fort Butler from the Federal forces. Green marched his Confederate troops at night 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 4.9 km (16 ft) wide moat reported to encircle the fort). He wrote: "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 five - eight 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).

Following the Confederate defeat at Fort Butler, General Green ordered three of his Texas regiments to keep the fortification under observation, while several artillery and cavalry units were assigned to a 32.2 km (20 mi) stretch of riverfront to fire on all passing Federal vessels. Minor skirmishing took place to the south along Bayou Lafourche, culminating on July 13 with the "battle of Kock's (sometimes spelled Cox) plantation" about 10 km (6 mi) south of Fort Butler. The tables were turned in this action, largely due to one Federal officer's drunkenness (Colonel Joseph Morgan) and to the summer heat. General Green's force of around 1,200 Confederates defeated a Federal army triple its size, with only 33 casualties, 3 killed and 30 wounded (6 later died). Reports of Federal casualties vary - one source states 16 killed and 20 wounded, another lists 56 killed, 217 wounded, and 186 missing or taken prisoner (Marchand 1936:160; Winters 1963:291-293).

On the east bank of the Mississippi River, Federal troops manned a stockade on "Doyal's Plantation" (included within the Carville to Marchand project item), located approximately 11 - 13 km (7 - 9 mi) northwest of Donaldsonville and Fort Butler. Although Henry R. Doyal also owned Hard Times Plantation, situated just east of the Iberville/Ascension Parish line, the fortified property probably was his downriver Mount Houmas Plantation, which was located along the east side of the New River Road and Landing between the Minor family's

Waterloo and Linwood Plantations (Figure 14) (Casey 1983:55). The Doyal plantation was the site of several encounters during its military occupation.

Interestingly, Henry Doyal proved to be one of the most tenacious harassers of the occupying forces in the region. In the later years of the war, Doyal commanded Company G of Ogden's Regiment. Doyal's men, as well as other companies comprised of Ascension and Iberville Parish residents, were assigned to the area along the lower Amite River and the Mississippi River below Baton Rouge (including the New River region), no doubt because that was their home territory (Bergeron 1989:53-54; U.S. Secretary of War [OR] 1891:34[2]; 1893:41[1-2]; 1896:48[1]).

On February 8, 1864, Captain Henry Doyal raided his own plantation and seized the Federal outpost stationed there. The reporting officers believed that the purpose of the attack was to obtain supplies at the Lewis store, which apparently was located near New River Landing. Captain Doyal was able to take only one cartload of stores, but captured eight of the Union pickets and wounded the two remaining men (OR 1891:34[2]:276-277, 284). In order to prevent further such incidents, Brigadier General Philip St. George Cooke, Federal commander at Baton Rouge headquarters, made the following statement:

... New River Landing is a noted smuggling place, and its being but 16 miles of Seviquest Ferry, on the Amite, raids are to be expected, and this is the third which has been made. The place is in Ascension, a trade district, but I strongly recommend that Lewis & Deckory's [store] permit be recalled and no store allowed on this side above Donaldsonville (OR 1891:34[2]:284).

Nearly six months later, on the morning of August 5, 1864, Confederate troops under Colonel John S. Scott entered the Doyal plantation grounds, via a back route through woods and corn fields, and covertly surrounded the Union camp. Startled and undermanned, Major S. Pierre Remington ordered his 206 cavalymen (of the Eleventh New York Cavalry) to charge the enemy line, which consisted of a cavalry brigade and four artillery pieces, and ride down the levee road to the telegraph station. The confusion cre-

ated by the Federal offense, rather than the expected defense, facilitated Remington's break through the Confederate line; however, Scott captured the 92 troops (most of whom were sick) remaining in the stockade, as well as 130 horses (many of which had been taken earlier from Captain Doyal's forces) and some of the abandoned camp equipment. Several mules and horses also were confiscated from the Doyal property and the adjacent Minor plantation (either Waterloo or Linwood). Remington returned with reinforcements and a gunboat before the Confederate troops completely depleted the stockade, then pursued them back to the Amite River. Official records referred to this incident as the "Affair at Doyal's Plantation." The stockade was reoccupied by Remington and his men on the following morning (Casey 1983:55; OR 1893:41[1]:213-218; 41[2]:582-583; Winters 1963:396).

Later in the same year, the Doyal plantation again was the site of a small skirmish. On November 29, 1864, a small force (14 men) of the Third Rhode Island Cavalry was detailed to chase a band of jayhawkers reported to have plundered a property in the New River area. While the cavalymen halted at the Doyal plantation to feed men and horses, a band of around 20 Confederate troops attacked and captured the Federals. The Rhode Island lieutenant later was criticized severely for permitting all of his men to eat at once, without assigning any pickets on the roads that led to the Doyal plantation, a place considered by Brigadier-General Thomas W. Sherman to be "a point most open to attack of any in that region" (OR 1893:41[1]:945-947).

Because Donaldsonville and New River Landing both were occupied points, the area saw a great deal of military traffic besides the above-mentioned incidents. Early in the war, Minor's Linwood house was ransacked and Kenner's Ashland Plantation 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 upriver from Donaldsonville and below Chatham Plantation (Figure 14) (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.

Postbellum Era

The years following the end of the Civil War were difficult for southern Louisiana in general and Ascension Parish in particular. The economy throughout the state had been destroyed; plantations and farms, railroads and levees, businesses and homes all had been affected by the war, physically and financially. During the postbellum period, many of the planters in the project vicinity lost their lands. Wartime property damages and stock confiscations, combined with lack of capital and loss of slave labor, conspired against those trying to rebuild their plantations. Sugar cane cultivation continued to dominate area agriculture; however, post-war conditions prevented the recovery of the sugar crop to its 1861 peak. The small planters who lined the waterways during the antebellum era could not sustain the high costs required for successful sugar yields. Large planters began to consolidate the smaller plantations, and area sugar production became more of a corporate enterprise (Begnaud 1980:38-39, 42-43; Heitmann 1987:48-50).

Several plantations in the project area were affected by the postbellum trend toward acreage consolidation. One example of such property amalgamation was Germania Plantation (crossing both the Alhambra to Hohen-Solms and the Hohen-Solms to Modeste project items), which was owned by George B. or John Reuss (Figure 15). Reuss combined several tracts, including Mulberry and Cuba Plantations, to form Germania. In 1882, the local newspaper hailed him as the "future" of Ascension Parish:

. . . Reuss appears to be swallowing the upper portions of the parish . . . He is welcome to all he can get, provided he continues, as he has begun, to improve and beautify his possessions. He has already inaugurated works on a gigantic scale. The sugarhouse he is now putting up on Germania to serve as a central cuisine, bids fair to be the most splendid structure of its kind in the state . . . Under the administration of Mr. Reuss, the unsightly willow and cottonwood growth on the batture will disappear; the unhealthy marshes which disfigure the pastures will be drained and

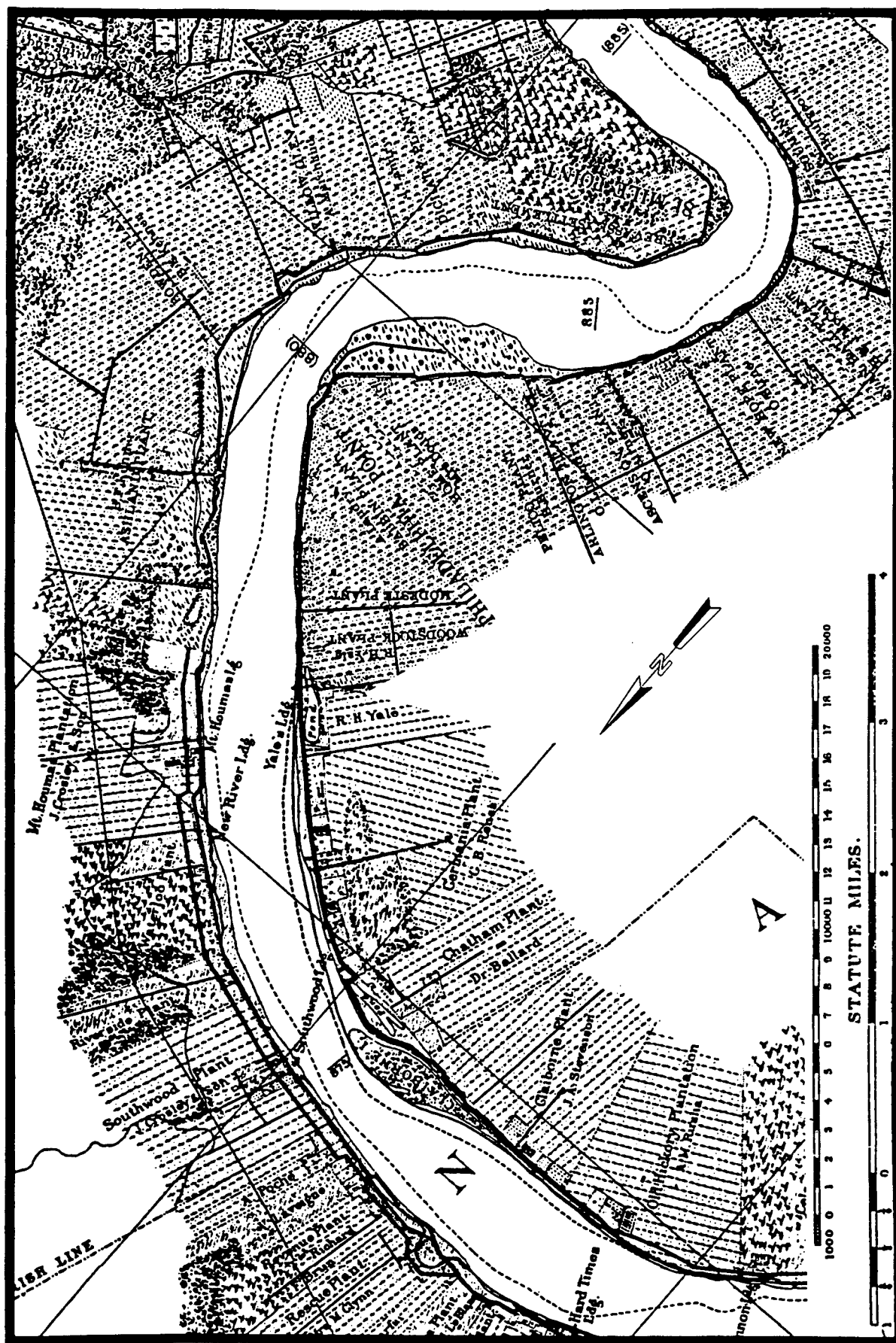


Figure 15. [1896-1907] Reduced excerpts from the Mississippi River Commission's *Map of the Lower Mississippi River from the Mouth of the Ohio River to the Head of the Passes*, Sheet Nos. 25 and 26, in reference to the Alhambra to Hohen-Solms, Hohen-Solms to Modeste, and Carville to Marchand project items. Excerpts depict plantations in the project vicinity, Ascension Parish.

filled up; substantial dirt wharves will be constructed on its front, with extensive warehouses for the landing of freight; neat cottages and other outhouses will be added . . . ; in one word, the 'confederation' will be the plantation of Ascension (Marchand 1936:205-206).

Along with the postbellum consolidation of sugar plantations came the conversion of former cane fields to rice acreage. As sugar production proved less profitable for financially distressed planters after the Civil War, a number of southern Louisiana growers turned to rice cultivation as a supplement to or, in many cases, a replacement for sugar cane agriculture. Because the necessary labor and stock could be utilized between the cane planting and grinding seasons, rice required little additional capital for successful cultivation. 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; Jones et al. 1938:22).

In 1860, the Federal agricultural census listed no rice crop for Ascension Parish; however, ten years later, the parish reported a rice yield of 15,926 lbs. (Kennedy 1864a:67; Walker 1872:743). There were several sugar plantations in the project area that had made the partial modification to rice cultivation by the mid-1880s. Included among these properties were the Woodstock Plantation (on the west bank near the Hohen-Solms to Modeste project item), and the Waterloo, Linwood, and Ashland Plantations (on the east bank near the Carville to Marchand project item). The first rice field in the region reportedly was cultivated at Woodstock Plantation, while Waterloo Plantation was planted almost entirely in rice by the latter part of the century (Figure 15) (Bouchereau 1868-1889; Sternberg 1996:233).

Twentieth Century

After the turn of the century, agriculture continued to dominate the project region. Sugar production remained the chief force behind the area economy, with continued consolidated management by such corporations as The Miles Planting and Manufacturing Company, Ltd. (Ascension and New Hope Plantations), The Grammercy Sugar Refining Company (Southwood [formerly Hard Times], Riverside, and

Mount Houmas Plantations), Picard & Geismar (Waterloo Plantation), and Belle Helene Planting Co. (Ashland and Belle Helene [formerly Bowden] Plantations) (Bouchereau 1898-1903; Hinks et al. 1994:38-40). By 1921, the riverfront fields of west bank Germania, Africa (formerly Babbins [Figure 15]), and Home Plantations were under rice cultivation, as was the levee-front acreage of Southwood Plantation on the east bank (Mississippi River Commission 1921:68-69).

Land tenure in the west bank project vicinity reflected the early twentieth century land use patterns for the region west of the Mississippi River – agricultural dominance, particularly sugar cane and rice cultivation, with most production in the hands of a few corporations. East of the Mississippi River, farms tended to be smaller, and by mid-century, truck crops, e.g., strawberries, beans, Irish potatoes, and sweet potatoes, comprised the chief yield on that side of the river in Ascension Parish. The large consolidated plantations along the Carville to Marchand project item, of course, were exceptions to the east bank truck farm trend. In recent years, soybeans, corn, and livestock have been added to the list of chief agricultural products in Ascension Parish (Ascension Parish Planning Board 1947:16-18; Calhoun 1995:196).

Although agriculture has remained a major local force through the twentieth century, the economic and physical landscape of the project region began to change with the discovery of petroleum in the area ca. the 1930s. In recent years, the riverfront, particularly the east bank, has been transformed by the evolution of the petroleum and chemical industries in Ascension Parish. By the early 1990s, the Ascension Parish (downriver) portion of the Carville to Marchand project study reach extended through or very near the following facilities: Arcadian Fertilizer, L.P.; Allied Signal, Inc., Geismar Complex; Union Texas Products Corporation, Geismar Plant (Union Texas Petroleum Holdings, Inc.); Rhone-Poulenc Basic Chemicals Company, Geismar Plant; Enron Louisiana Energy Company, Riverside Plant; Shell Western E & P Tebone Fractionation Plant; Borden Chemical Company; Morton Chemical Company; OSCA, Inc., Geismar Production Facility; Liquid Carbonic Process Plant; Monochem, Inc.; Rubicon

Chemicals, Inc.; Uniroyal Chemical Company, Inc., Geismar Plant; BASF Corporation, Geismar Plant; Shell Chemical Company, Geismar Plant; Vulcan Materials Company, Chemical Division; and the Koch Darrow Terminal/Dock. This east bank stretch of the Mississippi River also includes the Old Inger Oil Refinery (also known as Darrow Oil) Superfund Site, an abandoned petroleum refinery and waste oil reclamation facility that was contaminated in 1978 by waste oil and that site has been in the process of an EPA cleanup since the 1980s. Except for numerous petroleum pipelines and wells, the petrochemical industry west of the Mississippi River has developed in the interior of the parish and downriver past Donaldsonville (Ascension Parish Planning Board 1947:23; Draughon et al. 1995; DTC, Incorporated 1992a).

Summary of Ascension Parish History

The three Ascension Parish project items follow riverfront routes along sugar cane fields and petrochemical properties, traversed by several pipeline routes. With the exception of petroleum exploitation and the petrochemical industry, little has changed in the character of the region. Historically a sugar cane region, western Ascension Parish has remained largely dependent upon agriculture from earliest settlement to the present day. The west bank Alhambra to Hohen-Solms and Hohen-Solms to Modeste project items extend along acreage that remains largely agricultural, while the east bank Carville to Marchand project item follows an almost unbroken industrial line along the river. Because this part of southern Louisiana traditionally represented sugar cane country and it encompassed numerous thriving plantations, there is certainly a probability that some evidence of past plantation life, although impacted by cultivation or modern petrochemical activity, may have survived the years.

Concordia Parish, Louisiana

Introduction

The Fifth Louisiana Levee District Levee Enlargement and Borrow Pit project item extends along a 6 km (3.5 mi) stretch of the Mississippi River that borders southeastern Concordia Parish, Louisiana. This region is part of an

area historically important to the development of the cotton economy of northeastern Louisiana and the Natchez region. This section presents a general historic overview of Concordia Parish, with an emphasis on the project region. The exploration and early settlement of the area is outlined in the first section of this chapter.

Antebellum Era

The boundaries of Concordia Parish changed several times during the first decades of its existence as various parishes were created, revoked, or reconfigured. For a time, Concordia Parish was expanded to include the southeastern portion of present-day Franklin Parish and most of the area that later became Madison Parish. The current parish boundaries were established on March 17, 1843 (Calhoun ca. 1932:33-34; CPDB ca. 1950:8-9; Thorndale and Dollarhide 1985).

The project area does not appear to have been settled until after 1830 (Calhoun ca. 1932:54). A few government patents were issued prior to that time along the Mississippi River, but working plantations were not established in the region until the 1830s. Most of the early area planters were based in Natchez, a trend that apparently continued throughout the nineteenth century.

Much of the project area was patented by Archibald P. Williams in 1833 (Concordia Parish Clerk of Court [CPCC], Abstract of Land Entries:13-14). Other early property holders included District Judge Barnabas G. Tenney of Vidalia and James Kempe, who co-owned acreage below the Williams tract. Judge Tenney was killed on September 6, 1841 in a duel with Charles N. Rowley on Vidalia's riverbank "dueling ground." Rowley disagreed with Tenney's actions regarding the separation suit brought against him by his wife. Mrs. Rowley, previously divorced from Francis S. Girault, apparently was the former Jane Kemp [Kempe], daughter of Captain James Kemp [Kempe]. Sadly, it seems that Judge Tenney was killed for defending the rights of his business associate's daughter (CPCC, Conveyance Book [COB] L:80; COB M:7). Four years later, the Louisiana Constitution of 1845 forbade dueling, or assisting in a duel, under penalty of losing the rights to vote and to hold office. Private records,

though, noted that the Vidalia sand bar remained a site for settling "matters of honor" for at least another six years (Calhoun ca. 1932:48, 96-97; James 1968:264-266).

The Tenney and Kempe heirs sold their property interests, ca. 1846 to 1851, to William St. John Elliot, who also acquired those sections of the project area formerly belonging to Archibald Williams and Edward P. King (CPCC, COB L:22, 80, 330, 403, 433, 562; COB M:7). William St. John Elliot was a wealthy Natchez planter who transformed his riverfront acreage into a series of highly successful cotton plantations. As mentioned above, Elliot and his wife, like many of the area planters, were absentee owners. They oversaw their business affairs from their Natchez home, D'Evereux. In addition to his own plantation concerns, Elliot also insured the cotton crops harvested by many of the major planters of the region, serving for a number of years as president of the Natchez Protection Insurance Company, chartered in 1829 (Davis 1982:27; James 1968:211-212; Kane 1947:194, 199-200).

Antebellum census records reflected the growing dominance of the plantation economy in Concordia Parish. By 1820, population statistics for the parish counted approximately two slaves for each freeman, a ratio that steadily increased through the pre-war years. With the federal census of 1820, Concordia Parish tallied 827 whites, 1,787 slaves, and 12 free men of color, for a total of 2,626. A decade later, the parish recorded 4,662 inhabitants, including 1,025 whites, 3,617 slaves, and 20 free men of color. In 1840, the population count more than doubled to 9,414 residents – 1,380 whites, 8,003 slaves, and 31 free men of color – while the slave/freeman percentage leaped to nearly six to one. The 1850 census reflected the 1843 loss of territory to Tensas Parish, with a population drop to 7,758; however, the slave/freeman ratio continued to rise. The record for that year included 823 whites, 6,934 slaves, and one free man of color, a proportion of approximately eight slaves per freeman. Ten years later, the Concordia Parish tally reached its antebellum high with a total of 13,805 inhabitants, of whom there were 1,242 whites, 12,542 slaves, and 21

free men of color – nearly ten slaves for every freeman (Calhoun ca. 1932:35).

On the eve of the Civil War, the Concordia Parish census listed 95 major plantations, i.e., utilizing 50 or more slaves. Persac depicted the general configurations of many of these properties in his 1858 *Plantations on the Mississippi River from Natchez to New Orleans* (Figure 16). The 1860 federal census confirmed the land and chattel status of several of these major planters, whose aggregate Concordia Parish landholdings totaled 73,229 improved ac (29,636 improved ha), as well as 112,248 unimproved ac (45,427 unimproved ha). These areas were worked by a labor force of 10,514 slaves (out of the census total of 12,542). All of these principal landholders cultivated cotton; none planted sugar cane. Their 1860 crop of 55,863 bales of ginned cotton (400 lbs each) formed the bulk of the total parish yield of 63,971 bales (Kennedy 1864:66-67; Menn 1964:196-211). During the next few years, the economic ravages of the Civil War would change the status of most of these planters drastically.

The Civil War

There was no significant military action within the Concordia Parish project vicinity during the Civil War. After Baton Rouge and Natchez surrendered to Federal forces in May of 1862, activities along that stretch of the Mississippi River were geared towards the capture of Vicksburg (Davis 1971:253-265; McLemore 1973:1:452-491).

Although Concordia Parish was removed from the principal centers of military activity, the parish provided men and supplies to the Confederate cause. By the end of 1861, recruits had been mustered into the Concordia Rifles (later assigned as Company F to the 14th Louisiana Infantry Regiment), the Concordia Star Guards, and the Concordia Cavalry, with at least one other unit proposed for formation. Concordia troops also formed Company F of the 1st Louisiana Cavalry and Companies C and F of the 25th Louisiana Infantry, and contributed a number of men to Company D (the Catahoula Fencibles) of the 31st Louisiana Infantry. Funds to organize the military units, as well as to aid

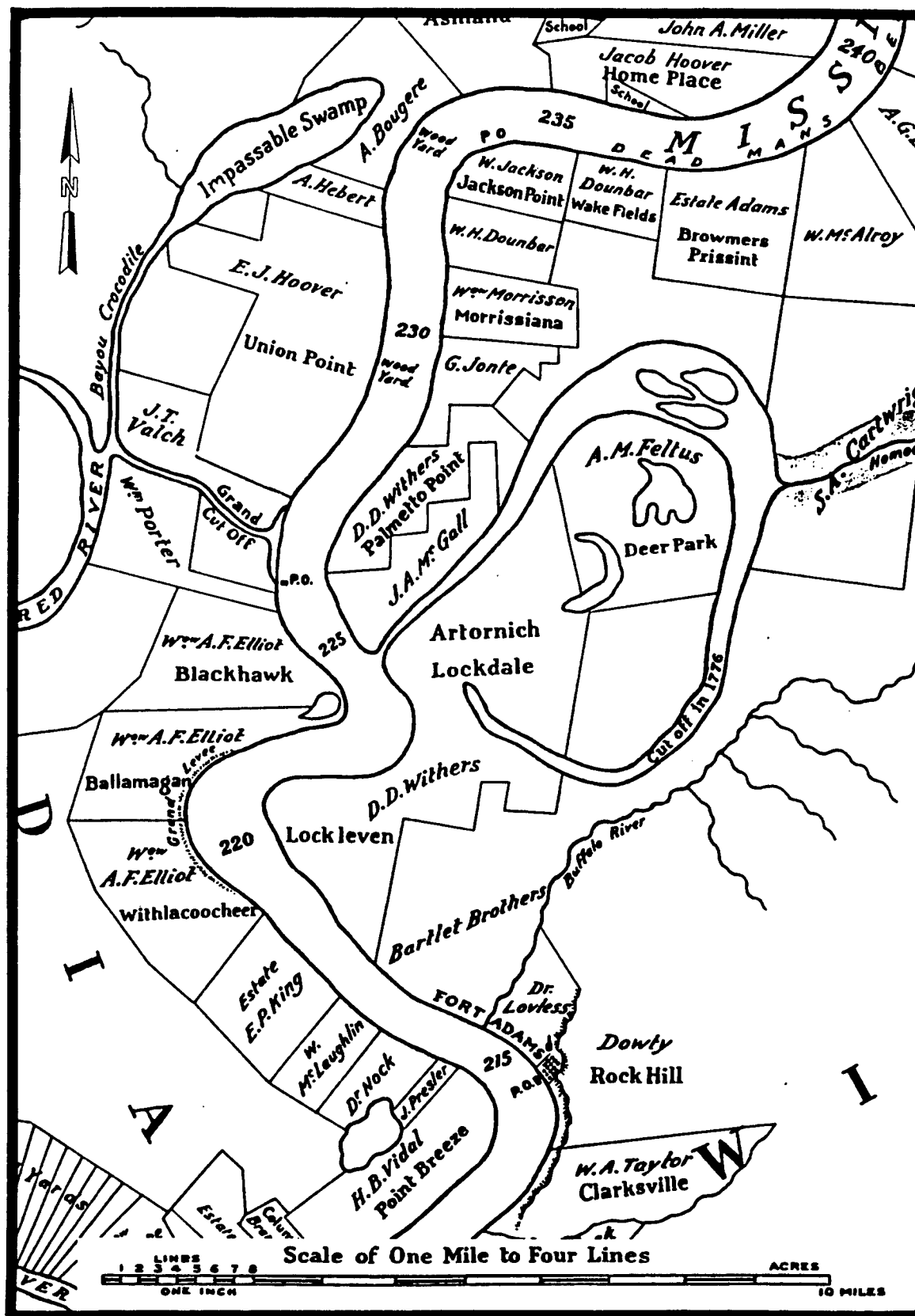


Figure 16. [1858] Excerpt from Persac's *Plantations on the Mississippi River from Natchez to New Orleans* (Norman's Chart), in reference to the Fifth La. Levee District Levee Enlargment and Borrow Pit project item. Excerpt depicts plantations in the project vicinity, Concordia Parish.

the families of the volunteers, had been appropriated by the Concordia Parish Police Jury as early as April of 1861 (Bergeron 1989:39, 107, 133, 142-143; Calhoun ca. 1932:110-116; Winters 1963:36-37, 74-75; 1984:165).

Despite the formation of the local regiments mentioned above, Federal troops continued to scavenge the Mississippi River parishes, seizing slaves for manual labor and raiding plantations for provisions and livestock. Many of these river planters retreated westward with their slaves to the safer interior territory near Monroe and Shreveport; others kept going until they reached Texas. Any cotton that could not be transported to safety was ordered burned. The Mississippi riverbank from Carroll through Concordia Parishes blazed with the cotton bale fortunes fired on the levees and Native American mounds of northeastern Louisiana (Winters 1963:211, 322; 1984:166-167).

Prior to the fall of Vicksburg, Federal gunboats steamed through the region, but nothing of consequence occurred. A Federal report dated June 8, 1863, did note, though, that there were numerous Confederate troops stationed along the west bank of the Mississippi River as far south as the Black Hawk Plantation. Southern military possession of the eastern Concordia Parish riverfront ended in mid-July of 1863, when Union forces occupied Natchez and Vidalia, which they held against Confederate attack through the end of the war (Calhoun ca. 1932:117-130; CPDB ca. 1950:9; Winters 1963).

On July 14, 1863, mounted troops of the 14th Wisconsin Infantry landed at Vidalia, where they were dispatched to scout the Concordia countryside. The expedition captured a lieutenant and the rear guard of a Confederate ordnance train some 15 mi (24 km) northwest of town on the Trinity road. The Wisconsin infantrymen returned to Natchez with 11 boxes of artillery ammunition, 312 new Austrian muskets, and 203,000 rounds of musket cartridges; however, 268,000 ammunition rounds had to be destroyed because they could not be transported (Calhoun ca. 1932:120-121; U.S. Secretary of War [OR] 1889:24[2]:680-682; Winters 1963:15, 301; 1984:162, 178).

This ordnance confiscation was a portent of Vidalia's future through the remainder of the

war – Federal occupation meant the shutdown of the town as a primary shipping center for cattle, cotton, and other necessities transported along the supply line connecting western Louisiana and Texas to the Confederate forces east of the Mississippi River (Calhoun ca. 1932:120-121; Winters 1963:301). According to the Union officer reporting the arms capture:

within a few days 150 wagons loaded with ordnance stores for [General] Kirby Smith had been ferried across at this point [Natchez] to the Louisiana shore, and . . . beef-cattle in large numbers were constantly being driven across through this point (OR 1889:24[2]:681).

In fact, on the same day as the Vidalia expedition, Federal troops on the east bank of the Mississippi River rounded up 5,000 cattle recently driven to Natchez, through the Vidalia crossing, from Texas (OR 1889:24[2]:681). The U.S. occupation of Vidalia and Natchez effectively terminated Confederate use of that passage.

Postbellum Era

Although Southern Concordia Parish suffered little, if any, physical damage during the Civil War, the consequent economic effects of the conflict were devastating to the area. Loss of the labor force and lack of funds combined to break up the Mississippi River plantations (Davis 1982:59-60). On April 17, 1866, Major General Lorenzo Thomas testified before the Joint Committee on Reconstruction in Washington, D.C., concerning the postwar state of affairs in Concordia Parish. He related that he:

Was acquainted with many of the planters and others who had been in the "Rebel" army; some of them of high rank, generals, colonels, etc., . . . That they were decidedly in favor of coming back into the Union; that they desired to be peaceful and quiet citizens and obey the law . . . I have been spoken to very freely by those who own plantations they want to lease . . . they say they want Northern men with capital to come there . . . There are sixteen plantations on Lake Concordia, and only six now cultivated by their owners; the others are leased to Northern men, and one place sold to negroes . . . There is a great scarcity of labor there, as a large number have gone away . . . In Concordia this year not more than one acre in ten that was formerly cultivated will be under the plow . . . The risk [of flooding] is considerable;

levees are not now in good order, and the plantations are liable to overflow at any time (Calhoun ca. 1932:133-136).

Major General Thomas was a Federal officer who had been stationed at Natchez before and during the Civil War. He became further acquainted with the region and its residents through co-supervision of the Lake Concordia plantation leased by his son (Calhoun ca. 1932:133).

Like most Mississippi River planters, Concordia Parish plantation owners suffered losses in their family fortunes during the war years. Less than seven months following the Confederate surrender at Appamattox, Mrs. Anna F. Elliot, widow of William St. John Elliot, sold her Concordia Parish cotton plantations, 7,000 ac (2,833 ha) in all. On November 7, 1865, Black Hawk, Bally Magan [sic], and Withlacoochee [sic] Plantations were conveyed to Lewis Trager for \$50,000.00 (CPCC, COB N:633).

Over the next four decades, these three plantations passed through various hands - some local parties, others Natchez and New Orleans interests. For brief periods during the 1880s, Black Hawk, Ballymagan, and Withlacoochie Plantations were seized by New Orleans creditors to satisfy debts owed to various banks, insurance companies, and individuals. According to the inventory taken during one of these settlements, the improvements listed on the properties in mid-1881 included 12 double cabins and galleries, four rooms and brick chimneys in each; six single cabins, two rooms in each, with galleries and brick chimneys; one engine and boiler with pipes; and three gin stands, feeders, and condensers (CPCC, COB R:77). Despite the economic troubles of the various owners, they apparently continued to cultivate cotton on the former Elliot acreage through the turn of the century (Figure 17). The plantation cotton crops, "present growing" as well as baled, were noted periodically in the postbellum parish records, along with the requisite agricultural equipment, livestock, and fodder. Ownership finally seemed to stabilize in 1894 with the conveyance of the properties to George Scott, who held sole title to the "Black Hawk" lands through mid-1907 (CPCC, Conveyance Records).

Concordia Parish remained primarily agricultural through the end of the nineteenth century. Cotton was the chief cash crop; however, subsistence crops of Indian corn, Irish potatoes, and sweet potatoes also were cultivated. In 1870, a total yield of 26,712 bales of cotton was harvested in Concordia, making it the top-producing cotton parish in Louisiana at that time. Some 20 years later, Concordia remained among the primary cotton parishes of the state, yielding 38,738 bales of cotton in 1890 (U.S. Census 1896:Table 16; Walker 1872:742-743).

Twentieth Century

After the turn of the century, agriculture continued to dominate Concordia Parish. Cotton remained the chief force behind the area's economy until 1907, when the boll weevil invaded the region. Planters shifted to rice cultivation until the weevil infestation was brought under control, but by 1925, cotton was king again in Concordia Parish. Corn was grown only as a subsistence crop until mechanized farming facilitated its development as commercial produce. By mid-century, cotton and corn "ran neck and neck" in cultivated acreage. Orchard crops also have become important, particularly pecans, peaches, pears, and plums. The twentieth century has seen a rise, too, in the Concordia Parish cattle and swine herds. While flooding has been a bane to the riverfront planters, the parish cattlemen have benefited from the conversion of inundated row-crop acreage to pastureland (Calhoun ca. 1932:185-187; CPDB ca. 1950:11, 17-24).

Land tenure in the project area has reflected the twentieth century land use patterns in this region - agricultural dominance, particularly cotton cultivation, with most production in the hands of a few families or corporations. Between 1907 and 1916, Rufus F. Learned purchased substantial interests in Black Hawk, Upper Ballymagan, Lower Ballymagan (Ballymagan was divided in the early 1890s), and Withlacoochie Plantations. The Learneds were one of the wealthiest families in Natchez at the turn of the century. Rufus Learned inherited the sawmill business developed by his stepfather, architect Andrew Brown, then expanded the family interests during the postbellum years to include cotton mills, ice companies, railroads, banks, and

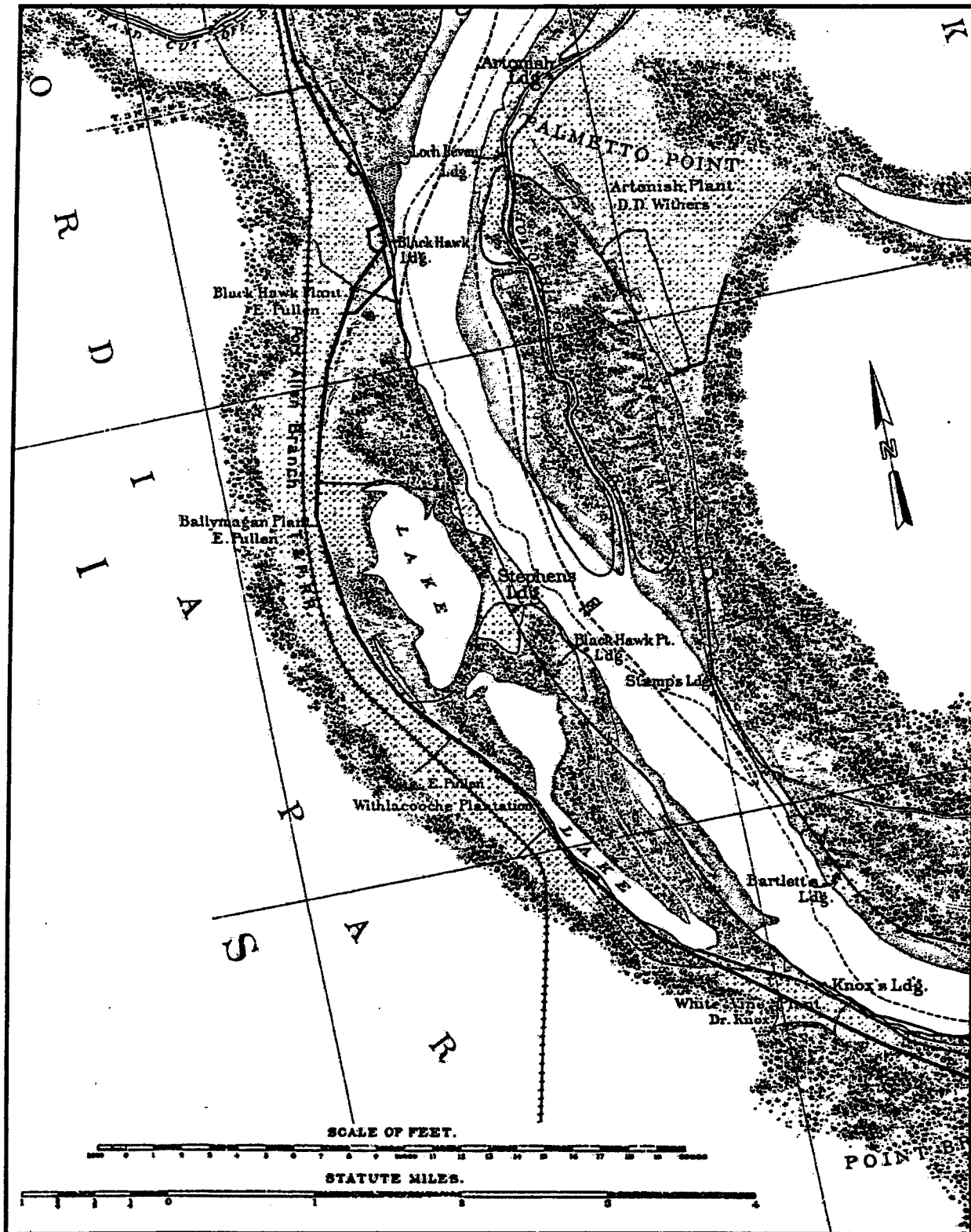


Figure 17. [1907] Reduced excerpts from the Mississippi River Commission's *Map of the Lower Mississippi River from the Mouth of the Ohio River to the Head of the Passes*, Sheet No. 22, in reference to the Fifth La. Levee District Levee Enlargement and Borrow Pit project item. Excerpt depicts Black Hawk, Ballymagan, and Withlacooche [Withlacoochie] Plantations, Concordia Parish.

steamboats (James 1968:207; Kane 1947:133-141; Wilson 1989:150-151). Along with the 8,403 plantation ac (3,401 ha), Learned also acquired all buildings and improvements, timber and logs, horses, mules, and cattle belonging to the Black Hawk area properties. Timber interests figured prominently in further land use on the plantations through the 1920s, a matter of particular interest, considering the sawmill background of the family (CPCC, COB X:540; COB Z:523; Conveyance Records).

In 1973, the four plantations passed out of the Learned family, when their Panola Land and Development Company, in a move "to consolidate operations," sold the properties, by then collectively known as Black Hawk Plantation, to Jess Carr Gilbert. "Sonny" Gilbert, a Catahoula Parish planter and state representative for Concordia and Catahoula Parishes, referred to Blackhawk [sic] Plantation as "an invaluable tract of property . . . one of the most historical plantations in the Mississippi River valley" (The Concordia Sentinel 1972:1, 7A). Six months following acquisition, Gilbert sold the 3,280 ac (1,327 ha) Black Hawk batture to Three Rivers Farm, Inc., for \$1,798,560.00, reserving 15-year hunting and fishing privileges "for himself and eleven persons of his selection." Since then, Black Hawk Plantation has been in the hands of various corporate owners, both agricultural and timber, with further reservations of hunting and fishing rights (CPCC, COB 56:100, #119462; COB 61:359, #121268).

Summary of Concordia Parish History

The Fifth Louisiana Levee District Levee Enlargement and Borrow Pit project item extends through a rather rural area of southeastern Concordia Parish. Vast cotton plantations lined along this stretch of the Mississippi during the early nineteenth century, but postbellum financial ruin converted the individual cotton empires lining the river to corporate-owned planting operations. Today, the project reach remains a part of "cotton country," however, changes in the course of the Mississippi have pushed the cultivated fields away from the riverside, leaving

behind terrain well-suited to hunting and fishing. The project item itself is situated in an area so scoured by the river that little, if anything, remains of the historical plantations that once occupied the area.

East Baton Rouge Parish, Louisiana

East Baton Rouge Parish contains a single U.S. Army Corps of Engineers, New Orleans District project item, the Baton Rouge Front Levee (Item M-230-L). This project item is located on the Mississippi River bankline in downtown Baton Rouge, Louisiana. Because the City of Baton Rouge has had such a long and colorful history and it is the home of the State Capitol, it was used as the focal point for research into the history of the area. The earliest history of the Baton Rouge area was discussed in the regional history section at the beginning of this chapter.

The Baton Rouge Waterfront, 1763 - 1812

The Baton Rouge waterfront is situated approximately 367 km (228 mi) above the mouth of the Mississippi River. One chronicler wrote:

. . . it presents a bold and picturesque effect in first viewing it from the river, for it is the first high land that the voyageur perceived when he ascended the river in bateaux, seeking for land and commercial relations with the savages (Police Jury, East Baton Rouge Parish, and City Council, Baton Rouge [Police Jury] ca. 1889:15).

From 1763 to 1812, control of Baton Rouge passed from France to Britain, Britain to Spain, Spain to the Republic of West Florida (which existed for 74 days), and finally to the United States (Meyers 1976:116). The French became the first Europeans to settle in the Baton Rouge area, but they relinquished control of it to the English in 1763. Charles Gayarré, a nineteenth century historian, described Baton Rouge when the English took possession. as ". . . composed of nothing better than a miserable fortlet and some huts which were scattered about in the neighborhood" (Thom 1967:5).

Powell Casey, the preeminent authority on fortifications in Louisiana, questions the Gayarré

assumption that the French actually fortified Baton Rouge. He discovered no documentary evidence of fortifications in Baton Rouge until 1779, when the British built a dirt fort on the east bank of the Mississippi River. According to Casey, the fort was situated just south of the present day Pentagon Barracks (Casey 1983:16).

Bernardo de Galvez, Governor of the Spanish province of Louisiana, led a small army that attacked the British fort. After bombardment of the fort for three hours on September 22, 1779, the British surrendered the installation (Casey 1983:17). Documentary evidence indicates that the fort fell into disrepair during the Spanish hegemony. In 1794, Governor Carondelet recorded that the fort stood in ruins (Manheim and Whitmer 1991:53).

Near the end of the Spanish regime in 1809 an American traveler to Spanish West Florida described Baton Rouge. He wrote, the area consisted of:

About half a dozen tolerably good frame (or wooden) houses scattered on an extensive plain surrounded on three sides by woods at a little distance, first made their appearance, while a dirty little town of 60 cabins crowded [sic] together in a narrow street on the river bank, penned in between the Mississippi and a low steep hill descending from the plain, filled the fourth side (Cumming 1904:340).

The narrow thoroughfare presumably occupied the position of the present Front Street.

Two years later, John Dutton, a surveyor, provided a map of a portion of Front Street depicting the levee and the high and low water lines. According to the Dutton map, high water completely submerged the village market lot on the waterfront between Convention Street and North Boulevard (Figure 18) (Survey of Federal Archives in Louisiana 1939:F1-2).

As of 1810, the Spanish still held Baton Rouge and the Province of West Florida, but American-born rebels within the province were anxious to seize the territory and annex it to the United States. Before dawn on September 23 of that year, approximately 75 rebels attacked and captured the Spanish fort at Baton Rouge. The rebels successfully overthrew Spanish rule, created the West Florida Republic, and shortly thereafter asked for annexation to the United States. The American government welcomed the new

territory. On December 7, 1810, the rebels raised the American flag as West Florida officially joined the Union.

General Wade Hampton, an officer in the United States Army, assumed command in Baton Rouge in 1811. He made himself immensely unpopular by burying Protestant soldiers in the Catholic cemetery and by evicting squatters from public land around the old fort. The local citizenry sent a complaint to the nation's capital. They declared:

He (Hampton) has turned about one third of the inhabitants of Baton Rouge out of their houses on the pretext of its being public land and attached to the fort. Some of the people were living there previous to the year 1800, and nearly all previous to 1803. The houses were built by the owners and not by the public (Meyers 1976:126).

The former occupants do not seem to have received redress of their grievances from the Federal government.

On April 8, 1812, the U.S. Congress admitted the State of Louisiana into the Union without the territory acquired from Spanish West Florida. Six days later, a supplemental act included East Baton Rouge and other West Florida parishes in the Louisiana territorial boundary. The state officially joined the Union on April 30, 1812 (Davis 1971:176).

The Baton Rouge Waterfront in the Antebellum Era, 1812 - 1860

During the early nineteenth century, the original fort at Baton Rouge suffered from further neglect. Barthelemy Lafon, a New Orleans surveyor and mapmaker, drafted a plan to repair the fort during the War of 1812. In the map of the fort, Lafon illustrated what appears to have been the cow path the American rebels used to enter the Spanish fortification. As depicted on the map, the path wound from the fort to the edge of the river. The path seems to reach the river at the approximate location of where North Street now intersects the waterfront, suggesting that the fort might have had a landing there.

When the United States chose Baton Rouge as the site of a new federal arsenal in 1816, the American forces abandoned the fort and built the Pentagon Barracks immediately upriver. Although only four of the buildings that comprised the Pen-



Figure 18. The Baton Rouge Waterfront in 1811 (Court Records of East Baton Rouge Parish 1939).

tagon survive, a fifth structure, the ordnance storehouse, once completed the design. Powell Casey noted that:

The ordnance storehouse was a two story building with a basement floor *opening out on the river landing* [italics added]. It formed the up-river half of a double building which formed the fifth building on the river bank of the Pentagon group (Casey 1983:13).

The fifth side of the Pentagon collapsed in 1821, and the U.S. Army demolished the remainder of the structure in 1828 (Casey 1983:13). Casey indicates, nevertheless, that the Pentagon Barracks had its own river landing situated upriver from North Street.

The Louisiana legislature incorporated Baton Rouge as a town on July 16, 1817 (Holland 1988:4). By April 1820, a ferry across the Mississippi had begun operation. According to a twentieth century newspaper account, the ferry, supposedly called the *Flying Bride* but more probably named the *Flying Bridge*, utilized a long chain that was anchored in midriver by a buoy. Operation of the ferry continued for only two years. Subsequent ferry service operated irregularly, if at all, during the antebellum era; the franchise changed hands many times.

In 1840, H. B. Favrot obtained an exclusive franchise to operate a steam ferry for 15 years across the river from the Town of Baton Rouge to West Baton Rouge Parish. The act required Favrot to transport military personnel, including militiamen attending muster, free of charge. Favrot also had to ferry military equipment belonging to the state and the federal government without a fee. The antebellum ferry proved unprofitable (Kellogg and Mayeux 1979:186-187), and no contemporary maps of the Baton Rouge area depict it.

Baton Rouge remained a village during the antebellum era; by 1840, its population stood at 2,269 persons (Wilson 1938:203). Nevertheless, in 1846, the legislature appropriated funds to build a new state house and they made Baton Rouge the capitol of Louisiana. On completion of the new capitol in 1850, Baton Rouge officially became the seat of government. At the time of its construction, the neighborhood surrounding the capitol consisted mostly of residential buildings (Davis 1971:194; Hinks et al. 1992:6-8).

According to one Louisiana historian, the legislators quickly became dissatisfied with Baton Rouge:

At that time Baton Rouge was an overgrown series of small contiguous villages, known locally as Gras, Devall, Leonard, Hickey, Duncan, Mather, and Beauregard Towns. Beauregard Town, elaborately planned by the Spanish, lay between present-day North and South boulevards and between East Boulevard and the river. It had a square in the center with four streets running diagonally from the corners, and on the entire east side was a Place d'Armes. Many streets were named after saints, and one sign painter . . . unwittingly canonized Napoleon, King Maximilian of Bavaria, and King Ferdinand of Spain. A market stood at the river end of North Boulevard about where the Confederate monument is today. . .

The old market, subject to flooding, was located on the waterfront between Convention and North Boulevard. A newer market later was located on the land side of the new state capitol.

When Baton Rouge officially became the seat of government in 1850, the Florida Street Wharf, just a block downriver from the Laurel Street pier, became the chief landing of the community. The wharf appears in Michael Gill's 1855 map of Baton Rouge (Heck 1970:23, 49).

Recalling an incident in Baton Rouge in 1859, one memoirist described his parents going "on board of an old dismantled steamboat, which answered the purposes of a wharf, to await the arrival of the *Princess*, as they intended to take passage on her for New Orleans" (Morgan 1917:3). Just below Baton Rouge, the *Princess* exploded in an accident that killed or seriously wounded many passengers. A newspaper account describes a wounded passenger as recuperating in Baton Rouge at "the wharf-boat" (New Orleans *Picayune* 1859). Presumably this "wharf-boat" was situated at the Florida Street Wharf.

At a site that several authorities identify as 727 Lafayette Street, situated between Lafayette and Front streets about 100 yards south of the Pentagon Barracks and overlooking the waterfront, stood the house of the Spanish Commandant, built about 1788. Beginning in 1821, Zachary Taylor intermittently occupied this house during his long career in the American army. According to local historians, Taylor was residing there when he was elected President of the United

States in 1848 (Casey 1983:15; Greene et al. 1984:I:B:3:332; Hansen 1971:242).

General Taylor's residence was identifiable to travelers on the Mississippi. Many steamers stopped there to let the passengers cheer and to observe the house more closely. Taylor left Baton Rouge for the Presidency of the United States on January 23, 1849. Many local residents gathered on the lawn of his house for a farewell speech before he boarded a steamer to go upriver (Thom 1967:24-25).

Damaged by a storm and in poor condition, the Taylor residence was demolished in September 1859 (Casey 1983:15). A race track replaced the old structure (Race Track Photograph 1860). Although no landing for the Zachary Taylor house has been identified, a location at North Street may have served that purpose.

On the eve of the Civil War the waterfront at Baton Rouge had developed commercially but not industrially. One historian's account of antebellum Baton Rouge notes that Front Street "... faced the levee and contained primarily hotels and boarding houses, a bakery, and several grocery establishments and residences" (Carleton 1981). According to another historian, "... along Front and Lafayette streets were a few stores, several large homes, and the Harney House [a hotel]" (Davis 1971:194).

Although a ferry across the Mississippi operated irregularly in the antebellum era, maps and directories fail to indicate a landing at the foot of Main Street, where the postbellum ferry docked. The Gill map of 1855 only shows a wharf at the foot of Florida Street.

During the antebellum era, the Mississippi River annually flooded the waterfront from Convention Street to South Boulevard. Further downriver, the Mississippi annually inundated the site of the Missouri Mill, which stood, according to the Gill map of 1855, on the waterfront between Europe and Asia Streets. The Burton Lumber Company (1885) and the Baton Rouge Lumber Company (1906) subsequently operated at the same site. Flooding facilitated the logging operations. One chronicler wrote:

There was no levee along the Mississippi in those early years; this not only facilitated removal of the logs from the river, but also allowed for ready access to low-lying areas along the river during its annual spring flooding (Carleton 1981:237).

Perhaps because of continual flooding, the Missouri Mill served as the chief recorded economic enterprise on the lower section of the waterfront in the antebellum era.

Despite the commercial success of Baton Rouge, New Orleanians continued to disparage its role as state capital. An antebellum Crescent City newspaper derided the town in the following note:

... at Baton Rouge members [of the legislature] find better lodgings in the Penitentiary than elsewhere; a good restaurant would be a blessing; a regular mail from the city or anywhere else would be looked upon as a miracle, and means of speedy transportation so soon as wanted, to any point up or down the coast would be hailed as a God-send (Davis 1971:194).

Baton Rouge nevertheless remained the capital of the state until the middle of the Civil War, when state government fled to Opelousas for fear of advancing Federal forces.

Baton Rouge During the Civil War Era

To defend Baton Rouge from attack by Federal forces, Confederates utilized slave labor to increase fortifications around the former Federal arsenal. In 1861, slaves built a dirt embankment that extended southwest from the powder magazine (1838), now the Arsenal Museum, to near the river (Casey 1983:243-244). On May 28, 1862, Admiral Farragut and the Federal fleet dropped anchor beside the town. Several Federal sailors set out in a rowboat to contract a local washwoman to clean their laundry. Witnessing this exchange, Confederates fired on the Union sailors. Angered, Admiral Farragut attacked the waterfront with a devastating cannon barrage (Spedale 1985:4-5). According to the diary of a young Confederate lady living in Baton Rouge:

It seems the only thing that saved the town was two gentlemen who rowed out to the ships, and informed the illustrious commander that there were no men there to be hurt, and he was only killing women and children. The answer was, 'He was sorry he had hurt them; he thought of course the town had been evacuated before the men were fools enough to fire on them, and had only shelled the principal streets to intimidate the people.' (Dawson 1960:50).

Realizing no Confederate troops were stationed in the city, Admiral Farragut seized Baton

Rouge the next day; however, Union occupation of Baton Rouge was short-lived.

On August 5, 1862, just over two months after the beginning of the Union occupation, a Confederate attack forced the Federals to retreat to the safety of the river. A signalman in the tower of the state capitol directed the fire of the ships' guns, which raked the Confederate lines (Hansen 1971:237). Lt. Geoffrey Weitzel, the chief engineer of the Federal forces in Baton Rouge, prepared a plan to remove trees, fences, and houses within rifle shot of a defense line that extended, among other places, along the north side of North Street to the river. To clear the area, the former post hospital and a residence on North Street were destroyed (Casey 1983:244).

Because Baton Rouge had no real strategic importance, at least militarily, the Federals evacuated the city on August 21, 1862. Although they did not burn Baton Rouge, they sacked the city before their departure. On December 17, 1862, the Federals returned, and they remained in possession of the community throughout the remainder of the war (Davis 1971:255-256). By January 1865, Federal forces had extended their defensive line by building stockades along North Street and into the waters of the Mississippi (Casey 1983:244).

Baton Rouge During the Postbellum Era

When the state government fled, Federal troops occupied the Gothic-style capitol in December 1862. According to a local chronicler, Baton Rouge "was desolated by the war, and languished without hope or enterprise until the Capitol was restored here in 1882." This was followed by the establishment of railroad connections with the Texas and Pacific and the Louisville, New Orleans, and Texas railroads, by which it was placed on the main arteries of trade" (Police Jury ca. 1889:16). By 1890, Baton Rouge could boast of two banks; a waterworks that stood on Front Street; an electric light system; an ice factory, also on Front Street; the State Penitentiary; the Deaf and Dumb and Blind Asylum; the State Agricultural and Mechanical College; and a ferry located at Main Street (Police Jury ca. 1889:16-19).

The Main Street Ferry

Beginning as early as 1820, antebellum attempts to establish a ferry across the Mississippi River near Baton Rouge were sporadic and ultimately unsuccessful. At the close of the conflict, various efforts were made to establish better communication across the river, but the ferry proved to be unprofitable. The holder of the franchise in 1867 asked to be released from his obligation because so many crevasses had inundated West Baton Rouge Parish.

In 1870, C. C. Gibbens acquired the franchise. The operation became a success under his ownership, and by 1879, he added a second vessel to the line, a new paddle wheeler. In 1881, Joseph Gebelin and Francis Phillips acquired the contract for the ferry (Kellough and Mayeux 1979:187-188,199; Morris 1969).

From at least 1882 until 1968, the ferry landing was situated on the batture at the foot of Main Street. The ferry provided transportation between Baton Rouge and Port Allen, and it is depicted on several maps, including the 1883 - 1884 and the 1921 Mississippi River Commission Charts 66; Kaiser and Swensson's 1895 *Map of the Parish of East Baton Rouge Louisiana*; the 1908 edition of the USGS 15' series topographic quadrangle, Baton Rouge; and the 1963 (photorevised 1971 and 1980) USGS 7.5' series topographic quadrangle, Baton Rouge West, Louisiana.

In 1906, the Baton Rouge Ferry Company held the franchise for the operation, with offices in the First National Bank Building. The company named its ferryboat the *Istrouma* (National Advertising Agency 1906:53). A 1908 plat of Baton Rouge depicts two small structures, presumably ticket offices for the ferry (Clerk of Court Office, East Baton Rouge Parish 1908).

According to historian Elizabeth Kellough, "Disaster struck the ferry service in 1915 when a hurricane roared in from the Gulf, breaking loose the *Istrouma*, then operated by E. C. Miller. The ship was loosened from her moorings and she sank downstream. The companion ship, the *Brookhill*, sank tied to the dock when a great pile of logs crushed against her" (Kellough and Mayeux 1979:188). This storm also may have

destroyed the structures depicted in the 1908 plat. Sanborn Fire Insurance Maps do not depict the ferry landing at Main Street until 1916, when a ferry pier and a tiny ferry ticket office apparently were constructed (Figure 19).

The ferry changed hands after the hurricane. In 1916, the Baton Rouge Transportation Company received the franchise to operate the service. Several photographs of the ferry landing at extremely high water appear in a 1920 *Pictorial Review of Baton Rouge* (Baton Rouge *Sunday News* [1921]: 38, n.p.). The Baton Rouge Transportation Company kept the ferry franchise throughout the remainder of its service to the city. The company vessel, *The City of Baton Rouge*, plied the waters after 1916, and in 1924, the *Louisiana* joined the operation. Both vessels operated until 1968 (Kellough and Mayeux 1979:188). The *Louisiana* originally had a capacity of 1,000 people and 70 automobiles, although the larger vehicles of later years reduced the number of cars that the ferry could transport.

The Florida Street Wharf

The Florida Street Wharf (Site 16EBR58) originated at approximately the time when Baton Rouge became the official seat of Louisiana's government in 1850 (Heck 1970). The structure appears on the Gill map of the city of Baton Rouge (1855) and it seems to have been the chief wharf in the community during the Civil War era. At the time of the explosion of the *Princess* in 1859, contemporary sources describe "an old dismantled steamboat, which answered the purposes of a wharf" (Morgan 1917:3), as well as a "wharf-boat" in Baton Rouge (New Orleans *Picayune* 1859). Presumably this "wharf-boat" was situated at the Florida Street Wharf.

Little specific information survives about the activities at the Florida Street Wharf during the Civil War, but its strategic location suggests that it would have been involved in the conflict. Gorlinski's topographical plan of the city and battlefield of Baton Rouge depicted Federal transport or pump boat Number 7 anchored at the head of Florida Street, but whether or not the vessel actually was docked at the wharf is unknown.

Twentieth century maps depict the wharf in somewhat more detail. Sanborn maps first depict the wharf in 1903; the map shows an irregularly shaped structure that included a tiny cubicle for an

office and a compartment for an electric motor (Sanborn 1903, Sheet 2). The Sanborn map of 1916 depicts a structure at Florida Street that apparently differed from the wharf shown in the Sanborn map of 1903. Perhaps the Florida Street Wharf was damaged by the hurricane that struck the waterfront in 1915 (Kellough and Mayeux 1979:188). The wharf of 1916 is of a different size and it appears to occupy a slightly different position. Furthermore, it is described as a wharf landing and general warehouse in 1916 (Figure 19). The Florida Street Wharf also appears on the Mississippi River Commission Map of 1921 (Sheet 66), but it disappears altogether from the Sanborn map of 1923. Presumably, the wharf was abandoned during the early 1920s.

The Baton Rouge Lumber Company and Its Predecessors, 1855 - 1970

Beginning in May 1885, a group of prominent citizens organized the Burton Lumber Company, which occupied not only the former site of the Missouri Mill but also extended its operations downriver to North Boulevard. Annual flooding of the waterfront facilitated the transfer of the logs from the river to the sawmill (Carleton 1981:237). By the 1880s, a local account proclaimed, "This gigantic lumber enterprise bears the proud distinction of being one of the pioneer manufacturing concerns of this city" (Muse 1902:72).

By 1898, the Burton operation extended from France Street downstream to South Boulevard and between Natchez Street and the river (Figure 20). Between France and Europe streets, elevated platforms over the levee and the batture held stack after stack of lumber. Just below Europe Street, the levee swerved outward towards the Mississippi. The Burton saw and shingle mill were located on the land side of the levee; a log run over the top of the levee connected the mill with the river. Further downriver, a dry kiln, connected by a pipe to the city water works, spanned the levee. The planing mill was located below the kiln and just within the levee. A shavings conveyor over the top of the levee connected it with the river (Sanborn 1898, Sheet 11).

In March 1906, the family of William Garig, a leading entrepreneur of Baton Rouge, obtained sole ownership of the lumber company and adopted a new name for the enterprise, the Baton Rouge Lumber Company (Carleton 1981:237). By

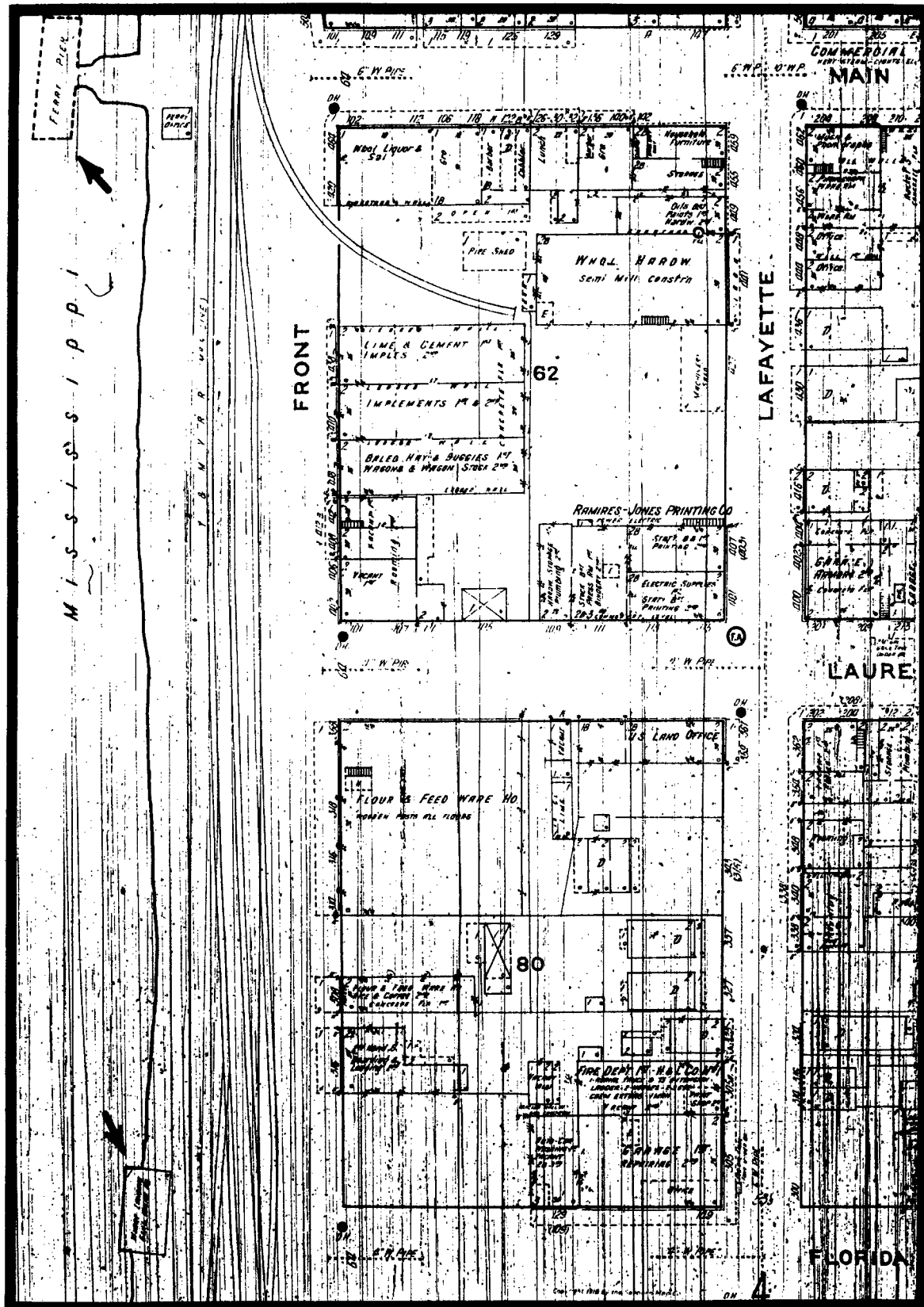


Figure 19. The Main Street Ferry and the Florida Street Wharf as depicted in the Sanborn Fire insurance map of Baton Rouge, 1916, Sheet 2.

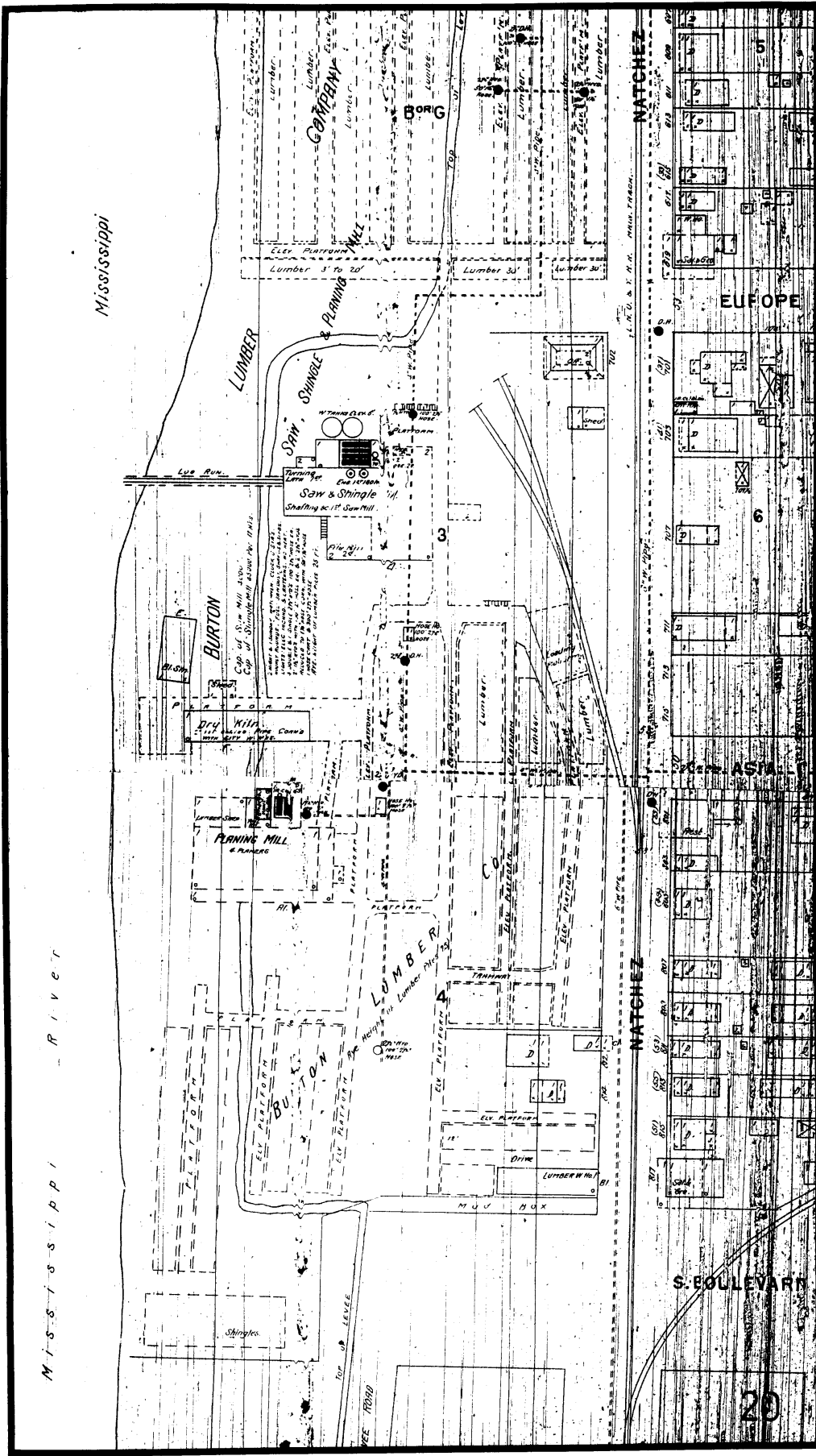


Figure 20. The Burton Lumber Company as depicted in the Sanborn Fire Insurance map of Baton Rouge, 1898, Sheet 11.

1916, a Sanborn map of the enterprise showed, for the first time, a shingle mill located on the batture. By 1923, the Sanborn map described the structure as the "Old Shingle Mill" and they assessed the condition of the building as dilapidated, with its machinery dismantled.

The lumber company survived the depression; in 1936, it still listed its offices at 702 Natchez Street (Southern Bell Telephone and Telegraph 1936). In 1968 the enterprise moved from its historic downtown site to a new location off Choctaw Drive (Carleton 1981:237). Nevertheless, an urban planning document of 1970 lists as a site and structure of visual significance, the Baton Rouge Lumber Company Building, ca. 1890, at Front Street and France (Heck 1970:44, 47).

The Municipal Dock

The port of Baton Rouge officially opened in 1916 (Thom 1967:35), but the city did not construct the Municipal Docks until the 1920s. By 1928, the new municipal dock had begun operations (Baton Rouge Chamber of Commerce [1928:1-4]). In 1936, the city leased the Municipal Docks to Federal Barge Lines for approximately 12 years.

In 1944, at the close of the Second World War, civic leaders organized the Port Development Committee, which became the Port Development Association in 1948. By 1949, the Municipal Dock was no longer used because the river was too shallow at the site. At the urging of the association, the legislature in 1952 appointed a Port Commission, which leased the Municipal Dock (Thom 1967:35; Kellough and Mayeux 1979:191-192).

Built on reinforced concrete pilings, the structure originally consisted of a concrete and steel framed deck with a steel frame superstructure. Steel also framed the approach to the deck. The levee was altered to veer sharply inward just below the docks (Figure 21).

The Port Commission declared the harbor limits of Baton Rouge to be the southern boundary of East Baton Rouge Parish up to the old, ca. 1940, Mississippi River Bridge upriver from the project area (Greater Baton Rouge Port Commission 1955:11). The port expanded rapidly in the years 1956-1958 and 1964-1970, boom years for

the development of the petrochemical industry (Hansen 1971:238). By 1975, the deep water Port of Greater Baton Rouge had become the fourth largest in the nation, surpassed only by New York, New Orleans, and Houston (Kellough and Mayeux 1979:99). Since that time, however, declining profits in the oil industry have affected adversely the fortunes of the Port of Baton Rouge.

The Baton Rouge Brickyard, ca. 1889-1906

The Baton Rouge brickyard was situated on 300 ac (121 ha) on the land side of Natchez Street, and it also had a steamboat landing on the river. According to a report of 1889:

At their steamboat landing bricks are loaded on barges, and delivered along the Mississippi River and Bayou Lafourche in large quantities to suit the demands of sugar planters. The Red River, Teche, Atchafalaya and Ouachita River boats buy largely to fill orders for their trade (Police Jury of East Baton Rouge [1889:20]).

At its peak, the company manufactured 50,000 bricks per day. By 1906, the brick yard no longer operated; it is not listed in the city directory of that year.

The Capital City Oil Mill, ca. 1889 - ca. 1923

Located at Natchez Street, the Capital City Oil Mill processed cottonseed oil; it was established in Baton Rouge ca. 1889 (National Advertising Agency 1906:91; Police Jury ca. 1889:20). The firm's property consisted of 7.25 ac (2.9 ha) of land, 290 m (950 ft) of batture, and "one of the finest landings on the river" (Police Jury ca. 1889:20). Vessels with deep draughts could unload and receive freight within a few yards of the mill. The company also owned a steamboat and a barge. According to a contemporary report:

The Louisville, New Orleans and Texas Railroad runs along the eastern line of the property, and furnishes a spur for the mill, which enables the company to handle freight by rail with great facility . . . [A] seed-house 50 x 100 feet is located on the bank of the river for the accommodation of boats.

The Sanborn maps of 1891, 1898, 1903, and 1908 depict the seed warehouse on the batture. The Sanborn map of 1908 also shows an additional structure that may be the cotton gin, but by 1916,

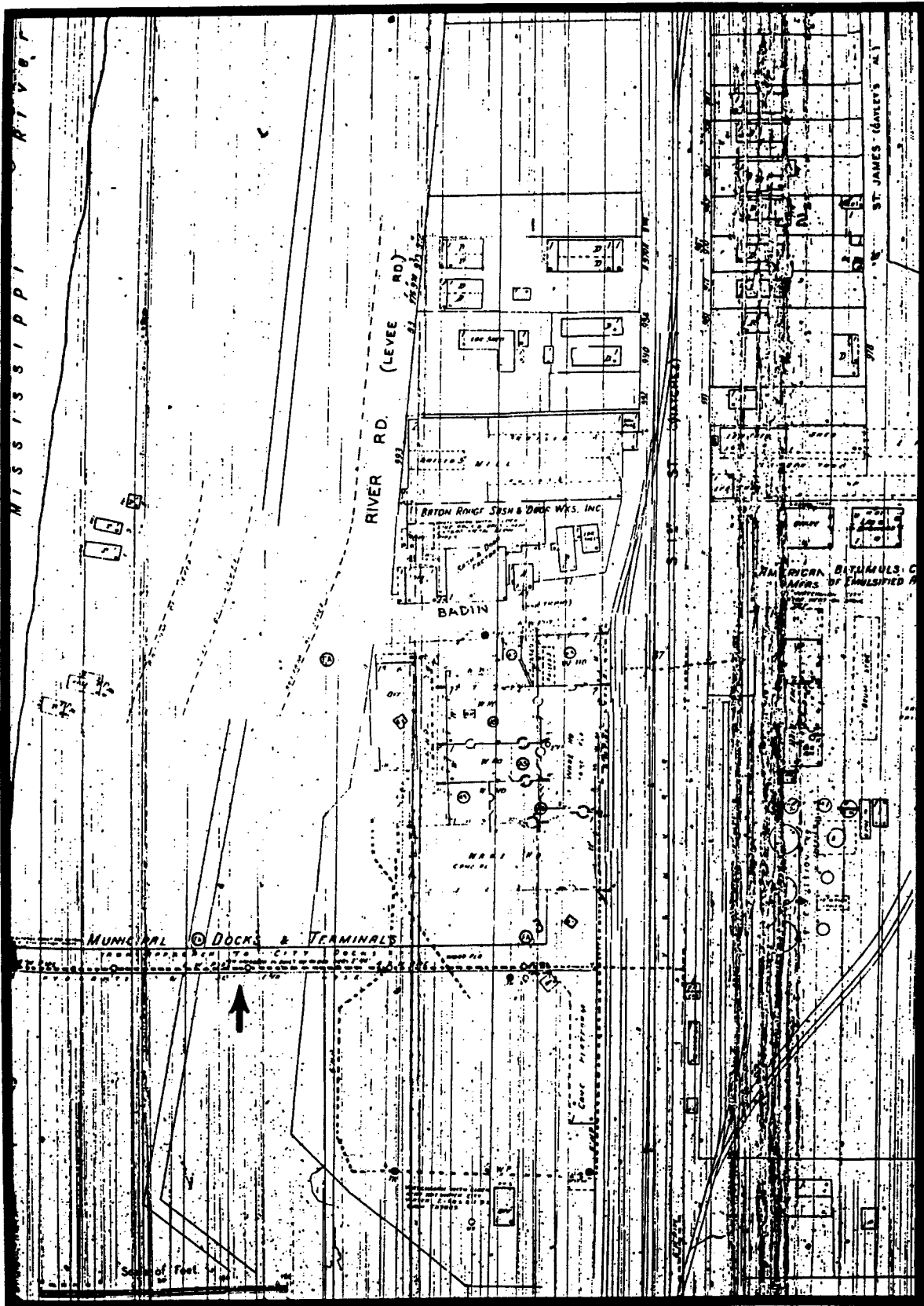


Figure 21. The Municipal Dock as depicted in the Sanborn Fire Insurance map of Baton Rouge, 1923, Sheet 33.

this building had been abandoned. The 1923 Sanborn map indicates that the Capital City Oil Mill structures on the batture had been removed.

Sawmills in the Downriver Area

As railroads developed during the latter nineteenth century, sawmills often developed beside the tracks. By the early twentieth century, sawmills operated in the area between the railroad and the Mississippi River. The 1908 edition of the USGS 15' series Baton Rouge topographic quadrangle depicts two sawmills, both lying below the city limits of the time. Only one of these enterprises, the Reliance Shingle Company, appeared on the 1908 Sanborn map. Located on the batture, the shingle mill had a log slip that led to the river. On the river side of the protection levee, the Reliance Company stood just above the point where Magnolia Avenue (later Oklahoma Avenue) intersected with River Road.

The Sanborn map of 1911 documented that the Reliance Shingle Company was no longer in operation. All machinery except the boiler and the engine had been removed. The same map depicted the sawmill of E. N. Ward, also on the batture, but it was located further downriver. According to the Sanborn map of 1916, E. Sondheimer had taken over the operation of the former E. N. Ward sawmill; the physical plant had not changed. The Reliance sawmill, upriver from Sondheimer, had disappeared (Sanborn 1916, Sheet 30).

According to the Mississippi River Commission map, a new sawmill, operated by the F. H. Liebke Lumber Company, had been established just downriver from the Sondheimer operation by 1921. The Liebke sawmill had steam power, electric lights, and city water. The local sawmills, however, seem to have suffered in the postwar depression of the early 1920s. Both the Sondheimer plant and the Liebke sawmill had ceased operations by 1923.

The Sanborn map of 1947 shows the structural remains of the Sondheimer sawmill that had long since closed; no trace of the Liebke sawmill survived (Sanborn 1947, Sheet 56). The 1950 Sanborn map indicated that the vestiges of the Sondheimer sawmill also had disappeared (Sanborn 1950, Sheet 56).

Changes Along the Riverfront, 1811 - 1992

In November 1811, surveyor John Dutton completed a map of a portion of the waterfront in Baton Rouge. He surveyed an area bounded by Laurel Street to the north, Second Street (now Lafayette Street) to the east, Convention Street to the south, and Front Street and the river to the west. The map documented that a levee of sorts already had been built immediately adjacent to Front Street and between that thoroughfare and the river by the early nineteenth century. By 1844, a series of levees of varying strength extended in an unbroken line from 32.2 km (20 mi) below New Orleans up the left descending bank of the Mississippi to Baton Rouge.

During the early years, individual owners along the riverfront had responsibility for building and maintaining levees on their property. This system proved unsatisfactory. Serious floods occurred throughout the antebellum period. In addition, during the Civil War, when maintenance proved impossible, breached levees or crevasses became a particular problem. During the three years after the Civil War, West Baton Rouge Parish experienced disastrous floods. In 1867, the operator of the ferry between the Baton Rouge and West Baton Rouge Parish asked to be released from his contractual obligations. He claimed that he could not make any money because of the frequent crevasses along the western banks of the river (Kellough and Mayeux 1979:199-200). Photographs and sketches of the Baton Rouge waterfront indicate that high water continued to rise to the edge of Front Street during the Civil War era (Carleton 1981).

In 1879, the United States Congress created the Mississippi River Commission [M.R.C.], which mapped the river. The M.R.C. map dating from 1883 - 1884 shows that the levee lay adjacent to Front Street, but that it had an unusual rectangular configuration between Africa (now Louisiana) and Spain Streets, caused by a levee setback above and below those two points. A possible reason for this setback might have been to preserve the integrity of the Plaza de Colomb or to protect the M. K. Knox Saw and Planing Mill, which occupied the site in 1891.

During the twentieth century, the U.S. Army Corps of Engineers, New Orleans District enlarged the levees along the Baton Rouge waterfront. The Corps completed the Baton Rouge [United States Senator Edward James] Gay Levee Enlargement in August 1932 for the area situated just below the Municipal Pier. By April 1934, the Corps had completed the even more extensive Baton Rouge Levee Enlargement project.

Changes on the waterfront also included recreational activities such as cruises on the river provided by the *Samuel Clemens*, a replica steamboat that first docked on the waterfront in 1981. The following year, the *U.S.S. Kidd*, a destroyer built during the Second World War, joined the *Samuel Clemens*. The destroyer rests in a unique cradle that allows the ship to dry-dock most of the year but to float in the spring when the Mississippi River rises (Mattice 1982:9, 11). Other features of today's waterfront include the Exxon pipeline cluster and the Acadian Pipeline Company's 16 in line, both of which run parallel to the waterfront.

Summary of East Baton Rouge Parish History

The history of East Baton Rouge Parish, and the City of Baton Rouge in particular, has been long and interesting. The city itself has undergone significant economic transformations. Numerous industrial and non-industrial pursuits have been undertaken in the region, including agriculture, brick manufacturing, lumber processing, ferry boat operations, and, more recently, petrochemical manufacture. In addition, the City of Baton Rouge has had a fascinating military history. During the Civil War, the city was a coveted prize, alternating back and forth between Confederate and Union control. Currently, Baton Rouge serves as the State Capitol of Louisiana and this urban environment relies on retail manufacture and trade, shipping, and petrochemical manufacture for survival.

Iberville Parish, Louisiana

All or portions of three project items extend along the Mississippi River as it runs through eastern Iberville Parish. On the west bank of the river are the 9 km (5.7 mi) Reveille to Point Pleasant Levee Enlargement and Concrete Slope Pavement project item and the upper 5 km (3 mi) section of the Alhambra to Hohen-Solms Concrete Slope Pavement project item. Across

the river from the latter item is the Carville to Marchand Levee Enlargement and Concrete Slope Pavement and Borrow Pit project item, the upper 0.8 km (0.5 mi) of which traverses the east bank of the Mississippi River through eastern Iberville Parish. Historically, this has been an agricultural region, with the project items crossing through several major sugar plantations along their routes. Much of the area remains planted in sugar cane today; however, portions have become industrialized in recent years. This section presents a general overview of the history of eastern Iberville Parish, with an emphasis placed on the project vicinity. The early exploration and settlement of the area was outlined in the first section of this chapter.

Antebellum Era

During the early nineteenth century, the economy of southern Louisiana changed drastically with the continued development of sugar cane agriculture. As was the case in other Louisiana parishes, the cultivation of this crop was too expensive for many of the small farmers who originally settled the region. Consequently, many of them sold their properties to large landholders who began to consolidate their plantation acreage by the 1820s (Goodwin et al. 1986:26).

Antebellum census records reflected the ascendancy of the plantation economy in the project region. By 1830, population statistics for Iberville Parish counted approximately two slaves for each freeman, a ratio that generally was maintained through the pre-war years. According to the federal census of 1830, Iberville Parish contained within its borders a population of 7,049 - 2,541 freemen (an aggregate sum of whites and free people of color) and 4,508 slaves. Some 20 years later, the population had risen to a total of 12,278 inhabitants, of whom there were 3,568 whites, 8,606 slaves, and 104 free people of color. Through the next decade, the Iberville Parish population grew in 1860 to 14,661, including 3,793 whites, 10,680 slaves, and 188 free people of color - an increase in the slave/freeman ratio to nearly three to one (Clerk of the House of Representatives 1832:32; DeBow 1853; Kennedy 1864b:194).

The Iberville Parish project area included several of the major antebellum sugar planta-

tions of the region. Among the west bank properties were the Rebecca, Hard Times, Retreat, Plaisance, Residence, and Palo Alto Plantations. These plantations extended along the Reveille to Point Pleasant project item. The Belle Grove Celeste, Old Hickory (also known as Home), and Claiborne Plantations all reached the riverfront within the Alhambra to Hohen-Solms project item. Across the river, on the east bank, were the Rescue and Revenue Plantations, fronting the Carville to Marchand project item (Figure 22). Among the project area landowners were some of the leading figures of the antebellum years – John Andrews, millionaire planter from Virginia; William C. C. Claiborne, governor of both the Territory of Orleans (1804 - 1812) and the State of Louisiana (1812 - 1816); and various members of the Cropper, Landry, and Hebert families, whose ancestors were among the first settlers of the region. The plantation belonging to Governor Paul Octave Hebert was located between the west bank project items in the Bayou Goula vicinity; however, his grave site was moved upriver to St. Raphael's Cemetery (within the Reveille to Point Pleasant project item) in 1928, when the Bayou Goula levee was shifted (Arthur and Kernion 1931:337-341; Calhoun 1995:472; Grace 1946:75, 115-116; Riffel 1985:19-20, 48-49; Seebold 1941:186-192; Sternberg 1996:171, 215-218, 229-231).

On the eve of the Civil War, several of the project area landowners were among the largest sugar planters and slaveholders in Iberville Parish. Persac depicted the general configurations of many of these properties in his map entitled 1858 Plantations on the Mississippi River from Natchez to New Orleans (Figure 22). The 1860 federal census confirmed the land and chattel status of the major planters (50 slaves or more), whose Iberville Parish landholdings totaled 44,639 improved acres (18,065 improved ha) and 84,512 unimproved acres (34,202 unimproved ha). Their combined labor force was estimated at 7,279 slaves, and their aggregate crop totaled 5,428 hogsheads of cane sugar and 73,119 gallons of molasses (Menn 1964:237-249). During the next few years, the economic ravages of the Civil War would alter radically the fortunes of many of these planters.

The Civil War

Although there were no major Civil War campaigns conducted in the project vicinity, this stretch of the Mississippi River saw a great deal of military traffic, both water and land-based. After New Orleans and Baton Rouge fell in the spring of 1862, battle centers were focused to the south along Bayou Teche, and northward along the Red River. Because control of the Mississippi River was a primary Federal objective, assaults on the Confederate defenses along its extent accounted for a great deal of naval activity up and down the river (Davis 1971:253-265).

The location of the Town of Plaquemine at the head of Bayou Plaquemine made it the key location between the Mississippi River and the lower Atchafalaya River, via the Grand River. Plaquemine also was a link to the Opelousas and Bayou Teche regions through the Atchafalaya basin waterways. Following their capture of the Iberville Parish seat in early 1863, Federal forces posted a small detachment there. With increased excursions into the Atchafalaya country and the threat of Confederate guerrilla activities in the Iberville region, Union troops built a dirt fortification at Plaquemine. Federal forces maintained the fortification from November of 1863 – November 1865 with a force of 22 officers and 540 enlisted men (Casey 1983:160; Raphael 1975; U.S. Secretary of War [OR] 1880-1901; Winters 1963).

Although a post never was established there, the Bayou Goula vicinity also saw a great deal of military traffic. Like Plaquemine, Bayou Goula was a gateway to the Atchafalaya region and, thus, it became a crossroads for troops moving between the Donaldsonville and Plaquemine posts and points westward. Official war records cite numerous incidents in the area, e.g., reconnaissance expeditions, guerrilla attacks, and supply confiscations from neighboring plantations (OR 1880-1901; Riffel 1985:20). On June 29, 1864, Major Richard G. Shaw, commander of the Eighth U.S. Heavy Artillery stationed at Plaquemine, wrote:

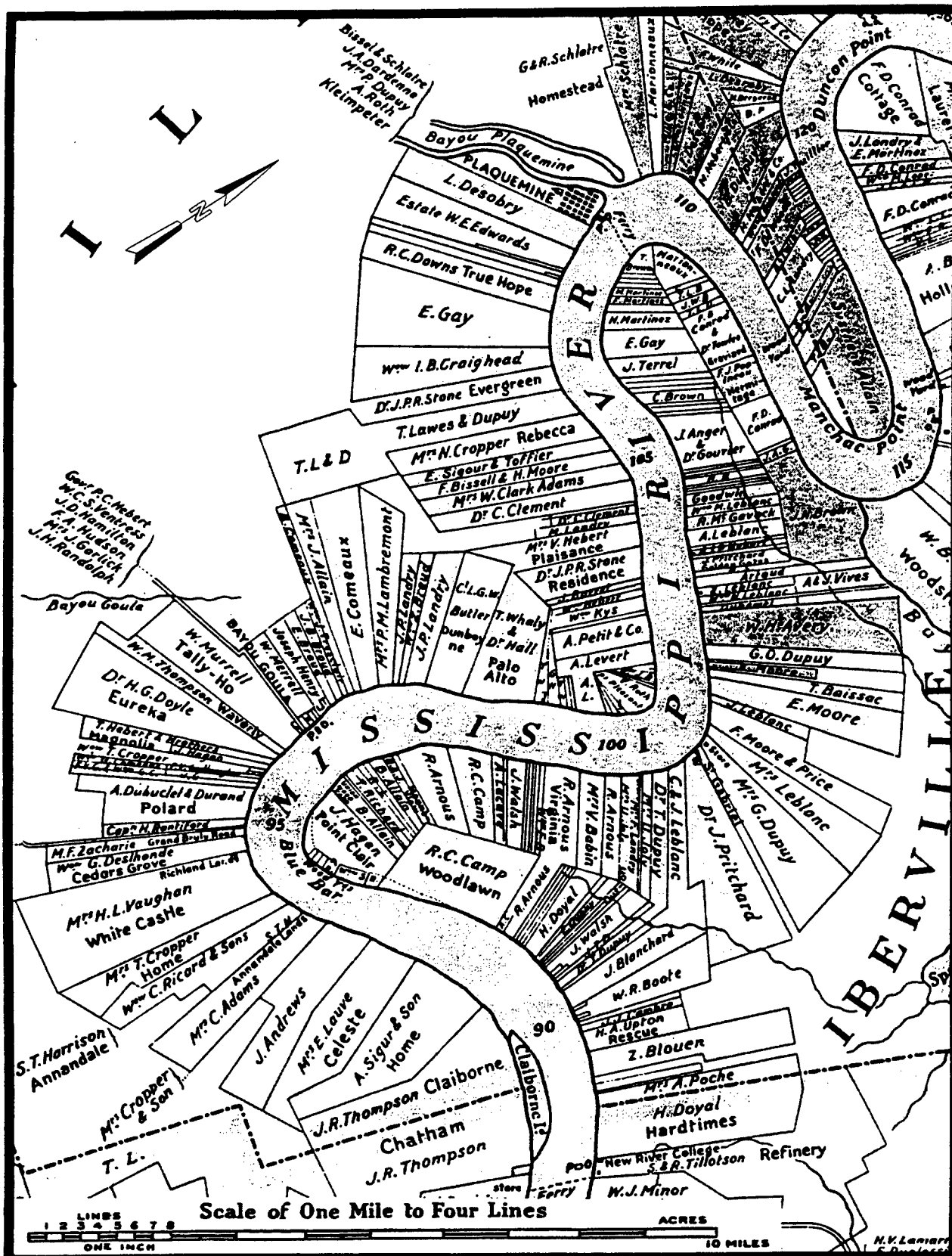


Figure 22. [1858] Excerpt from Persac's *Plantations on the Mississippi River from Natchez to New Orleans* (Norman's Chart), in reference to the Iberville Parish project items. Excerpt depicts plantations in the project vicinity, Iberville Parish.

Hardly a night passes but some parties of the enemy visit the plantations on the river between this place and Bayou Goula, for the purpose of stealing horses, mules, &c., and it is impossible to put a stop to these depredations with the small force of cavalry here at present (OR 1893:34[4]:588).

Later that summer, the Federal commander of the Lafourche District, Brigadier-General Robert A. Cameron, related that:

The citizens in the neighborhood of Bayou Goula, believing their horses may be taken by the Federals, are putting them where the rebels can get them and then report them stolen, but are perfectly satisfied with the thief (OR 1891:41 [2]:382).

There were two notable military actions in the region during the Civil War. The first was the "Skirmish at Plaquemine" on June 18, 1863. The second occurred on June 19, 1863 and it has been referred to as the "Raid on Bayou Goula." Both of these actions were reported in the official army records of the Civil War. Colonel James P. Major, commanding the Confederate Second Cavalry Brigade, rode from Washington in St. Landry Parish to Indian Village at the junction of Bayou Grosse Tete and Bayou Plaquemine. Due to the logistical difficulties in crossing Bayou Plaquemine, Colonel Major sent Colonel Joseph Phillips and his regiment first across the waterway and on ahead to attack the Federal forces in Plaquemine. Around 6:30 a.m. on June 18, 1863, "Phillips' regiment . . . made a dash into Plaquemine, taking 87 prisoners, burning 3 fine steamers [the Lasykes, the Anglo-American, and the Belfast], 2 steam flats, 100 bales of cotton, and capturing a large quantity of commissary stores" (OR 1889:26[1]:217). Colonel Major spent the remainder of the day crossing the bayou with the rest of his brigade and riding to Plaquemine, from which his troops were forced by shelling from the *Winona*, a Baton Rouge-based gunboat that came to the rescue of the beleaguered Federal post. Colonel Major and his cavalry continued downriver, as his report relates:

At 6 p.m. started down the Mississippi River, and at daylight on 19th arrived at Bayou Goula. In marching down the bank of the river, three large gunboats passed the column, but did not discover us. As an attack on them would have given our

locality, which I was anxious to conceal, I allowed them to pass unmolested. At Bayou Goula took commissary and quartermaster's stores; destroyed Federal plantations; recaptured over 1,000 negroes, stolen by Banks from planters living in Saint Landry and Rapides Parishes; found them starving and in great destitution; kept the men, and left women and children (OR 1889:26[1]:217-218).

From Bayou Goula, Major and his 300 cavalrymen continued downriver toward Donaldsonville and then southeastward to Thibodeaux and the Lafourche country (OR 1889:26[1]:191-192, 217-218; Winters 1963:284-285).

Because Plaquemine and Donaldsonville were occupied points, the territory between the two towns saw a great deal of military activity. This stretch of the Mississippi River would have included the plantations situated in what are now the Reveille to Point Pleasant and the Alhambra to Hohen-Solms project items. Union reports made mention of military traffic through several Iberville Parish properties, including plantations belonging to Madam Lawes, V. Roth, Whaley, Hall, Thompson, and Dr. J. P. R. Stone. All of these parties owned acreage within or near the project area, although some also held other tracts in the region (Figure 22). Although fighting may not have been involved in all instances, the Mississippi River plantations of the region certainly would have been traversed by both Union and Confederate forces as they moved from post to post, foraged for supplies, and scouted for the enemy.

Postbellum Era

Although Iberville Parish did not suffer as much physical property damage as some areas of the state, the economic effect of the Civil War on the region was devastating (Riffel 1985:20). During the postbellum period, many of the planters in the project vicinity lost their lands. Wartime property damages and stock confiscations, combined with lack of capital and loss of slave labor, hampered efforts by most landowners trying to rebuild their plantations. Sugar cane cultivation continued to dominate area agriculture; however, post-war conditions prevented the sugar crop from reaching its 1861 peak. The small planters who lined the waterways during the antebellum era could not sustain the high

costs required to maintain successful sugar yields. Consequently, large planters began to consolidate the smaller plantations, and area sugar production was transformed into a corporate enterprise (Begnaud 1980:38-39, 42-43; Heitmann 1987:48-50).

Several plantations in the project region were affected by the postbellum trend toward acreage consolidation. An example of such property amalgamation was the Soulouque Plantation (on the west bank, fronting the Rev-eille to Point Pleasant project item). No structures from the plantation exist today, but the modern USGS topographic quadrangle of the region (Plaquemine, LA) depicts a few scattered structures that represent the remains of the small community of Soulouque (Grace 1946:100; Hansen 1971:536; Riffel 1985:53; Sternberg 1996:215-216). By the mid-1880s, the Soulouque Plantation encompassed Dr. J. P. R. Stone's Residence Plantation and the adjacent small farms that had existed along that river stretch prior to the Civil War (Figures 22 and 23).

Downriver from the Soulouque Plantation, on the east bank of the Mississippi, was the Rescue Plantation, which extended into the 2 km (1.2 mi) wide project corridor of the western end of the Carville to Marchand project item. The Rescue Plantation was owned by the Winfree and Upton families from around 1845 to 1875 (Figure 22). The annual sugar yield for the plantation was sporadic during the postbellum years, with no production reported in the 1868-1869 or 1872-1873 seasons. In 1875, the front acreage of the Rescue Plantation was subdivided into 11 one-arpent lots, possibly in anticipation of future sell-offs to multiple parties. On May 10, 1875, the two heirs to the property sold all 11 land parcels to Martin Glynn, the plantation manager since 1869. Excluded from the conveyance was the Winfree family cemetery, noted in the deed of sale as "the Graveyard," which occupied an 24.4 m x 30.5 m (80 ft by 100 ft) tract in Lot I (this cemetery was not depicted on the researched maps, nor was it recorded in the Louisiana state site files or historic preservation files). Under Glynn's tenure, sugar production on Rescue seemed to stabilize, and while the plantation apparently did not expand during

those years, it did maintain its acreage and modest sugar crop through the end of the century (Figure 23) (Goodwin et al. 1985a:139-141).

As sugar production proved less profitable for financially distressed planters after the Civil War, a number of growers turned to rice cultivation as a supplement to or, in many cases, a replacement for sugar cane agriculture. Because the necessary labor and stock could be utilized between the cane planting and grinding seasons, rice required little additional capital for successful cultivation. Additionally, 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).

In 1860 and 1870, the Federal agricultural statistics listed no rice crop for Iberville Parish; however, in 1890, the parish reported a rice yield of 4,615,963 lbs. (Kennedy 1864a:67; Walker 1872:743; U.S. Census 1896:435). In the project vicinity, there were a few sugar plantations that had made the partial modification to rice cultivation by the mid-1880s. Included among these properties were the Celeste Plantation (fronting the Alhambra to Hohen-Solms project item), the Revenue Plantation, and the F. Brun [Bruns] property (the latter two were located along the Carville to Marchand project item). Most of the rice in this region apparently was cultivated on the east bank Point Clair plantations (between present-day St. Gabriel and Carville), just a few kilometers upriver from the Carville to Marchand project item (Figure 23) (Sternberg 1996:174).

Twentieth Century

After the turn of the century, agriculture continued to dominate the economy of Iberville Parish. Sugar production remained the chief force behind the area economy, with continued consolidated management by such corporations as the Old Hickory Planting and Manufacturing Company and the Guyton Sugar Company, which operated Old Hickory Plantation (along the Alhambra to Hohen-Solms project reach) (Louisiana Planter and Sugar Manufacturer 1924:92, 1929:49). By 1921, the riverfront fields of west bank Belle Grove Plantation were under rice cultivation. Most of the Belle Grove rice

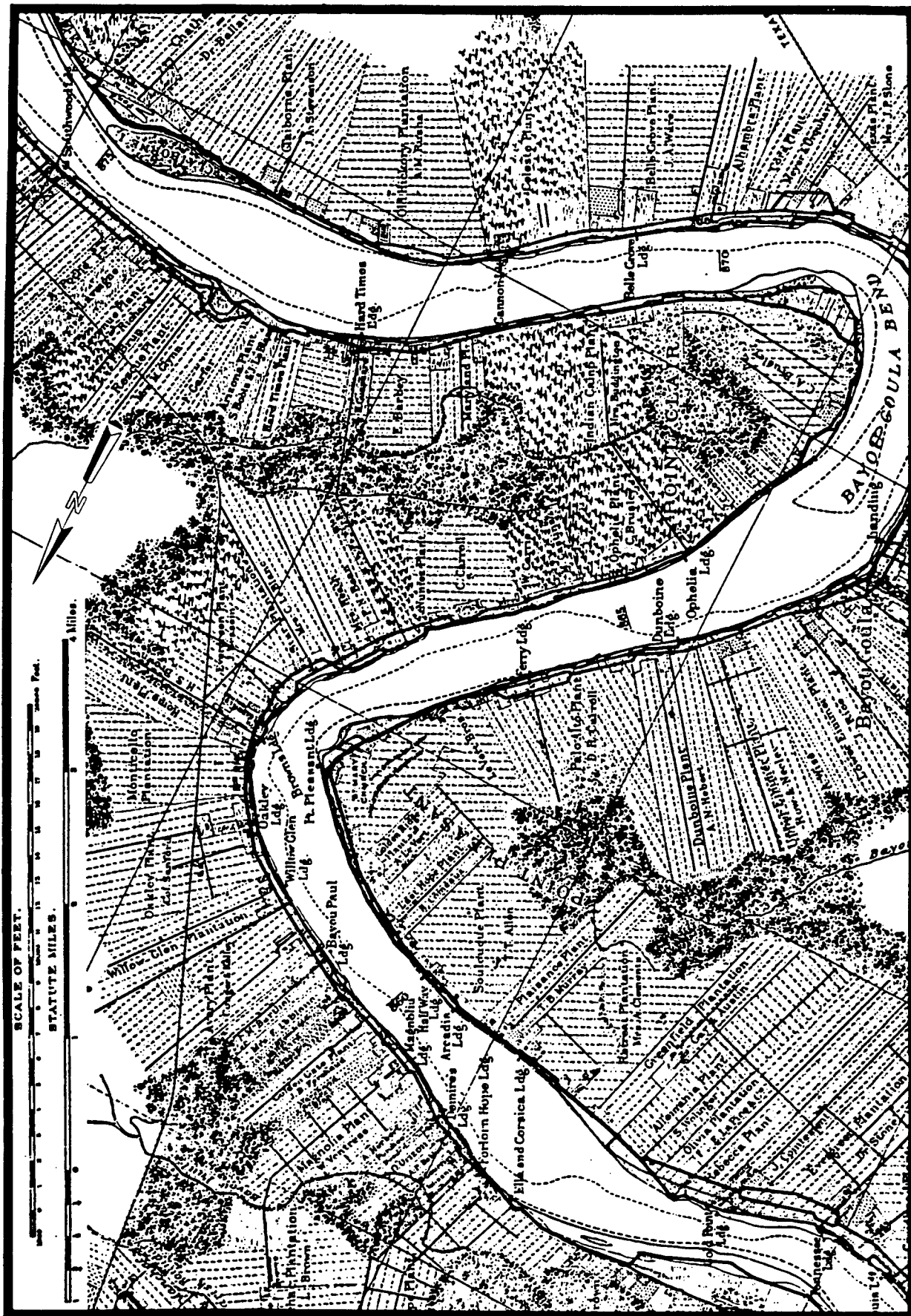


Figure 23. [1907] Reduced excerpts from the Mississippi River Commission's *Map of the Lower Mississippi River from the Mouth of the Ohio River to the Head of the Passes*, Sheet No. 25. Excerpts depict plantations in the project vicinity, Iberville Parish.

acreage actually encompassed the old Celeste Plantation, which had been planted in rice during the postbellum years. As in the previous century, much of the rice along the Iberville extent of the Mississippi River apparently was cultivated on the west bank Point Clair Plantations (Mississippi River Commission [MRC] 1921:67-68).

Land tenure in the project vicinity reflected the early twentieth century land use patterns common along the Mississippi River through 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 (Figure 23). In 1945, Iberville Parish recorded 26,000 ac (10,522 ha) planted in sugar cane, with only 2,000 ac (809 ha) under rice cultivation. Sugar cane fields at that time represented 50 percent of the cultivated acreage in the parish; of the balance, 30 percent was planted in corn and 20 percent in pasture, rice, hay, potatoes, and truck crops. Currently, sugar cane, soybeans, grain sorghum, pecans, and livestock are the chief agricultural products of Iberville Parish (Calhoun 1995:218; Draughon et al. 1995:5; Grace 1946:225).

Although agriculture has remained a major local force through the twentieth century, the economic and physical landscape of the project area began to change with the discovery of petroleum in the area. In June of 1901, the White Castle Oil & Gas Company was established and the company drilled a well; however, the located oil pockets were not commercially viable. Petroleum exploration did not begin in earnest in Iberville Parish until 1926, when salt domes were discovered southwest of White Castle and at Bayou Bouillon, or Bayou Larompe. Today, the Point Pleasant Gas Field and the Laurel Ridge Oil and Gas Fields extend into or very near the Reveille to Point Pleasant and the Alhambra to Hohen-Solms project items, respectively. Across the river, the primary pool of the St. Gabriel petroleum field lies just a few kilometers north of the Carville to Marchand project item (Grace 1946:189-190; Louisiana Department of Transportation and Development 1994; Riffel 1985:58).

In recent years, the Mississippi riverfront in Iberville Parish has been transformed by the evolution of the petrochemical industries. By the early 1990s, the upper end of the Reveille to Point Pleasant study reach extended through the Georgia Gulf Corporation and Ashland Chemical, Inc., facilities, whereas the lower portion ended very near the Union Carbide site. On the east bank of the river, the Iberville Parish portion of the Carville to Marchand project item fell within the Fina/CosMar plant; Arcadian Fertilizer, L.P.; and Allied Signal, Inc., Geismar Complex. Although there are no large petrochemical facilities within the Alhambra to Hohen-Solms project item, there are numerous petroleum pipelines and wells located through its length (Draughon et al. 1995; DTC Incorporated 1992a).

Summary of Iberville Parish History

The three Iberville Parish project items follow riverfront routes along sugar cane fields and petrochemical properties. With the exception of petroleum exploitation and the petrochemical industry, little has changed in the character of the region. Historically a sugar cane region, eastern Iberville Parish has remained largely dependent upon agriculture from earliest settlement to the present. Because this part of southern Louisiana traditionally was sugar cane country and encompassed numerous thriving plantations, there is certainly a probability that some evidence of past plantation life, although impacted by cultivation or modern petrochemical activity, may have survived the years.

Orleans and Jefferson Parishes, Louisiana

Introduction

Because some of the U.S. Army Corps of Engineers, New Orleans District project items were situated near to each other in adjacent Orleans and Jefferson Parishes, the history of these two parishes was treated in a single section. Project items located in these parishes include the Carrollton Levee Enlargement (M-104 - 100.2L), the Jefferson Heights Levee (M-104.3-L), and the New Orleans District Floodwall (M-102.9-L). The early exploration and settlement of this area was chronicled in the first section of this chapter.

Economic Development, 1728 - 1836

Agriculture and exportation provided the economic foundation of the greater Orleans and Jefferson Parishes area during this period. The fertile alluvial soil along the banks of the Mississippi supported successful plantations based on crops that were well-suited to the tropical climate. Indigo was the primary crop grown, while rice, tobacco, wheat, beans, cotton, and corn also were cultivated (Swanson 1975:67). Initial settlers also exploited the local timber supply and lumber eventually became a major export commodity (Clark 1970:57).

During the later eighteenth century, agricultural patterns changed to meet the changing demands of the colony. As the profitability of indigo declined, sugar became the principal crop grown in Orleans and Jefferson Parishes. Cotton also later emerged as a major agricultural product. Improvements in processing technology further spurred this shift to sugar cane and cotton farming. During this period, an economical process of producing sugar from immature cane was developed, and the invention of the cotton gin allowed for the production of cotton on a larger scale (Goodwin et al. 1985b). By the early nineteenth century, sugar emerged as the dominant agricultural product. The labor, water access, and capital required for sugar cane cultivation and refining, however, dictated that only owners of larger plantations could profitably produce sugar (Goodwin et al. 1985b).

Lumber production also adjusted to meet new governmental and commercial demands. In addition to the needs prompted by the construction of new houses and business establishments, the Cuban sugar trade initiated a significant market for wooden boxes made from local timber (Goodwin et al. 1985b). By the early nineteenth century, sawmills were constructed to process more timber. At that time, the growing demand for building materials also prompted the construction of numerous brickyards (Goodwin et al. 1985b). This period in general was one of steady increases in the economy of the region.

The Development of the Carrollton Area

Origin of the Name

The Carrollton area was named by William H. Williams in 1876. Williams named the area

after General William Carroll, who commanded Kentucky troops at the Battle of New Orleans and who camped at the Macarty Plantation near Carrollton in 1814 (Bezou 1973:71-72). Carroll subsequently became Governor of Tennessee and visited New Orleans in 1825, where he received a hero's welcome (Chase 1979:100).

At least one historian has argued that the name of the village honored Charles Carroll of Carrollton, the only Catholic and last surviving signer of the Declaration of Independence (Perilloux 1945:4-6). Since the earliest streets in the village honored the American statesmen, the argument may have some merit. Certainly Carroll's wealth and fiscal conservatism would have appealed to the entrepreneurs who created Carrollton.

The Railroad to Carrollton

No doubt orchestrated by the entrepreneurs who developed the area, a group of railroad boosters held a public meeting in 1832 to urge planners to develop a railroad between the City of New Orleans and the fledgling village. The Louisiana legislature chartered the New Orleans and Carrollton Railroad in February 1833. The railroad started laying tracks in 1834 and it began passenger service on September 26, 1835 (Mahé 1976:26-40). By 1836, steam cars commuted between New Orleans and Carrollton every two hours, seven days a week (Swanson 1975:105).

In a single generation the railroad "transformed a rural countryside into the premier residential neighborhood of New Orleans" (Chase 1979:121). The railroad improved communication and stimulated business interaction between Carrollton and New Orleans, contributing to the village's rapid development (Ledet 1938:235). Carrollton was incorporated by the legislature in 1845 and became a city in 1859. Carrollton was annexed to the City of New Orleans on March 23, 1874 (Swanson 1975:106).

Carrollton Hotel and Gardens

In tandem with the railroad was the construction of the Carrollton Hotel and Gardens in 1835 (Ledet 1938:238). The project was successful in luring large numbers of city dwellers to the village on excursions (Swanson 1975:105). Fire destroyed the hotel in 1842, but the structure was rebuilt almost immediately due to its profitability

(Ledet 1938:239). According to one historian, "the Carrollton Hotel, the first resort hostelry opened in Jefferson, attracted a large clientele transported by the trains while horse fanciers rode to the Eclipse Course after 1838" (Bezou 1973:73).

The Carrollton Hotel, which became known as Carrollton Gardens, had a long and successful operation. A steamboat landing in the vicinity of the hotel provided a disembarkation point for hotel visitors. However, guests generally returned to the city by rail (Ledet 1938:239-240). The hotel and gardens survived until 1891 when the new levee constructed in that year required its demolition (Mahé 1976:217).

Samuel Short, An Early Settler in Carrollton

Samuel Short built the first residence in Carrollton at a site between Canal Street (the present Carrollton Avenue) and Short Street. Built close to the river, the house was lost to a cave-in a few years after its construction. Short also built the first lumber and shingle mill in the area and he cleared and developed a large tract of land in the area. Unfortunately, Short lost everything in the Panic of 1837 (Mahé 1976:71-74).

The Lumber Industry in Carrollton

Although Samuel Short disappeared after the Panic of 1837, other enterprising men entered into the lumber trade in Carrollton. Wood became the focus of industry in Carrollton for many years. Frederick A. Raslar established a woodyard and sawmill at the head of Monroe Street in the upper section of Carrollton. Raslar had the advantage of selecting the first of the free timber floating rounding the river bend. The batture along his property contained a large pool of water having two outlets to the river. Logs that collected in this basin supplied the sawmills behind the levee. Nevertheless, the pool on the batture created problems for the neighborhood. In 1853, a new levee was built, and Raslar was required to move his business. He relocated his lumber business to Jefferson Street (Ledet 1938; Mahé 1976:76-77).

The Jefferson and Lake Pontchartrain Railroad

The success of the New Orleans and Carrollton Railroad inspired work on a second railroad in 1851, the Jefferson and Lake

Pontchartrain. Completed in 1853, it ran from Carrollton along the boundary between Orleans and Jefferson Parishes to Lake Pontchartrain. The president of the new railroad, G. Currie Duncan, successfully petitioned the Carrollton Council to set aside a portion of the levee between the lower line of Canal (Carrollton) Avenue and the upper line of Jefferson (Joliet) Street for steamboats only. As a result, the Jefferson and Lake Pontchartrain had a landing on the river for transporting passengers to the Carrollton Hotel, as well as for moving cargo to and from the lake. The railroad continued in operation until the Civil War, when it was abandoned in 1864 for lack of profitability (Mahé 1976:114-116; Swanson 1975:98).

Steamboat Landings, Ferries, and Waterborne Commerce

A popular outing for New Orleanians was to take the steamer to Carrollton, spend a few hours at the Carrollton Gardens, and return to the Crescent City by rail. Beginning in 1845, a ferry also operated from Carrollton across the Mississippi; its landing was situated between Madison (Dante) and Jefferson (Joliet) Streets. Originally just a skiff, the ferry became steam-powered in 1868. In the meantime, flatboats landed at the lumber mills operating on the batture or behind the levee. On the eve of the Civil War, brigs, schooners, sloops, flatboats, and keelboats also could be found tied up along the Carrollton waterfront. In 1871, soon after the close of the Civil War, the city of Carrollton erected a wharf at the head of Madison (Dante) Street. The structure was 76.2 km (250 ft) long and cost \$8,246.19. It was constructed by the firm of Drumm and Hardy with the idea of attracting additional waterborne commerce to the Carrollton area.

The Civil War

Although no military engagements of any consequence took place in the area during the Civil War, the vicinity assumed importance in defending the upriver approaches to New Orleans.

Construction of Fort Morgan

To defend the northern approaches to the city, Confederate forces constructed a fortified line about 9.7 km (6 mi) above New Orleans at

Carrollton, Louisiana. The main line of defenses ran in a zig-zag pattern from the edge of the Mississippi River to a nearby swamp. The two ends were anchored by redoubts, with the principal redoubt located near the Mississippi River. The works stood 2.7 m (9 ft) high and were 8.2 m (27 ft) thick at the base. A 2.1 - 2.7 m (7 - 9 ft) deep ditch fronted the earthworks (Casey 1983:145-147, Green 1982:290; *Harpers Weekly* May 24, 1862; RG 77, Drawer 133, Sheet 77). Newspapers called the line of fortifications the Victor Smith line in honor of the son of Major M. L. Smith, C.S.A., who supervised the operations. On March 21, 1862, Major General M. Lovell named the fortifications Fort John Morgan in honor of the Confederate bushwacker in Kentucky.

The Confederates mounted an impressive array of artillery in the fort. The heavy guns consisted of nine 42-pound cannon, two 32-pound cannon, nine 24-pound cannon, and four 18-pound cannon; however, the fortifications proved unimportant to the defense of New Orleans. When a Federal expedition led by Union Flag Officer David Farragut attacked and captured New Orleans from downriver in April 1862, Union troops took over Fort Morgan. The Rebels had no time to remove their guns; according to one account they threw 15 of them in the river.

Union Occupation of Fort Parapet

Following the capture of New Orleans, the Federals occupied Fort Morgan, renaming it Fort Parapet. Abandoned Confederate guns were repaired and placed on the ramparts. The portion of land behind the parapets was used for encampments of Union soldiers (Casey 1983:145-145). While this area has been developed in modern times, the powder magazine of the main redoubt still survives at the end of Arlington Street. Through the efforts of historic preservationists in Jefferson Parish, the structure was placed on the National Register in May 1977 (Casey 1983:145-147).

The first Union commander of the fort was General John Phelps, but he resigned following a quarrel with General Butler over the organization of black soldiers (Cornish 1956:62). For the average soldier, duty at Camp Parapet was one of constant drudgery. In addition to camp maintenance, soldiers were forced to practice battle drills over and over until as one soldier put it, the

company "... could move as if by instinct like one vast machine" (McGregor 1900:223).

Besides the exigencies of daily life, problems of disease and death soon developed. Camp Parapet was located on low ground, near the swamp. The combination of living in tents on the muddy grounds and the exposure to southern diseases caused heavy casualties among the Union soldiers. One officer from the 15th New Hampshire wrote home that "A malarial fever carried many boys to their graves, and one could almost anytime hear the band playing a funeral dirge as the body was borne to its last resting place" (McGregor 1900:224).

The Effects of the Civil War

In general, the Civil War devastated the South's economy. Before the war, Louisiana ranked as the second wealthiest state in the nation; the state emerged from the War as the poorest of the southern states. The Orleans/Jefferson Parish area was fortunate in that it escaped any major fighting on its soil, but the area was devastated financially.

Many residents of the area supported the Confederacy with their money and their lives. Private citizens and the local government contributed significant amounts of money for the construction of a variety of war-related structures, including fortifications, barracks, redoubts, and magazines. All of this was lost when the City of New Orleans was taken by Federal forces in April 1862.

The unexpectedly rapid, but bloodless, capitulation of New Orleans allowed the area to pass peacefully under Union control. Once in Union hands, the region was fortified quickly by Union troops. The westbank of the Orleans/Jefferson Parish area was strategically important to the defense of New Orleans. Union soldiers garrisoned the area for the remainder of the war to discourage Confederate sympathizers living on the westbank of Jefferson Parish (Goodwin et al. 1985c). By the end of May 1862, Union soldiers under Major General Butler occupied all of the previous Confederate camps in the area.

Agriculture remained the dominant industry in the area following federal occupation, but planters had difficulty maintaining a sufficient labor force. Despite an order by General Butler

prohibiting interference with slave ownership, some Union soldiers seized slaves and the Union camps became havens for runaway slaves known as "contrabands" who joined the Union Army. When Bulter was replaced by Nathaniel Banks at the end of 1862, he transferred command of several regiments of former slaves (Goodwin et al. 1985c). Despite the war ending, the area remained under Union control until July 1868 when Louisiana was officially readmitted to the Union. The state remained part of Major General Philip Sheridan's Fifth Military District until Reconstruction ended in 1877.

The East Bank of the River above the Carrollton Area

Residential, industrial, and commercial development did not occur along the east bank in the vicinity of the Jefferson Heights and Carrollton Levee Enlargement project items until well into the twentieth century. Prior to that time, the area remained largely agricultural (Thoede 1976:116).

Sugar Planting Along the East Bank

The Sauvé Crevasse of 1849 severely affected many families along the east bank of Orleans and Jefferson Parishes, including the Arnoult family who had occupied the project area since 1825. The 1850 agricultural census documented that the Arnoult Brothers owned 900 ac (364 ha), 400 of which were improved. The value of their property was listed as \$30,000.00. They produced 12,000 bushels of corn, 140 tons of hay, 300 1000-pound hogsheads of cane sugar, and 12,000 gallons of molasses. Due to economic decline, they had abandoned sugar production altogether by 1858.

In 1870, the Arnouldts' estates were greatly reduced. T. Arnoult owned 15 improved ac (6.1 improved ha) and no unimproved land. His farm was valued at \$10,000.00, and he paid \$1,200.00 in wages for the year 1869 - 1870. He produced 8,000 bushels of corn, 14 bushels of Irish potatoes, and 100 bushels of sweet potatoes; all products from the farm had a total value of \$2,000.00. J. Arnouldt owned 45 improved ac (18.2 improved ha) and 200 unimproved ac (80.9 unimproved ha). His property was valued at \$11,500.00. Arnouldt paid \$300.00 in wages for the year 1869 - 1870. J. Arnoult produced 600

bushels of corn, 350 bushels of Irish potatoes, and 200 bushels of sweet potatoes; all farm produce had a total value of \$2,000.00.

In 1858, only members of the De La Barre or LaBarre family continued to produce sugar in the area. The *Statement of the Sugar Crop* for 1859 indicates that P. L. La Barre and F. La Barre together harvested 170 hogsheads. In 1860, P. L. La Barre held 56 slaves and his real property was valued at \$35,000.00, his personal property at \$65,000.00. In 1860, he produced 65 1,000-pound hogsheads of sugar and 11,000 gallons of molasses (Menn 1963:255-256).

After the Civil War, the La Barres still tried to produce sugar at the Whitehall Plantation. The 1870 agricultural census lists F. P. La Barre and Company of Jefferson Parish as owning 1,200 ac (486 ha), 400 of which were improved. The plantation was valued at \$30,000.00. The company produced 3,000 bushels of corn, 1,200 bushels of Irish potatoes, 900 bushels of sweet potatoes, 60 tons of hay, 60 hogsheads (at 1,000 pounds each) of cane sugar, and 2,400 gallons of molasses. By the 1880s, the La Barres had given up the effort to grow sugar production (Bouchereau 1875:34, 1876:77, 1881:10, 1889:51). They were the last major sugar producers in the project area.

The Postbellum and Industrialization Period, 1865-1945

During the postbellum nineteenth century and the early twentieth century, the extractive industries in Orleans and Jefferson Parishes became increasingly mechanized. The traditional family-based industries were replaced by corporate ownership. The lumber industry expanded at a phenomenal rate, until the vast stands of Barataria cypress and other woods were depleted in the late 1920s. Brickmaking decreased in importance along the westbank, however, partly because of competition from alternative building materials and better made St. Louis bricks. The expanding commercial activity of the City of New Orleans found the westbank a prime location for new port facilities and manufacturing plants (Jefferson Parish Yearly Review 1939; Swanson 1975; Reeves 1980).

Transportation systems were enlarged and improved, with the railroad industry in particular increasing its holdings along the riverfront. The

Harvey Canal was widened, and its shipping capabilities attracted various industries. Manufacturing along the study area riverfront increased rapidly between 1890 and 1945. Most of the new plants made products from familiar resources such as cotton, sugar, lumber, and seafood (Swanson 1975; Jefferson Parish Yearly Review 1939).

The Lumber Industry

Joseph Rathborne's Louisiana Cypress Company, established in 1889, was the largest post Civil War industry in the area. This extensive cypress logging and lumber business remained prominent until it closed in 1929. Ranked as the world's largest cypress mill in 1897, the company owned 50,000 ac (20,235 ha) of Barataria swamp forest. The Barataria forest stands were felled in the fall and winter by laborers called "swampers." Pushboats were used to transport felled timber from the logging canals to riverfront processing centers.

Another large lumber company in the area was the Harvey Factory. The factory was built in 1889. It was described as "... located on the Southern Pacific road," and it consisted of sawmills, shingle mills, planing mills, and dry kilns (Evans 1901:20).

Two smaller Louisiana Cypress Company satellite plants, built in the 1890s, were located downriver toward Gretna (Swanson 1975:117). These sawmill yards were the sites of the previous Gardere and LaBarre sawmills. They ceased operation in the 1920s.

Brickyards

The extensive loam deposits along the Mississippi River in the area facilitated brick manufacture. Brickmaking continued in the area until the beginning of the twentieth century. The original brickyard in that area, the Destrehan Brickyard, was established in the 1830s. The descendants of Destrehan, the Harveys, later constructed another brickyard immediately downriver from the Harvey Canal while the canal was being constructed in 1848 (Figure 24). The Harvey family continued to operate this family brickyard until 1896 (Swanson 1975:122).

The expansion of the Louisiana Cypress Company holdings along the downriver side of the Harvey Canal during the early twentieth cen-

tury may have ended the operation of the Harvey family brickyard. During this same period, the LaBarre brothers began operating their brickyard near Gretna. This brickyard operated until 1893. The revenues of the brickyard declined after 1860 (Reeves 1980:11), and it is not clear whether the Louisiana Cypress Company, which purchased the brickyard property in 1890, continued the operation of the brickyard.

Railroads

The first railroad in the area, the New Orleans, Opelousas, and Great Western Railroad, was established in the 1850s and it linked Algiers and New Orleans with Texas. In 1869, this line went bankrupt and it was sold to steamship magnate Charles Morgan. The railroad line was renamed Morgan's Louisiana and Texas Railroad, and rail transportation was coordinated with shipping on his existing New Orleans and Texas steamship line. In March of 1885, Morgan's railroad was leased to the Southern Pacific Company, which later merged into the larger Southern Pacific system (Oge 1930:4).

The New Orleans, Mobile, and Texas Railroad was established in 1870. It extended from New Orleans to Houston, with Westwego as the initial point of operations. At Harvey, the Texas and Pacific and Southern Pacific lines, which replaced the New Orleans, Mobile and Texas Railroad and Morgan's Louisiana and Texas Railroad respectively, intersected with the Harvey Canal. It was operated as a link in the New Orleans and Texas Railroad and Steamship line.

In addition, Jay Gould owned a small local railroad line in the study area in the 1880s called the New Orleans Pacific Railroad. Gould built a terminal for his line in McDonoghville; the terminal eventually was absorbed by his larger Texas and Pacific Railroad. During the 1880s, Gould became president of the Missouri Pacific Railroad. He merged this line with the Texas Pacific creating the Texas Pacific-Missouri Pacific Railroad, which had a terminal in upper Gretna (Figure 25).

Wharves and Warehouses

The industrial buildup of the riverfront area included construction of large storage facilities. As manufacturing increased, so did the number of structures used to store valuable products and

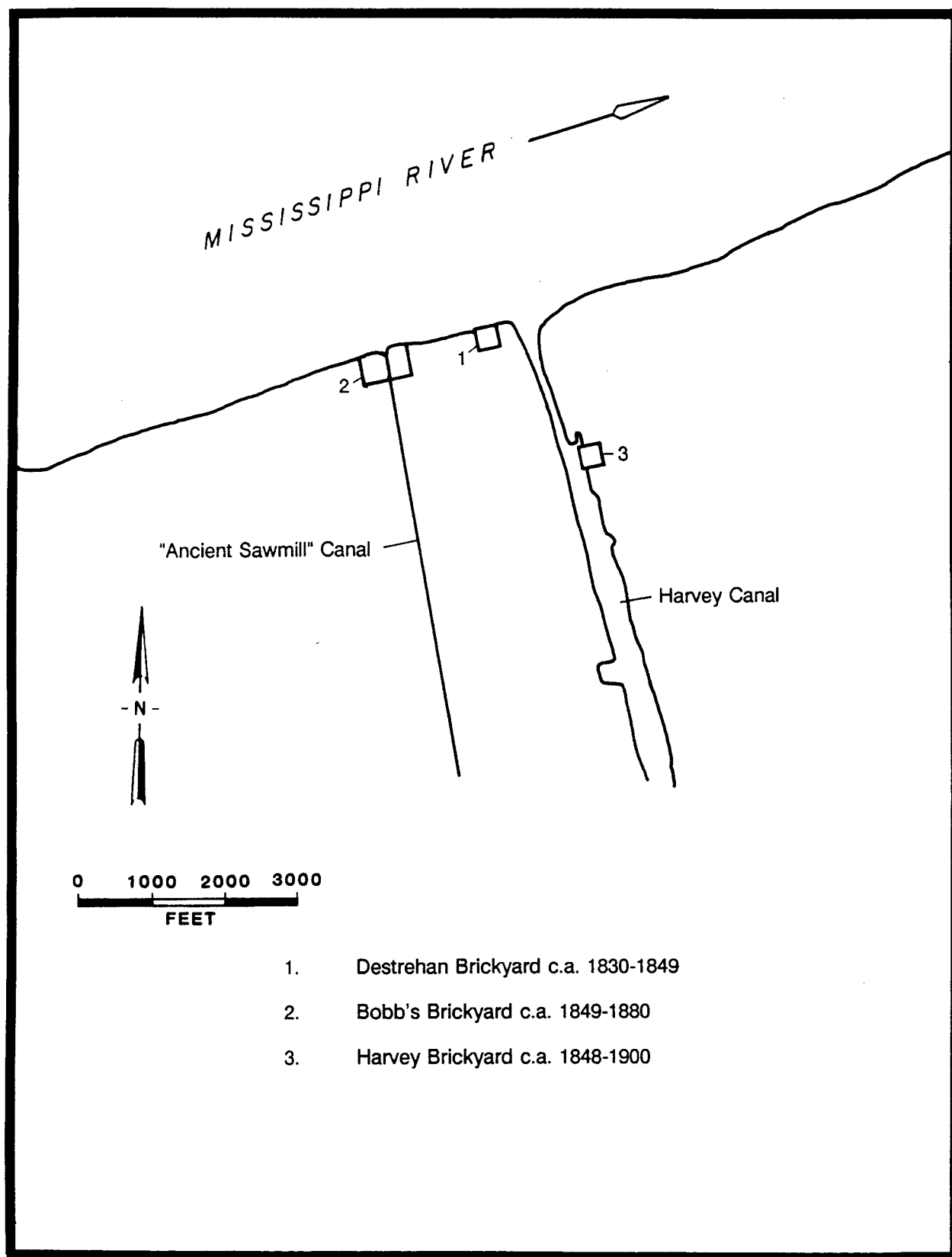


Figure 24. Historic brickyards in the vicinity of the Harvey Canal.

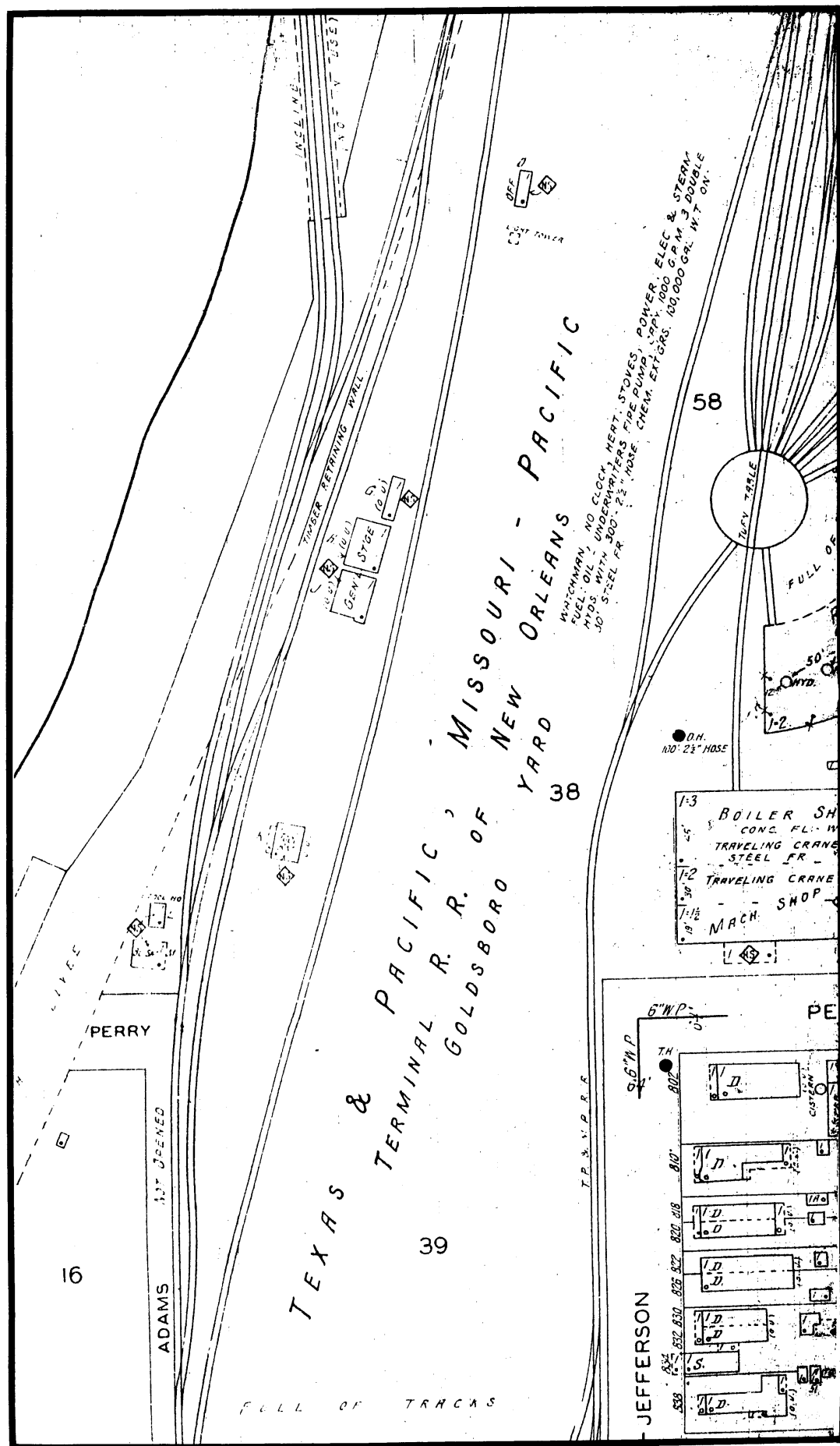


Figure 25. Excerpt from 1937 Sanborn Fire Insurance map depicting the Texas Pacific-Missouri Pacific Railroad riverfront property (Louisiana Collection, University of New Orleans Library).

equipment. The railroad companies owned most of the wharves and warehouses in the area. Prior to the completion of the Huey P. Long Bridge in 1935, the Southern Pacific and the Texas Pacific-Missouri Pacific Railroad transported railroad cars across the Mississippi River on railroad barges to rail yards in New Orleans. Figure 26 shows the Gretna railroad depot and wharves, where sidewheel steamers barges transported rail cars. There were two rail car barges, the *L. S. Thorne* and the *Gouldsboro*. The *L.S. Thorne*, operated between 1898 and 1942 and it ferried up to 18 freight or 9 passenger railroad cars at a time. The smaller *Gouldsboro* could carry 10 freight cars or 5 passenger cars at a time (Curry 1986:49).

The Texas Pacific-Missouri Pacific Goldsboro Terminal Yard covered approximately 20 blocks of riverfront property in Gretna. W. C. Coyle and Company, Inc., transported coal using a barge fleet that docked at the end of Slidell Street in Gretna. Other large, privately owned wharves and riverfront warehouses in the area during the early twentieth century included the American Distilling Company warehouse, the Fairy Soap wharf, the Southern Cotton Seed Oil Company facility, the Jefferson Ice Company, the Gulf Refining Company, and the Seaboard Refining Company.

Railroad Wharves

Railroad wharves first appeared along the riverfront near the city of New Orleans during the early part of the twentieth century. The basic design of the Mississippi River railroad wharves has remained similar over the decades, with new building materials and loading technology improvements being the major differences between the older railroad wharves and the newer ones. Most of the railroad wharves in the New Orleans area are marginal wharves, with a warehouse placed on the landward side and railroad tracks placed on the riverward side of the wharf (Figure 27).

One of the earliest Mississippi River railroad wharves of this type in the New Orleans area was constructed by the United Railway and Trading Company on the Orange Grove Plantation property at English Turn. Built before 1915, the 107 m (350 ft) marginal wooden railroad wharf served the sugar factory and bagasse paper mill exclu-

sively. The New Orleans and Gulf Railroad, and later the Louisiana Southern Railroad, ran one track onto the riverward side of the wharf. The structure was abandoned in the 1920s, and it burned in the 1930s (*States Item* January 24, 1932).

During the 1910-1920 decade, the Southern Pacific Railroad constructed a similarly designed railroad wharf along the Mississippi River. This wharf was torn down during the 1940s and it was replaced by a smaller railroad wharf. The original wooden designed cargo wharf measured 265 m (870 ft) in length, 61 m (200 ft) in width and maintained a single-story transit shed that measured 3,622 m² (38,992 ft²). The total wharf space measured 9,364 m² (100,800 ft²). The Southern Pacific Railroad wharf supported an average holding capacity of 350 pounds of cargo per square ft (McChesney 1920:13). Wooden pilings supported the large wooden deck, with three separate railroad tracks accessing onto the wharf.

Another railroad wharf, the Seatrain Terminal, was located on the west bank of the Mississippi River, near Belle Chasse. It was constructed in 1927-1928 as part of an early containerized cargo system. Filled railroad cars were loaded onto specially designed vessels, and the railroad cars were transported to a similar railroad wharf facility in Havana, Cuba. The cars were reloaded in Havana with agricultural goods such as pineapples and sugar, and they were returned to the Seatrain Terminal. Because of labor and political problems, use of the terminal ended during the 1950s, prior to Fidel Castro's takeover of Cuba (Garson et al. 1982).

Manufacturing

The rise of manufacturing along the riverfront coincided with the expansion of the transportation industry. The increased availability of shipping and railroad lines encouraged entrepreneurs to invest in manufacturing plants. Most of the first large-scale manufacturing facilities in the area produced the traditional extractive products. Cotton, sugar, lumber, and seafood products were the basis for related manufacturing industries during the late nineteenth and early twentieth century. The largest manufacturing industry in the area during the early twentieth century produced cotton seed oil and cake and other cotton seed products. Shipments of cotton seed oil and cake

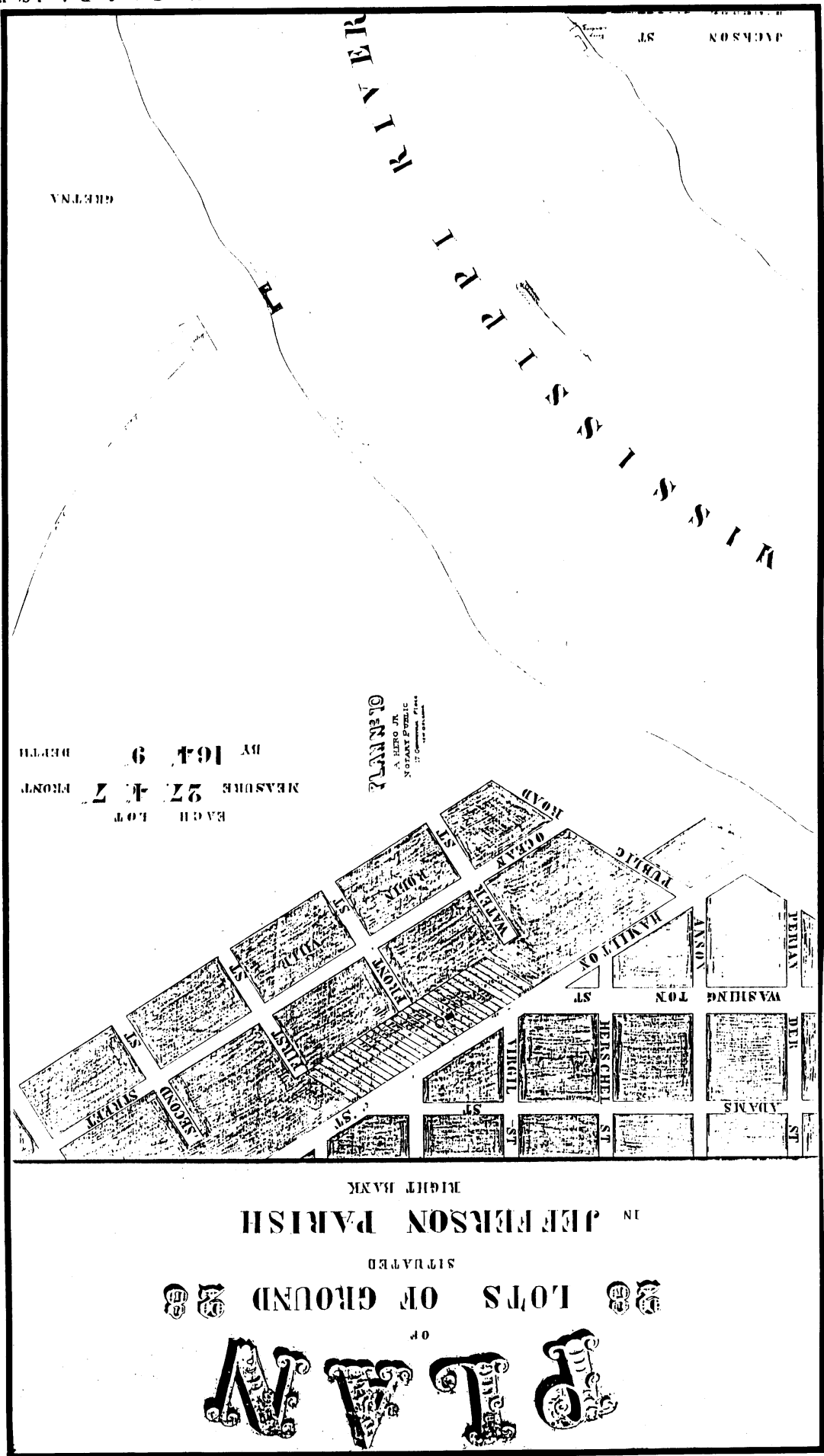


Figure 26. 1916 survey map by W.H. Reynolds depicting Gretna depot railroad wharves (Archives Center for Regional Studies, Southeastern Louisiana University).

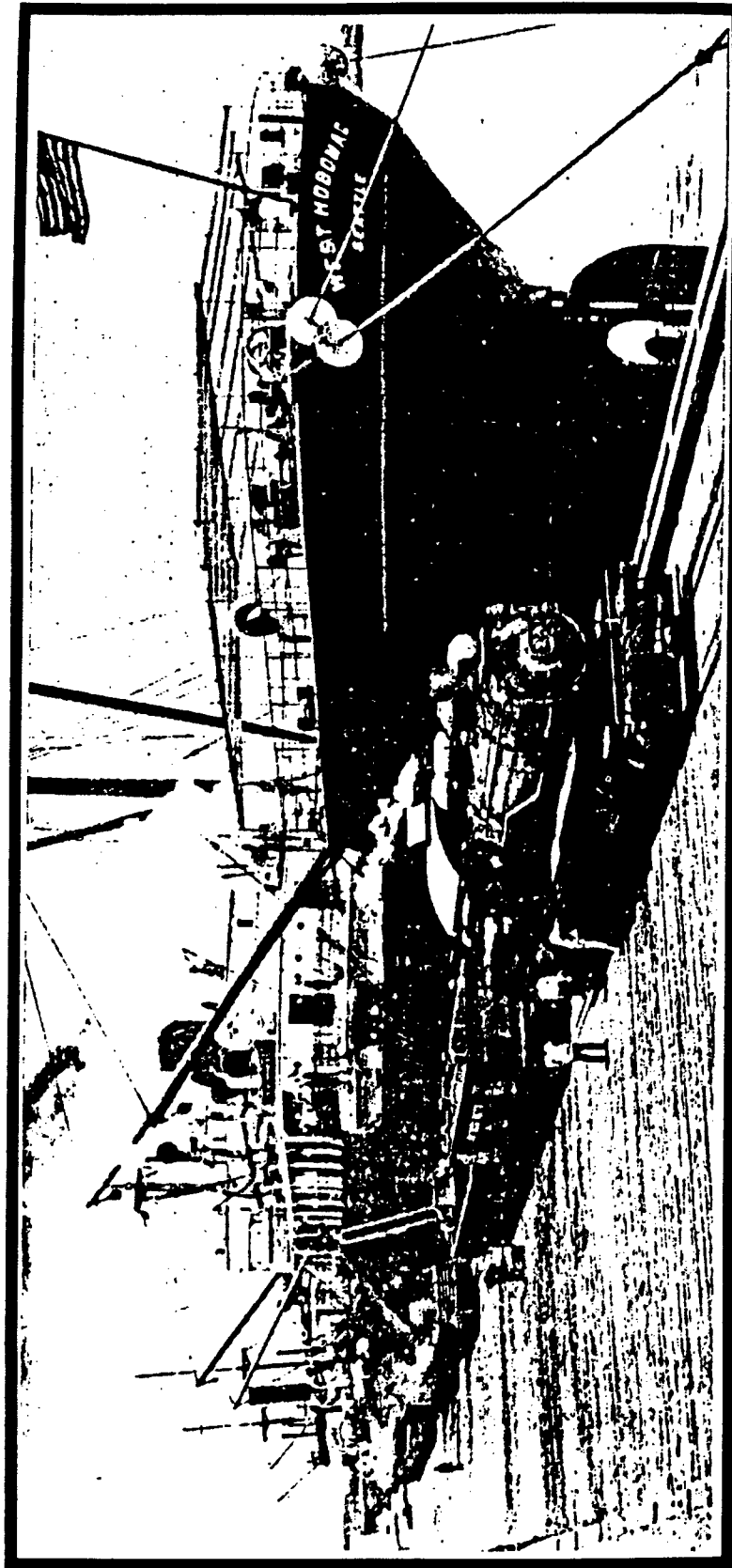


Figure 27. 1920 photograph of a typical New Orleans railroad wharf (Louisiana Collection, New Orleans Public Library).

from New Orleans totaled 68,885 tons in 1896 and 211,635 tons by 1902 (Englehardt 1903:131,132). Seven large cotton seed companies established manufacturing plants in the area. The Southern Cotton Oil Company, established in Gretna in 1887, was one of the first processing plants in the Jefferson Parish area. The company was founded by Dr. Wesson, who discovered the exclusive process for producing cooking oil under steam vacuum. The Seaboard Refining Company, Ltd., established in Gretna in 1902, also processed cotton seed oil for southern markets, as did the Gulf and Valley Cotton Oil Company, the Standard Cotton Seed Oil Company, the Sherwood Refining Company, and the Union Oil Company. Swift and Company, established upriver from the Harvey Canal, also manufactured cotton seed oil products (Jefferson Parish Yearly Review 1939).

Sugar companies established processing facilities and large storage warehouses in the vicinity. Pennick and Ford, Limited, Inc., was founded in Gretna in 1910. After moving to a larger facility in Marrero, this company was the world's largest canner of cane syrup in the 1920s. The American Distilling Company produced rum and commercial alcohol from molasses and grain. The American Molasses Company established a barreling plant in Gretna in 1929. This plant shipped raw molasses via water transport to markets in Boston and New York (Jefferson Parish Yearly Review 1939). The Union Stave Company was located on the river between Harvey and Gretna; it produced sugar and rice barrels and shipped staves to both plantations and refineries. In 1901, this company employed 120 people (Evans 1901:19).

Petrochemical Companies

As mechanization and industrial technology evolved during the early twentieth century, the demand for petroleum and related chemical products increased. Most manufacturing plants in the study area maintained their own machine shops and chemical laboratories. The cotton seed oil companies, for example, made their own chemical reagents, i.e., sulphuric and hydrochloric acids, to make fertilizers and soap products. Chemical reagents also were made locally (on a small scale) for the distillation of petroleum hydrocarbons, which was conducted by oil companies in

the area. After crude oil was discovered in Lafitte in 1935, capital investment in the oil industry along the westbank increased dramatically. One of the first petroleum companies in the area was the Delta Oil Company, located upriver from the Harvey Canal. After 1935, Shell Oil, Texaco, WITCO, and Standard Oil of California purchased real estate in the area (Jefferson Parish Yearly Review 1939).

Summary of Orleans and Jefferson Parishes History

The people who first settled the area made their living by exploiting the available natural resources. The land in the vicinity of New Orleans and the Mississippi River offered rich agricultural soil, abundant cypress timber, plentiful game and fish, large deposits of alluvial clays for brickmaking, and natural bayous for transportation. The available natural resources stimulated the development of industries that exploited markets in the expanding city of New Orleans. The economy of the Carrollton area changed as the village evolved from a region of agricultural development into a vacation spot and bedroom community for New Orleans (Ledet 1938:23).

The local economy developed along agromonic patterns characteristic of lower Louisiana during the historic periods. The nineteenth century sugar cane industry, however, did not dominate the economic setting of the region as it did in most areas of south Louisiana. Rather, initial extractive industries such as lumber, brickmaking, diversified farming, and water transportation became the post monocrop economic base that continued well into the twentieth century. Antebellum steam technology diversified and expanded the earlier industries. As these industries grew, the need for skilled labor increased. Working class suburban communities were established in the area throughout the nineteenth century.

The Civil War, however, stifled economic development in the New Orleans area during the mid nineteenth century. Rather than export goods produced on their plantations, many landowners utilized their agricultural products for subsistence purposes; other materials were commandeered by Union or Confederate troops. This decline in marketable goods produced a debilitating effect on the port of New Orleans and its associated in-

dustries (Beavers and Lamb 1980:31). Following the war, the city slowly recovered and it resumed shipping activities. Efforts to deepen the city's port improved its potential to meet and surpass former levels of trade (Beavers and Lamb 1980:31).

The agricultural component of the economy also shifted after the Civil War, as the cotton market plummeted and sugar slowly regained its importance. Although sugar production experienced a slowdown during the 1870s, production of the crop increased significantly through the beginning of the twentieth century. Technological advances in sugar production and a reorientation of the organizational system from family management to modern corporate industrial management contributed to this increase (Goodwin et al. 1985b).

The Cotton Centennial Exposition of 1884-1885 further signaled New Orleans' return to commercial prominence (Huber 1991:11). During the late nineteenth century and into the twentieth century, industry emerged in the city and played an increasing vital role in the local economy (Beavers and Lamb 1980:32). Manufacturing facilities and the transportation industry expanded at this time. Most of the first manufacturing companies in the area made products from traditional south Louisiana resources such as cotton, sugar, lumber, truck farm products, and seafood. The development of the railroad industry provided further impetus for industrial growth and it stimulated the expansion of suburban communities along the Mississippi River. Today, the area's economy is supported by the oil and gas industry, as well as tourism. The New Orleans Metro area, including much of Orleans and Jefferson Parishes, is home to a culturally diverse population.

Plaquemines Parish, Louisiana

Introduction

The Lower Venice 2nd Lift project item is located at the lower end of the Town of Venice in Plaquemines Parish, Louisiana, i.e., on the west side of the Mississippi River, east of Spanish Pass and west of The Jump above Grand Pass. Historically, this region was exploited primarily for its oyster beds and its fishing resources; today, pipelines and other petroleum

facilities thread through the marshes and waterways. This section presents an overview of the history of lower Plaquemines Parish, with emphasis placed on the project vicinity.

Early Exploration

The Spanish were the first Europeans to claim the Louisiana region, although sources disagree as to who first discovered the mouth of the Mississippi River – Alonso Alvarez de Piñeda in 1519, or survivors of the Pánfilo de Narváez expedition in October 1528. In his account of the ill-fated Narváez journey, Alvar Núñez Cabeza de Vaca included a description of the mouth of the Mississippi River and the Louisiana coastline, including what would later become southernmost Plaquemines Parish. Following De Narváez was Hernando de Soto, who explored southeastern America from May of 1539 until his death three years later, somewhere along the Mississippi River between Memphis and Baton Rouge. De Soto's men continued their exploration into Texas before returning to the Mississippi for their final journey southward to the Spanish settlements in Mexico. Following these disastrous expeditions, Spain took no further action to strengthen her claim to the lower Mississippi Valley, leaving the region undisturbed for nearly 140 years (Davis 1970:27-28; McLemore 1973:1:91-100).

Next to explore the lower Mississippi was a French expedition under the leadership of René Robert Cavalier, Sieur de la Salle. La Salle traveled down the Mississippi River from its confluence with the Illinois, reaching its mouth in early April, 1682. He and his men made camp roughly three leagues (14 km [9 mi]) from the mouth of the river, then explored the various outlets (through lower Plaquemines Parish) for the next few days. With assurances from the Native American tribes encountered along the journey that they were the first Europeans to travel the Mississippi River, La Salle claimed all lands drained by the great river for Louis XIV, King of France, on April 9, 1682 (Davis 1971:28-29; French 1875:17-27). According to one local source, the present-day community of Venice is located on the site where La Salle made this proclamation (Meyer 1981:63).

Colonial Era

French Colonial Period

The French began colonization efforts at the close of the seventeenth century. The expedition of Pierre le Moyne, Sieur d'Iberville, departed France in 1698 with four ships and approximately 200 settlers. Iberville reached the mouth of the Mississippi River in March 1699, and from that point, journeyed upriver past the present-day city of Baton Rouge before returning to the Gulf of Mexico. The primary purpose of this expedition was to find a suitable place to establish a fort for maintenance of French control of the Mississippi basin. Accordingly, in the spring of 1699, Iberville established Fort Maurepas east of the Pearl River on Biloxi Bay (Davis 1971:38-41).

Incidentally, Iberville's location of the mouth of the Mississippi River also marked the first celebration of Mardi Gras in Louisiana. "On Tuesday, the 3rd [of March, 1699], mass was performed, and a Te Deum sung in gratitude for our discovery of the entrance of the Mississippi river" (French 1875:57). Following the ceremony, the expedition continued up the main channel of the river to a point that was estimated to be some 10 leagues from the river mouth. The members of the party landed and camped there for the night at the junction of the river and a small east bank bayou, which was promptly named Bayou Mardi Gras for the day of its discovery. Mass was celebrated the following morning, on Ash Wednesday, and a cross was erected to mark the spot before Iberville and his men continued their upriver journey. Bayou Mardi Gras extends below the site of Fort St. Philip, across the river and about 14 km (9 mi) upstream from the Lower Venice 2nd Lift project item (Figure 28) (Buras 1996:17-19; French 1875:57-59).

Before returning to France for additional colonists and supplies, Iberville assigned his brother, Jean Baptiste le Moyne, Sieur de Bienville, command of the Mississippi River explorations. Returning downriver in September 1699 from one such expedition, Bienville met a ship commanded by Captain Lewis Banks, who had been sent on a reconnaissance of the lower Mississippi River by the British, who also were seeking a colonization site. Banks traveled ap-

proximately 25 leagues (121 km [75 mi]) upriver before encountering Bienville, who managed to persuade the British captain that his ship was an advance party for the French fleet. Banks immediately reversed his journey and headed back toward the Gulf of Mexico. Since that time, the bend in the river where the two ships met has been called *Détour à l'Anglais*, or English Turn (Figure 28) (Davis 1971:41; Meyer 1981:24, 41-42, 94).

Learning of the British encounter, Iberville ordered immediate construction of fortifications on the first high ground located above the mouth of the river. Bienville chose a site approximately 18 leagues (87 km [54 mi]) upriver on the east bank of the Mississippi River near the present-day community of Phoenix in Plaquemines Parish (across the river and about 72 km [45 mi] northwest of the Lower Venice 2nd Lift project item). Completed in 1700, Fort Mississippi, more commonly known as Fort de la Boulaye, became the first European settlement in the lower Mississippi Valley (Figure 28). With the establishment of New Orleans in 1718, though, along with the numerous concessions granted above and below the new town along both sides of the river, Fort de la Boulaye became obsolete. The fort, which had not been garrisoned officially since 1707, finally was abandoned. All surface traces of the fort were destroyed by a hurricane in 1722, and, except for a few historic map notations, the site was lost until discovered by New Orleans historians around 1927 (Davis 1971:41-42, 55-56; Meyer 1981:32-35, 94-95; Wilson 1987a:46-47).

A number of agricultural concessions were established below New Orleans after 1718, although most were situated within 48 km (30 mi) of the settlement. In 1724, a French infantry officer named Banet reported to the Company of the Indies, stating that:

From New Orleans to the mouth of the River there are only ten leagues of country settled, though there are thirty leagues of road, the remaining twenty leagues being so low a country that it will not be possible to settle it. I count in the ten leagues way that there are fourteen or fifteen good settlers, the least of whom has six or seven negroes. There may also be seven or eight small ones, each of whom has one or two negroes (Cruzat 1929:126).

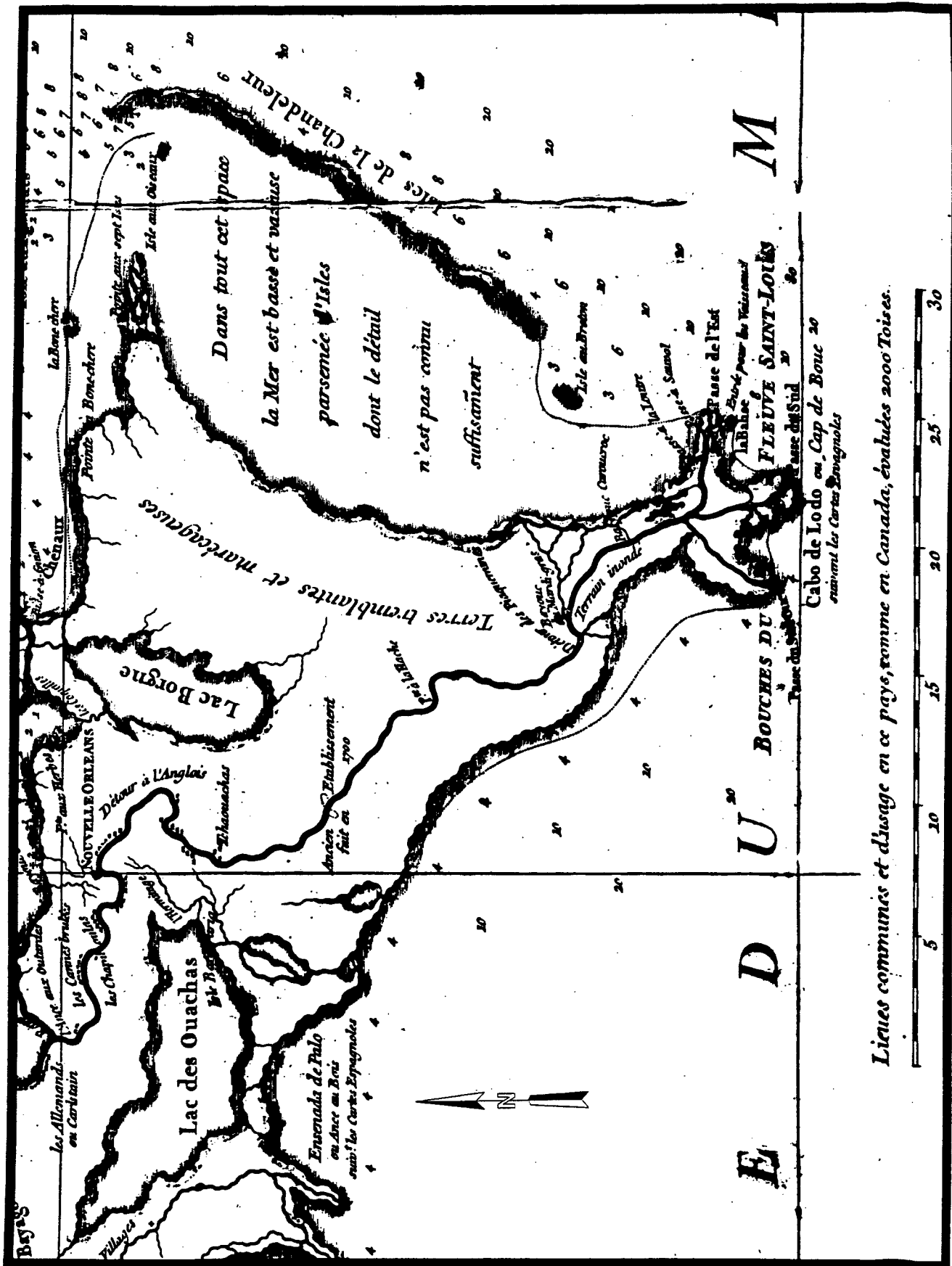


Figure 28.

[surveyed in 1732, published in 1752] Excerpt from D'Anville's Carte de la Louisiane, in reference to the Lower Venice 2nd Lift project item, Plaquemines Parish. Excerpt depicts Bayou Mardi Gras (Bayou du Mardi-gras), English Turn (Détour à l'Anglais), Fort de la Boulaye (Ancien Etablissement fait en 1700), and the west bank region of lower Plaquemines Parish (Terrain inondé).

Southernmost of these concessions apparently was a tract issued by the Company of the West in 1719 to the Duc de Belle-Isle, lieutenant-general of the French armies. The Belle-Isle property was located along the east bank of the Mississippi River, below English Turn, in an area that later would become part of upper Plaquemines Parish (Wilson 1987b:105-107).

In late 1721, orders were given to establish a fortification at the mouth of Southeast Pass, which at that time was the chief point of entry to the Mississippi River. The post, called the Balise (meaning beacon or buoy), was garrisoned by June of 1722, but work continued on the fort into the mid-1730s. Although the Balise (commonly spelled Balize since the Civil War) was proposed as a military fortification, it also served as a lighthouse, pilot station, cargo warehouse, and customs house. Through the colonial era, the Balise, or Balize, went through various incarnations – thriving until the 1740s, ruined and abandoned by the mid-1760s, temporarily revived by the Spanish in the early 1770s. During Spain's dominion, the Spanish constructed another Baliza near the mouth of Northeast Pass, one and a half leagues (72 km [45 mi]) northeast of the former French Balise, while the British, leery of putting their merchant ships under Spanish control, placed their own pilots at a British Balize station. Although all of these installations were located at least 24 km (15 mi) downriver from the Lower Venice 2nd Lift project item, the Balize posts played an immensely important role in the development of the region (Buras 1996:29-45; Casey 1983:7-10; Goodwin et al. 1985b:45-50).

Spanish Colonial Period

Spain acquired the Isle of Orleans (that territory east of the Mississippi River and south of the Rivière d'Iberville, or Bayou Manchac) by French cession through the secret Treaty of Fontainebleau, signed on November 3, 1762. This action relieved France of the heavy financial burden of administering and supporting the colony, and the transfer also was intended to prevent a sizeable portion of the territory from falling under British control as a result of impending English victory in the French and Indian War. Although the transfer was announced pub-

licly in 1764, it was not until 1769 that the French colonial government finally was abolished and Spanish control was established under the governorship of Alejandro O'Reilly (Chambers 1898:48; Davis 1971:69-70, 97-105).

As noted previously, the Spanish Baliza was constructed northeast of the old French Balise. This fortification was located at Real Catolica San Carlos, an island on Northeast Pass. Governor O'Reilly declared the post inadequate for defense and transferred the garrison to the old French Balise in March of 1770. Several years later, after 1778, another Spanish post was established on Pass a l'Outre, near its intersection with Southeast Pass. In 1792, the primary Spanish fortification was moved upriver to Plaquemines Bend (approximately 14 km [9 mi] upriver from the Lower Venice 2nd Lift project item), where Fort St. Philip (San Felipe) was constructed along the east bank of the Mississippi River. Ca. 1793 - 1794, the Spanish erected Fort Bourbon (Borbon) opposite Fort St. Philip on the west bank of the river (Casey 1983:8-10, 30-31, 183-184, 204-206; Goodwin et al. 1985b:47-50).

Although colonization flourished under Spanish rule, the region that became lower Plaquemines Parish was deemed too low-lying for permanent settlement. A few decades earlier, D'Anville simply marked the area on his map as "Terrain inondé", meaning inundated ground (Figure 28). At the beginning of the Spanish colonial period (ca. 1770), Captain Philip Pittman, a British officer, described the terrain north of the Balize as follows: "From this place nothing is to be seen but low marshes, continually overflowed, till we get within a few leagues of the Detour de l'Anglois, where there are some few plantations, most of which are but very late establishments, and are, as yet, but of very little consequence" (Pittman 1906:38-39). By 1802, colonization had extended beyond English Turn into the Plaquemines Parish region, but still well above Plaquemines Bend, as Berquin-Duvallon wrote: "It is about fifteen leagues [72 km, or 45 mi] below New Orleans that the settlements on the colony commence, which comprehend a tongue of land susceptible only of cultivation between the river and the swamps" (Davis 1906:19-20).

Territorial Era

As part of the negotiations leading to the 1803 Louisiana Purchase, Spain transferred 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 thirty-third parallel was designated the Territory of Orleans. In the following year, the new territory was partitioned into 12 counties, including the county of Orleans, which encompassed present-day Plaquemines Parish, as well as Orleans and St. Bernard Parishes and most of Jefferson Parish. In 1807, the territorial legislature reorganized the county system, further dividing the Territory of Orleans into 19 parishes. Orleans County was superseded by Orleans, Plaquemines, and St. Bernard Parishes. Plaquemines Parish has maintained the same general configuration to the present day. 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).

Even after the U.S. acquisition of the Louisiana Territory, lower Plaquemines Parish remained generally uninhabited except for the Balize and the other such scattered and isolated outposts. In those early years, that southernmost delta of the territory was considered uninhabitable. According to an 1804 description:

From Balize to Fort Plaquemine [Fort St. Philip] – the first fort met on the river – is reckoned ten leagues. The lands lying on the right and left are very low, that being the reason why no habitations are seen. Ducks, water fowl, wild geese, and all other animals that inhabit the swamps, are the sole living things that the hunter finds there, and he makes good provision of them (Robertson 1911:51).

The War of 1812

The project vicinity was affected only indirectly by the War of 1812. Capture of the city of New Orleans was vital to the British plan for control of the lower Mississippi River Valley. The Mississippi River, of course, was considered among the potential British attack routes to New Orleans – the river was the most advantageous passage to the target city and large naval

vessels could navigate its main channel with ease. While the Lower Venice 2nd Lift project item did not lie in the pathway of any military activities, that area would have been passed by American vessels making initial defense preparations at the Balize and, later, by British ships en route to Fort St. Philip (Davis 1971:178-179; Owsley 1981:127).

Fortifications already existed along the Mississippi River; however, further defense arrangements were made in the event of British approach up the river during the 1814 - 1815 campaign against New Orleans. Because the Balize was determined to be indefensible (despite earlier reinforcement of the post), Fort St. Philip, at Plaquemines Bend, was chosen as the primary line of defense against the British. General Andrew Jackson ordered reinforced defense works at the second defense line, Fort St. Leon, which was situated upriver on the west bank at English Turn (northernmost Plaquemines Parish). In addition, a battery was placed opposite Fort St. Philip near the old Spanish Fort Bourbon; this position later became the site for Fort Jackson (Casey 1983:10-11, 79, 202-208; Meyer 1981:24).

The Balize was captured by the British navy in December of 1814, as part of a plan to destroy Fort St. Philip and move upriver to aid the British troops at Chalmette. The Battle of New Orleans ended with a decisive victory for the Americans on January 8, 1815; however, the British fleet began the bombardment of Fort St. Philip the following day. The British unsuccessfully fired on Fort St. Philip for over a week, until they finally withdrew on January 19 (Casey 1983:11, 207-208; Meyer 1981:24-31; Owsley 1981:166-172).

Antebellum Era

The antebellum era was marked by numerous technological advances that stimulated economic growth in Plaquemines Parish. Trade on the Mississippi River, for example, increased dramatically with the arrival of the steamboat in 1812. With steam power, goods could be shipped more efficiently both upriver and downriver. In 1822, there were 83 steamers plying the Mississippi River trade. By the mid-1830s, not only was New Orleans the chief export city in

the United States, but it also ranked as one of the principal international ports (Goodwin et al. 1985b).

While the flourishing steamer trade certainly boosted the commercial development of the region, it was the evolution of sugar cane agriculture that drastically influenced the economy of southern Louisiana during the early nineteenth century. By the 1820s, wealthy landowners began amassing and consolidating small plantation whose owners could not compete in the market because of the high costs of production. (Goodwin et al. 1986:82).

Census records dating from the antebellum era reflect the dominance of the plantation economy in Plaquemines Parish, which held a relatively constant ratio of two slaves for every freeman throughout the pre-war period. In 1820, there were 2,354 residents of the parish – 637 whites, 151 free people of color, and 1,566 slaves. Ten years later, the population grew to 4,489 and it included 1,082 whites, 219 free people of color, and 3,188 slaves. By 1850, the census tallied 2,221 whites, 390 free people of color, and 4,779 slaves, for a total of 7,390 inhabitants. A decade later, the parish recorded a population of 8,494, of whom there were 2,595 whites, 514 free people of color, and 5,385 slaves (DeBow 1853; Kennedy 1864b:194; Stringfield 1985:169; U.S. Census 1872:34-35).

Although there were numerous sugar plantations along the banks of the lower Mississippi River, many planters also cultivated rice. DeBow's Review stated in 1847 that: "Interspersed among the sugar plantations, and forming the largest number of the east bank, are some two hundred rice plantations, many not more than two arpents, or nearly one hundred and thirty yards front on the river, and contribute to give that coast that village-like appearance which is remarked by every one" (DeBow 1847:258-259). According to various records, the west bank plantations did not extend beyond the river bend at Nairne, or Nairn, Plantation (represented today by the community of Nairn), some 32 km (20 mi) upriver from the Lower Venice 2nd Lift project item. Across the river, the farms and plantations extended at least 11 km (7 mi) farther downriver, but still well away from the project vicinity (Champomier 1856-1862; Henry and Gerodias 1857:4-5).

Besides sugar cane and rice, the antebellum planters of Plaquemines Parish also cultivated potatoes, citrus trees, and even small amounts of cotton (DeBow 1847:307; Henry and Gerodias 1857:2-5; Menge n.d.). Another valuable "crop" was the parish oyster harvest. In the mid-1840s, there were approximately 500 oystermen conducting business in Plaquemines Parish. During the five-month season, 150 men actually collected the oysters – a yield of approximately 4,000 barrels per week – while the rest transported them to New Orleans. Through the remainder of the year, the oyster shells were conveyed to New Orleans and the parish forts, where they were used for making cement. In 1847, there were "170 small luggers, sloops, and schooners of from 5 to 15 tons burthen" used by the oyster trade (DeBow 1847:309).

Although much of the Plaquemines Parish antebellum era economy revolved around agriculture, it also was dependent upon naval industries such as the fore-mentioned oystering business. The census records listed a number of coopers, carpenters, and wood yard workers, many of whom were employed in boat building and repair. Additionally, the parish population included numerous pilots, sailors, and fishermen among its antebellum inhabitants. Many of these men were Yugoslav fishermen who came to New Orleans as sailors, then moved downriver to make their livings on the plentiful waterways of lower Plaquemines Parish (Menge n.d.; Vujnovich 1974:100-101).

English-born Richard "Dick" Cubit (sometimes spelled Cubitt) was one of the oystermen working the Plaquemines Parish waters during the antebellum years. According to local lore, Cubit used slave labor in 1830 to enlarge Wilder's Bayou, which was located immediately below the present-day site of the community of Venice. By expanding the width and depth of the existing waterway, he created a channel facilitating skiff access to his oyster beds. Some time during the next three decades, the Mississippi River "jumped" its banks and created a new outlet to the Gulf of Mexico. The canal break has been called "The Jump" since that time and it still funnels the river waters through Grand Pass to the Gulf (Figure 28). Just before the Civil War, Cubit engineered the same sort of ditch above the Mississippi River Head of

Passes, with the same results during a river break in 1862. This east bank point is known today as Cubit's Gap (located just above Pilot-town, about 11 km [7 mi] downriver from the project item). Besides carrying on the oyster trade, Cubit was a farmer, river pilot, and telegraph operator in the Pilottown vicinity. It was in the latter capacity, during the early years of the Civil War, that Cubit was arrested under the suspicion that he had provided the Confederates with information on Union naval activities; however, his British citizenship saved him from the hangman's noose (Buras 1996:188-192; Goodwin et al. 1985b; Hansen 1971:406, 555).

The Civil War

The project vicinity saw no significant military action during the Civil War. The area was economically affected, of course, by the Union blockade at the mouth of the Mississippi River, but, except for some early naval maneuvers in the lower delta region, fighting was confined to the six-day Union naval bombardment of Fort Jackson and Fort St. Philip, both situated approximately 14 km (9 mi) north of the project vicinity (Figure 29). Once Commodore David G. Farragut broke through the Confederate fort blockade, in April of 1862, the capture of New Orleans was relatively simple. The early surrender of the city and lower Mississippi River to Federal control effectively ended military action in Plaquemines Parish (Davis 1971:254-256; Goodwin, et al. 1985a:58-60).

Despite the lack of military hostilities, wartime conditions made life on many of the river-front plantations below New Orleans intolerable. General Benjamin F. Butler ordered the confiscation of the plantations belonging to Confederate sympathizers, e.g., Judah P. Benjamin's Belle Chasse Plantation (upper Plaquemines Parish); unauthorized looting and foraging also occurred. Undoubtedly the worst blow to the planters was the loss of labor caused by slave desertion to the protection of the Union army, leaving formerly thriving plantations neglected and vulnerable to flooding. In 1863, the drastically reduced labor force in Plaquemines Parish prompted the New Orleans Bee to forecast a poor sugar crop for the region (Roland 1957:68-73, 101-110).

Postbellum Era

The years following the end of the Civil War were difficult for southern Louisiana; however, lower Plaquemines Parish was not affected as harshly as other parts of the state. The regional economy was in ruin, but the early fall of the lower Mississippi River to Federal forces prevented much physical damage to the parish. The postbellum years marked a period of financial recovery for the parish.

Area planters were among the most influential men in the sugar industry and by the 1880s, Plaquemines Parish again ranked as one of Louisiana's major sugar producers (Heitmann 1987:84-85). Prior to the fall of New Orleans, the parish sugar crop was listed at 16,226 hogsheads (1860-1861 season). Despite the wartime conditions, the yield rose to 22,433 hogsheads in the next year (1861-1862); however, 10 years later (1871-1872), only 9,509 hogsheads of sugar were produced. The Plaquemines sugar harvest remained relatively low through the next decade, but began building again in the mid-1880s. During the 1887-1888 season, the parish sugar crop was recorded at 12,995 hogsheads. That figure rose to 21,197,445 hogsheads after the 1890-1891 harvest. By the turn of the century, the parish sugar yield had fallen, but it still remained high at 16,722,871 hogsheads produced during the 1899-1900 season (Bouchereau 1871-1900; Champomier 1861-1862).

Most of the Plaquemines sugar plantations were situated in the upper portion of the parish. Lower Plaquemines Parish primarily produced rice and oranges. The low-lying fields along the lower Mississippi River delta were well-suited to the cultivation of rice. Even before the Civil War, Plaquemines Parish was the top rice producer in Louisiana, with a crop of 4,635,500 pounds harvested in 1860. Ten years later, the agricultural census reported the Plaquemines rice crop at 8,639,026 pounds, still the chief yield in the state. By 1890, Plaquemines Parish had dropped to second in Louisiana rice production behind Acadia Parish, but, nevertheless, it cultivated more rice per acre – 9,662,163 pounds on 9,146 acres (3,701 ha), compared to Acadia's 10,807,426 pounds on 15,352 acres (6,213 ha). Louisiana at this time ranked first in rice production in the nation, harvesting 58.83 percent

of the U.S. total yield (Kennedy 1864a:67; U.S. Census 1895:71-72, 1896:435; Walker 1872:743).

The first sizable orange grove in Plaquemines Parish was planted in 1860 by Florentine Buras near the present-day community of Buras (about 23 km [14 mi] upriver from the project item). Citrus trees had been cultivated in the parish prior to that time, but their status as a principal cultivated crop was not realized until after the Civil War. Through the end of the nineteenth century, large-scale orchards became increasingly common in lower Plaquemines Parish. By 1895, the banks of the Mississippi River were lined with orange trees as far south as The Jump. In that year, the acreage encompassing the Lower Venice 2nd Lift project item was owned by the Tropical Fruit Co. (Figure 30) (DeBow 1847:307; Meyer 1981:62).

Across The Jump from the project item was the Old Custom House, situated on the downriver side of the junction of the Mississippi River and The Jump/Grand Pass (Figure 30). This facility was replaced by the U.S. Custom Station, which was constructed ca. the 1870s on Custom House Bayou on the east side of Southwest Pass, some 29 km (18 mi) south (farther by river miles) of the earlier location. Southwest Pass served as the main shipping channel for the Mississippi River during that period of time (Buras 1996:66-72, 135).

Twentieth Century

After the turn of the century, agriculture continued to dominate the economy of Plaquemines Parish; however, many of the large sugar plantations were subdivided into small truck farms. Hundreds of Italian immigrants who previously worked the cane fields took advantage of the plantation breakups and purchased small plots where they grew truck crops - cucumbers, lettuce, spinach, cauliflower, cabbage, artichokes, onions, garlic, celery, corn, tomatoes, legumes, Irish potatoes, sweet potatoes, and other vegetables. These crops then were shipped upriver to the French Market in New Orleans or to northern markets. The shipping business, in turn, gave a boost to the Louisiana Southern Railroad, which although in existence under various names through that area since 1887, had

experienced declining business for a number of years (Meyer 1981:76, 78; Southern Manufacturer 1905:3-4).

Rice and oranges continued to be cultivated as principal cash crops in Plaquemines Parish. Most of the parish orange groves were planted on the west bank of the Mississippi River "extending down to a point known as the 'Jump'", then reached to the edge of the marshes for a width measuring "from a half mile to a few acres" (Southern Manufacturer 1905:5). Generally, the front acreage of the property was planted in orange trees, while the backlands were reserved for rice or vegetable cultivation. Plaquemines Parish orange growers held the advantage over west coast planters since the marketing season in southern Louisiana began in early October, as early as 45 days before the California market opened (Southern Manufacturer 1905:5-8).

The twentieth century brought a boom to the oyster industry in Plaquemines Parish. The success of oystering was "a stimulous [sic] for added investments of capital in packing houses, oyster companies and in the dredging and locking of the various waterways" (Southern Manufacturer 1905:1). Prior to 1905, the area oystermen depended almost exclusively on the New Orleans market, but in the early years of the twentieth century, the mechanization of the industry, i.e., the introduction of oyster dredges, boat motors, and lock construction, revolutionized the business. The accelerated travel time from oyster bed to market allowed for packing and re-icing in New Orleans for transport to Texas and to the northern states (Buras 1996:118; Southern Manufacturer 1905:8011; Vujnovich 1974:114-125).

The village of Venice developed above The Jump to accommodate the pilots, fishermen, and oystermen working in the region. Venice remains a community of hunters and fishermen, but today it also serves the flourishing offshore petroleum industry of southeastern Louisiana. As the literal end of the road of the lower Plaquemines Parish delta, Venice has become a station for offshoremen, petroleum helicopters, and various petroleum pipeline and well service facilities (DTC 1992b; Hansen 1971:405-406, 555).

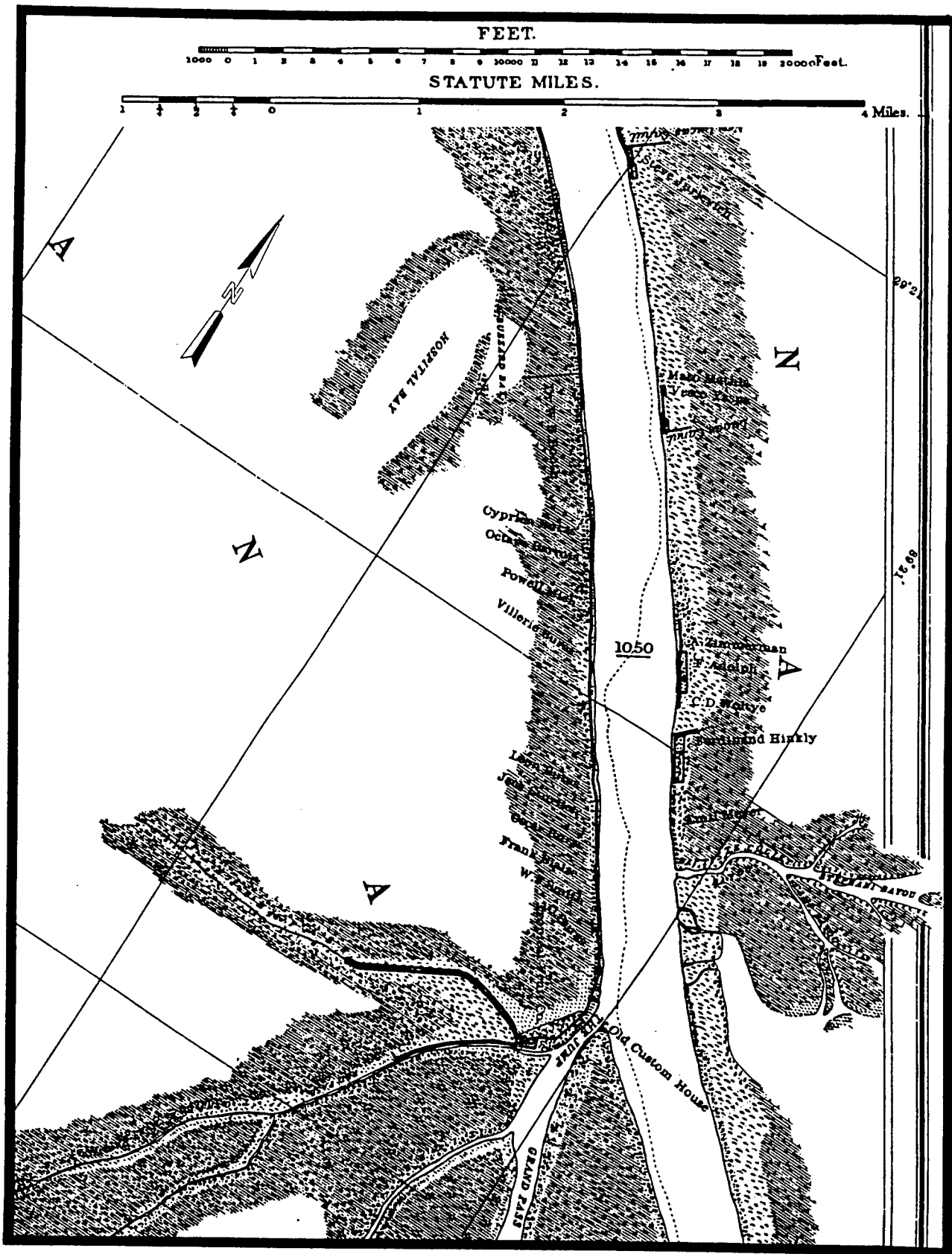


Figure 30. [1895] Reduced excerpt from the Mississippi River Commission's Map of the Lower Mississippi River from the Mouth of the Ohio River to the Head of the Passes, Sheet No. 31, in reference to the Lower Venice 2nd Lift project item, Plaquemines Parish. Excerpt depicts the region surrounding The Jump, including the Tropical Fruit Co. property and the Old Custom House.

Summary of Plaquemines Parish History

The Lower Venice 2nd Lift project item lies within an area that has been exploited for its natural resources since before the Civil War. This is a region of relatively isolated marshland, traversed by numerous natural and manmade waterways. With the exception of petroleum exploitation, little has changed in the character of the region. Historically water-bound, southern

Plaquemines Parish has remained dependent upon its canals and natural waterways from earliest settlement to the present day. This region of southern Louisiana traditionally was worked by fishermen and small farmers. Considering the terrain and the forces of nature, their modest homes and outbuildings probably would not have survived the years.

CHAPTER V

PREVIOUS INVESTIGATIONS

Introduction

This chapter presents the results of an archival review relating to the 11 previously identified project items (Chapter I). This records review was conducted on behalf of the U.S. Army Corps of Engineers, New Orleans District, and the information presented here is based on information currently on file at the Louisiana Department of Culture, Recreation and Tourism, Office of Cultural Development, Divisions of Archaeology and Historic Preservation, Baton Rouge, Louisiana.

This records review was designed to identify those previously recorded cultural resources located within and/or immediately adjacent to the 11 proposed project items. This research focused on the identification of previously completed cultural resources inventories, archeological sites, historic cemeteries, standing structures, and National Register of Historic Places properties situated within the proposed project corridors. When identified, the historic properties and associated surveys were mapped on 7.5' USGS topographic quadrangles. Standing structure forms, National Register of Historic Places Nomination forms, and archeological site forms for all cultural resources located within the associated project corridors were reviewed. The information pertaining to these cultural resources is presented by parish below.

Previously Conducted Cultural Resource Inventories within the Current Study Area

A review of records currently on file with the Louisiana Department of Culture, Recreation and Tourism, Office of Cultural Development, Division of Archaeology, Baton Rouge, Louisi-

ana, resulted in the identification of 45 previously completed cultural resources surveys within the 11 proposed 2.0 km (1.2 mi) wide study corridors (Table 6). These surveys are discussed below in ascending order by parish. Those surveys that encompassed more than one parish are reported at the end of this section under the heading of Multiple Parishes.

Ascension Parish

On June 19, 1976, J. Richard Shenkel conducted a Phase I cultural resources inventory of the proposed Smoke Bend Revetment project item at the request of the U.S. Army Corps of Engineers, New Orleans District (Shenkel 1976a). The project item was located along the right descending bank of the Mississippi River in the vicinity of River Mile 177.5, in Ascension Parish, Louisiana. The proposed project item measured 4.4 km (2.7 mi) in length; the width of the survey area was not reported. Pedestrian survey of the proposed project item failed to identify any cultural material or evidence of intact cultural deposits. No additional testing of the proposed Smoke Bend Revetment project item was recommended.

During January 1989, R. Christopher Goodwin & Associates, Inc. conducted National Register eligibility testing of three cultural features associated with Site 16AN26 (the Ashland-Belle Helene Plantation) in Ascension Parish; this survey also was performed at the request of the U.S. Army Corps of Engineers, New Orleans District (Goodwin et al. 1989). The main house and surrounding yard area of the Ashland-Belle Helene Plantation had previously been listed on the National Register of Historic Places in 1979, and the

Table 6. Previously Conducted Cultural Resource Surveys within the SEIS New Orleans District Project Area.

USACE DISTRICT	STATE	PROJECT ITEM	PROJECT NAME	FIELD DATE	REPORT NUMBER	TITLE/AUTHOR	PROJECT DESCRIPTION	RESULTS AND RECOMMENDATIONS
Ascension Parish								
New Orleans	LA	M-185 to M-179-R	Hohen-Solms to Modeste	1976	22-0155	Cultural Resources Survey of the Proposed Smoke Bend Revetment, Ascension Parish, Louisiana (Shenkel 1976a)	Pedestrian survey	No cultural resources were identified; no additional testing was recommended.
New Orleans	LA	M-189 to M-181-L	Carville to Marchand	1989	22-1383	Significance Assessment of Site 16AN26, New River Bend Revetment, Ascension Parish, Louisiana (Goodwin et al. 1989)	Records review, pedestrian survey, shovel testing, auger testing, and unit excavation	Conducted investigations of three features located on the batture associated with Site 16AN26. None of these features was assessed as significant; no additional testing was recommended.
New Orleans	LA	M-189 to M-181-L	Carville to Marchand	1989	22-1454	Pillars on the Levee: Archaeological Investigations at Ashland-Belle Helene Plantation, Geismar, Ascension Parish, Louisiana (Babson 1989)	Pedestrian survey and unit excavation	Testing of Site 16AN26 (Ashland-Belle Helene Plantation) identified the remains of structures associated with the plantation. Site was assessed as significant and additional testing was recommended.
New Orleans	LA	M-189 to M-181-L	Carville to Marchand	1990	22-1488	Archaeological Survey of the Geismar Liquid Carbonic Plant Extension, Ascension Parish, Louisiana (Guevin 1990)	Records review, pedestrian survey, and shovel testing	No cultural resources were identified; no additional testing was recommended.
New Orleans	LA	M-189 to M-181-L	Carville to Marchand	1990	22-1497	A Report of a Level II Archaeological Field Investigation of the Proposed Plant Expansion - Allied Signal, Inc., Geismar, Louisiana - Ascension Parish (Beavers and Lamb 1990)	Records review, pedestrian survey, and shovel testing	Identified Site 16AN51. The site was assessed as potentially significant; however, it was located outside the area of potential effect. No additional testing was recommended.
New Orleans	LA	M-185 to M-179-R	Hohen-Solms to Modeste	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, shovel testing, auger testing, and unit excavation	Identified Site 16AN54. The site was assessed as potentially significant; however, it was reported that it would not be impacted by proposed construction and no additional testing was recommended.
New Orleans	LA	M-189 to M-181-L	Carville to Marchand	1992 & 1993	22-1830	Archaeological Data Recovery at Ashland - Belle Helene Plantation (16AN26), Ascension Parish, Louisiana (Yakubik et al. 1994)	Records review, pedestrian survey, shovel testing, unit excavation, and backhoe trenching	Conducted data recovery of portions of Site 16AN26 which had previously been assessed as potentially significant. The Ashland-Belle Helene Plantation great house and surrounding yard had previously been listed on the National Register in 1979.
New Orleans	LA	M-185 to M-179-R	Hohen-Solms to Modeste	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, shovel testing, and auger testing	No cultural resources were identified; no additional testing was recommended.
Concordia Parish								
New Orleans	LA	M-319.4 to M-317-R	Fifth Louisiana Levee District	1976	22-0148	Archaeological Survey of the Louisiana Mississippi River Levee Between Morville, Louisiana and Blackhawk, Louisiana (Servello n.d.)	Records review, pedestrian survey, and limited shovel testing	Identified five historic house locations (Sites 16CO52 - 16CO56). All were assessed as potentially significant; additional testing was recommended if the sites were to be impacted.
New Orleans	LA	M-319.4 to M-317-R	Fifth Louisiana Levee District	1988	22-1276	Cultural Resources Survey of the Right-of-Way Corridor for a High Power Transmission Line in Concordia Parish, Louisiana (Shuman and Jones 1988)	Records review, pedestrian survey, and shovel testing	Identified the New St. James Cemetery. Avoidance of cemetery, or monitoring of proposed construction in the vicinity of the cemetery was recommended.

Table 6, continued

USACE DISTRICT	STATE	PROJECT ITEM	PROJECT ITEM NAME	FIELD DATE	REPORT NUMBER	TITLE/AUTHOR	PROJECT DESCRIPTION	RESULTS AND RECOMMENDATIONS
East Baton Rouge Parish								
New Orleans	LA	M-230-L	Baton Rouge Front Levee	1972 - 1974	22-0650	The Archaeology of the Baton Rouge Civic Center Area (Haag 1974)	Excavated numerous privies by reported means	Identified several cultural features within the areas of Catfish Town and Beauregard Town. No statements as to significance were reported and no recommendations were provided.
New Orleans	LA	M-230-L	Baton Rouge Front Levee (Borrow Pit)	1976	22-0352	Archaeological Survey of the Proposed New General Aviation Airport for East Baton Rouge Parish, Louisiana (Toth and Woodiel 1976)	Pedestrian survey	Identified Sites 16EBR35, 15EBR37 & 16EBR38. Sites 16EBR37 & 16EBR38 were assessed as potentially significant but were outside the project area. Site 16EBR35 was assessed as not significant; no additional testing was recommended.
New Orleans	LA	M-230-L	Baton Rouge Front Levee (Borrow Pit)	1977	22-0319	Cultural Resource Testing along the Mississippi Riverbank of Woodstock Plantation, East Baton Rouge Parish, Louisiana (Gagliano et al. 1977)	Records review, pedestrian survey, bankline survey, and backhoe trenching	Reinvestigated 16EBR35 "B." The site was assessed as not significant. No recommendations concerning additional testing were reported.
New Orleans	LA	M-230-L	Baton Rouge Front Levee	1979	22-0528	Cultural Resources Survey and Testing at Convention and Maximilian Streets, Baton Rouge, Louisiana (Castille et al. 1979)	Records review, pedestrian survey, auger testing, magnetometer survey, and limited unit excavation	No significant cultural resources were identified; no additional testing was recommended.
New Orleans	LA	M-230-L	Baton Rouge Front Levee	1983	22-0956	An Archeological Survey of the Proposed Baton Rouge Levee Project (M-231 to 228-L), East Baton Rouge Parish, Louisiana (Shafer et al. 1984)	Records review and pedestrian survey	Identified 11 historic standing structures and two previously recorded landings (Florida Street Dock and North Street Landing). None was assessed as significant; no additional testing was recommended.
New Orleans	LA	M-230-L	Baton Rouge Front Levee	ca. 1984	22-1753	Archeological Reconnaissance at the New State Capitol Grounds: 1984 (Smith 1984)	Records review, pedestrian survey, and limited auger testing	Identified several areas within the capitol grounds which may be suitable for a "public dig" proposed by the Division of Archaeology.
New Orleans	LA	M-230-L	Baton Rouge Front Levee	1988	22-1358	Preliminary Archaeological Testing on the Grounds of the Old State Capitol (16EBR8), Baton Rouge, Louisiana (Holland 1988)	Records review and limited unit excavation	Failed to identify any significant cultural deposits. It was recommended that an archeologist monitor proposed construction activities.
New Orleans	LA	M-230-L	Baton Rouge Front Levee	1989	22-1437	Hard Labor: A Cultural Resources Survey of the Old Louisiana State Penitentiary, Baton Rouge, Louisiana (Wurtzburg and Hahn 1989)	Records review, auger testing, probing, and unit excavation	Identified 11 brick foundations associated with the former penitentiary (Site 16EBR19). The site was assessed as significant and it was recommended that an archeologist monitor proposed construction.
New Orleans	LA	M-230-L	Baton Rouge Front Levee	1989 - 1990	22-1679	Investigations of the State Capitol Grounds (16EBR79 and 16EBR25) (Manheim and Whitmer 1991)	Records review, magnetometer survey, pedestrian survey, shovel testing, and unit excavation	Conducted testing throughout the State Capitol Grounds. Identified several prehistoric and historic period locations. Recommended consulting with the Division of Archaeology prior to any planned alterations to the capitol grounds.
New Orleans	LA	M-230-L	Baton Rouge Front Levee	1992	22-1662	Cultural Resources Investigations for the Baton Rouge Front Levee Enlargement and Concrete Slope Pavement, Item M-230 to 227-L, East Baton Rouge Parish, Louisiana (Hinks, Heinrich, Draughton, Jr., et al. 1993)	Records review, pedestrian survey, auger testing, and unit excavation	Identified four sites (16EBR95, 16EBR96, 16EBR98, and 16EBR99) and reinvestigated Site 16EBR38. None of these sites were assessed as significant and no additional testing was recommended.

Table 6, continued

USACE DISTRICT	STATE	PROJECT ITEM	PROJECT NAME	FIELD DATE	REPORT NUMBER	TITLE/AUTHOR	PROJECT DESCRIPTION	RESULTS AND RECOMMENDATIONS
New Orleans	LA	M-230-L	Baton Rouge Front Levee	1992	22-1718	Archaeological Monitoring at the Old State Capitol of Louisiana (Hinks et al. 1992)	Records review, unit excavation, trench monitoring, and probing	Conducted testing of two cisterns identified during renovation of the Old State Capitol Building (16EBR8). Additional testing was recommended if the cisterns were to be disturbed in the future.
New Orleans	LA	M-230-L	Baton Rouge Front Levee	1992	22-1786	Archaeological and Architectural Investigations of a Nineteenth-Century Underground Cistern at the Baton Rouge Barracks (16EBR43), Louisiana (Holland 1993)	Pedestrian survey, shovel testing, and backhoe trenching	Examined cistern associated with associated with Baton Rouge Barracks (16EBR43). The cistern and surrounding area was assessed as potentially significant; it was recommended that the Division of Archaeology be consulted prior to any planned construction.
Iberville Parish								
New Orleans	LA	M-205 to M-198.5-R	Reveille to Point Pleasant	ca. 1979	22-0711	A Cultural Resource Survey of Whitecastle Revetment, Iberville Parish, Louisiana (Cagliano et al. 1979)	Records review, pedestrian survey, and bankline profiles	Identified two historic artifact scatters (Localities A and B). Neither was assessed as significant and no additional testing was recommended.
New Orleans	LA	M-205 to M-198.5-R	Reveille to Point Pleasant	1982	22-0853	An Archeological Survey of the Proposed Plaquemine Bend Revetment (M-204.9 to 201-R), Iberville Parish, Louisiana (Stuart and Greene 1983a)	Records review and pedestrian survey	No cultural resources were identified; no additional testing was recommended.
New Orleans	LA	M-191 to M-185-R	Alhambra to Hohen-Solms	1985	22-1079	Cultural Resources Survey of the White Castle Revetment Item, Iberville Parish, Louisiana (Goodwin et al. 1987)	Records review, pedestrian survey, shovel testing, auger testing, unit excavation, and probing	Identified Sites 16IV147 - 16IV151. Of these Sites 16IV147 and 16IV149 were assessed as potentially significant and additional testing was recommended. The remaining sites were assessed as not significant; no additional testing was recommended.
New Orleans	LA	M-191 to M-185-R	Alhambra to Hohen-Solms	1987	22-1269	Archeological Testing at Two Sites Near White Castle, Iberville Parish, Louisiana: 16 IV 147 and 16 IV 149 (Goodwin et al. 1988)	Pedestrian survey, auger testing, unit excavation, and bankline profiles	Conducted additional testing at previously recorded Sites 16IV147 and 16IV149. Both sites were assessed as not significant and no additional testing was recommended.
Orleans Parish								
New Orleans	LA	M-104 to 100.2-L	Carrollton Levee Enlargement	1977	22-0053	Cultural Resource Survey of the Nashville Avenue to Napoleon Avenue Floodwall, Mississippi River Levees Item M-100-L, Orleans Levee District, Orleans Parish, Louisiana (Shenkel 1977)	Records review and pedestrian survey	No cultural resources were identified; no additional testing was recommended.
New Orleans	LA	M-104 to 100.2-L	Carrollton Levee Enlargement (Borrow Pit)	1988	22-1370	Cultural Resources Survey of Four Construction Items Below New Orleans (Franks and Yakubik 1994)	Records review, pedestrian survey, shovel testing, and unit excavation	Identified Sites 16OR119 - 16OR125 and two loci for which no site numbers were assigned. Of these only Site 16OR125 was assessed as potentially significant and additional testing of the site was recommended.
New Orleans	LA	M-104 to 100.2-L	Carrollton Levee Enlargement (Borrow Pit)	1990	22-1569	Archaeological Investigations within the Freeport McMoran Audubon Species Survival and Research Center and Wilderness Park, Orleans Parish, Louisiana, Including Beka Plantation (16OR90) (Yakubik and Franks 1992)	Pedestrian survey, shovel testing, and unit excavation	Relocated previously recorded Site 16OR90. The site was assessed as significant. It was recommended that Site 16OR90 be avoided during proposed construction. If avoidance was not possible, mitigation was recommended.

Table 6, continued

USACE DISTRICT	STATE	PROJECT ITEM	PROJECT ITEM NAME	FIELD DATE	REPORT NUMBER	TITLE/AUTHOR	PROJECT DESCRIPTION	RESULTS AND RECOMMENDATIONS
Plaquemines Parish								
New Orleans	LA	M-10-4-R	Lower Venice 2nd Lift	1977	22-0328	Cultural Resource Survey of Grand and Tiger Passes and Batiste Collette Bayou, Plaquemines Parish, Louisiana (Gagliano et al. 1978)	Records review and bankline survey	No archeological sites were recorded; monitoring during project construction was recommended.
New Orleans	LA	M-10-4-R	Lower Venice 2nd Lift	1979	22-0560	An Archeological and Historic Survey of the Lowermost Mississippi River: Cultural Resources Survey, New Orleans to Venice Hurricane Protection Levee: East Bank Barrier Levee Plan (Davis et al. 1981)	Records review, pedestrian survey, "trowel testing," unit excavation, and auger testing	Recorded or updated 28 sites and loci (16PL38, 16PL39, 16PL47, 16PL61, 16PL64 - 16PL82, 16PLA - 16PLD, and Nestor Canal II). Sites 16PL61 and 16PL66 were assessed as potentially significant and additional testing was recommended.
New Orleans	LA	M-10-4-R	Lower Venice 2nd Lift	1983	22-0850	An Archeological Survey of the Proposed Venice Revetment (M-18.7 to 10.5-R), Plaquemines Parish, Louisiana (Stuart and Greene 1983b)	Records review, pedestrian survey, and windshield survey	No cultural resources were identified; no additional testing was recommended.
Multiple Parishes								
New Orleans	LA	M-230-L	Baton Rouge Front Levee (Borrow Pit)	1976	22-0140	Cultural Resource Survey of Mississippi River Levees, Pontchartrain Levee District Item M-218L to M-213-L (Shenkel 1976b)	Records review and pedestrian survey	Identified Sites 16EBR40, 16IV126, & 16IV127. None of the sites were assessed. Of the three, only Site 16EBR40 was located within the proposed construction area. No recommendations were reported.
New Orleans	LA	M-185 to M-179-R	Hohen-Solms to Modeste	1978	22-0421	Archeological/Historical Survey: Shell Pipeline's Proposed Geismir-Napoleonville Pipeline (McIntire 1978)	Records review, pedestrian survey, shovel testing, and auger testing	No cultural resources were identified; no additional testing was recommended.
New Orleans	LA	M-104 to 100.2-L	Carrollton Levee Enlargement (Borrow Pit)	1979	22-0578	Cultural Resources Survey of the Proposed Levee Enlargement and Concrete Slope Pavement Project Item M-82.5 to M-77.5-R, Orleans and Plaquemines Parishes, Louisiana (Rader 1980)	Records review, pedestrian survey, and limited subsurface testing	No cultural resources were identified within the proposed project area; no additional testing was recommended.
New Orleans	LA	M-189 to M-181-L	Carville to Marchand	1980	22-0672	Cultural Resources Survey of Six Revetment and Levee Items Above New Orleans (Hartley 1982)	Records review and pedestrian survey	A total of five historic sites was identified within the proposed Kenner and Convent project areas; however, no cultural resources were identified within the proposed Marchand project area. No additional testing was recommended.
New Orleans	LA	M-191 to M-185-R	Alhambra to Hohen-Solms	ca. 1981	22-1021	Cultural Resource Survey, Louisiana Section of Proposed Pipeline Corridor from Weeks Island to Mississippi Border (McIntire 1981)	Records review, aerial survey, pedestrian survey, shovel testing, and auger testing	Reidentified Site 16AS14. The site was located beyond the proposed construction corridor and it was recommended that the site be avoided during proposed construction.
New Orleans	LA	M-189 to M-181-L	Carville to Marchand	1984	22-0976	Cultural Resources Survey of Five Mississippi River Revetment Items (Goodwin et al. 1985)	Records review,	Eight sites (16PL131, 16PL132, 16SJ39, 16SJ40, 16IV143 - 16IV145, and a portion of Site 16AN26) were identified. Site 16SJ40 and the portion of Site 16AN26 were assessed as potentially significant and additional testing was recommended.

Table 6, continued

USACE DISTRICT	STATE	PROJECT ITEM	PROJECT NAME	FIELD DATE	REPORT NUMBER	TITLE/AUTHOR	PROJECT DESCRIPTION	RESULTS AND RECOMMENDATIONS
New Orleans	LA	M-191 to M-185-R; M-189 to M-181-L	Alhambra to Hohen-Solms; Carville to Marchand	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, pedestrian survey, and shovel testing	Two loci (X161V-G and X161V-F) were identified. Neither was assessed as significant; no additional testing was recommended.
New Orleans	LA	M-189 to M-181-L	Carville to Marchand	1986 & 1987	22-1188	A Level I Cultural Resources Survey of Proposed Telephone Cable Routes in Ascension and Livingston Parishes, Louisiana (Coastal Environments, Inc. 1987)	Records review, pedestrian survey, and shovel testing.	Reinvestigated 27 sites; however, only three of the sites (16LV41, 16LV43, and 16AN39) were identified within the proposed R-O-W. These sites were assessed as potentially significant and monitoring during construction was recommended.
New Orleans	LA	M-10-4-R	Lower Venice 2nd Lift	1988	22-1274	Final Report of the Cultural Resources Investigations within the U.S. Army Corps of Engineers New Orleans to Venice Hurricane Protection Project (Montgomery et al. 1988)	Review, summary of previously completed cultural resources surveys	A total of 80 sites was identified. Avoidance or additional testing of 3 National Historic Landmarks (16PL27, 16PL38, and 16PL39) and significant sites 16PL61, 16PL66, 16PL80, and 16PL82) was recommended.
New Orleans	LA	M-104 to 100-2-L; M-104-3-L; M-102-9-L	Carrollton Levee Enlargement; Jefferson Heights; New Orleans District Floodwall	1992	22-1621	Cultural Resource Survey of Carrollton Bend Revetment, Mississippi River M-105 7 to 101.7-L, Jefferson and Orleans Parishes, Louisiana (Hinks, Heinrich, Draughon et al. 1993)	Records review, pedestrian survey, shovel testing, auger testing, limited unit excavation	Identified 1 locus (Location 1). No official state site number was requested for the locus which was assessed as not significant. No additional testing was recommended.
New Orleans	LA	M-319.4 to M-317-R	Fifth Louisiana Levee District	1992	22-1640	Cultural Resources Survey of Palmetto and Coochie Revetments, Mississippi River M-326 to 315 (Hinks, Heinrich, Smith et al. 1993)	Records review, pedestrian survey, shovel testing, and auger testing	No cultural resources were identified; no additional testing was recommended.
New Orleans	LA	M-189 to M-181-L; M-185 to M-179-R	Carville to Marchand; Hohen-Solms to Modeste	1995	22-1926	A Cultural Resources Survey From Sorrento, Louisiana to Mont Belvieu, Texas (Skinner et al. 1995)	Records review, pedestrian survey, and shovel testing	No cultural resources were identified; no additional testing was recommended.
New Orleans	LA	M-189 to M-181-L	Carville to Marchand; Baton Rouge Front Levee Borrow Pit	1995	22-1775	Cultural Resources Survey of the Proposed Route of a Liquid Hydrogen Pipeline in Ascension, East Baton Rouge, Iberville, and West Baton Rouge Parishes, Louisiana (Shuman et al. 1995)	Records review, pedestrian survey, shovel testing, and unit excavation	Identified two sites (16AN57 and 16AN58) and reinvestigated Site 16AN1. Sites 16AN1 and 16AN58 were assessed as potentially significant and it was recommended that the proposed pipeline be rerouted to avoid impacting the sites.

1989 survey was undertaken to assess the significance of batture components of the greater plantation area. The three investigated features consisted of the remains of a warehouse, a brick scatter, and a portion of an old levee. These features originally were identified by R. Christopher Goodwin & Associates, Inc., in 1985 during a prior cultural resources inventory of several Mississippi River revetment items (Goodwin et al. 1985).

The project area measured approximately 12.5 ac (5.1 ha) in area, and it was located at River Mile 182.9 on the left descending bank of the Mississippi River. Pedestrian survey augmented by both shovel and auger testing was utilized to define the limits of the Site 16AN26 batture components. Shovel tests were excavated at 10 - 20 m (32.8 - 65.6 ft) intervals across the planned project area. A total of 143 shovel tests was excavated in front of the plantation, near the warehouse, and throughout the brick scatter area. In addition, 12 auger tests were excavated to a depth of 2 m (6.6 ft) in an attempt to identify any deeply buried cultural deposits that might lie within the area. Finally, probing within features was utilized in order to choose locations for unit excavations. A total of nine 1 x 1 m (3.3 x 3.3 ft) units was excavated: six of these were placed in the warehouse area, two in the brick scatter, and one at the riverside toe of the old levee, i.e., in the vicinity of the warehouse feature.

Goodwin et al. (1989) reported that the entire batture area directly in front of the National Register portion of site 16AN26 had been impacted prior to the investigation, and that no *in situ* archeological remains were present. Since additional archeological investigation within the batture area would not provide significant information about regional historical themes or about the adjacent National Register site, no additional testing of the batture component of Ashland-Belle Helene Plantation (Site 16AN26) was recommended.

Between January and December 1989, archeological investigations of the Ashland-Belle Helene Plantation Site (16AN26) were undertaken by the Midwestern Archaeological Research Center at Illinois State University, Norman, Illinois to assess the eligibility of the greater site area for inclusion in the National Register of Historic Places (Babson 1989). The investigations

covered an area measuring 160 ac (64.8 ha) in size, including 120 ac (48.6 ha) of the Ashland-Belle Helene Plantation, and 40 ac (16.2 ha) of levee and batture lying in front of the plantation tract. Pedestrian survey was augmented by the excavation of 13 1 x 1 - 2 x 2 m (3.3 x 3.3 - 6.6 x 6.6 ft) units in the vicinity of known or suspected remains. Archeological components identified included a warehouse foundation, the main house and its associated outbuildings, the slave/workers quarters area, and the sugar mill area. The integrity of these components and other identified features was judged to be excellent and the entire Ashland-Belle Helene site was determined eligible for listing in the National Register of Historic Places. It is unclear if the warehouse foundation referred to by Babson (1989) is the same as that studied by Goodwin et al. (1989). Regardless, Babson (1989) recommended further testing of Site 16AN26. Site 16AN26 was located within the current study corridor and is discussed in greater detail in the section on previously recorded sites below.

On March 19, 1990, Coastal Environments, Inc. conducted a Phase I cultural resources inventory of the proposed 3.5 ac (1.4 ha) Liquid Carbonic Specialty Gas Corporation Expansion Project area within Sec. 11, T 10S, R 2E, Ascension Parish, Louisiana. The survey was completed at the request of Liquid Carbonic Gas Specialty Corporation of Geismar, Louisiana (Guevin 1990). Pedestrian survey augmented by the excavation of an unreported number of shovel tests failed to identify any cultural material or evidence of intact cultural deposits within the proposed project parcel. No additional testing of the proposed project area was recommended.

During January, 1990, Richard Beavers and Teresa Lamb conducted a Phase I cultural resources survey of the proposed Allied Signal plant expansion located northwest of the town of Geismar, Ascension Parish, Louisiana (Beavers and Lamb 1990). Beavers and Lamb (1990) reported that two parcels, each measuring approximately 30 ac (12.1 ha) in area, were examined at the request of Waldemar S. Nelson and Company, Inc. of New Orleans. Pedestrian survey augmented by shovel testing identified the ruins of a sugar mill (Site 16AN51) within the vicinity of the proposed "South" project area. Site 16AN51 apparently was located approximately

152.4 m (500 ft) to the southeast of the proposed project area and therefore, the structure would not be impacted adversely by the proposed construction. No additional testing of the proposed plant expansion area was recommended. Site 16AN51 was not assessed (Beavers and Lamb 1990), however, the site is located within the current study area. Site 16AN51 is discussed in more detail in the section on sites below.

During July, 1992, R. Christopher Goodwin & Associates, Inc. conducted a Phase I cultural resources survey of two revetments within Ascension Parish, Louisiana. The survey was completed at the request of the U.S. Army Corps of Engineers, New Orleans District (Hinks et al. 1994). The Smoke Bend Revetment project item 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 located along the left descending bank of the Mississippi River between River Miles 176.2 - 175.3-L. Pedestrian survey, augmented by systematic shovel testing and limited auger testing, resulted in the identification of Site 16AN54 within the boundaries of the proposed St. Elmo Revetment project item. No cultural resources were identified within the proposed Smoke Bend Revetment project item and no additional testing of that revetment was recommended. Site 16AN54 is not located within the current study corridor.

Site 16AN54 was described as archeological remains associated with the town of Darrow, Louisiana. Hinks et al. (1994) reported that a three block portion of the town was razed prior to the construction of the U.S. Darrowville levee setback in 1932. The site measured approximately 25 x 350 m (82 x 1148 ft) in size and the excavation of two 1 x 1 m (3.3 x 3.3 ft) units resulted in the recovery of various historic period cultural material dating from the late nineteenth to the early twentieth century. Hinks et al. (1994) reported that the cultural deposits were covered by approximately 45 cm (17.7 in) of modern alluvium, and they assessed Site 16AN54 as potentially significant. Since the site was not to be impacted by the proposed construction; no additional testing of Site 16AN54 or the proposed St. Elmo Revetment project area was recommended.

During 1992 and 1993, Earth Search, Inc. conducted an archeological investigation of por-

tions of the Ashland-Belle Helene Plantation (Site 16AN26) in Ascension Parish (Maygarden et al. 1994; Yakubik et al. 1994). This property was listed on the National Register of Historic Places in 1979, and it had been acquired and slated for partial development by Shell Chemical Company. An agreement between the Environmental Protection Agency, the Louisiana State Historic Preservation Officer, the Advisory Council on Historic Preservation, and Shell Chemical Company was developed to protect the National Register listed portion of Site 16AN26. This agreement called for: 1) Phase I archeological investigation of the entire 102 ac (41.3 ha) property; 2) a Phase II archeological investigation of the former quarters and industrial complexes; 3) data recovery throughout the quarters' complex; and 4) data recovery excavations within the area of the sugar house. This investigation included a records review, surface collection, shovel testing, backhoe trenching, 1 x 1 m (3.3 x 3.3 ft) unit excavation, and archeological monitoring.

Results of the investigations were presented in a three volume report (Yakubik et al. 1994; Maygarden et al. 1994). Among the issues addressed by the report were the lifestyles and material culture of African-Americans at the plantation and the material aspects of nineteenth-century sugar manufacturing technology. As a result of the extensive excavations conducted at Ashland-Belle Helene, numerous recommendations for future study of plantation grounds were presented.

During 1993 and 1994, Earth Search, Inc. conducted a Phase I cultural resources inventory along the right descending bank of the Mississippi River between River Mile 178.0 and 173.2, in Ascension Parish, Louisiana. The survey was conducted at the request 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 potential of the entire project area to contain cultural resources. This review resulted in the identification of two areas, totaling 104.8 ac (42.4 ha), that possessed some potential for containing undiscovered prehistoric and/or historic period resources.

The first survey area was located between Levee Stations 0+00 and 50+68. Pedestrian sur-

vey augmented by the excavation of 35 auger tests and four shovel tests failed to identify any significant cultural deposits. No additional testing of that area was recommended. The second area consisted of a proposed borrow pit location, situated between Levee Stations 6168+00 and 6188+00. Pedestrian survey augmented by the excavation of 34 auger tests in this area failed to identify evidence of intact cultural deposits. No additional testing of the proposed borrow pit was recommended.

In November 1996, Surveys Unlimited Research Associates, Inc., conducted a Phase I cultural resources inventory of a 12.9 km (8 mi) long proposed railroad extension in Ascension Parish, Louisiana. The survey was conducted at the request of the Surface Transportation Board and Kansas City Southern Railway Company, Inc. (Shuman et al. 1997). Shuman et al. (1997) reported that an approximately 111.7 ac (45.2 ha) area was examined as a result of this undertaking. Pedestrian survey augmented by the excavation of an undisclosed number of shovel tests was conducted along a single survey transect placed along the approximate location of the proposed project center line. Additional transects were excavated in the expanded areas and the project corridor. In one location, probing and auger testing was employed for additional subsurface exploration. A standing structure survey also was undertaken utilizing topographic and aerial survey maps of the project area. Only two cultural resources loci were identified during survey (a slag deposit and a pile of construction debris). Both loci were assessed as not significant and neither warranted archeological site status. In addition, two standing structures were identified outside of the proposed right-of-way. Shuman et al. (1997) reported that the structures would not be impacted by the proposed construction. No additional testing of the proposed project area was recommended.

Concordia Parish

During February and March, 1976, A. Frank Servello conducted a Phase I cultural resources survey of an approximately 350 m (1148.3 ft) wide area extending along both sides of the Mississippi River levee between the towns of Morville and Blackhawk, Louisiana (Servello n.d.). Pedestrian survey augmented by limited shovel

testing resulted in the identification of five historic period sites (16CO52 - 16CO56). None of these sites were located within the 2.0 km (1.2 mi) wide study corridor associated with the Fifth Louisiana District Levee Enlargement.

Site 16CO52 was described as a single standing structure with an adjacent cemetery. Servello (n.d.) reported that the structure as well as the burials contained within the cemetery had been moved to their present location at the time the levee was constructed. The potential age of the structure and cemetery were not reported, but Servello (n.d.) assessed Site 16CO52 as potentially significant. Additional archival research was recommended if Site 16CO52 was to be impacted adversely by any future construction activities.

Site 16CO53 was described as a low earthen mound of historic period construction, the ruins of two brick cisterns, and the remains of a structure. In addition, Servello (n.d.) reported that two small cemeteries were associated with Site 16CO53. Subsurface testing resulted in the recovery of historic period material to a depth of 30 cm (11.8 in) below ground surface. Site 16CO53 also was assessed as potentially significant and additional testing of the site was recommended.

Site 16CO54 was described as a standing structure of brick and wood construction; it measured approximately 10 x 15 m (32.8 x 49.2 ft) in size. Servello (n.d.) reported that historic period cultural material was recovered from a depth of 20 cm (7.9 in) below ground surface throughout the area surrounding the structure. While the cultural affiliation of Site 16CO54 was not reported, the site was assessed as potentially significant. Additional testing of Site 16CO54 was recommended.

Site 16CO55 was described as a cypress plank structure measuring approximately 7 x 10 m (23 x 32.8 ft) in area. Servello (n.d.) reported that the associated cultural material dated from the early to middle twentieth century. Site 16CO55 was assessed as potentially significant and additional testing of the site was recommended.

Site 16CO56 was described as the ruins of a gin mill and three domed cisterns located approximately 0.8 km (0.5 mi) northeast of Site 16CO55. Servello (n.d.) reported that site was in good to excellent condition. Site 16CO56 was

assessed as potentially significant and additional testing of the site was recommended.

During March, 1988, Surveys Unlimited Research Associates, Inc. of Baton Rouge, Louisiana, conducted a Phase I cultural resources inventory of two proposed power transmission line rights-of-way in Concordia Parish, Louisiana; the survey was completed at the request of the city of Vidalia, Louisiana (Shuman and Jones 1988). The two proposed power line corridors totaled approximately 80.1 km (49.8 mi) in length, but Shuman and Jones (1988) reported that approximately 1.6 km (1 mi) of the proposed right-of-way could not be surveyed due to landowner refusal. The proposed project corridors measured approximately 30.5 m (100 ft) in width.

Pedestrian survey augmented by limited shovel testing identified two standing structures within the proposed project corridors. Neither structure was assessed as significant and no additional recordation was recommended. Shuman and Jones (1988) also reported that the St. James Cemetery was located within the eastern portion of the proposed right-of-way. The cemetery contained burials dating from the mid-1960s to the 1979. While the St. James Cemetery was not assessed during survey, it was recommended that the cemetery be avoided during proposed construction. If avoidance of the cemetery was not possible, Shuman and Jones (1988) suggested that an archeologist monitor construction activities throughout the vicinity. None of the structures noted by Shuman and Jones (1988) or the St. James Cemetery were located within the 2.0 km (1.2 mi) wide study corridor associated with the Fifth Louisiana District Levee Enlargement.

East Baton Rouge Parish

Between 1972 and 1974, Louisiana State Archeologist William Haag conducted a cultural resources survey of the proposed Baton Rouge Civic Center Area (Haag 1974). A map of the exact location of the project area was not included in the report; however, 16 cultural resources loci (Localities 1-16) were identified. These included 11 structures recorded within the area referred to as Catfish Town. These structures consisted of a well (Locality 1); an ash hopper with scattered cultural materials (Locality 2); a concrete walled fish pond (Locality 3); a privy with historic period cultural material dating from

the early twentieth century (Locality 4); two trash pits (Localities 5 and 6); one trash midden (Locality 7); two artifact scatters dating from the late twentieth century (Localities 8 and 9); a possible well (Locality 10); and a possible lined privy pit or cistern that contained historic period cultural material dating from post-1925 (Locality 11).

Within the area referred to as Beauregard Town, the remaining five localities were identified. These included a brick-walled and floored structure used as a trash dump dating from 1830 - 1857 (Locality 12); a brick well (Locality 13); a trash pit containing faunal remains and historic ceramic sherds (Locality 14); a nineteenth century saloon location (Locality 15); and a modern trash pit (Locality 16). Haag reported that the excavation of these localities revealed two distinct socioeconomic classes of recent occupation: a poorer class in Catfish Town and a more affluent class in Beauregard Town. No official state site numbers were assigned to these localities, and no management recommendations for the identified loci were provided.

During April and May, 1976, the Louisiana Archaeological Survey and Antiquities Commission conducted a Phase I cultural resources inventory of the proposed new general aviation airport located within East Baton Rouge Parish, Louisiana (Toth and Woodiel 1976). The overall size of the project area was not reported, but pedestrian survey resulted in the identification of one site (16EBR38) within the proposed project area and two additional sites (16EBR35 and 16EBR37) adjacent to but outside of the proposed project parcel. None of these sites are located within the currently proposed Baton Rouge Front Levee project item.

Site 16EBR35 was described as the location of Woodstock Plantation. Toth and Woodiel (1976) reported that the plantation was the largest sugar producer in East Baton Rouge Parish during the late 1800s; however, the last standing structure at the plantation reportedly burned during the early 1970s. Site 16EBR35 was assessed as potentially significant, the site was located outside the boundaries of the proposed construction site. Therefore, no recommendations concerning additional testing of Site 16EBR35 were reported.

Site 16EBR37 also was located outside of the proposed project area. The site was described as a surface scatter of historic period cultural

material dating from the nineteenth century. Toth and Woodiel (1976) suggested that Site 16EBR37 possibly represented the remains of several homesteads. No surface features were noted. Site 16EBR37 was assessed as potentially significant, but due to the fact that it was located outside the proposed construction area, no recommendations concerning additional testing were reported.

Site 16EBR38 was described as a historic period surface scatter identified within the proposed airport construction parcel. The authors suggested that the site possibly represented a ca. 1880 - 1940 residential occupation. Due to the disturbed nature of the site and the lack of structural remains, Site 16EBR38 was assessed as not significant. No additional testing of the site was recommended. Toth and Woodiel (1976) did recommend, however, that the northern portion of the proposed project area under go additional Phase I inventory once the land was cleared of vegetation.

During 1977, Coastal Environments, Inc., conducted additional testing at previously recorded Site 16EBR35 (Woodstock Plantation) in an attempt to identify any cultural remains associated with the plantation prior to proposed revetment construction (Gagliano et al. 1977). This survey was conducted at the request of the U.S. Army Corps of Engineers, New Orleans District. Gagliano et al. (1977) reported that only a portion of the site located adjacent to the Mississippi River in the vicinity of the proposed revetment was subject to cultural resources testing. This area was referred to as Site 16EBR35 "B." It also was noted that Fort Bute (Site 16EBR55), an English fort established in 1765 may have been located in the vicinity of the current project area. Pedestrian survey augmented by the excavation of five backhoe trenches and a bankline examination identified the remains of an historic midden. Gagliano et al. (1977) suggested that this midden was associated with what was thought to be the location of the nineteenth century Woodstock Plantation big house; however, other than the midden, no cultural features were noted. It was reported that the area had been previously disturbed by levee construction and erosion. The portion of Site 16EBR35 tested by Gagliano et al. (1977) was assessed as not significant. No recommendations concerning additional testing of Site 16EBR35 "B" were reported by Gagliano et

al. (1977). It should be noted that Site 16EBR35 "B" is not plotted on the Plaquemine, La. 7.5' topographic quadrangle currently on file at the Louisiana Division of Archaeology. It would appear that this portion of Site 16EBR35 never was officially recorded with the State of Louisiana. Site 16EBR35, as plotted at the Louisiana Division of Archaeology, is not located within the current study area.

During February, 1979, Coastal Environments, Inc. conducted a Phase I cultural resources survey of a parcel measuring approximately 1.5 ac (0.6 ha) in size. The project area was located at the intersection of Convention and Maximilian Streets in Baton Rouge (Castille et al. 1979). The survey was conducted at the request of Inter-agency Archaeological Services prior to the construction of a proposed U.S. Post Office parking lot. Pedestrian survey augmented by auger testing, magnetometer survey, and limited unit excavation failed to identify any significant cultural resources. No additional testing of the proposed parking lot was recommended.

During 1983, the National Park Service, Denver Service Center, conducted a Phase I cultural resources inventory of the area adjacent to the Mississippi River between River Miles 231-L and 228-L (Shafer et al. 1984). The survey was conducted at the request of the U.S. Army Corps of Engineers, New Orleans District. Pedestrian survey resulted in the identification of 11 standing structures and two previously recorded landing sites (Florida Street Dock and North Street Landing). The 11 standing structures included nine one-story houses constructed during the First World War, a small twentieth century brick building once used to house an electrical substation for the capital building, and a small twentieth century brick building that contained a pumping station. No cultural remains were observed by Shafer et al. (1984) at the previously recorded landing sites. None of these structures or sites were assessed as significant, and no additional testing of the planned project area was recommended.

Prior to 1984, Steven Smith of the Louisiana Division of Archaeology conducted an informal Phase I cultural resources survey throughout the new State Capitol gardens to determine if any *in situ* cultural remains were located in the area. The purpose of this investigation was to evaluate how

well the area lent itself to public interpretation (Smith 1984). Pedestrian survey augmented by limited auger testing identified several areas that were considered suitable for a public excavation. Smith (1984), however, reported that no large cultural features existed in the area, thus, the area was not suitable for public interpretation. Additional testing and discussion of the appropriateness of a public excavation in this area was recommended.

In May, 1988, Berger, Barnard & Thomas Engineering, Inc., of Baton Rouge conducted a Phase I cultural resources survey of a parcel measuring approximately 243.8 x 243.8 m (800 x 800 ft) in area. The project parcel was located on the grounds of the Old State Capital (16EBR8) and the survey was conducted prior to proposed construction activities (Holland 1988). The survey was conducted at the request of the Louisiana Department of Culture, Recreation and Tourism, Office of Cultural Development, Division of Archaeology. Holland (1988) noted that an asphalt parking lot covered the area to be tested, and fieldwork consisted only of the excavation of a single 1 x 1 m (3.3 x 3.3 ft) unit. Excavation of the unit resulted in the recovery of a single slate fragment and an unspecified number of small cement and brick fragments; unit excavation was terminated at approximately 42 cm (16.5 in) below ground surface. Although no significant cultural resources were identified, Holland (1988) recommended that an archeologist be present to monitor the proposed construction activities. Site 16EBR8 is located within the current Baton Rouge Front Levee study corridor and it is discussed in the section on previously recorded archaeological sites.

During August, 1989, Coastal Environments, Inc., conducted a Phase I cultural resources survey and archeological inventory of a 4.7 ac (1.9 ha) parcel located within the city of Baton Rouge, Louisiana. The investigation was conducted at the request of The Courthouse Joint Venture consortium prior to the proposed construction of the new federal building (Wurtzburg and Hahn 1989). Auger testing augmented by probing and unit excavation identified 11 brick foundations reportedly associated with the first Louisiana State Penitentiary (Site 16EBR19). The penitentiary operated within the proposed project area between 1833 - 1917. In addition to the vari-

ous brick foundations, 622 artifacts including historic ceramic sherds, glass shards, metal, brick fragments, slate fragments, *Rangia* shell, plastic, and faunal material also was recovered. Site 16EBR19 was assessed as significant and Wurtzburg and Hahn (1989) recommended that an archeologist monitor construction throughout the area. Site 16EBR19 lies within the Baton Rouge Front Levee study corridor and it is discussed later in this chapter.

Between 1989 and 1990, the Department of Geography and Anthropology at Louisiana State University conducted testing throughout the State Capital Grounds (16EBR79 and 16EBR25) (Manhein and Whitmer 1991). The survey was sponsored by the Louisiana State Legislature, the Louisiana State Division of Archaeology, and Louisiana State University. Magnetometer survey augmented by pedestrian survey, shovel testing, and unit excavation resulted in the identification of several prehistoric and historic period cultural resources loci. The number of prehistoric and historic period locations recorded, however, was not defined clearly in the report. Due to a uniform mixture of prehistoric and historic period artifacts throughout a variety of landforms and depths, Manhein and Whitmer (1991) speculated that the area had been subjected to massive and intensive disturbance. Although most of the surveyed land showed evidence of disturbance, intact deposits were identified in the northeastern sector of the project area. In addition, archival/oral information was collected about a cemetery located in the area. Manhein and Whitmer recommended consulting with the Louisiana Division of Archaeology prior to initiating any alterations to the capitol grounds. Both Sites 16EBR25 and 16EBR79 are located within the Baton Rouge Front Levee study corridor; they are discussed in turn, below.

During September and October 1992, R. Christopher Goodwin & Associates, Inc. conducted a Phase I/II cultural resources survey and testing between Mississippi River Mile 230 and River Mile 227-L at the request of the U.S. Army Corps of Engineers, New Orleans District prior to proposed levee enlargement and concrete slope paving (Hinks et al. 1993). Pedestrian survey augmented by auger testing and unit excavation resulted in the identification of four historic period sites (16EBR95, 16EBR96, 16EBR98, and

16EBR99) and the reidentification of previously recorded Site 16EBR58. In addition, Site 16EBR75 was revisited, but no additional testing of the site was conducted. Hinks et al. (1993) reported that none of the five sites was assessed as significant and no additional testing was recommended. Sites 16EBR58, 16EBR75, and 16EBR99 were identified within the current study area and are discussed below in the section on previously recorded sites.

During May 1992, R. Christopher Goodwin & Associates, Inc., investigated two cisterns that had been uncovered during the renovation of the Old State Capitol building (Site 16EBR8) in Baton Rouge, Louisiana. The excavation was conducted on behalf of the Louisiana Division of Administration, Facility Planning and Control (Hinks et al. 1992). Fieldwork consisted of the excavation of two 1 x 2 m (3.3 x 6.6 ft) units adjacent to the exterior of each cistern, trench monitoring, and probing. Cistern 1 measured 4.8 m (15.7 ft) in diameter and it extended to a depth of at least 2.5 m (8.2 ft) below the top of the surviving brickwork. Cistern 2 measured 5.05 m (16.6 ft) in diameter and it extended to a depth of at least 2.5 m (8.2 ft). Hinks et al. (1992) reported that between 1857 and 1858 a small gas manufacturing system was installed on the ground floor of the Old State Capitol Building and that the cisterns served as storage tanks for the manufactured coal gas. Since the excavation of these cisterns, the ground floor of the Old State Capitol has been covered with concrete and thus both cisterns are protected and inaccessible. Additional recordation of these two cisterns was recommended in the event that the two features are disturbed in the future. The Old State Capitol (16EBR8) was located within the Baton Rouge Front Levee project corridor and it is discussed in more detail below.

During 1992, a nineteenth century cistern (16EBR43) was excavated under the supervision of the Louisiana Department of Archaeology (Holland 1993). The cistern was located at the site of the Baton Rouge Barracks. Pedestrian survey augmented by both shovel testing and backhoe trenching revealed a cistern that served as a source of water from the 1870s through the mid 1890s. Based on the historic period material re-

covered from within the cistern, Holland (1993) suggested that trash dumping occurred in the cistern between the 1890s and the 1920s. In addition to the cistern, a shallow brick gutter was identified around the cistern. Trenching revealed the base of a flagpole in the courtyard and the foundation of a pump utilized to draw water from the cistern. The cistern and the surrounding area were assessed as potentially significant. Holland (1993) recommended that the Division of Archaeology be consulted prior to any planned construction activities. Site 16EBR43 is located within the current Baton Rouge Front Levee project item study corridor; it is discussed in more detail later in this chapter.

Iberville Parish

Prior to February, 1979, Coastal Environments, Inc., conducted a cultural resources investigation in the vicinity of Mississippi River Mile 197.5, in Iberville Parish, Louisiana. This archaeological inventory was conducted at the request of the U.S. Army Corps of Engineers, New Orleans District (Gagliano et al. 1979). Fieldwork included pedestrian survey and bankline examination of a portion of the proposed Whitecastle Revetment project item, in an area where U.S. Army Corps of Engineers, New Orleans District personnel had observed historic period material eroding from the bank of the river. The artifact scatter (later designated as Site 16IV136) measured approximately 12 x 80 m (39.4 x 262.5 ft) in area. Site 16IV136 is located within the Reveille to Point Pleasant project item study corridor and it is discussed in more detail below.

Pedestrian survey throughout the proposed project area resulted in the collection of historic period ceramic sherds, nails, brick fragments, coal, mortar, and an unspecified number of bone fragments. The authors suggested that the material recovered from the site dated from ca. 1820 - 1920. Gagliano et al. (1979) reported that these materials were not *in situ* and they suggested that the artifacts may have been redeposited in the area at the time that the original levee was constructed. Site 16IV136 was assessed as not significant and no additional testing of the proposed White Castle Revetment was recommended. In 1983, Bureman completed a State of Louisiana

Site Record Update Form for Site 16IV136; no new information was provided on the examined site form.

During November, 1982, the National Park Service, Denver Service Center, Southeast-Southwest Team conducted a Phase I cultural resources survey and archeological inventory of the proposed Plaquemine Bend Revetment project area. The survey corridor was located on the right descending bank of the Mississippi River between River Miles 204.9 - 201-R (Stuart and Greene 1983a). This survey was conducted on behalf of the U.S. Army Corps of Engineers, New Orleans District. Pedestrian survey of the proposed project area failed to identify any cultural resources. No additional testing of the proposed project item was recommended.

Between August and September, 1985, R. Christopher Goodwin & Associates, Inc., conducted a Phase I cultural resources inventory of the proposed White Castle Revetment Item located on the right descending bank of the Mississippi River between River Miles 192-R and 191.2-R, in Iberville Parish. The survey was conducted at the request of the U.S. Army Corps of Engineers, New Orleans District (Goodwin et al. 1987). Pedestrian survey augmented by shovel testing, auger testing, and unit excavation resulted in the identification of Sites 16IV147 - 16IV151. In addition, a single locus (White Castle Site 1) for which no official state site number was requested also was identified. Locus White Castle Site 1 was described as a surface scatter of brick, concrete, asphalt, and other unspecified construction materials. Goodwin et al. (1987) suggested that the materials had been redeposited as fill and/or rip-rap. White Castle Site 1 was assessed as not significant and no additional testing of that site was recommended. Of the remaining sites (16IV147 - 16IV151), only Sites 16IV147 and 16IV149 were not assessed. Additional testing of these sites was recommended in order to assess more fully their National Register significance. Sites 16IV148, 16IV150, and 16IV151 were assessed as not significant. All of the sites identified by Goodwin et al. (1987) was located within the proposed Alhambra to Hohen-Solms project corridor; they are discussed in more detail below.

During 1987, R. Christopher Goodwin & Associates, Inc., completed the additional testing of Sites 16IV147 and 16IV149 in order to assess

their significance applying the National Register of Historic Places criteria of evaluation (Goodwin et al. 1988). Fieldwork included pedestrian survey, shovel testing, auger testing, unit excavation, and the examination of bankline profiles. This testing effort failed to identify any cultural features or evidence of structural remains at either site. Site 16IV147 was described as a brick scatter and a fire-stained and thermally-altered soil profile located in the bluff face; no additional cultural material was noted at the site. The site may represent the remains of a nineteenth century furnace. Only a small portion of the site remained at the time of the survey. Site 16IV147 was assessed as not significant and no additional testing of the site was recommended.

Site 16IV149 was described as a domestic refuse scatter that may have been associated with the ca. 1830s occupation of Celeste Plantation. Goodwin et al. (1988) reported that only a small portion of the original scatter remained intact. It was noted that other portions of the scatter had been disturbed by levee construction and road grading. Site 16IV149 was assessed as not significant and no additional testing of the site was recommended. Both Sites 16IV147 and 16IV149 lie within the currently proposed Alhambra to Hohen-Solms project corridor. Each is discussed in the section on previously recorded sites.

Orleans Parish

On January 19, 1977, J. Richard Shenkel conducted a Phase I cultural resources survey of the proposed Nashville Avenue to Napoleon Avenue Floodwall on behalf of the U.S. Army Corps of Engineers, New Orleans District (Shenkel 1977). The proposed project corridor measured approximately 2,317.2 m (7,602.5 ft) in length. The width of the proposed right-of-way corridor was not reported. Fieldwork consisted primarily of pedestrian survey, and Shenkel (1977) concluded that the proposed floodwall would not impact any significant archeological sites or structures. No additional testing of the proposed project area was recommended.

Between October and December, 1988, the Museum of Geoscience at Louisiana State University, in Baton Rouge conducted a Phase I cultural resources inventory of four proposed Mississippi River levee and revetment construction items located between River Miles 93.8 - 81.8, in

Orleans Parish, Louisiana. The survey was conducted at the request of the U.S. Army Corps of Engineers, New Orleans District (Franks and Yakubik 1994). Pedestrian survey augmented by both shovel testing and unit excavation resulted in the identification of Sites 16OR119 - 16OR125 and two loci (Twelve Mile Revetment Locale No. 5 and Algiers Locale No. 1) for which no official state site number was assigned. Only Site 16OR125 was assessed as potentially significant; it was characterized as a cultural material surface scatter. Both historic period ceramic sherds dating from the eighteenth century and prehistoric ceramic sherds associated with an unspecified cultural affiliation were recovered from the site. In addition, the ruins of a wharf dating from the nineteenth century also were identified at Site 16OR125. Additional testing of Site 16OR125 was recommended.

Sites 16OR120 and 16OR121 are located within the current study area and they are discussed later in this chapter. The remaining sites (16OR119 and 16OR122 - 16OR124) were described as historic period material scatters. Sites 16OR123 and 16OR124 were characterized as late nineteenth to early twentieth century occupations, while Site 16OR119 was assigned a late eighteenth to early nineteenth century date. Site 16OR122 represented a late eighteenth century occupation. Each of these sites was assessed as not significant. No additional testing of Sites 16OR119 - 16OR124 was recommended.

Between October and November, 1990, Earth Search, Inc., of New Orleans completed a Phase I cultural resources inventory within the proposed Freeport-McMoRan Audubon Species Survival and Research Center and Wilderness Park, Orleans Parish, Louisiana. The survey was conducted on behalf of The Audubon Institute (Yakubik and Franks 1992). Fieldwork included pedestrian survey augmented by the systematic excavation of shovel tests throughout the project corridor. This investigation resulted in the re-identification of previously recorded Site 16OR90 (Beka Plantation). Archeological investigations at Site 16OR90 revealed the presence of intact cultural deposits. These deposits consisted of the remains of a large plantation complex that dated from the mid-nineteenth to the early twentieth century. Archeological fieldwork resulted in the identification of numerous surface and subsurface

cultural material scatters associated with the great house, slave quarter, and the sugar house. As a result of these investigations, Site 16OR90 was assessed as significant and avoidance of this National Register eligible site was recommended. Site 16OR90 lies within the current study area and it is discussed in more detail below.

Plaquemines Parish

During 1977, Coastal Environments, Inc. undertook a Phase I cultural resources survey of both Grand and Tiger passes, as well as Baptiste Collette Bayou (Gagliano et al. 1978). This investigation was conducted on behalf of the U.S. Army Corps of Engineers, New Orleans District prior to proposed dredging activities designed to maintain and improve navigation capabilities on the lower Mississippi River. This investigation included an initial literature search and review of historic maps and aerial photographs, followed by a visual reconnaissance of each watercourse. Visual inspection from a boat resulted in the identification of numerous cultural properties including modern camps, launches, partially submerged watercraft, and the remains of several oil derricks. Gagliano et al. (1978) noted that the oldest buildings in the area were associated with "The Jump." The Jump (Site 16PL48) was described as a small fishing village situated along either side of Grand Pass, i.e., immediately below the right descending bank of the Mississippi River. Site 16PL48 was located within the currently proposed study area and it is discussed more fully below. No additional testing of Site 16PL48 was recommended. Monitoring of the proposed construction activities throughout the site area was recommended.

Between February and March, 1979, the Department of Anthropology at Tulane University conducted a Phase I cultural resources inventory of the left descending bank of the Mississippi River between River Miles 45.0 - 10.0 and the right descending bank between River Miles 20.0 - 10.0, Plaquemine Parish, Louisiana (Davis et al. 1979). The survey was conducted at the request of the U.S. Army Corps of Engineers, New Orleans District prior to proposed improvements to the New Orleans to Venice Hurricane Protection Levee. Pedestrian survey augmented by limited auger testing, "trowel testing," and unit excavation resulted in the identification and/or reex-

amination of 28 archeological sites or cultural resources loci, all of which dated from the nineteenth and/or twentieth century. These loci included artifact scatters (n=13), structures or structural remains (n=10), settlements (n=2), Fort St. Philip and Fort Jackson, and a single cemetery. The 13 artifact scatters (Sites 16PL67, 16PL70, 16PL72 - 16PL74, 16PL76 - 16PL78, 16PL81, and 16PL82, and loci Y16PLA, Y16PLD, and Nestor Canal II) contained mostly pieces of metal, brick, and glass, and historic period ceramic sherds. Each of these locations was assessed as not significant. Prehistoric ceramic sherds were recovered from the surface at Nester Canal II; it appeared, however, that this material was included as fill that was once deposited in the area. No official state site number was requested for this locus. The Tabony Cemetery (Site 16PL69) was assessed as not significant, Davis et al. (1979) reported, however, that the cemetery would be impacted adversely by the proposed construction activities. No recommendations for additional testing or assessment of the site were provided.

Each of the two recorded settlements (Olga and Ostrica) were commercial in nature, and both sites (16PL61 and 16PL66) were recommended for additional testing. Site 16PL61 (Olga) was identified as the remains of an oyster fishing community that was founded by Yugoslavian immigrants in ca. 1840. Intact cultural deposits and a variety of cultural features were unearthed at this locale. The other settlement, Site 16PL66 (Ostrica), represented the remains of a Slavic oyster cannery and village. The site was important to the early historic development of southern Plaquemines Parish, and the remains of several kilns along with other cultural features were documented. The status of both Ostrica (16PL66) and Olga (16PL61) was elevated from potentially significant to significant by Montgomery et al. (1988) following a review of the original project notes and site inspection at each location. Both sites (16PL61 and 16PL66) were recommended for inclusion in the National Register of Historic Places.

An additional 10 locations (Sites 16PL47, 16PL64, 16PL65, 16PL68, 16PL71, 16PL75, 16PL79, 16PL80, and loci Y16PLB and Y16PLC) were characterized either as standing structures or as structural remains. Most of these

sites represented the collapsed remains of camps or former residences, although Site 16PL80 (Adolph's Camp) has been occupied continually since ca. 1880. Site 16PL47 represent the remains an abandoned salt works that dated from ca. 1860 - 1906, while Site 16PL68 may be the base of a warning light constructed at Point Bolivar. All of these sites initially were assessed as not significant, and no additional testing was recommended. Because of the shared heritage at the loci with Olga (16PL61) and Ostrica (16PL66), both Site 16PL80 (Adolph's Camp) and Site 16PL82 (Dunn's Camp) were reassessed by Montgomery et al. (1988). Each was assessed as a significant cultural resource (Montgomery et al. 1988, Table 7:115). Since avoidance of Sites 16PL61, 16PL66, 16PL80, and 16PL82 was not feasible, Montgomery et al. (1988) recommended partial data recovery within those portions of the sites to be impacted directly by the implementation of the New Orleans to Venice Hurricane Protection project.

In addition to the previously discussed archeological sites, two forts, Fort Jackson (16PL38) and Fort St. Phillip (16PL39), also were examined during survey. Both sites have since been awarded National Register Landmark status, and both are listed in the National Register of Historic Places. A review of project schematics determined that only a portion of the grounds at Fort St. Phillip would be impacted by proposed levee construction, and that the grounds of Fort Jackson fell entirely outside of the proposed impact area. No management recommendations were made for Fort Jackson. In order to mitigate potential damages to Fort St. Phillip, Davis et al. (1979) recommended three possible alternatives: survey of that portion of the impact corridor across Fort St. Phillip using a proton magnetometer; a reconfiguration of construction plans to avoid the fort; or archeological monitoring during the construction process. None of these previously identified sites are located within the currently proposed study area.

At an unspecified time prior to March, 1983, the National Park Service conducted a Phase I cultural resources inventory of the right descending bank of the Mississippi River between River Miles 18.7 - 10.5-R, Plaquemines Parish, Louisiana prior to proposed revetment construction (Stuart and Greene 1983b). The survey was

conducted at the request of the U.S. Army Corps of Engineers, New Orleans District. Windshield survey augmented by limited pedestrian survey of the river batture failed to identify any cultural resources. No additional testing of the proposed project area was recommended.

Multiple Parishes

During October, 1976, J. Richard Shenkel conducted a Phase I cultural resources survey and archeological inventory of the left descending bank of the Mississippi River between River Miles 218 - 213 in the vicinity of Manchac Bend, East Baton Rouge and Iberville parishes, Louisiana. The survey was completed at the request of the U.S. Army Corps of Engineers, New Orleans District (Shenkel 1976b). Pedestrian survey resulted in the identification of Sites 16EBR40, 16IV126, and 16IV127. All three sites were described as prehistoric period material surface scatters.

Site 16EBR40 was described as a scatter of *Rangia* shells and 2 prehistoric ceramic sherds. It was suggested that Site 16EBR40 represented Marksville - Plaquemine period occupations. Site 16IV126 was described as a scatter of unspecified shell, burned daub, and prehistoric ceramic sherds found eroding from the riverbank. It was suggested that the site dated from the Late Marksville - Coles Creek periods. Site 16IV127 was described as a surface scatter of prehistoric ceramic sherds dating from the Coles Creek period. In addition, an unspecified amount of modern debris also was noted at Site 16IV127. None of the three sites was assessed by Shenkel (1976b). It was reported, however, that Site 16EBR40 would be impacted adversely by proposed construction. Shenkel (1976b) reported that Site 16EBR40 had been previously impacted by levee construction and by prior borrowing activities, and he recommended that the Louisiana State Archeologist and the State Historic Preservation Officer be consulted concerning mitigation of the site. Of the three sites identified by Shenkel (1976b) only Site 16IV126 is located within the current study area. It is discussed in more detail in the sections below.

During 1978, William McIntire conducted a Phase I cultural resources inventory of a proposed pipeline right-of-way located within portions of Assumption, Ascension, and Iberville Parishes,

Louisiana. The survey was conducted at the request of the Shell Pipeline Corporation, Lafayette, Louisiana (McIntire 1978). The overall length and width of the proposed pipeline corridor was not reported, however, both pedestrian survey augmented by judgmental shovel and auger testing throughout the area of potential effect failed to identify any significant cultural resources. No additional testing of the proposed pipeline right-of-way was recommended.

On September 5, 1979, the U.S. Army Corps of Engineers, New Orleans District, conducted a Phase I cultural resources inventory of a proposed levee enlargement and concrete slope pavement project between River Miles 82.5 - 77.5-R, Orleans and Plaquemines Parishes, Louisiana (Rader 1980). Pedestrian survey augmented by limited subsurface testing with an entrenching tool identified a single historic period materials scatter. No site number was reported for this locus and Rader (1980) stated that the artifact scatter was located outside the proposed project corridor. This historic locus was not assessed as a result of this investigation, however, archeological monitoring apparently was conducted during construction within the vicinity of the identified locus. In addition, Rader (1980) reported that monitoring during construction also would be conducted in the vicinity of Fort St. Leon. It too was located adjacent to, but outside the proposed project area.

In September 1980, Iroquois Research Institute of Fairfax, Virginia conducted a Phase I cultural resources inventory of six proposed revetment and levee items located adjacent to the Mississippi River in portions of Ascension, Jefferson, St. James, St. John the Baptist, and St. Charles Parishes (Hartley 1982). The survey was conducted at the request of the U.S. Army Corps of Engineers, New Orleans District. The six proposed project areas included: (1) Marchand project item, located in Ascension Parish at river mile M-181-L and between levee stations 2460+00 and 2480+00, and stations 2537+00 to 2552+00. The revetment area included an upstream area measuring 102 x 457 m (335 x 1499 ft) and a downstream area that encompassed 267 x 610 m (876 x 2,001 ft); (2) Convent Levee Enlargement project item, located in St. James Parish between river miles M-163-L and M-157-L, and between levee stations 3546+00 and 3678+00, as well as

3707+30 and 3724+35. The project area included an enlargement area measuring 73 x 4,023 m (240 x 13,199 ft) and a borrow area encompassing 482 x 533 m (1,581 x 1,749 ft); (3) Willow Bend Revetment project item, measuring 122 x 1,520 m (400 x 4,987 ft) at river mile 141-R, and between levee stations 1826+00 and 1876+00, located in St. John the Baptist Parish; (4) Montz Revetment project item, measuring 183 x 366 m (600 x 1,200 ft) located in St. Charles Parish at river mile M-129.5L, and between levee stations 2521+00 and 2561+00; (5) Waterford Revetment project item, also located in St. Charles Parish at river mile M-128-R, and between levee stations 2521+00 and 2561+00. The project dimensions were 64 x 1,219 m (210 x 3,999 ft); and (6) Kenner Revetment project item, measuring 139 x 5,480 m (456 x 17,979 ft) located in Jefferson Parish at river mile M-113-L, and between levee stations 6119+00 and 6301+00.

All proposed project areas were inventoried utilizing pedestrian survey along transects spaced at approximately 12.8 - 44.5 m (42 - 146 ft) intervals augmented by shovel testing. A total of five historic loci were identified, four of which fell within the proposed Kenner Revetment project item and one within the proposed Convent Levee Enlargement project item. Hartley (1982) reported that all loci identified were subjected to more intensive shovel testing and surface collection during the site delineation process. None of these loci were identified within the current study area.

Site 16SJ31 was located in the downstream section of the Convent Levee Enlargement project item. The site consisted of a low wall formed of wooden planks. The planks were thought to represent the remains of a wooden retaining wall designed to control erosion during high water stages. A total of four historic artifacts were collected during survey, but none were temporally diagnostic. Site 16JE136 was defined as the possible remains of a structure. A scatter of brick, nails, ceramic sherds, glass, and miscellaneous other materials were found on the bank of the river, and eroding from the cutbank. The site lacked integrity, and it was suggested that the materials may have represented a dump site. Site 16JE137 was identified as the fragmentary wooden hull of a ship or boat beached within a repair facility located in St. Rose. Because of the

condition of the wood and the preservation of paint on the sides of the hull, the site was not considered to represent an historic shipwreck or beaching. Locus WP3-1 consisted of a wide variety of modern artifacts associated with dumping episodes and it was not assigned a state site number. Locus WP-3 reportedly consisted of a square concrete slab foundation situated on the batture. A mixture of modern artifacts were found on the slab. This locus was not assigned a state site number. None of these sites or loci were assessed as significant, and no additional testing was recommended.

Prior to May, 1981, William McIntire conducted a Phase I cultural resources inventory of the Louisiana section of a proposed Shell Pipeline corridor located between Weeks Island, Iberia Parish, Louisiana, and the Louisiana-Mississippi border, St. Helena Parish, Louisiana (McIntire 1981). The survey was conducted at the request of Dames & Moore of Houston, Texas. Helicopter survey augmented by pedestrian survey and limited shovel and auger testing identified previously recorded Site 16AS14. The nature of Site 16AS14 was not reported; however, McIntire (1981) did state that the site was located outside the proposed pipeline right-of-way and would not be impacted by proposed construction. In addition, Site 16AS14 was not located within the current study area. No additional testing of the proposed corridor was recommended by McIntire (1981).

Between July and August 1984, R. Christopher Goodwin and Associates, Inc., conducted a Phase I cultural resources inventory of five proposed Mississippi River revetment construction rights-of-way located within portions of Ascension, St. James, Iberville, and Plaquemine parishes, Louisiana (Goodwin et al. 1985). The survey was conducted at the request of the U.S. Army Corps of Engineers, New Orleans District. The five proposed revetments subjected to cultural resources inventory included: (1) Port Sulphur, located in Plaquemines Parish on the right descending bank of the river between River Miles 38.0 - 38.5-R, and between levee stations 2330+48.2 - 2293.3; (2) Vacherie, located in St. James Parish on the right descending bank of the river between River Miles 148.5 - 149.5-R, and between levee stations 1407+53 - 1457+65; (3) Romeville, located in St. James Parish on the left

descending bank of the river between River Miles 160.3 - 159.7-L, and between levee stations 3516+93 - 3547+44; (4) Marchand, located within Ascension Parish on the left descending bank of the river between River Miles 183.8 - 181.5-L, and between levee stations 2333+71 - 2467+06; and (5) New River Bend, located within Iberville Parish on the left descending bank of the river between River Miles 191.0 - 188.0-L, and between levee stations 1913+45 - 2089+94.

All five revetment areas were located on the grounds of historically documented plantations, and historic activity areas and cultural materials were encountered at several of the revetment areas. Survey baselines were established roughly parallel to the river course and pedestrian survey was then undertaken along transects spaced at 20 m (56.6 ft) intervals throughout the proposed project areas. In addition, shovel testing was conducted at unspecified regular intervals along each transect, and subsurface probing was conducted near observed cultural remains. In addition, exposed bankline profiles also were cleared in selected locations to provide stratigraphic information.

The Port Sulphur revetment area contained a portion of Homeplace Plantation, also known as Bellevue Plantation. During survey, Site 16PL131 was identified as containing redeposited material from a nearby borrow pit, and Site 16PL132 marked the remains of a relocated late nineteenth to twentieth century church cemetery. Neither of these sites were assessed as significant. The Vacherie revetment area contained Site 16SJ40, a multi-component occupation with late eighteenth to early twentieth century materials. This site contained *in situ* examples of privies and wood irrigation flumes associated with postbellum rice cultivation, and was assessed as potentially significant. Additional testing was recommended for Site 16SJ40. Site 16SJ39 was identified within the Romeville revetment area. This site was described as a surface scatter of late nineteenth to early twentieth century artifacts. The site was reported to lack cultural integrity and was assessed as not significant. The Marchand revetment area contained two features possibly associated with the Ashland-Belle Helene Plantation (16AN26), a site that had previously been listed on the National Register of Historic

Places. Goodwin et al. (1985) reported that one of the features consisted of a brick scatter with no cultural integrity. This feature was assessed as not significant. The remaining feature was described as the brick foundation of a warehouse, and was assessed as potentially significant. Additional testing of this feature was recommended. Goodwin et al. (1985) referred to the brick foundation feature as a portion of a landing, and assigned it site number 16AN38. While the site number may be correct (all features associated with Ashland-Belle Helene Plantation were eventually given the single site number 16AN26), the reference to a landing is apparently a misnomer for the warehouse foundation, also referred to in later reports (e.g., Yakubik et al. 1994:6-1). Site 16AN26 was identified within the current study area and is discussed in the section on previously recorded sites below.

A total of three sites consisting of late nineteenth to twentieth century materials were identified within the New River Bend project area. Site 16IV143 was described as a surface scatter lacking integrity. Site 16IV144 was reported to represent a scatter of modern materials. Site 16IV145 consisted of the brick foundations of a possible boiler furnace. None of these sites were assessed as significant and no additional testing was recommended. None of these sites were located within the current study area.

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, Baton Rouge, Louisiana (Bryant 1985). The proposed corridor measured approximately 17.7 km (11 mi) in length by 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 of 3 historic ceramic sherds and an unspecified number of brick fragments measuring approximately 30.5 m (100 ft) in diameter. Locus X16IV-F was assessed as not significant and no additional testing was recommended.

Locus X16IV-G was described as a surface scatter of brick measuring 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 also were noted at locus X16IV-G. The locus was assessed as not significant and no additional testing was recommended. Of the two loci identified by Bryant (1985), only Locus X16IV-F was located within the current study area.

During December 1986 and January 1987, Coastal Environments, Inc., conducted a Phase I cultural resources inventory of proposed telephone cable routes within portions of Ascension and Livingston parishes, Louisiana. The survey was conducted at the request of Certified Engineering, Inc., and East Ascension Telephone Company, Inc. (Coastal Environments, Inc. 1987). The proposed project area included much of the northern portion of Ascension Parish and the southern portion of Livingston Parish, including approximately 241 km (150 mi) of narrow (15 cm [6 in]) corridor. Coastal Environments, Inc. (1987) reported that 20 areas considered to have a high probability for containing cultural resources were subjected to cultural resources inventory. In addition, 26 previously recorded sites in the vicinity of the project area were examined as to update their status. A records review was conducted to identify the natural and cultural history of the area, and potential locations for new sites. The field survey consisted of pedestrian survey augmented by the excavation of shovel tests within each of the 20 sample areas.

Survey of the 20 sample areas failed to identify any new cultural resources. A single newly recorded site, 16AN38, was noted outside of the proposed project area. No further information was reported regarding this site. Furthermore, only three of the 26 revisited sites were determined to be in any danger from the proposed project. Site 16AN39, the location of a late eighteenth to early nineteenth century Spanish colonial town referred to as Galveztown, was located on the Amite River just below the mouth of Bayou Manchac. The survey re-examination of the site indicated that large numbers of artifacts were present at the site, and that the potential for intact subsurface deposits was high. It was recommended that a professional archeologist be present at the time of cable installation in this area. The second revisited site, 16LV41, also known as Whitehall Cemetery, was situated on a low earthen mound on a Pleistocene terrace. The surveyors noted that the telephone cable was to run

25 m (82 ft) west of the mound, and that because of the potential for subsurface deposits at the cemetery, a professional archeologist should be present at the time of cable installation. The third site revisited, 16LV43 (Bayou Chene Blanc), was located on the east side of Old River at the point where Highway 22 veers away from that stream. The site consisted of a shell midden and an extensive artifact scatter. A single previously excavated unit revealed an intact shell midden and two human burials. Due to the proximity of the shell midden and the human burials to the cable right-of-way, it was recommended that a professional archeologist monitor installation of the cable were made.

With the exception of the monitoring of these three sites, it was recommended that the project be allowed to proceed as planned. If professional monitoring was not possible, then it was recommended that additional testing be conducted within the proposed project right-of-way portions of sites 16AN39, 16LV41, and 16LV43. None of these sites was located within the current study area.

During 1988, the Agency for Conservation Archaeology, Eastern New Mexico University, prepared a synthesis and summary for the U.S. Army Corps of Engineers, New Orleans District of all cultural resource investigations conducted along the proposed route of the New Orleans to Venice Hurricane Protection Project (Montgomery et al. 1988). This review was conducted in order to provide an overview for project managers, to reassess site evaluations, and to determine the remaining work that would be required prior to implementing planned construction. Montgomery et al. (1988, Table 3:48-54) recapitulated 31 cultural resources investigations that had been conducted over a 14 year period. These projects resulted in the recordation of 80 archeological sites, of which 40 were positioned within the proposed impact area. Where practical, and deemed necessary, a pedestrian reconnaissance and visual examination of these sites was made to confirm National Register of Historic Places status, and to make additional project recommendations. Of the 40 sites that would be directly impacted by proposed project construction, 33 had been evaluated as not significant, four sites (16PL61, 16PL66, 16PL80, and 16PL82) were assessed as significant cultural resources. The three remaining sites

(16PL27, 16PL38, and 16PL39 [Fort de la Boulaye, Fort Jackson, and Fort St. Phillip, respectively]) had been classified as National Landmarks.

Management recommendations were confined to site status and additional outstanding work. Avoidance, additional survey, data recovery, and/or monitoring was recommended in the vicinity of each of the three forts (Montgomery et al. 1988:117 - 118). As presented in the review of Davis et al. (1979), a partial data recovery was advised at each of the significant sites (16PL61, 16PL66, 16PL80, and 16PL82) that would be adversely affected by implementing the New Orleans to Venice Hurricane Protection project. Montgomery et al. (1988) also identified four areas above Fort Jackson that required cultural resources survey prior to the initiation of the proposed project impacts. None of these sites was identified within the current study area.

During June, 1992, R. Christopher Goodwin & Associates, Inc., conducted archival research and a Phase I/II cultural resources survey from River Mile 105.7 - River Mile 101.7-L (Hinks et al. 1993). Pedestrian survey augmented by systematic and judgmental excavation of 86 auger tests and one, 1 x 2 m (3.3 x 6.6 ft) unit identified one cultural resources loci (Location 1). Location 1 reportedly contained an alignment of brick piers believed to date from post World War II. The piers were not found *in situ*. Hinks et al. (1993) suggested that the piers probably served to limit riverine cutting. Due to the lack of archeological integrity and research potential, Location 1 did not warrant designation as an archeological site. Location 1, which was not located within the current study area, was assessed as not significant and no additional testing was recommended.

Only archival research was conducted by Hinks et al. (1993) on the portion of batture within the current study area. No archeological testing was conducted. Archival research suggested that most archeological deposits within the project area would have been damaged or destroyed by prior levee and railroad construction. However, Hinks et al. (1993) also suggested that remains associated with nineteenth and early twentieth century riverine businesses may have survived under the fill upon which the U.S. Army Corps of Engineers, New Orleans District offices were constructed. It was reported that no non-

modern cultural resources were identified in the areas subject to Phase I cultural resources survey. No additional testing of these areas was recommended.

During April, 1992, R. Christopher Goodwin & Associates, Inc. conducted a Phase I/II cultural resources inventory of the proposed Palmetto and Coochie Revetment Items located in Adams and Wilkinson Counties, Mississippi and Concordia Parish, Louisiana, at the request of the U.S. Army Corps of Engineers, New Orleans District (Hinks et al. 1993). The proposed Palmetto Revetment item was located between River Miles 326.1 - 324.5-L, while the proposed Coochie Revetment item was located between River Miles 319.3 - 318.3-R. A total of 131 ac (53 ha) was subjected to cultural resources survey. Pedestrian survey augmented by shovel and auger testing failed to identify any cultural resources; no additional testing of the proposed project areas was recommended.

Between September and October 1995, AR Consultants of Dallas, Texas conducted a Phase I cultural resources inventory of a proposed pipeline right-of-way extending from Sorrento, Louisiana to Mont Belvieu, Texas for Concha Chemical Pipeline Company (Skinner et al. 1995). The cultural resources survey was conducted at the request of Global Environments, Inc. of Houston, Texas. Within Louisiana, the proposed route was to pass through Ascension, Iberville, St. Martin, Lafayette, Acadia, Jefferson Davis, and Calcasieu parishes. The proposed pipeline corridor was to utilize an existing right-of-way, but Skinner et al. (1995) reported that an additional 18.3 m (60 ft) of new right-of-way was required. 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 April and May, 1995, Surveys Unlimited Research Associates, Inc., of Baton Rouge conducted a Phase I cultural resources inventory of a proposed liquid hydrogen pipeline right-of-way located in portions of Ascension, East Baton Rouge, Iberville, and West Baton Rouge parishes, Louisiana, at the request of R-S-H Engineering, Inc., of Baton Rouge (Shuman et al. 1995). A 47 km (29.2 mi) long corridor measuring approximately 15.2 m (50 ft) wide was subjected to cultural resources survey. Pedestrian

survey augmented by shovel testing and limited unit excavation resulted in the identification of two sites (16AN57 and 16AN58) and reinvestigated previously recorded Site 16AN1. Of these, Sites 16AN1 and 16AN58 were assessed as potentially significant. It therefore was recommended that the proposed pipeline be rerouted to avoid adversely impacting the sites. Sites 16AN57 and 16AN58 were located within the current study area and are discussed in the section on previously recorded sites below.

Previously Recorded Archeological Sites within the Current Study Area

A review of the Louisiana site files maintained by the Louisiana Department of Culture, Recreation and Tourism, Office of Cultural Development, Division of Archaeology, Baton Rouge, Louisiana resulted in the identification of 47 previously recorded archeological sites within the examined 2 km (1.2 mi) wide study corridor (Table 7). These sites are discussed below.

Ascension Parish

Site 16AN3 (Mount Houmas) was recorded by Lawrence Van Horn in 1983. The site was located within Section 11, Township 10S, Range 2E, and it was described as the former location of two prehistoric mounds. The State of Louisiana Site Record Form notes that two small rises were depicted on early topographic maps of the area. Van Horn stated that historic burials of an undetermined period reportedly were present at this site. Although a pedestrian survey was conducted by Van Horn, he did not report what, if any, cultural material was observed or collected from the site; however, he did note that the two mounds had been destroyed by industrial construction. Site 16AN3 was not assessed and no management recommendations concerning additional testing were reported.

During 1987, Coastal Environments, Inc. (1987), reinvestigated Site 16AN3. They suggested that Site 16AN3 possibly represented the location of the ca. 1706 - 1732 Native American village known as Petit or Little Houmas. Pedestrian survey of the area confirmed that it had been graded for the construction of an industrial plant and parking lot.

Sites 16AN19 - 16AN22 were recorded by Castille in 1977. Site 16AN19 was described as

Noel Plantation. Castille stated that the site dated from the nineteenth and twentieth centuries. On the basis of information provided on the State of Louisiana Site Record Form it appears that only a windshield survey of Site 16AN19 was conducted. Site 16AN19 was not assessed and no recommendations concerning additional testing were provided.

Site 16AN20 was described as the New Hope Plantation. Castille reported that the site dated from the nineteenth and twentieth centuries and that it consisted of the big house, the overseer's house, and six workers dwellings. Castille remarked on the State of Louisiana Site Record Form that the site appeared to have good archeological potential and that the big house was in excellent condition. Site 16AN20 was assessed as potentially significant; however, no recommendations concerning additional testing of the site were reported.

Site 16AN21 was described as the location of the nineteenth century Ascension Plantation; however, Castille noted that an attempt to locate structures associated with the plantation proved unsuccessful. Site 16AN21 was not assessed and no recommendations concerning additional testing of the site were reported.

Site 16AN22 was described as two structures possibly associated with Delicia or Arlington Plantations. The site was reported to date from the late nineteenth to the early twentieth century. Castille assessed the site as potentially significant; however, no recommendations concerning additional testing of Site 16AN22 were reported on the State of Louisiana Site Record Form.

Site 16AN26 (Ashland-Belle Helene) was first recorded by Douglas Hayward in 1979. It was Hayward who completed the National Register of Historic Places Inventory Nomination that resulted in the listing of 32 ac (13 ha) of the Ashland-Belle Helene Plantation (including the plantation house) to the National Register of Historic Places in 1979. This aspect of Site 16AN26 is discussed below in the section on standing structures. In addition, a number of cultural resource inventories (Goodwin et al. 1985; Goodwin et al. 1989; Babson 1989; Maygarden et al. 1994; Yakubik et al. 1994) have been conducted of various portions of Site 16AN26. These surveys have been previously discussed.

Table 7. Previously Recorded Archeological Sites Located within the SEIS New Orleans District Project Area.

USACE DISTRICT	STATE	PROJECT ITEM	PROJECT ITEM NAME	SITE NUMBER	UTM COORDINATE	USGS 7.5' QUAD	SITE DESCRIPTION	CULTURAL AFFILIATION	FIELD METHODS	NRHP ELIGIBILITY	RECORDED BY
Ascension Parish											
New Orleans	LA	M-189 to M-181-L	Carville to Marchand	16AN3	Zone 15 N3342600 E691440	Carville	Prehistoric mound with historic burials	Undetermined prehistoric; historic	Pedestrian survey	Not Assessed	Van Horn 1983
New Orleans	LA	M-185 to M-179-R	Hohen-Solms to Modeste	16AN19	Zone 15 N3334300 E688450	Carville and Belle Rose	Noel Plantation	19th - 20th centuries	Windshield survey	Not assessed	Castille 1977
New Orleans	LA	M-185 to M-179-R	Hohen-Solms to Modeste	16AN20	Zone 15 N3335250 E689300	Carville	New Hope Plantation	19th - 20th centuries	Unknown	Potentially significant	Castille 1977
New Orleans	LA	M-185 to M-179-R	Hohen-Solms to Modeste	16AN21	Zone 15 N3335960 E689700	Carville	Former location of Ascension Plantation	19th century	Pedestrian survey	Not assessed	Castille 1977
New Orleans	LA	M-185 to M-179-R	Hohen-Solms to Modeste	16AN22	Zone 15 N3336500 E690300	Carville	Two structures possibly associated with Delicia or Arlington Plantations	Late 19th - 20th century	Unknown	Potentially significant	Castille 1977
New Orleans	LA	M-189 to M-181-L	Carville to Marchand	16AN26	Zone 15 N3339800 E692740	Gonzales and Carville	Ashland-Belle Helene Plantation	ca. 1840s - 1930s	Pedestrian survey, shovel testing, unit excavation, and backhoe trenching	Great house listed (1979); surrounding grounds assessed as significant	Hayward 1979; Hinks 1989; Babson 1989; Yakubik 1994
New Orleans	LA	M-189 to M-181-L	Carville to Marchand	16AN51	Zone 15 N3344600 E687750	Carville	Southwood Plantation sugar mill ruins	ca. 1860 - 1890	Pedestrian survey	Potentially significant	Beavers and Lamb 1990
New Orleans	LA	M-189 to M-181-L	Carville to Marchand	16AN57	Zone 15 N3343775 E690380	Carville	Historic materials scatter and concrete foundations	Undetermined historic	Pedestrian survey and shovel testing	Not significant	Lindemuth and Lemke 1995
New Orleans	LA	M-189 to M-181-L	Carville to Marchand	16AN58	Zone 15 N3343500 E690275	Carville	Historic materials scatter	19th century	Pedestrian survey and shovel testing	Potentially significant	Lindemuth and Lemke 1995
New Orleans	LA	M-189 to M-181-L	Carville to Marchand	16AN59	Zone 15 N3338170 E693720	Gonzales	Historic materials scatter and sugar mill ruins	ca. 1820 - 1920	Pedestrian survey with a metal detector	Not assessed	Rivet 1996
New Orleans	LA	M-189 to M-181-L	Carville to Marchand	16AN61	Zone 15 N3339000 E693460	Gonzales	Historic brick tomb ruins and human skeletal material	Mid - late 19th century	Pedestrian survey	Potentially significant	Hays 1997

Table 7, continued

USACE DISTRICT	STATE	PROJECT ITEM	PROJECT ITEM NAME	SITE NUMBER	UTM COORDINATE	USGS 7.5' QUAD	SITE DESCRIPTION	CULTURAL AFFILIATION	FIELD METHODS	NRHP ELIGIBILITY	RECORDED BY
East Baton Rouge Parish											
New Orleans	LA	M-230-L	Baton Rouge Front Levee	16EBR8	Zone 15 N3369460 E673920	Baton Rouge West	Old State Capitol building and grounds	Mid - late 19th century	Pedestrian survey and limited unit excavation	Listed (1971)	Holland 1988
New Orleans	LA	M-230-L	Baton Rouge Front Levee	16EBR19	Zone 15 N3369980 E674400	Baton Rouge West	Louisiana State Penitentiary location	1835 - 1917	Pedestrian survey, auger testing, and unit excavation	Not assessed	Hahn 1989; Wurtzburg 1991
New Orleans	LA	M-230-L	Baton Rouge Front Levee	16EBR24	Zone 15 N3370300 E673940	Baton Rouge West	Historic fort location	ca. 1779 - 1810	Unspecified	Potentially significant	Paige 1982
New Orleans	LA	M-230-L	Baton Rouge Front Levee	16EBR25	Zone 15 N3370740 E674300	Baton Rouge West	Prehistoric mound	Late Coles Creek - early Plaquemine period	Pedestrian survey, shovel testing, unit excavation, and soil coring	Potentially significant	Jones and Shuman 1986; Whitmer 1990
New Orleans	LA	M-230-L	Baton Rouge Front Levee	16EBR29	Zone 15 N3369270 E673930	Baton Rouge West	Historic materials scatter	18th - 20th century	Pedestrian survey and unit excavation	Not assessed	Haag 1974
New Orleans	LA	M-230-L	Baton Rouge Front Levee (Borrow Pit)	16EBR41	Zone 15 N3357580 E678760	Plaquemine	Historic plantation	Unspecified historic period	Pedestrian survey	Potentially significant	Paige 1983
New Orleans	LA	M-230-L	Baton Rouge Front Levee	16EBR43	Zone 15 N3470500 E673850	Baton Rouge West	Former military barracks	1819 - present	Pedestrian survey, shovel testing, unit excavation, and trenching	Listed (1973)	LSU n.d.; Wurtzburg 1992
New Orleans	LA	M-230-L	Baton Rouge Front Levee	16EBR44	Zone 15 N3369090 E674410	Baton Rouge West	Historic materials scatter	Undetermined historic	Pedestrian survey	Not assessed	Castille and Morgan 1976
New Orleans	LA	M-230-L	Baton Rouge Front Levee	16EBR45	Zone 15 N3369500 E674400	Baton Rouge West	Historic materials scatter	Undetermined historic	Pedestrian survey	Not assessed	Castille 1975
New Orleans	LA	M-230-L	Baton Rouge Front Levee (Borrow Pit)	16EBR55	Zone 15 N3355450 E678850	Plaquemine	Possible historic fort location	ca. 1803 - 1860	Pedestrian survey and shovel testing	Not significant	Paige 1983; Hays 1995
New Orleans	LA	M-230-L	Baton Rouge Front Levee	16EBR58	Zone 15 N3369730 E673720	Baton Rouge West	Historic materials scatter	19th - early 20th century	Pedestrian survey, auger testing, and limited unit excavation	Not significant	Paige 1982; Hinks 1992
New Orleans	LA	M-230-L	Baton Rouge Front Levee	16EBR59	Zone 15 N3370200 E673150	Baton Rouge West	Possible location of historic residence	ca. 1803 - 1860	Unspecified	Potentially significant	Paige 1983
New Orleans	LA	M-230-L	Baton Rouge Front Levee	16EBR75	Zone 15 N3369010 E673720	Baton Rouge West	Historic materials scatter	18th - 20th century	Pedestrian survey	Not significant	Rivet 1990; Hinks 1992

Table 7, continued

USACE DISTRICT	STATE	PROJECT ITEM	PROJECT ITEM NAME	SITE NUMBER	UTM COORDINATE	USGS 7.5' QUAD	SITE DESCRIPTION	CULTURAL AFFILIATION	FIELD METHODS	NRHP ELIGIBILITY	RECORDED BY
New Orleans	LA	M-230-L	Baton Rouge Front Levee	16EBR79	Zone 15 N3370700 E674260	Baton Rouge West	Louisiana State Capitol Grounds	Coles Creek and Plaquemine periods; ca. 1779 - present	Pedestrian survey; magnetometer survey, shovel testing; unit excavation, and soil coring	Listed (1982)	Whitmer 1991
New Orleans	LA	M-230-L	Baton Rouge Front Levee	16EBR81	Zone 15 N3370500 E675000	Baton Rouge West	Historic materials scatter	Late 18th century	Pedestrian survey	Not Significant	Hornbaker 1991
New Orleans	LA	M-230-L	Baton Rouge Front Levee	16EBR90	Zone 15 N3369060 E674180	Baton Rouge West	Historic materials scatter	ca. 1840s - 1930s	Pedestrian survey	Not significant	Wurtzburg and Wilkie 1992
New Orleans	LA	M-230-L	Baton Rouge Front Levee	16EBR91	Zone 15 N3369400 E674220	Baton Rouge West	Historic privy	Mid - late 19th century	Pedestrian survey, probing, and unit excavation	Not significant	Wurtzburg 1992
New Orleans	LA	M-230-L	Baton Rouge Front Levee	16EBR92	Zone 15 N3370140 E673860	Baton Rouge West	Historic materials scatter	ca. 1790 - 1800	Pedestrian survey	Not significant	Dutton and Wurtzburg 1992
New Orleans	LA	M-230-L	Baton Rouge Front Levee	16EBR99	Zone 15 N3370120 E673720	Baton Rouge West	Historic materials scatter	ca. 1800 - 1910s	Pedestrian survey, auger testing, and unit excavation	Not significant	Hinks 1992
New Orleans	LA	M-230-L	Baton Rouge Front Levee	16EBR150	Zone 15 N3370260 E673820	Baton Rouge West	Historic brick foundation and materials scatter	Late 18th century	Mechanical trenching and unit excavation	Potentially significant	Hays 1996
New Orleans	LA	M-230-L	Baton Rouge Front Levee	16EBR151	Zone 15 N3370160 E673820	Baton Rouge West	Historic materials scatter	18th - 20th century	Pedestrian survey	Not significant	Hays 1996
New Orleans	LA	M-230-L	Baton Rouge Front Levee	16EBR155	Zone 15 N3370140 E673960	Baton Rouge West	Historic brick and cement foundations	Late 19th - mid 20th century	Pedestrian survey	Not significant	Hays 1996
Iberville Parish											
New Orleans	LA	M-230-L	Baton Rouge Front Levee (Borrow Pit)	16IV126	Zone 15 N3355210 E678710	Plaquemine	Prehistoric midden; historic materials scatter	Marksville and Troyville periods; late 18th century historic	Pedestrian survey	Not assessed	Shenkel 1976
New Orleans	LA	M-205 to M-198.5-R	Reveille to Point Pleasant	16IV136	Zone 15 N3350440 E679170	White Castle	Two historic materials scatters	19th - 20th century	Pedestrian survey	Not significant	Gagliano, McCloskey, and Castille 1979; Bureman 1983; Paige 1983; Hays 1995
New Orleans	LA	M-230-L	Baton Rouge Front Levee (Borrow Pit)	16IV140	Zone 15 N3355000 E678400	Plaquemine	Possible historic fort location	Unspecified historic period	Pedestrian survey	Not significant	Paige 1983; Hays 1995
New Orleans	LA	M-191 to M-185-R	Alhambra to Hohen-Solms	16IV141	Zone 15 N3340580 E681000	Carville	Former Belle Grove Plantation location	ca. 1850s - 1940s	Pedestrian survey	Not assessed	Van Horn 1983

Table 7, continued

USACE DISTRICT	STATE	PROJECT ITEM	PROJECT ITEM NAME	SITE NUMBER	UTM COORDINATE	USGS 7.5' QUAD	SITE DESCRIPTION	CULTURAL AFFILIATION	FIELD METHODS	NRHP ELIGIBILITY	RECORDED BY
New Orleans	LA	M-191 to M-185-R	Alhambra to Hohen-Solms	16IV147	Zone 15 N3341400 E681560	Carville	Prehistoric and historic materials scatter	Undetermined prehistoric; late 18th - early 19th century historic	Pedestrian survey, auger testing, unit excavation, and probing	Not significant	Gendel 1985
New Orleans	LA	M-191 to M-185-R	Alhambra to Hohen-Solms	16IV148	Zone 15 N3341600 E681960	Carville	Prehistoric and historic materials scatter	Coles Creek period; undetermined historic	Pedestrian survey, shovel testing, and auger testing	Not significant	Gendel and Goodwin 1985
New Orleans	LA	M-191 to M-185-R	Alhambra to Hohen-Solms	16IV149	Zone 15 N3341660 E682010	Carville	Historic materials scatter	Early 19th century	Pedestrian survey and probing	Not significant	Gendel 1985
New Orleans	LA	M-191 to M-185-R	Alhambra to Hohen-Solms	16IV150	Zone 15 N3341800 E682210	Carville	Historic materials scatter	Undetermined historic	Pedestrian survey, shovel testing, and auger testing	Not significant	Gendel and Goodwin 1985
New Orleans	LA	M-191 to M-185-R	Alhambra to Hohen-Solms	16IV151	Zone 15 N3341690 E682090	Carville	Prehistoric and historic materials scatter	Undetermined prehistoric; undetermined historic	Pedestrian survey, shovel testing, and auger testing	Not significant	Gendel and Goodwin 1985
Orleans Parish											
New Orleans	LA	M-104 to 100.2-L	Carrollton Levee Enlargement (Borrow Pit)	16OR90	Zone 16 N3309400 E219960	Chalmette	Beka Plantation ruins	19th - early 20th century	Pedestrian survey, shovel testing, and unit excavation	Significant	Clemenson 1983; Yakubik 1991
New Orleans	LA	M-104 to 100.2-L	Carrollton Levee Enlargement	16OR96	Zone 15 N3313360 E776820	New Orleans West	Historic brick floor	ca. post 1830 - 1870	Backhoe trenching	Potentially significant	Gendel and Goodwin 1983
New Orleans	LA	M-104 to 100.2-L	Carrollton Levee Enlargement (Borrow Pit)	16OR120	Zone 16 N3308140 E219000	Belle Chase	Historic materials scatter	Late 19th - early 20th century	Pedestrian survey	Not significant	Franks 1988
New Orleans	LA	M-104 to 100.2-L	Carrollton Levee Enlargement (Borrow Pit)	16OR121	Zone 16 N3308640 E219120	Chalmette	Portion of historic road	19th century	Pedestrian survey	Not significant	Franks 1988
Plaquemines Parish											
New Orleans	LA	M-10.4-R	Lower Venice 2nd Lift	16PL48	Zone 16 N3239700 E271450	Venice	Former location of historic fishing village	Late 19th - early 20th century	Records review and pedestrian survey	Not assessed	Gagliano and Castille 1977

Site 16AN26 was identified within Section 9, Township 10S, Range 2E, adjacent to Louisiana Highway 75 approximately 3.2 km (2 mi) south of the Town of Geismar. The site was described by Hayward as the location of a nineteenth century Classic Revival style plantation house and four small associated frame structures. According to the State of Louisiana Site Record Form, no survey was conducted at Site 16AN26 at the time it was recorded and the site had previously been listed on the National Register of Historic Places. No recommendations concerning additional testing of the site were reported.

During 1989, Hinks completed a Site Record Update Form reporting on testing conducted by R. Christopher Goodwin & Associates, Inc. (1989), along the Mississippi River batture portion of Site 16AN26. The batture components investigated included the remains of a foundation, a brick scatter, and a portion of old levee identified during cultural resources survey prior to proposed revetment construction (Goodwin et al. 1985). Pedestrian survey augmented by the excavation of shovel tests and six 1 x 1 m (3.3 x 3.3 ft) units within the vicinity of the Site 16AN26 batture components resulted in the recovery of 168 artifacts. These cultural materials included historic ceramic sherds, nails, iron fragments, glass shards, a shell button, 1 pike, faunal materials, brick, mortar, coal, and shell. The cultural materials were recovered from the vicinity of the warehouse dated from the late nineteenth to the early twentieth century; however, none was located *in situ*. None of the three batture components examined by Goodwin et al. (1989) were assessed as significant and no additional testing of this portion of Site 16AN26 was recommended.

Also during 1989, Babson completed a Site Record Update Form reporting on additional testing of the main portion of Site 16AN26 (Babson 1989). According to the Site Record Update Form completed by Babson, Site 16AN26 measured approximately 120.1 ac (48.6 ha) in area. Pedestrian survey identified the ruins of the worker's quarters, as well as other unspecified structures. In addition, a total of 13 units were excavated in the vicinity of the quarters and in the area of an outbuilding foundation. Babson reported that the cultural material recovered during survey dated from the 1850s - 1920s. Babson as-

sessed this 120 ac (48.6 ha) portion of Ashland-Belle Helene Plantation as significant and recommended that the entire site area be nominated to the National Register of Historic Places.

In 1994, Jill-Karen Yakubik completed a Site Record Update Form reporting on a cultural resources survey of an approximately 100 ac (40.5 ha) portion of Ashland-Belle Helene Plantation which contained the former quarters and industrial complex prior to proposed development (Maygarden et al. 1994; Yakubik et al. 1994). Yakubik stated that a total of eight-nine 1 x 1 m (3.3 x 3.3 ft) units was excavated at two quarters cabin locations. These were augmented by the excavation of backhoe trenches in the vicinity of the sugar house complex and archeological monitoring of construction activities in the remainder of the quarters and industrial areas. The data recovery resulted in the collection of historic ceramic sherds, glass shards, faunal materials, metal, architectural debris, and machinery. No additional testing of the area surveyed by Maygarden et al. (1994) and Yakubik et al. (1994) was recommended.

Yakubik reported on the site update form for Site 16AN26 that the quarters and industrial complex areas were destroyed following data recovery of the area. It was recommended that any construction in the vicinity of the Ashland-Belle Helene plantation house be monitored. In addition, it was recommended that an archeological data recovery should be undertaken if any substantial construction was planned for the vicinity of the plantation house.

Site 16AN51 was recorded by Richard Beavers and Teresa Lamb in 1990. The site was located within Section 41, Township 9S, Range 2E and was described as the brick foundations of a late nineteenth century sugar mill. It was suggested that these remains were possibly associated with Southwood Plantation. In addition, a small section of narrow gage railroad track also was identified. Beavers and Lamb stated that brick rubble covered the surrounding area. The overall size of Site 16AN51 was not reported. Site 16AN51 was assessed as potentially significant. No management recommendations concerning additional testing were reported.

Site 16AN57 was recorded in 1995 by John Lindemuth and Paul Lemke. The site, which measured approximately 39.6 x 48.8 m (130 x

160 ft) in area, was located within Section 48, Township 9S, Range 2E. Site 16AN57 was described as an historic materials scatter and concrete foundation. Pedestrian survey augmented by shovel testing resulted in the collection of historic ceramic sherds and brick fragments. While no date of occupation was reported, it was suggested that Site 16AN57 may have represented the location of a cattle dipping vat. The site was assessed as potentially significant and it was recommended that impact to the site be avoided during proposed construction. In addition, monitoring of the site during construction also was recommended.

Site 16AN58 also was recorded by Lindemuth and Lemke in 1995. The site was identified within portions of Sections 10 and 48, Townships 9S and 10S, Range 2E and was described as a historic period materials scatter. Site 16AN58 measured approximately 48.8 x 281.9 m (160 x 925 ft) in area. Pedestrian survey augmented by shovel testing resulted in the collection of historic ceramic sherds, nails, brass lamp parts, and bottle glass. It was suggested that Site 16AN58 may have represented a nineteenth century plantation. The site was assessed as potentially significant and it was recommended that impact to Site 16AN58 be avoided during proposed construction. In addition, it was recommended that the site be monitored during construction.

Site 16AN59 was recorded by Rivet in 1996. The site was located within Sections 24, 25, and 26, Township 10S, Range 2E, and measured approximately 457.2 x 914.4 m (1,500 x 3,000 ft) in area. Site 16AN59 was described as an historic period materials scatter as well as the ruins of a sugar mill. Pedestrian survey utilizing metal detectors resulted in the collection of agricultural, domestic, and personal types of metal artifacts. It was suggested that Site 16AN59 represented a ca. 1820 - 1920 sugar plantation location. The significance of Site 16AN59 was undetermined, but it was recommended that additional testing be conducted to delineate the boundaries of the site, as well as to identify the various components of the site.

Site 16AN61 was recorded in 1997 by Hays and was described as the remains of a mid to late nineteenth century historic burial tomb. The site was identified within Section 21, Township 10S, Range 2E, and was reported to measure approxi-

mately 10 x 10 m (32.8 x 32.8 ft) in area. Pedestrian survey resulted in the observation of human skeletal fragments, brick, and coffin parts. Site 16AN61 was assessed as potentially significant and additional testing of the site was recommended.

East Baton Rouge Parish

As previously mentioned, Site 16EBR8 (Old State Capital) was formally recorded by Claudia Holland in 1988, and it had previously been listed to the National Register of Historic Places in May, 1974. The site included Louisiana's first state capitol building and surrounding grounds. Site 16EBR8 was located on the east bank of the Mississippi River just to the south of North Fourteenth Street. While Holland noted on the site record form that a pedestrian survey of the Site 16EBR8 area failed to identify any surface materials, a listing of cultural material presumably recovered from the site included mid to late nineteenth century historic ceramic sherds, glass, metal, bone, shell, brick and cement fragments, and slate. In addition, Holland suggested that the area surrounding the old capital building possibly contained prehistoric and early historic period components, as well as documented historic outbuildings associated with the capitol building. On the State of Louisiana Site Record Form, Holland recommended archeological monitoring of the Old Capitol Building and surrounding grounds be conducted during any future restorative work.

Site 16EBR19 (Prison Site/State Penitentiary Site) was recorded by Hahn in 1989 and was updated by Wurtzburg in 1991 (Wurtzburg and Hahn 1989). Site 16EBR19 was identified within Section 46, Township 7S, Range 1W and it was described as the former location of the first Louisiana State Penitentiary that was in use between 1835 - 1917. The site was bound to the south by Florida Boulevard, to the East by Interstate 110, to the north by Laurel Street, and to the west by North Seventh Street. The site was reportedly the location of a parking lot and federal building at the time it was recorded. Auger testing augmented by unit excavation identified numerous brick foundations associated with the former penitentiary, as well as late nineteenth to twentieth century historic ceramic sherds, glass shards and metal fragments. Wurtzburg and Hahn (1989)

assessed the site as significant and recommended that an archeologist monitor proposed construction at the site.

On the Site Record Update Form completed in 1991, Wurtzburg stated that the pedestrian survey of the site revealed that much of the site had been destroyed. It was reported that the remaining portions of Site 16EBR19 were covered by structures, aiding in the preservation of the site. A current assessment of Site 16EBR19 was not provided on the site update form completed by Wurtzburg and no recommendations concerning additional testing were reported.

Site 16EBR24 was recorded by Paige in 1982. According to the State of Louisiana Site Record Form, portions of the site previously were excavated in 1967 and 1968 by Louisiana State University. Site 16EBR24 was described as Fort Richmond, a military fortification dating from between 1779 - 1810. Although the size of the site, artifact density, and method of investigation were not reported, a description of the recovered cultural material was presented. The historic cultural material noted at the site consisted of gunflints, cannon balls, historic ceramic sherds, and a silver coin dating from 1789. Although no recommendations concerning additional testing were reported, Site 16EBR24 was assessed as potentially significant.

Although the State Capital Mound (Site 16EBR25) was recorded at an unspecified time by an unreported party, a Site Record Update Form reporting on additional testing at the site was completed by Jones and Shuman in 1986. Site 16EBR25 was located on the grounds of the Louisiana State Capital (Site 16EBR79) within Section 44, Township 7S, Range 1W. Jones and Shuman suggested that the mound possibly represented a Coles Creek period cultural affiliation, but no prehistoric cultural material was noted during pedestrian survey and mapping of the site. Site 16EBR25 was assessed as significant and additional testing was recommended.

During 1990, Whitmer completed a Site Record Update Form reporting on additional testing at Site 16EBR25 (Manhein and Whitmer 1991). It was reported that the site measured approximately 27 x 43 m (88.6 x 141.1 ft) in area. Shovel testing, unit excavation, and soil coring of the mound resulted in the collection of prehistoric ceramic sherds, shell, charcoal, brick fragments,

mortar, glass shards, and metal fragments. It was reported that Site 16EBR25 represented a Late Coles Creek - Early Plaquemine period mound and midden. In addition, Whitmer stated that the mound was utilized during the early part of the nineteenth century as part of the Baton Rouge post defenses, as well as being utilized as a cemetery for military officers. Later, during the Civil War, it was reported that the Union Army established an artillery/lookout post on the mound. While the significance of Site 16EBR25 was not assessed, it was noted that the State Capital Grounds (Site 16EBR79) were previously listed on the National Register of Historic Places.

As previously discussed in the section on surveys, Site 16EBR29 was recorded by Haag in 1974. The Civic Center Site (16EBR29) was identified on a bluff overlooking the Mississippi River in Baton Rouge within Township 7S, Range 1W. It was reported that the site consisted of several privies and wells within the areas referred to as Catfish Town and Beauregard Town. These features dated from the eighteenth to the twentieth century. Surface collection, as well as unit excavation, resulted in the collection of glass shards, historic ceramic sherds, brick and mortar fragments, and faunal materials. No statement as to the significance of Site 16EBR29 was reported and no management recommendations concerning additional testing were provided. The Site Record Form indicated that the site had been destroyed.

Site 16EBR41 was recorded by John Paige in 1983 and was described as the remains of Longwood Plantation. The site was noted in Greene et al. (1984). Site 16EBR41 was located within Section 44, Township 8S, Range 1E. Site size and cultural materials and/or features present at Site 16EBR41 were not reported on the State of Louisiana Site Record Form. Greene et al. (1984) reported that the Longwood Plantation house was present at the site and it was suggested that the structure was constructed ca. 1790. Site 16EBR41 was assessed as potentially significant; however, no recommendations concerning additional testing were reported.

The Pentagon Barracks Site (16EBR43) was recorded by Louisiana State University at an unspecified date and was officially entered to the Louisiana Division of Archaeology site files by an unreported party in 1988. It was reported that

the site was located within Section 44, Township 7S, Range 1W and it consisted of four brick standing structures. The structures were reportedly constructed in 1819 and served as military barracks. The barracks was later utilized as a part of the Louisiana State University campus. Pedestrian survey augmented by the excavation of four shovel tests during 1982 resulted in the collection of historic ceramic sherds, glass shards, and brick fragments. At the time Site 16EBR43 was recorded in 1988, the buildings were reportedly utilized by the State of Louisiana as offices. Site 16EBR43 was not assessed, nor were recommendations concerning additional testing made at this time; however, it was noted that the site had previously been listed on the National Register of Historic Places in 1973.

Wurtzburg completed a site update form for Site 16EBR43 in 1992 reporting on additional testing conducted at the site by Holland (1993). In addition to the four previously mentioned structures, Wurtzburg reported that a cistern located in the central plaza formed by the buildings was identified and examined. Unit excavation augmented by backhoe trenching in the vicinity of the cistern resulted in the collection of historic ceramic sherds, glass shards, metal fragments, and wood. The entire site measured approximately 150 m (492.1 ft) in diameter. Site 16EBR43 was not assessed on the site update form; however, Wurtzburg noted that the site was listed on the National Register of Historic Places in 1973. No additional testing of Site 16EBR43 was recommended by Wurtzburg, but Holland (1993), who assessed the cistern and surrounding area as potentially significant, recommended that the Louisiana Division of Archaeology be consulted prior to any planned construction.

Site 16EBR44 was recorded by Castille and Morgan in 1976. The site was identified within Section 44, Township 7S, Range 1W and it was described as a historic period, non-temporally diagnostic cultural material scatter situated on a lot where a residence was once located. According to the State of Louisiana Site Record Form pedestrian survey was conducted; however, what (if any) cultural material was observed and/or collected during the survey was not reported. Site 16EBR44 was not assessed and no recommendations concerning additional testing were reported on the site record form.

Site 16EBR45, recorded by Castille in 1975, was identified at the intersection of Royal and America Streets in the City of Baton Rouge within Section 44, Township 7S, Range 1W. The site was characterized as a historic period material scatter of an unknown temporal affiliation. Fieldwork consisted of pedestrian survey. No information as to the density or types of cultural material observed and/or collected was reported. It was suggested that Site 16EBR45 possibly represented the former location of a house. The significance of Site 16EBR45 was not assessed by Castille and no recommendations concerning additional testing were reported on the State of Louisiana Site Record Form.

Site 16EBR55 was recorded by Paige and it was noted in Greene et al. (1984). The site was located within Section 46, Township 8S, Range 1E and it was described as the possible location of Fort Bute. No information concerning site size and/or cultural materials recovered from Site 16EBR55 was reported on the State of Louisiana Site Record Form; however, it was suggested that the site represented a ca. 1803 - 1860 occupation. Site 16EBR55 was assessed as potentially significant and additional testing was recommended to precisely locate the fort.

In 1995, Hays submitted a Site Record Update Form concerning additional testing that had been conducted at the reported location of Site 16EBR55. Hays stated that pedestrian survey augmented by the excavation of two shovel tests in the plotted location of Site 16EBR55 failed to result in the recovery of any cultural materials that dated from the period the fort was in use. Hays suggested that the Mississippi River had totally eroded the location of Fort Bute. Site 16EBR55 was assessed as not significant and no additional testing was recommended. In addition, the plotted location was relocated to place the site within the Mississippi River.

Site 16EBR58 was recorded by Paige in 1982. The site was identified within Section 72, Township 7S, Range 1W and it was reported to be the former location of the Florida Street Wharf. Paige stated that Site 16EBR58 measured approximately 1 ac (0.4 ha) in area and consisted of the possible ruins of the wharf. The presumed cultural affiliation of the site was not reported. No information was presented as to the type of survey conducted by Paige nor what, if any, cultural

material was observed and/or collected from Site 16EBR58. Site 16EBR58 was assessed as potentially significant; however, no recommendations concerning additional testing were provided.

During 1992, Hinks completed a State of Louisiana Site Record Update Form that reported on additional testing conducted by R. Christopher Goodwin and Associates, Inc., at Site EBR58 (Hinks et al. 1993). Excavation of auger tests and a single 1 x 2 m (3.3 x 6.6 ft) unit at Site 16EBR58 resulted in the collection of historic ceramic sherds, glass shards, wire nails, iron fragments, brick fragments, coal, concrete fragments, fragments of roofing slate, gravel, and oyster shell. Hinks stated that the Florida Street Wharf dated from ca. 1850s - 1920s but that the observed and/or collected materials identified during survey mostly post dated ca. 1940. In addition, no evidence of the Florida Street Wharf was identified by Hinks et al. (1993). Site 16EBR58 was assessed as not significant and no additional testing was recommended.

Site 16EBR59 was recorded by Paige in 1983 as part of records review conducted at the request of the U.S. Army Corps of Engineers, New Orleans District (Greene et al. 1984). The site was identified at 727 Lafayette Street, Baton Rouge within Section 44, Township 7S, Range 1W. Site 16EBR59 was characterized as the former location of the Zachary Taylor/Spanish Commandant's House dating from between 1803 - 1860. Paige stated that at the time Site 16EBR59 was recorded that the area was being utilized as a gravel covered parking lot. No additional information concerning the size of the site, cultural material that may have been observed or collected, cultural features (if any) noted at the site, or the survey methodology was reported. Although Site 16EBR59 was assessed as potentially significant, no recommendations concerning additional testing were reported.

Site 16EBR75 was recorded by Rivet in 1990. The site was identified along the Mississippi River bature within Section 49, Township 7S, Range 1W and it was described as the possible location of a wharf or steamboat landing dating from the eighteenth to the nineteenth century. Pedestrian survey resulted in the observation of wharf ruins, as well as the remains of a steamboat paddlewheel axle and drive crank. Site 16EBR75 was assessed as not significant; however, it was

recommended that the site be recorded and documented.

Hinks completed a Site Record Update Form in 1992 reporting on pedestrian survey of Site 16EBR75 (Hinks et al. 1993). As previously mentioned, Hinks et al. (1993) re-identified Site 16EBR75 but no additional testing was conducted due to the site previously being assessed as not significant. Hinks reported that at the time of survey the paddlewheel axle was no longer present at the site; however, a concrete slab banded with iron straps, as well as modern materials, were observed. The overall size of the site was reportedly unknown. Site 16EBR75 was assessed as not significant. No additional testing was recommended.

Site 16EBR79 (Louisiana State Capitol Grounds) was recorded in 1991 by Whitmer and was reported on in Manhein and Whitmer (1991). The Louisiana State Capitol Grounds were located within Section 44, Township 7S, Range 1E and measured approximately 43.2 ac (17.5 ha) in area. Whitmer stated that Site 16EBR79 contained portions of many sites, including the Powder Magazine (Old Arsenal), the Old Louisiana State University Campus, the Old Protestant and Old Military Cemeteries, Fort Baton Rouge, the New State Capitol, and the Capitol Lakes Area. In addition, Site 16EBR25 (State Capitol Mound) was located within the Louisiana State Capitol Grounds Site. Whitmer reported that the area was occupied during the Late Coles Creek/Early Plaquemine period (based on prehistoric ceramic sherds recovered from Site 16EBR25) and from ca. 1779 to the present day. Pedestrian survey augmented by shovel testing, unit excavation, soil coring, and magnetometer survey resulted in the collection prehistoric ceramic sherds, historic ceramic sherds, glass shards, metal, construction debris, and human bone in various areas throughout the site. Site 16EBR79 was listed on the National Register of Historic Places in 1982. The Old Arsenal (Powder Magazine) had previously been listed separately in 1973. Whitmer recommended that additional testing be conducted to identify the extent of the cemetery (discussed below), as well as to verify the integrity of the area south of the capitol building.

In addition to the State of Louisiana Site Record Form completed for the Louisiana State Capitol Grounds (16EBR79), Whitmer also com-

pleted Site Record Update Forms for the American Cemetery (Site 16EBR79 - Locality A) and the Powder Magazine (Site 16EBR79 - Locality B) in 1991. A remnant of the American Cemetery was identified within the western ½ of Section 44, Township 7S, Range 1W. This remnant measured approximately 18 x 24 m (59.1 x 78.7 ft) in area. Pedestrian survey augmented by shovel testing, unit excavation, and magnetometer survey resulted in the identification of human burials, coffin nails and fragments of a headstone. In addition, historic ceramic sherds, glass shards, metal fragments, brick fragments, and mortar fragments also were identified. Whitmer noted that Site 16EBR79 had previously been listed to the National Register of Historic Places and recommend that additional testing be conducted in the vicinity of Locality A in an effort to identify additional burials.

The Powder Magazine also was identified within the W ½ of Section 44, Township 7S, Range 1W, and measured approximately 55 x 90 m (180.4 x 295.3 ft) in area. Whitmer stated that the magazine represented a U.S. military structure dating from 1838. Pedestrian survey augmented by shovel testing, unit excavation, and soil coring resulted in the collection of Coles Creek and Plaquemine period prehistoric ceramic sherds, historic ceramic sherds dating from the nineteenth to the twentieth century, glass shards, metal fragments, brick, mortar, and slate fragments, nails, and projectiles. Whitmer noted that the Powder Magazine, as well as Site 16EBR79, had previously been listed on the National Register of Historic Places. No additional testing of Site 16EBR79 - Locality B was recommended.

Site 16EBR81 was recorded by Hornbaker in 1991. The site was identified in the area between Canal Street, Tenth Street, North Street, and Spanish Town Road in Baton Rouge. Pedestrian survey of a construction site resulted in the collection of historic ceramic sherds, glass shards, 1 milk glass ointment jar, 1 brick, 1 glass bottle, 1 modern can lid, porcelain electric insulators, and 1 porcelain pipe connector from the backfill. It was suggested that Site 16EBR81 possibly represented a late eighteenth century Spanish domestic location. It was reported that the site had been destroyed by construction activities. Site 16EBR81 was assessed as not significant, but

additional testing of adjacent areas was recommended before any proposed development.

Site 16EBR90 was recorded by Wurtzburg and Wilkie in 1992. The site was identified within the W ¼ of Section 49, Township 7S, Range 1W during construction activities at a gas station at the intersection of Government and St. Ferdinand Streets in downtown Baton Rouge. Site 16EBR90 measured approximately 20 x 40.5 m (65.6 x 132.9 ft) in area. The site was characterized as an historic cultural materials scatter dating from the 1840s - 1930s. Pedestrian survey resulted in the collection of historic ceramic sherds, glass shards, and nails. Site 16EBR90 was assessed as not significant; no recommendations concerning additional testing were reported.

Site 16EBR91 was recorded by Wurtzburg in 1992. The site was identified at the northeast corner of St. Ferdinand and America Streets in downtown Baton Rouge within Section 73, Township 7S, Range 1W. Site 16EBR91 was described as the remains of a foundation and a privy uncovered during construction activities. The site measured approximately 19 x 38 m (62.3 x 124.7 ft) in area. Pedestrian survey augmented by probing and the excavation of a single unit in the area of the privy resulted in the collection historic ceramic sherds, glass shards, nails, bone buttons, and a bone toothbrush. Wurtzburg reported that the privy extended to a depth of 155.5 cm (61.2 in) below ground surface, and suggested it dated from the mid nineteenth to the early twentieth century. Site 16EBR91 was assessed as not significant and no additional testing was recommended.

Site 16EBR92 was recorded by Dutton and Wurtzburg in 1992, and it was identified at the northwest corner of Lafayette and North Streets in downtown Baton Rouge within Section 71 of Township 7S, Range 1W. Dutton and Wurtzburg stated that the site was uncovered during construction activities in 1977 and 1978. Site 16EBR92 was characterized as a dense scatter of cultural material dating from between 1790 - 1800 noted within a construction trench. It was reported that approximately 554 gun flints manufactured from mostly English and French cherts and a military button were recovered from the trench. It was suggested that Site 16EBR92 possibly represented a military cache. Due to distur-

bance from the construction of a parking lot, Site 16EBR92 was assessed as not significant and no additional testing was recommended.

As previously discussed, Site 16EBR99 was reported by Hinks in 1992 (Hinks et al. 1993). The site was situated on the Mississippi River bature at the foot of North Street in Baton Rouge. Site 16EBR99 extended into the SW ¼ of the SW ¼ of Section 71 Township 7S, Range 1W and the NW ¼ on the NW ¼ of Section 46 in Township 7S, Range 1W. It was reported that Site 16EBR99 consisted of the archeological remains of the W.G. Coyle Company's upper coal yard. On the basis of the collected cultural remains, Hinks et al. (1993) speculated that the area may have been utilized as an antebellum and civil war landing. Pedestrian survey augmented by auger testing and the excavation of three 1 x 2 m (3.3 x 6.6 ft) units resulted in the collection of historic ceramic sherds, glass shards, one .58 cal. Union bullet, nails, unidentified iron objects, wooden boards and pilings, brick, coal, and modern debris. Due to extensive disturbance from prior levee and pipeline construction, Site 16EBR99 was assessed as not significant and no additional testing was recommended.

Site 16EBR150 was recorded in 1996 by Hays and it was described as a late eighteenth century brick foundation located approximately 132 m (433.1 ft) south-southwest of Pentagon Barracks (Site 16EBR43) in the city of Baton Rouge. The excavation of three backhoe trenches and six excavation units resulted in the recovery historic ceramic sherds, a black glass wine bottle, a British pharmaceutical bottle, a Spanish coin dating from 1783, 2 pewter American military buttons, and rose head machine cut nails. It was suggested that the foundation may have been a military structure. Site 16EBR150 was assessed as significant and avoidance of the site was recommended. Hays reported that Site 16EBR150 would be covered and preserved in place.

Site 16EBR151 also was recorded by Hays in 1996. The site was located at the intersection of Lafayette and North Streets within the city of Baton Rouge and was described as an historic period midden, a brick pier, and a wooden post. All of these items were revealed during mechanical construction excavation. An unspecified quantity of glass shards, metal, historic ceramic sherds, brick fragments, and 2 gun flints were

collected from the site. It was suggested that Site 16EBR151 represented the remains of a nineteenth to twentieth century residence. Due to the disturbed nature of the site, Site 16EBR151 was assessed as not significant and no additional testing was recommended.

Site 16EBR155 was recorded by Hays in 1996. The site was uncovered during mechanical excavation, and it was described as a brick and concrete foundation located in downtown Baton Rouge between Third Street, North Street, Fifth Street, and Spanish Town Road. It was suggested that Site 16EBR155 dated from the late nineteenth to the mid twentieth century and possibly represented the remains of Louisiana State University buildings. Hays stated that the exposed foundation was sketched and photographed. No cultural material was collected from the site. Site 16EBR155 was assessed as not significant and no additional testing was recommended.

Iberville Parish

Site 16IV126 was recorded by Shenkel in 1976. The site was described as a prehistoric midden eroding from an abandoned levee located within Section 2, Township 8S, Range 1E, and it measured approximately 50 x 70 m (164 x 229.7 ft) in area. Unspecified historic period materials also were noted at the site. On the State of Louisiana Site Record Form, Shenkel suggested that Site 16IV126 dated from the Marksville and Troyville periods; however, in Shenkel (1976b) it was suggested that the site represented a Late Marksville - Coles Creek period of occupation. In both cases the historic period component was reported as dating from the late eighteenth century. Site 16IV126 was not assessed and no recommendations concerning additional testing were reported.

Site 16IV136 was recorded by Gagliano et al. (1979). The site measured approximately 12 x 80 m (39.4 x 262.5 ft) in area. Pedestrian survey by Gagliano et al. (1979) resulted in the collection of historic period ceramic sherds, nails, brick fragments, coal, mortar, and unspecified bone fragments. It was suggested that the materials recovered from Site 16IV136 dated from ca. 1820 - 1920. Gagliano et al. (1979) reported that the artifacts were not *in situ* and suggested that they were redeposited in the area at the time the original levee was constructed. Site 16IV136 was as-

sessed as not significant and no additional testing was recommended. During 1983, Bureman completed a State of Louisiana Site Record Update Form for Site 16IV136. No information other than that previously provided by Gagliano et al (1979) was provided.

Site 16IV140 originally was recorded in 1983 by Paige and was noted in Greene et al. (1984). The site was described as the possible location of a Spanish fort established in 1767. The site was plotted within Section 2 of Township 8S, Range 1E. According to the State of Louisiana Site Record Form a surface collection was conducted of Site 16IV140, but what (if any) artifacts were recovered, was not reported. Site 16IV140 was assessed as potentially significant. Paige reported that additional research would be required to locate the Spanish fort.

In 1995, Hays submitted a State of Louisiana Site Update Form concerning additional testing at Site 16IV140. A pedestrian survey of the plotted location of Site 16IV140 failed to identify any cultural materials. Hays suggested that the site had been completely destroyed by the Mississippi River. Site 16IV140 was assessed as not significant; no additional testing was recommended.

Site 16IV141 was recorded by Van Horn in 1983. The site was located in Section 12 of Township 10S, Range 13E and was described as the former location of the Belle Grove Plantation house. Van Horn reported that the plantation house was constructed ca. 1850 and was demolished at an unspecified time following World War II. Pedestrian survey of Site 16IV141 was conducted; however, no cultural material was not listed on the Site Record Form. Site 16IV141 was not assessed and no recommendations concerning additional testing were provided.

Site 16IV147 was recorded by Gendel in 1985 and reported on in Goodwin et al. (1987). Site 16IV147 was identified within Section 10 of Township 10S, Range 13E and was described as a surface scatter of historic bricks, ceramic sherds, and glass shards. In addition, prehistoric ceramic sherds of an undetermined cultural affiliation were noted at Site 16IV147. It was suggested, based on mean ceramic dates of 1779.7 and 1792.1 obtained from the recovered historic ceramic sherds, that Site 16IV147 possibly represented the remains of a Colonial Period Arcadian farmstead. Goodwin et al. (1987) reported that the

majority of the site had been disturbed by bank-line erosion but that intact cultural deposits and a feature consisting of a course of bricks may still have been present at Site 16IV147. Site 16IV147 was not assessed; however, additional testing of the site was recommended in order to fully assess its significance.

During 1987, R. Christopher Goodwin & Associates, Inc., conducted additional testing at Site 16IV147 to assess its significance (Goodwin et al. 1988). Shovel testing, auger testing, and examination of the bluff line revealed that Site 16IV147 consisted of a scatter of brick and thermally altered soil. No cultural features were identified during survey. It was suggested that Site 16IV147 may have represented the remains of a nineteenth century furnace. Only a small portion of the site had remained, the rest had eroded into the Mississippi River. Site 16IV147 was assessed as not significant and no additional testing was recommended.

Site 16IV148 was recorded in 1985 by Gendel and Goodwin (1987). The site, located within Section 9 of Township 10S, Range 13E, was described as consisting of both prehistoric and historic period components. Pedestrian survey augmented by shovel and auger testing resulted in the collection of historic ceramic sherds and glass shards possibly dating from the late nineteenth century as well as prehistoric ceramic sherds dating from the Coles Creek period. Site 16IV148 measured approximately 10 x 30 m (32.8 x 98.4 ft) in area. Goodwin et al. (1987) reported that Site 16IV148 was heavily disturbed and that no intact cultural deposits were noted at the site. Site 16IV148 was assessed as not significant and no additional testing was recommended.

Site 16IV149 was recorded in 1985 by Gendel (Goodwin et al. 1987). The site was identified within Section 9 of Township 10S, Range 13E and was described as an historic period sheet midden. Pedestrian survey augmented by the cleaning of two cutbank profiles resulted in the identification of a portion of intact brick floor. Site 16IV149 measured approximately 30 x 40 m (98.4 x 131.2 ft) in area. Goodwin et al. (1987) reported that a majority of Site 16IV149 had eroded into the Mississippi River; however, it was suggested that intact cultural deposits may have been present at the site. It also was reported that Site 16IV149 may have represented the loca-

tion of an early nineteenth century Acadian farmstead based on the recovery of 26 historic ceramic sherds with a mean ceramic date of 1815.96 (Goodwin et al. 1987:106). Site 16IV149 was not assessed; however, additional testing of the site was recommended in order to fully assess its significance.

During 1987, R. Christopher Goodwin & Associates, Inc., conducted additional testing at Site 16IV149 to assess its significance (Goodwin et al. 1988). The excavation of two 1 x 1 (3.3 x 3.3 ft) units augmented by auger testing and the examination of the bluff line resulted in the collection of historic ceramic sherds, coal, faunal remains, and brick fragments. It was suggested that Site 16IV149 represented the redeposited remains of a ca. 1830s refuse deposit associated with Celeste Plantation. Goodwin et al. (1988) reported that only a small portion of the original midden remained intact and that no structural features were identified during additional testing. Site 16IV149 was assessed as not significant and no additional testing was recommended.

Site 16IV150 was recorded by Gendel and Goodwin in 1985 and was reported on in Goodwin et al. (1987). The site was located within Section 8 of Township 10S, Range 13E and it was described as an historic materials scatter dating from the late eighteenth century. Site 16IV150 measured approximately 25 x 60 m (82 x 196.9 ft) in area. Pedestrian survey resulted in the collection of ceramic sherds, glass, metal, and brick fragments. Goodwin et al. (1987) reported that the excavation of shovel and auger tests failed to identify any additional cultural materials and that no intact cultural deposits were noted at Site 16IV150. Site 16IV150 was assessed as not significant and no additional testing was recommended.

Site 16IV151 was recorded in 1985 by Gendel and was reported in Goodwin et al. (1987). The site was located within Section 9 of Township 10S, Range 13E and it was described as a surface scatter of historic period ceramic sherds, metal, brick, and non-diagnostic prehistoric ceramic sherds. The site measured 30 x 30 m (98.4 x 98.4 ft) in area. Goodwin et al. (1987) suggested that the site may have represented the remains of the Celeste Plantation great house complex. It was reported that Site 16IV151 possibly dated from ca. 1859 based on the mean ceramic

date obtained from the recovered historic ceramic sherds. Goodwin et al. (1987) reported that the excavation of shovel tests and a single auger test failed to identify any additional cultural material or evidence of *in situ* cultural deposits. Site 16IV151 was assessed as not significant; no additional testing was recommended.

Orleans Parish

Site 16OR90 originally was recorded by Clemensen in 1983 and it was described as the location of an historic plantation dating from the nineteenth to the twentieth century. The site measured approximately 121.9 x 121.9 m (400 x 400 ft) in area and was located on the right descending bank of the Mississippi River at approximately River Mile 83. Clemensen stated that Site 16OR90 was relatively undisturbed and recommended additional testing of the site to assess its significance.

Site 16OR90 was subject to additional testing in 1990 by Yakubik and Franks (1992). Pedestrian survey augmented by shovel testing and unit excavation resulted in the identification of the Beka Plantation great house and quarters complexes, as well as the remains of the sugar house complex. In addition, four wells were identified at Site 16OR90. The great house portion of Site 16OR90 measured approximately 350 x 400 m (1148.3 x 1312.3 ft) in area, while the sugar complex area measured 100 x 175 m (328.1 x 574.1 ft) in area. Cultural materials dating from the nineteenth to the early twentieth century were recovered from the surface to a depth of 50 cm (19.7 in) below ground surface. In addition, architectural features were found to be preserved *in situ* at the site. Yakubik and Franks (1992) reported that Site 16OR90 was eligible for nomination to the National Register of Historic Places. It was recommended that the site be avoided; however, if disturbance to Site 16OR90 could not be avoided, a data recovery of Site 16OR90 within the area of proposed impact was recommended.

Site 16OR96 was recorded by Gendel and Goodwin in 1983. The site was located within Section 14 of Township 13S, Range 11E on land owned by the Audubon Zoo. The overall size of Site 16OR96 was not reported. The site was described as a light historic period materials scatter. A brick floor laid out above a lens of charcoal speckled matrix that contained faunal remains

and historic ceramic sherds also was identified. Backhoe survey resulted in the collection of 20+ *Bos* talus fragments, 5 historic ceramic sherds, and the remains of a house. Due to the presence of faunal remains and charcoal, it was suggested that Site 16OR96 represented a kitchen area. Site 16OR96 was assessed as potentially significant. Preservation of Site 16OR96, as well as mapping the location of the former plantation structures, was recommended.

Site 16OR120 was recorded by Franks in 1988 and it was reported on by Franks and Yakubik (1994). The site was described as a surface scatter of historic period glass bottles located adjacent to the Mississippi River. It was suggested that Site 16OR120 dated from the late nineteenth to the early twentieth century and may have been the result of picnicking and/or recent dumping. Site 16OR120 was assessed as not significant and no additional testing was recommended.

Site 16OR121 also was recorded in 1988 by Franks and it was reported on by Franks and Yakubik (1994). The site was described as a portion of a road that led from the Beka Plantation (16OR90) sugar house to the plantation river landing. While Franks and Yakubik (1994) reported that no cultural material was recovered from Site 16OR121, they suggested that the road dated from the nineteenth century. Site 16OR121 was assessed as not significant; no additional testing was recommended.

Plaquemines Parish

Site 16PL48 was recorded in 1977 by Gagliano and Castille. The site was described a late nineteenth to early twentieth century fishing village referred to as "The Jump." The site situated along either side of Grand Pass immediately below the right descending bank of the Mississippi River. According to the State of Louisiana Site Record Form, an 1884 USGS map depicted five structures in this area. No structural remains or artifacts were observed or recovered during visual reconnaissance of the area however. It was presumed that The Jump had been destroyed by construction of a modern industrial complex. Site 16PL48 was assessed as not significant and no additional testing was recommended.

Previously Recorded Standing Structures within the Current Study 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, Baton Rouge, Louisiana, resulted in the identification of 142 previously recorded standing structures within the current 2 km (1.2 mi) wide study corridor (Table 8). In addition, a total of four National Register of Historic Places National Register districts also were within portions of the study corridor. These structures, as well as the historic districts, are discussed below by parish.

Ascension Parish

A total of 82 previously recorded standing structures (3-198 - 3-262, 3-620 - 3-635, and the Ashland Plantation house) were identified within the Ascension Parish portion of the current study area. Structures 3-198 - 3-262 were recorded by Tadashi Nakagawa during the later part of 1984 and early 1985. The majority of these structures (n=59) were described as residential constructions raging in date from 1836 - ca. 1920. With the exception of Structure 3-224 (Mulberry Grove Plantation House), none of these structures was assessed by Nakagawa.

The Mulberry Grove Plantation House and quarters structures were listed to the Register during October, 1993. According to the National Register of Historic Places Registration Form completed by the National Register staff at the Louisiana Department of Culture, Recreation and Tourism, Office of Cultural Development, Division of Historic Preservation, the Mulberry Grove plantation house dated from ca. 1836 and was described as a two-story, double galleried residence constructed in the Greek Revival style. In addition to the main house, the plantation site consists of four quarters houses constructed ca. 1890, a privy, and a cistern associated with the main house.

None of the remaining structures recorded by Nakagawa (3-198 - 3-223 and 3-225 - 3-262) were listed on the National Register. Structures 3-620 - 3-635 were recorded in 1985 by an unspecified party. A majority of these structures (n=14)

Table 8. Previously Recorded Standing Structures Located within the SEIS New Orleans District Project Area.

USACE DISTRICT	STATE	PROJECT ITEM	PROJECT ITEM NAME	STRUCTURE NO.	UTM COORDINATE	USGS 7.5' QUAD	DATE	TYPE	STYLE	NRHP ELIGIBILITY	RECORDED BY
Ascension Parish											
New Orleans	LA	M-191 to M-185-R	Alhambra to Hohen-Solms	3-171	N3342416.00, E687699.63	Carville	ca. 1900 - present	N/A	N/A	Not Assessed	Nakagawa 1984
New Orleans	LA	M-191 to M-185-R	Alhambra to Hohen-Solms	3-172	N3342416.00, E687699.63	Carville	ca. 1869 - present	N/A	N/A	Not Assessed	Nakagawa 1984
New Orleans	LA	M-191 to M-185-R	Alhambra to Hohen-Solms	3-198	N3342335.51, E688039.40	Carville	ca. 1880	Residential	Queen Anne	Not Assessed	Nakagawa 1984
New Orleans	LA	M-191 to M-185-R	Alhambra to Hohen-Solms	3-199	N3342294.66, E687930.58	Carville	ca. 1880	Agricultural	Not Reported	Not Assessed	Nakagawa 1984
New Orleans	LA	M-191 to M-185-R	Alhambra to Hohen-Solms	3-200	N3342335.51, E688094.27	Carville	ca. 1900	Residential	Not Reported	Not Assessed	Nakagawa 1984
New Orleans	LA	M-191 to M-185-R	Alhambra to Hohen-Solms	3-201	N3442314.72, E688081.97	Carville	ca. 1880	Residential	Shotgun	Not Assessed	Nakagawa 1984
New Orleans	LA	M-191 to M-185-R	Alhambra to Hohen-Solms	3-202	N3342243.32, E688239.21	Carville	ca. 1910	Residential	Not Reported	Not Assessed	Nakagawa 1984
New Orleans	LA	M-191 to M-185-R	Alhambra to Hohen-Solms	3-203	N3342200.87, E688268.68	Carville	ca. 1890	Residential	Creole Cottage	Not Assessed	Nakagawa 1984
New Orleans	LA	M-191 to M-185-R	Alhambra to Hohen-Solms	3-204	N3342180.99, E688345.61	Carville	ca. 1880	Residential	Eastlake Shotgun	Not Assessed	Nakagawa 1984
New Orleans	LA	M-191 to M-185-R	Alhambra to Hohen-Solms	3-205	N3342125.16, E688352.88	Carville	ca. 1880	Residential	Not Reported	Not Assessed	Nakagawa 1984
New Orleans	LA	M-191 to M-185-R	Alhambra to Hohen-Solms	3-206	N3342077.89, E688481.76	Carville	ca. 1880	Residential	Queen Anne	Not Assessed	Nakagawa 1984
New Orleans	LA	M-191 to M-185-R	Alhambra to Hohen-Solms	3-207	N3342055.41, E688517.77	Carville	ca. 1900	Residential	Not Reported	Not Assessed	Nakagawa 1984
New Orleans	LA	M-191 to M-185-R; M-185 to M-179-R	Alhambra to Hohen-Solms; Hohen-Solms to Modeste	3-208	N3341717.54, E688943.79	Carville	ca. 1890	Residential	Queen Anne	Not Assessed	Nakagawa 1984
New Orleans	LA	M-191 to M-185-R; M-185 to M-179-R	Alhambra to Hohen-Solms; Hohen-Solms to Modeste	3-209	N3341635.91, E689035.62	Carville	ca. 1880	Residential	Creole Cottage	Not Assessed	Nakagawa 1984
New Orleans	LA	M-191 to M-185-R; M-185 to M-179-R	Alhambra to Hohen-Solms; Hohen-Solms to Modeste	3-210	N3341863.56, E688782.88	Carville	1884	Commercial	Not Reported	Not Assessed	Nakagawa 1984
New Orleans	LA	M-191 to M-185-R; M-185 to M-179-R	Alhambra to Hohen-Solms; Hohen-Solms to Modeste	3-211	N3341903.28, E688652.03	Carville	ca. 1850	Residential	Victorian	Not Assessed	Nakagawa 1984
New Orleans	LA	M-191 to M-185-R; M-185 to M-179-R	Alhambra to Hohen-Solms; Hohen-Solms to Modeste	3-212	N3341879.82, E688631.36	Carville	ca. 1860	Residential	Not Reported	Not Assessed	Nakagawa 1984

Table 8, continued

USACE DISTRICT	STATE	PROJECT ITEM	PROJECT ITEM NAME	STRUCTURE NO.	UTM COORDINATE	USGS 7.5' QUAD	DATE	TYPE	STYLE	NRHP ELIGIBILITY	RECORDED BY
New Orleans	LA	M-191 to M-185-R; M-185 to M-179-R	Alhambra to Hohen-Solms; Hohen-Solms to Modeste	3-213	N3341844.49, E688652.34	Carville	ca. 1880	Agricultural	Not Reported	Not Assessed	Nakagawa 1984
New Orleans	LA	M-191 to M-185-R; M-185 to M-179-R	Alhambra to Hohen-Solms; Hohen-Solms to Modeste	3-214	N3341825.41, E688668.93	Carville	ca. 1880	Agricultural	Not Reported	Not Assessed	Nakagawa 1984
New Orleans	LA	M-191 to M-185-R; M-185 to M-179-R	Alhambra to Hohen-Solms; Hohen-Solms to Modeste	3-215	N3341790.06, E688818.57	Carville	ca. 1870	Residential	Not Reported	Not Assessed	Nakagawa 1984
New Orleans	LA	M-191 to M-185-R; M-185 to M-179-R	Alhambra to Hohen-Solms; Hohen-Solms to Modeste	3-216	N3341791.00, E688715.89	Carville	ca. 1890	Residential	Plain Shotgun	Not Assessed	Nakagawa 1984
New Orleans	LA	M-191 to M-185-R; M-185 to M-179-R	Alhambra to Hohen-Solms; Hohen-Solms to Modeste	3-217	N3341778.81, E688592.54	Carville	ca. 1900	Agricultural	Not Reported	Not Assessed	Nakagawa 1984
New Orleans	LA	M-191 to M-185-R; M-185 to M-179-R	Alhambra to Hohen-Solms; Hohen-Solms to Modeste	3-218	N3341638.20, E688591.44	Carville	ca. 1880	Residential	Not Reported	Not Assessed	Nakagawa 1984
New Orleans	LA	M-191 to M-185-R; M-185 to M-179-R	Alhambra to Hohen-Solms; Hohen-Solms to Modeste	3-219	N3341676.56, E688556.74	Carville	ca. 1900	Residential	Not Reported	Not Assessed	Nakagawa 1984
New Orleans	LA	M-191 to M-185-R; M-185 to M-179-R	Alhambra to Hohen-Solms; Hohen-Solms to Modeste	3-220	N3341594.76, E688557.67	Carville	ca. 1880	Residential	Not Reported	Not Assessed	Nakagawa 1984
New Orleans	LA	M-191 to M-185-R; M-185 to M-179-R	Alhambra to Hohen-Solms; Hohen-Solms to Modeste	3-221	N3341547.62, E688535.46	Carville	ca. 1920	Residential	Not Reported	Not Assessed	Nakagawa 1984
New Orleans	LA	M-191 to M-185-R; M-185 to M-179-R	Alhambra to Hohen-Solms; Hohen-Solms to Modeste	3-222	N3341617.40, E688523.90	New Orleans East, New Orleans West	Not Reported	Residential	Not Reported	Not Assessed	Nakagawa 1984
New Orleans	LA	M-191 to M-185-R; M-185 to M-179-R	Alhambra to Hohen-Solms; Hohen-Solms to Modeste	3-223	N3344148.45, E688488.29	Carville	ca. 1880	Residential	Not Reported	Not Assessed	Nakagawa 1984

Table 8, continued

USACE DISTRICT	STATE	PROJECT ITEM	PROJECT ITEM NAME	STRUCTURE NO.	UTM COORDINATE	USGS 7.5' QUAD	DATE	TYPE	STYLE	NRHP ELIGIBILITY	RECORDED BY
New Orleans	LA	M-191 to M-185-R; M-185 to M-179-R	Alhambra to Hohen-Solms; Hohen-Solms to Modeste	3-224 (Mulberry Grove)	N3341440.74, E689202.72	Carville	1836	Residential	Greek Revival	Listed on the National Register in 1993	Nakagawa 1984; Division of Historic Preservation 1993
New Orleans	LA	M-191 to M-185-R; M-185 to M-179-R	Alhambra to Hohen-Solms; Hohen-Solms to Modeste	3-225	N3341364.58, E689344.17	Carville	ca. 1880	Residential	Not Reported	Not Assessed	Nakagawa 1984
New Orleans	LA	M-191 to M-185-R; M-185 to M-179-R	Alhambra to Hohen-Solms; Hohen-Solms to Modeste	3-226	N3341328.19, E689397.11	Carville	ca. 1880	Residential	Not Reported	Not Assessed	Nakagawa 1984
New Orleans	LA	M-191 to M-185-R; M-185 to M-179-R	Alhambra to Hohen-Solms; Hohen-Solms to Modeste	3-227	N3341276.57, E689435.66	Carville	ca. 1880	Residential	Not Reported	Not Assessed	Nakagawa 1984
New Orleans	LA	M-191 to M-185-R; M-185 to M-179-R	Alhambra to Hohen-Solms; Hohen-Solms to Modeste	3-228	N3341188.22, E689524.84	Carville	ca. 1880	Residential	Not Reported	Not Assessed	Nakagawa 1984
New Orleans	LA	M-191 to M-185-R; M-185 to M-179-R	Alhambra to Hohen-Solms; Hohen-Solms to Modeste	3-229	N3341124.75, E689602.35	Carville	ca. 1890	Residential	Not Reported	Not Assessed	Nakagawa 1984
New Orleans	LA	M-185 to M-179-R	Hohen-Solms to Modeste	3-230	N3340166.95, E690424.49	Carville	ca. 1870	Residence	Not Reported	Not Assessed	Nakagawa 1984
New Orleans	LA	M-185 to M-179-R	Hohen-Solms to Modeste	3-231	N3339671.77, E690880.60	Carville	ca. 1890	Residence	Not Reported	Not Assessed	Nakagawa 1984
New Orleans	LA	M-185 to M-179-R	Hohen-Solms to Modeste	3-232	N3339622.08, E690899.00	Carville	ca. 1910	Residence	Not Reported	Not Assessed	Nakagawa 1984
New Orleans	LA	M-185 to M-179-R	Hohen-Solms to Modeste	3-233	N3339605.19, E690912.93	Carville	ca. 1880	Residence	Not Reported	Not Assessed	Nakagawa 1984
New Orleans	LA	M-185 to M-179-R	Hohen-Solms to Modeste	3-234	N3339524.46, E690960.94	Carville	ca. 1910	Governmental	Not Reported	Not Assessed	Nakagawa 1984
New Orleans	LA	M-185 to M-179-R	Hohen-Solms to Modeste	3-235	N3339395.80, E691004.38	Carville	ca. 1890	Residence	Creole Cottage	Not Assessed	Nakagawa 1984
New Orleans	LA	M-185 to M-179-R	Hohen-Solms to Modeste	3-236	N3339310.55, E691039.03	Carville	ca. 1900	Residence	Shotgun	Not Assessed	Nakagawa 1984
New Orleans	LA	M-185 to M-179-R	Hohen-Solms to Modeste	3-237	N3339256.74, E691058.65	Carville	ca. 1910	Residence	Not Reported	Not Assessed	Nakagawa 1984
New Orleans	LA	M-185 to M-179-R	Hohen-Solms to Modeste	3-238	N3339254.39, E691103.52	Carville	ca. 1890	Residence	Not Reported	Not Assessed	Nakagawa 1984
New Orleans	LA	M-185 to M-179-R	Hohen-Solms to Modeste	3-239	N3339149.00, E691018.11	Carville	ca. 1920	Residence	Not Reported	Not Assessed	Nakagawa 1984
New Orleans	LA	M-185 to M-179-R	Hohen-Solms to Modeste	3-240	N3339090.81, E690909.87	Carville	ca. 1920	Residence	Shotgun	Not Assessed	Nakagawa 1984

Table 8, continued

USACE DISTRICT	STATE	PROJECT ITEM	PROJECT ITEM NAME	STRUCTURE NO.	UTM COORDINATE	USGS 7.5' QUAD	DATE	TYPE	STYLE	NRHP ELIGIBILITY	RECORDED BY
New Orleans	LA	M-185 to M-179-R	Hohen-Solms to Modeste	3-241	N3339157.26, E690936.64	Carville	ca. 1900	Residence	Not Reported	Not Assessed	Nakagawa 1984
New Orleans	LA	M-185 to M-179-R	Hohen-Solms to Modeste	3-242	N3339130.92, E690984.26	Carville	ca. 1900	Residence	Not Reported	Not Assessed	Nakagawa 1984
New Orleans	LA	M-185 to M-179-R	Hohen-Solms to Modeste	3-243	3339206.41, E691107.45	Carville	ca. 1900	Residence	Not Reported	Not Assessed	Nakagawa 1985
New Orleans	LA	M-185 to M-179-R	Hohen-Solms to Modeste	3-244	N3339191.47, E691086.99	Carville	1907	Residence	Not Reported	Not Assessed	Nakagawa 1985
New Orleans	LA	M-185 to M-179-R	Hohen-Solms to Modeste	3-245	N3339201.69, E691146.02	Carville	1910	Residence	Shotgun	Not Assessed	Nakagawa 1985
New Orleans	LA	M-185 to M-179-R	Hohen-Solms to Modeste	3-246	N3339181.25, E691151.11	Carville	ca. 1880	Residence	Creole Cottage	Not Assessed	Nakagawa 1985
New Orleans	LA	M-185 to M-179-R	Hohen-Solms to Modeste	3-247	N3338935.69, E691302.51	Carville	ca. 1910	Residence	Shotgun	Not Assessed	Nakagawa 1985
New Orleans	LA	M-185 to M-179-R	Hohen-Solms to Modeste	3-248	N3338965.40, E691498.65	Carville	ca. 1890	Residence	Not Reported	Not Assessed	Nakagawa 1985
New Orleans	LA	M-185 to M-179-R	Hohen-Solms to Modeste	3-249	N3337992.58, E691840.15	Carville	ca. 1910	Residence	Not Reported	Not Assessed	Nakagawa 1985
New Orleans	LA	M-185 to M-179-R	Hohen-Solms to Modeste	3-250	N3338023.71, E691883.10	Carville	ca. 1880	Residence	Not Reported	Not Assessed	Nakagawa 1985
New Orleans	LA	M-185 to M-179-R	Hohen-Solms to Modeste	3-251	N3337924.20, E691792.61	Carville	ca. 1910	Residence	Shotgun	Not Assessed	Nakagawa 1985
New Orleans	LA	M-185 to M-179-R	Hohen-Solms to Modeste	3-252	N3337859.17, E691847.23	Carville	ca. 1910	Residence	Creole Cottage	Not Assessed	Nakagawa 1985
New Orleans	LA	M-185 to M-179-R	Hohen-Solms to Modeste	3-253	N3337877.71, E691904.21	Carville	ca. 1890	Residence	Creole Cottage	Not Assessed	Nakagawa 1985
New Orleans	LA	M-185 to M-179-R	Hohen-Solms to Modeste	3-254	N3337245.29, E691350.41	Carville	ca. 1910	Residence	Shotgun	Not Assessed	Nakagawa 1985
New Orleans	LA	M-185 to M-179-R	Hohen-Solms to Modeste	3-255	N3337257.38, E691311.76	Carville	ca. 1900	Residence	Creole Cottage	Not Assessed	Nakagawa 1985
New Orleans	LA	M-185 to M-179-R	Hohen-Solms to Modeste	3-256	N3337258.16, E691397.64	Carville	ca. 1900	Residence	Not Reported	Not Assessed	Nakagawa 1985
New Orleans	LA	M-185 to M-179-R	Hohen-Solms to Modeste	3-257	N3337267.13, E691274.68	Carville	ca. 1900	Residence	Shotgun	Not Assessed	Nakagawa 1985
New Orleans	LA	M-185 to M-179-R	Hohen-Solms to Modeste	3-258	N3337315.88, E691163.42	Carville	ca. 1910	Residence	Shotgun	Not Assessed	Nakagawa 1985
New Orleans	LA	M-185 to M-179-R	Hohen-Solms to Modeste	3-259	N3337303.40, E691080.27	Carville	ca. 1920	Residence	Not Reported	Not Assessed	Nakagawa 1985
New Orleans	LA	M-185 to M-179-R	Hohen-Solms to Modeste	3-260	N3336979.61, E691148.19	Carville	ca. 1910	Residence	Not Reported	Not Assessed	Nakagawa 1985
New Orleans	LA	M-185 to M-179-R	Hohen-Solms to Modeste	3-261	N3336617.01, E690659.96	Carville	ca. 1900	Residence	Not Reported	Not Assessed	Nakagawa 1985
New Orleans	LA	M-185 to M-179-R	Hohen-Solms to Modeste	3-262	N3336378.65, E690273.31	Carville	ca. 1880	Residence	Not Reported	Not Assessed	Nakagawa 1985
New Orleans	LA	M-189 to M-181-L	Carville to Marchand	3-620	N3342887.72, E690193.90	Carville	ca. 1895	Residential	Creole	Not Assessed	"P.B.M." 1985

Table 8, continued

USACE DISTRICT	STATE	PROJECT ITEM	PROJECT ITEM NAME	STRUCTURE NO.	UTM COORDINATE	USGS 7.5' QUAD	DATE	TYPE	STYLE	NRHP ELIGIBILITY	RECORDED BY
New Orleans	LA	M-189 to M-181-L	Carville to Marchand	3-621	N3342936.45, E690126.58	Carville	ca. 1895	Residential	Folk	Not Assessed	"P.B.M." 1985
New Orleans	LA	M-189 to M-181-L	Carville to Marchand	3-622	N3342949.74, E690100.53	Carville	ca. 1895	Residential	Creole	Not Assessed	"P.B.M." 1985
New Orleans	LA	M-189 to M-181-L	Carville to Marchand	3-623	N3342974.92, E690060.60	Carville	ca. 1920	Residential	Bungalow	Not Assessed	"P.B.M." 1985
New Orleans	LA	M-189 to M-181-L	Carville to Marchand	3-624	N3342991.04, E690025.78	Carville	ca. 1895	Residential	Creole	Not Assessed	"P.B.M." 1985
New Orleans	LA	M-189 to M-181-L	Carville to Marchand	3-625	N3342841.81, E690230.34	Carville	ca. 1900	Residential	Not Reported	Not Assessed	"P.B.M." 1985
New Orleans	LA	M-189 to M-181-L	Carville to Marchand	3-626	N3342741.35, E690297.77	Carville	ca. 1890	Residential	Creole	Not Assessed	"P.B.M." 1985
New Orleans	LA	M-189 to M-181-L	Carville to Marchand	3-627	N3342827.64, E690274.81	Carville	ca. 1925	Commercial	Not Reported	Not Assessed	"P.B.M." 1985
New Orleans	LA	M-189 to M-181-L	Carville to Marchand	3-628	N3343026.97, E690162.25	Carville	ca. 1925	Residential	Bungalow	Not Assessed	"P.B.M." 1985
New Orleans	LA	M-189 to M-181-L	Carville to Marchand	3-629	N3342968.98, E690243.80	Gonzales	ca. 1895	Residential	Creole	Not Assessed	"P.B.M." 1985
New Orleans	LA	M-189 to M-181-L	Carville to Marchand	3-630	N3337710.98, E693315.59	Gonzales	ca. 1930	Residential	Bungalow	Not Assessed	"P.B.M." 1985
New Orleans	LA	M-189 to M-181-L	Carville to Marchand	3-631	N3336949.85, E693212.04	Gonzales	1922	Residential	Folk	Not Assessed	"P.B.M." 1985
New Orleans	LA	M-189 to M-181-L	Carville to Marchand	3-632	N3336951.71, E693289.51	Gonzales	ca. 1850	Residential	Not Reported	Not Assessed	"P.B.M." 1985
New Orleans	LA	M-189 to M-181-L	Carville to Marchand	3-633	N3336963.88, E693234.27	Gonzales	ca. 1920s	Commercial	Not Reported	Not Assessed	"P.B.M." 1985
New Orleans	LA	M-189 to M-181-L	Carville to Marchand	3-634	N3336905.66, E693249.25	Gonzales	ca. 1890	Residential	Queen Anne	Not Assessed	"P.B.M." 1985
New Orleans	LA	M-189 to M-181-L	Carville to Marchand	3-635	N3336893.03, E693209.00	Gonzales	ca. 1900	Residential	Creole	Not Assessed	"P.B.M." 1985
New Orleans	LA	M-189 to M-181-L	Carville to Marchand	Ashland	Zone 15 A: 692820E, 3340090N; B: 692970E, 3339870N; C: 692520E, 3339510N; D: 692370E, 3339760N	Gonzales	1841	Residential	Classical Revival	Listed on National Register in 1979	Hayward 1979

Table 8, continued

USACE DISTRICT	STATE	PROJECT ITEM	PROJECT ITEM NAME	STRUCTURE NO.	UTM COORDINATE	USGS 7.5' QUAD	DATE	TYPE	STYLE	NRHP ELIGIBILITY	RECORDED BY
East Baton Rouge Parish											
New Orleans	LA	M-230-L	Baton Rouge Front Levee	Spanish Town Historic District	Zone 15 A: 674190E, 3370590N; B: 674640E, 3370620N; C: 674660E, 3370170N; D: 674210E, 3370130N	Baton Rouge West	ca. 1823 - present	Residential, Commercial, and Governmental (a total of 268 structures)	Greek Revival, Queen Anne, Shotgun, Creole, Bungalow, and Classical Revival	Listed on the National Register in 1978	Thom, Jensen, and Fricker 1977
New Orleans	LA	M-230-L	Baton Rouge Front Levee	Beauregard Town Historic District	Zone 15 A: 673770E, 3369490N; B: 674780E, 3369530N; C: 675000E, 3368870N; D: 673820E, 3368830N	Baton Rouge West	ca. pre 1850 - present	Residential, Commercial, Educational, Governmental, and Religious	Unspecified	Listed on the National Register in 1980	Melby, Brown, and Fricker 1979
New Orleans	LA	M-230-L	Baton Rouge Front Levee	Beauregard Town Historic District Boundary Increase (Levy Hay Warehouse)	Zone 15 A: 674820E, 3369540N; B: 674980E, 3368840N; C: 673720E, 3368800N; D: 673800E, 3369520N	Baton Rouge West	ca. 1920	Commercial	Not Reported	Listed on the National Register in 1983	Not Reported
New Orleans	LA	M-230-L	Baton Rouge Front Levee	Beauregard Town Historic District Boundary Increase (Armour Building)	Zone 15 A: 674820E, 3369540N; B: 674980E, 3368840N; C: 673720E, 3368800N; D: 673800E, 3369520N	Baton Rouge West	1929	Commercial	Not Reported	Listed on the National Register in 1983	Not Reported
Iberville Parish											
New Orleans	LA	M-205 to M-198.5-R	Reveille to Point Pleasant	24-493	N3349290.99, E657904.38	Plaquemine	ca. 1880	Residential	Not Reported	Not Assessed	Nakagawa 1983
New Orleans	LA	M-205 to M-198.5-R	Reveille to Point Pleasant	24-494	N3349325.68, E675912.79	Plaquemine	ca. 1880	Residential	Not Reported	Not Assessed	Nakagawa 1983
New Orleans	LA	M-205 to M-198.5-R	Reveille to Point Pleasant	24-495	N3349394.24, E675970.29	Plaquemine	ca. 1890	Agricultural	Not Reported	Not Assessed	Nakagawa 1983
New Orleans	LA	M-205 to M-198.5-R	Reveille to Point Pleasant	24-496	N3349373.10, E675862.60	Plaquemine	ca. 1890	Agricultural	Not Reported	Not Assessed	Nakagawa 1983
New Orleans	LA	M-205 to M-198.5-R	Reveille to Point Pleasant	24-497	N3349469.39, E676438.90	Plaquemine	ca. 1880	Residential	Not Reported	Not Assessed	Nakagawa 1983

Table 8, continued

USACE DISTRICT	STATE	PROJECT ITEM	PROJECT ITEM NAME	STRUCTURE NO.	UTM COORDINATE	USGS 7.5' QUAD	DATE	TYPE	STYLE	NRHP ELIGIBILITY	RECORDED BY
New Orleans	LA	M-205 to M-198.5-R	Reveille to Point Pleasant	24-498	N3349447.74, E676461.24	Plaquemine	ca. 1880	Agricultural	Not Reported	Not Assessed	Nakagawa 1983
New Orleans	LA	M-205 to M-198.5-R	Reveille to Point Pleasant	24-499	N3349411.09, E676475.75	Plaquemine	ca. 1880	Agricultural	Not Reported	Not Assessed	Nakagawa 1983
New Orleans	LA	M-205 to M-198.5-R	Reveille to Point Pleasant	24-550	N3350191.55, E676886.65	Plaquemine	ca. 1880	Residential	Not Reported	Not Assessed	Nakagawa 1984
New Orleans	LA	M-205 to M-198.5-R	Reveille to Point Pleasant	24-551	N3350185.14, E677044.40	Plaquemine	ca. 1930	Agricultural	Not Reported	Not Assessed	Nakagawa 1984
New Orleans	LA	M-205 to M-198.5-R	Reveille to Point Pleasant	24-552	N33492129.08, E680177.21	Plaquemine	ca. 1900	Residential	Not Reported	Not Assessed	Nakagawa 1984
New Orleans	LA	M-205 to M-198.5-R	Reveille to Point Pleasant	24-553	N3349050.24, E680203.15	Plaquemine	ca. 1930	Residential	Not Reported	Not Assessed	Nakagawa 1984
New Orleans	LA	M-205 to M-198.5-R	Reveille to Point Pleasant	24-554	N3348909, E680333.52	Plaquemine	ca. 1890 - present	N/A	N/A	Not Assessed	Nakagawa 1984
New Orleans	LA	M-205 to M-198.5-R	Reveille to Point Pleasant	24-555	N3348909.49, E680333.52	Plaquemine	ca. 1910	Residential	Not Reported	Not Assessed	Nakagawa 1984
New Orleans	LA	M-205 to M-198.5-R	Reveille to Point Pleasant	24-556	N3348993.29, E680368.67	Plaquemine	ca. 1920	Residential	Shotgun	Not Assessed	Nakagawa 1984
New Orleans	LA	M-205 to M-198.5-R	Reveille to Point Pleasant	24-564	N3348629.36, E680677.21	St. Gabriel	ca. 1930	Residential	Shotgun	Not Assessed	Nakagawa 1984
New Orleans	LA	M-205 to M-198.5-R	Reveille to Point Pleasant	24-565	N3348680.71, E680723.62	St. Gabriel	ca. 1920	Residential	Not Reported	Not Assessed	Nakagawa 1984
New Orleans	LA	M-205 to M-198.5-R	Reveille to Point Pleasant	24-566	N3348710.88, E680666.98	St. Gabriel	ca. 1890	Agricultural	Not Reported	Not Assessed	Nakagawa 1984
New Orleans	LA	M-205 to M-198.5-R	Reveille to Point Pleasant	24-567	N3348654.75, E680792.13	St. Gabriel	ca. 1890	Residential	Not Reported	Not Assessed	Nakagawa 1984
New Orleans	LA	M-205 to M-198.5-R	Reveille to Point Pleasant	24-568	N3348639.89, E680774.06	St. Gabriel	ca. 1890	Residential	Not Reported	Not Assessed	Nakagawa 1984
New Orleans	LA	M-205 to M-198.5-R	Reveille to Point Pleasant	24-569	N3348638.77, E680842.04	St. Gabriel	ca. 1910	Residential	Not Reported	Not Assessed	Nakagawa 1984
New Orleans	LA	M-205 to M-198.5-R	Reveille to Point Pleasant	24-570	N3348735.00, E680698.92	St. Gabriel	ca. 1920	Residential	Not Reported	Not Assessed	Nakagawa 1984
New Orleans	LA	M-205 to M-198.5-R	Reveille to Point Pleasant	24-571	N3348767.41, E680700.67	St. Gabriel	ca. 1930	Residential	Not Reported	Not Assessed	Nakagawa 1984
New Orleans	LA	M-205 to M-198.5-R	Reveille to Point Pleasant	24-572	N3348793.84, E680675.97	St. Gabriel	ca. 1920	Residential	Not Reported	Not Assessed	Nakagawa 1984
New Orleans	LA	M-205 to M-198.5-R	Reveille to Point Pleasant	24-573	N3348081.57, E680975.64	St. Gabriel	1860 - present	N/A	N/A	Not Assessed	Nakagawa 1984
New Orleans	LA	M-205 to M-198.5-R	Reveille to Point Pleasant	24-576	N3347948.93, E680898.21	St. Gabriel	ca. 1900	Residential	Not Reported	Not Assessed	Nakagawa 1984
New Orleans	LA	M-205 to M-198.5-R	Reveille to Point Pleasant	24-577	N3347921.86, E680882.30	St. Gabriel	ca. 1910	Agricultural	Not Reported	Not Assessed	Nakagawa 1984
New Orleans	LA	M-205 to M-198.5-R	Reveille to Point Pleasant	24-578	N3347969.56, E680927.03	St. Gabriel	ca. 1900	Agricultural	Not Reported	Not Assessed	Nakagawa 1984
New Orleans	LA	M-205 to M-198.5-R	Reveille to Point Pleasant	24-579	N3347967.84, E680968.75	St. Gabriel	ca. 1930	Agricultural	Not Reported	Not Assessed	Nakagawa 1984

Table 8, continued

USACE DISTRICT	STATE	PROJECT ITEM	PROJECT ITEM NAME	STRUCTURE NO.	UTM COORDINATE	USGS 7.5' QUAD	DATE	TYPE	STYLE	NRHP ELIGIBILITY	RECORDED BY
New Orleans	LA	M-205 to M-198.5-R	Reveille to Point Pleasant	24-583	N3347120.40, E680258.55	White Castle	ca. 1900	Residential	Not Reported	Not Assessed	Nakagawa 1984
New Orleans	LA	M-205 to M-198.5-R	Reveille to Point Pleasant	24-584	N3346731.72, E679746.99	White Castle	ca. 1920	Residential	"French type"	Not Assessed	Nakagawa 1984
New Orleans	LA	M-205 to M-198.5-R	Reveille to Point Pleasant	24-585	N3346629.21, E679658.51	White Castle	ca. 1840	Residential	"French type"	Not Assessed	Nakagawa 1984
New Orleans	LA	M-205 to M-198.5-R	Reveille to Point Pleasant	24-586	N3346432.89, E679476.26	White Castle	ca. 1920	Residential	Not Reported	Not Assessed	Nakagawa 1984
New Orleans	LA	M-205 to M-198.5-R	Reveille to Point Pleasant	24-587	N3346533.71, E679476.92	White Castle	ca. 1900	Commercial	Not Reported	Not Assessed	Nakagawa 1984
New Orleans	LA	M-205 to M-198.5-R	Reveille to Point Pleasant	24-588	N3346493.93, E679448.37	White Castle	ca. 1910	Residential	Not Reported	Not Assessed	Nakagawa 1984
New Orleans	LA	M-205 to M-198.5-R	Reveille to Point Pleasant	24-589	N3346471.69, E679513.43	White Castle	ca. 1910	Residential	Not Reported	Not Assessed	Nakagawa 1984
New Orleans	LA	M-205 to M-198.5-R	Reveille to Point Pleasant	24-590	N3346458.10, E679493.19	White Castle	ca. 1910	Commercial	Not Reported	Not Assessed	Nakagawa 1984
New Orleans	LA	M-205 to M-198.5-R	Reveille to Point Pleasant	24-591	N3346397.10, E679433.44	White Castle	ca. 1900	Residential	Not Reported	Not Assessed	Nakagawa 1984
New Orleans	LA	M-205 to M-198.5-R	Reveille to Point Pleasant	24-592	N3346447.15, E679423.81	White Castle	ca. 1900	Agricultural	Not Reported	Not Assessed	Nakagawa 1984
New Orleans	LA	M-205 to M-198.5-R	Reveille to Point Pleasant	24-593	N3346243.76, E679140.10	White Castle	ca. 1930	Religious	Not Reported	Not Assessed	Nakagawa 1984
New Orleans	LA	M-205 to M-198.5-R	Reveille to Point Pleasant	24-650	N3345705.77, E678548.40	White Castle	1906	Residential	Not Reported	Not Assessed	Nakagawa 1984
New Orleans	LA	M-205 to M-198.5-R	Reveille to Point Pleasant	24-651	N3345772.29, E678718.74	White Castle	ca. 1900	Residential	Not Reported	Not Assessed	Nakagawa 1984
New Orleans	LA	M-205 to M-198.5-R	Reveille to Point Pleasant	24-652	N3346438.50, E679412.40	White Castle	1890	Residential	Not Reported	Not Assessed	Nakagawa 1984
New Orleans	LA	M-205 to M-198.5-R	Reveille to Point Pleasant	24-653	N3345971.06, E678773.29	White Castle	ca. 1900	Agricultural	Not Reported	Not Assessed	Nakagawa 1984
New Orleans	LA	M-205 to M-198.5-R	Reveille to Point Pleasant	24-654	N3345927.49, E678720.96	White Castle	ca. 1930	Agricultural	Not Reported	Not Assessed	Nakagawa 1984
New Orleans	LA	M-205 to M-198.5-R	Reveille to Point Pleasant	24-655	N3345891.15, E678737.76	White Castle	1890	Residential	Not Reported	Not Assessed	Nakagawa 1984
New Orleans	LA	M-205 to M-198.5-R	Reveille to Point Pleasant	24-660	N3346180, E679066.05	White Castle	Unknown	Unknown	Unknown	Unknown	Unknown
New Orleans	LA	M-205 to M-198.5-R	Reveille to Point Pleasant	24-661	N3346054.15, E678924.07	White Castle	ca. 1910	Residential	Not Reported	Not Assessed	Nakagawa 1984
New Orleans	LA	M-205 to M-198.5-R	Reveille to Point Pleasant	24-662	N3346117.98, E678855.08	White Castle	ca. 1890	Agricultural	Not Reported	Not Assessed	Nakagawa 1984
New Orleans	LA	M-205 to M-198.5-R	Reveille to Point Pleasant	24-663	N3346031.62, E678900.72	White Castle	ca. 1900	Residential	Not Reported	Not Assessed	Nakagawa 1984
New Orleans	LA	M-205 to M-198.5-R	Reveille to Point Pleasant	24-664	N3346090.62, E678836.56	White Castle	ca. 1900	Agricultural	Not Reported	Not Assessed	Nakagawa 1984
New Orleans	LA	M-205 to M-198.5-R	Reveille to Point Pleasant	24-665	N3346010.71, E678873.60	White Castle	1928	Residential	Not Reported	Not Assessed	Nakagawa 1984

Table 8, continued

USACE DISTRICT	STATE	PROJECT ITEM	PROJECT ITEM NAME	STRUCTURE NO.	UTM COORDINATE	USGS 7.5' QUAD	DATE	TYPE	STYLE	NRHP ELIGIBILITY	RECORDED BY
New Orleans	LA	M-205 to M-198.5-R	Reveille to Point Pleasant	24-666	N3346038.06, E678815.35	White Castle	ca. 1930	Agricultural	Not Reported	Not Assessed	Nakagawa 1984
New Orleans	LA	M-191 to M-185-R	Alhambra to Hohen-Solms	24-753	N3340491.57, E680920.41	Carville	ca. 1910	Residential	Not reported	Not Assessed	Nakagawa 1984
New Orleans	LA	M-191 to M-185-R	Alhambra to Hohen-Solms	24-754	N3340448.75, E680945.47	Carville	ca. 1890	Residential	Not reported	Not Assessed	Nakagawa 1984
New Orleans	LA	M-191 to M-185-R	Alhambra to Hohen-Solms	24-755	N3341073.73, E681678.51	Carville	Ca. 1910	Residential	Not reported	Not Assessed	Nakagawa 1984
New Orleans	LA	M-191 to M-185-R	Alhambra to Hohen-Solms	24-756	N3341296.58, E682042.21	Carville	Ca. 1930	Agricultural	Not reported	Not Assessed	Nakagawa 1984
New Orleans	LA	M-191 to M-185-R	Alhambra to Hohen-Solms	24-757	N3341341.52, E6820081.10	Carville	ca. 1930	Agricultural	Not reported	Not Assessed	Nakagawa 1984
New Orleans	LA	M-191 to M-185-R	Alhambra to Hohen-Solms	24-758	N3341504.63, E682242.66	Carville	ca. 1920	Residential	Not reported	Not Assessed	Nakagawa 1984
New Orleans	LA	M-191 to M-185-R	Alhambra to Hohen-Solms	24-759	N3341607.71, E682418.57	Carville	ca. 1930	Agricultural	Not reported	Not Assessed	Nakagawa 1984
New Orleans	LA	M-191 to M-185-R	Alhambra to Hohen-Solms	24-760	N3341797.13, E682487.92	Carville	ca. 1930	Residential	Not reported	Not Assessed	Nakagawa 1984
New Orleans	LA	M-191 to M-185-R	Alhambra to Hohen-Solms	24-761	N3342620.95, E685550.59	Carville	ca. 1900	Residential	Not reported	Not Assessed	Nakagawa 1984
New Orleans	LA	M-191 to M-185-R	Alhambra to Hohen-Solms	24-762	N3342629.40, E685509.80	Carville	ca. 1880	Residential	Not reported	Not Assessed	Nakagawa 1984
Orleans Parish											
New Orleans	LA	M-104 to 100.2-L; M-102.9-L	Carrollton Levee Enlargement; New Orleans District Floodwall	Uptown New Orleans Historic District	Zone 15 A: 778220E, 3316850N; B: 780180E, 3315720N; C: 781560E, 3312520N; D: 775480E, 3312720N	New Orleans East, New Orleans West	ca. 1820 - 1935	Residential, Commercial, Religious, and Educational (a total of 10,716 structures)	Italianate, Gothic Revival, Creole, Greek Revival, Eastlake, Queen Anne, Colonial Revival, California, and 20th Century Eclectic	Listed on National Register in 1985	Preservation Resource Center and the Division of Historic Preservation 1985
New Orleans	LA	M-104 to 100.2-L; M-104.3-L; M-102.9-L	Carrollton Levee Enlargement; Jefferson Heights; New Orleans District Floodwall	Carrollton Historic District	Zone 15 A: 776220E, 3318180N; B: 778240E, 3317940N; C: 778720E, 3317520N; D: 776720E, 3314420N	New Orleans East, New Orleans West	ca. 1880 - 1937	Residential and Commercial (a total of 5198 structures)	Greek Revival, Italianate, Eastlake, Bungalow, Colonial Revival, Eclectic, and Plain	Listed on National Register in 1987	Division of Historic Preservation 1987

represented residential construction. These structures ranged in date from ca. 1850 - ca. 1930; however, none of the structures were assessed. None of these structures were currently listed on the National Register of Historic Places. The final Nomination Form completed by Douglas Hayward in 1979, construction of the Ashland-Belle Helene plantation house was completed in 1841 and was representative of the Classical Revival architectural style. In addition to the main house, four related structures (a double quarters type house, a gazebo, a modern caretakers residence, and a frame kitchen building constructed in 1974) also were included in the total 34 ac (13.8 ha) nominated to the National Register of Historic Places. According to the Nomination Form, Ashland-Belle Helene was considered significant due to its architecture as well as the fact that it was the residence of Duncan Kenner. It was reported that prior to the Civil War Kenner served several terms in the Louisiana House of Representatives and Senate. He also was a member of the state constitutional convention in 1845 and president of that convention in 1851. Kenner also was one of Louisiana's delegates to the provisional Congress of the Confederacy in 1861 and became a member of the Confederate governments House of Representatives. Following the Civil War Kenner served in the state senate and made an unsuccessful bid for the U.S. Senate. According to the Nomination Form, Kenner retained ownership of Ashland-Belle Helene until his death in 1887.

East Baton Rouge Parish

A review of the standing structure survey files at the Louisiana Department of Culture, Recreation and Tourism, Office of Cultural Development, Division of Historic Preservation identified two previously recorded historic districts within the 2 km (1.6 mi) wide study corridor: The Spanish Town Historic District and the Beauregard Town Historic District. Both listed on the National Register of Historic Places.

The Spanish Town Historic District, located within the city of Baton Rouge, Louisiana was listed to the National Register of Historic Places in August 1978. The approximately 50 ac (20.2 ha) district is bound by the state capitol grounds to the north, North Street to the south, Interstate 110 to the east, and North Fifth Street to the west.

structure identified (Ashland Plantation) within the Ascension Parish portion of the current study corridor was listed on the National Register of Historic Places in 1979. According to the National Register of Historic Places Inventory According to the National Register of Historic Places Inventory Nomination Form completed in 1977 by the Historic Spanish Town Civic Association, Spanish Town was established in 1805 making it the oldest neighborhood in Baton Rouge. A total of 268 structures ranging in date from ca. 1930 - 1960 was included in the district; however, 10 of these structures were not additive to the historic district. Comprised mostly of private residential buildings, the Spanish Town Historic District reportedly contained various style houses including Greek Revival, Queen Anne, shotgun, Creole, and craftsmen bungalow type houses.

The Beauregard Town Historic District was listed to the National Register of Historic Places in October, 1980. The district measures approximately 100 ac (40.5 ha) in area and it is approximately bound to the west by the Mississippi River, to the south by the Mayflower Street, to the east by Interstate 110, and to the north by North Boulevard. According to the National Register of Historic Places Inventory Nomination Form completed by the Beauregard Civic Association in 1977, a majority of Government Street was excluded from the historic district due to redevelopment of the street ca. post 1950. While most of the district is residential in nature, an area of warehouses (referred to as Catfish Town) is located within the Beauregard Town Historic District. Catfish Town consists of a total of five two-story brick warehouse structures dating from the late nineteenth to the early twentieth century. These structures are located adjacent to the Mississippi River.

Approximately 455 structures dating from prior to 1850 - present are included within the Beauregard Historic District. Residential styles present within the district included craftsman bungalows, shotgun houses, and Spanish colonial houses. In addition, the National Register of Historic Places Inventory Nomination Form also mentions the presence of houses exhibiting Eastlake details, as well as Queen Anne and Creole type residences. It was reported that approximately 1 percent of the buildings included within

the district were classified as intrusions. A majority of these intrusions were classified as one-story brick commercial buildings.

Iberville Parish

A total of 60 previously recorded standing structures (24-493 - 24-499, 24-550 - 24-553, 24-555, 24-556, 24-564 - 24-572, 24-576 - 24-579, 24-583 - 24-593, 24-650 - 24-655, 24-660 - 24-666, and 24-753 - 24-762) were identified within the Iberville Parish portion of the current study area. All of these structures were recorded by Tadashi Nakagawa during late 1983 and early 1984. The majority of the structures (n=38) are residential. A total of 18 structures are agricultural buildings. Of the remaining four structures, two represent commercial establishments, one represents a religious building, and one is of unknown function.

These structures represented construction dates ranging from ca. 1840 - ca. 1930. Nakagawa did not assess any of the structures. A review of the State of Louisiana National Register of Historic Places list revealed that none of the 60 previously recorded standing structures identified within the Iberville Parish portion of the currently current study area were listed on the National Register of Historic Places.

Orleans Parish

The Carrollton Historic District was listed to the National Register of Historic Places in November 1987. The approximately 6.5 km² (2.5 mi²) district is roughly bound by Lowerline Street, the Mississippi River, Monticello Avenue, and Earhart Boulevard in New Orleans, Louisiana. With few exceptions, the district's building date from ca. 1880 to 1937. According to the National Register Nomination Form, the Carrollton Historic District has not suffered an unacceptable loss of integrity since 1937. Comprised mostly of private residential buildings, the Carrollton Historic District consists of a total of 5198 buildings, including 104 Creole Cottage style houses, 2339 Shotgun style houses, 103 Camel back style houses, 884 Bungalow style houses, 156 Side Hall style houses, 365 commercial buildings, and 1247 unspecified buildings.

The Uptown New Orleans District was listed to the National Register of Historic Places in July, 1985. The district measures approximately 2,260

ac (914.6 ha) in area and it is approximately bound to the west by Lowerline Street, to the south by the Mississippi River, to the east by Louisiana Avenue, and to the north by Claiborne Avenue. According to the National Register of Historic Places Inventory Nomination Form the Uptown New Orleans District dates from ca. 1820 - 1935. Based on a random sample of 54 city blocks, a total of 954 structures was noted within the district included. Building types included Creole tradition (1 percent), raised cottages (2 percent), shotgun houses (48 percent), camel back houses (4 percent), one-story side-hall plan houses (2 percent), multi-story side-hall plan houses (2 percent), one-and one-half story center-hall houses (less than 1 percent), two-and-a-half story central-hall plan houses (less than 1 percent), one-story asymmetrical-plan houses (9 percent), two-story asymmetric-plan houses (17 percent), basement houses (10 percent), commercial buildings (3 percent), industrial buildings (less than 1 percent), and institutional buildings (1 percent). Overall, a total of 10,716 structures are included within the Uptown New Orleans District. Of these, 1,959 structures were reported to represent intrusions; however, according to the National Register of Historic Places Inventory Nomination Form, these intrusions (mostly commercial structures and modern residences) do not significantly impose upon the historic character of the district.

Historic Period Cemeteries Noted within the Current Study Area

A review of the archeological site and standing structure files located at the Louisiana Department of Culture, Recreation and Tourism, Office of Cultural Development, Divisions of Archaeology and Historic Preservation, Baton Rouge, Louisiana and pertinent USGS 7.5' topographic quadrangles resulted in the identification of six historic cemeteries within the 2 km (1.2 mi) wide study corridor (Table 9). These cemeteries are discussed by parish below.

Ascension Parish

Only two previously recorded historic cemeteries lie within the Ascension Parish portion of the SEIS New Orleans district project area. The St. Mary Baptist Church Cemetery (3-171), located within Section 21 of Township 10S,

Table 9. Previously Recorded Historic Period Cemeteries Located within the SEIS New Orleans District Project Area.

USACE DISTRICT	STATE	PROJECT ITEM	PROJECT ITEM NAME	CEMETERY NAME	UTM COORDINATE	USGS 7.5' QUAD	DATE RANGE	APPROXIMATE AREA (M/FT)	NRHP ELIGIBILITY	RECORDED BY
Ascension Parish										
New Orleans	LA	M-191 to M-185-R	Alhambra to Hohen-Solms	St. Mary Baptist Church Cemetery (3-171)	N3342416, E687699.63	Carville	ca. 1900 - present	30 x 60 m (98.4 x 196.9 ft)	Not Assessed	Nakagawa 1984
New Orleans	LA	M-185 to M-179-R	Hohen-Solms to Modeste	St. Philip Baptist Church (3-172)	N3339716, E690776.82	Carville	ca. 1869 - present	20 x 40 m (65.6 x 131.2 ft)	Not Assessed	Nakagawa 1984
Iberville Parish										
New Orleans	LA	M-205 to M-198.5-R	Reveille to Point Pleasant	Mt. Olive Baptist Church Cemetery (24-554)	N3348909, E680333.52	Plaquemine	ca. 1890 - present	30 x 50 m (98.4 x 164 ft)	Not Assessed	Nakagawa 1984
New Orleans	LA	M-205 to M-198.5-R	Reveille to Point Pleasant	St. Raphael Cemetery (24-573)	N3348081, E680975.64	St. Gabriel	1860 - present	70 x 160 m (229.7 x 524.9 ft)	Not Assessed	Nakagawa 1984
New Orleans	LA	M-191 to M-185-R	Alhambra to Hohen-Solms	Unnamed	N3341702.37, E682748.02	Carville	Unknown	15 x 30 m (49.2 x 98.4 ft)	Unknown	N/A
Plaquemines Parish										
New Orleans	LA	M-10.4-R	Lower Venice 2nd Lift	Unnamed	N3243718.26, E854340.97	Venice	Unknown	10 x 10 m (32.8 x 32.8 ft)	Unknown	N/A

Range 14E, was recorded by Tadashi Nakagawa in 1984. Although Nakagawa reported on the Historic Standing Structure Survey Form that the cemetery was established ca. 1900, the only observed graves were interred after ca. 1950. Nakagawa did not offer a significance assessment of the St. Mary Baptist Church Cemetery.

The remaining cemetery, the St. Philip Baptist Church Cemetery (3-172), also was recorded in 1984 by Nakagawa. The cemetery, located within Section 37 of Township 10S, Range 14E, contained 90 burials. Nakagawa reported that the majority of the burials utilized concrete vaults. Nakagawa suggested that the cemetery was established ca. 1869, and he noted that it still was in use at the time of its recordation. The National Register eligibility of the cemetery was not assessed. A review of the 7.5' USGS topographic quadrangles that included the Hohen-Solms to Modesto project item failed to identify any additional cemeteries within the currently proposed project corridor.

Iberville Parish

A review of the standing structure survey files housed by the Louisiana Department of Culture, Recreation and Tourism, Office of Cultural Development, Division of Historic Preservation identified three historic cemeteries (24-554, 24-573, and an unnamed cemetery) within the Reveille to Point Pleasant and the Alhambra to Hohen-Solms project item portion of the U.S. Army Corps of Engineers, New Orleans District project area. The first two cemeteries were recorded by Tadashi Nakagawa in 1984.

The Mt. Olive Baptist Church Cemetery (24-554) was located within Section 3 of Township 9S, Range 13E. This cemetery was referred to as the "Miolive" cemetery on the Historic Standing Structure Survey Form; a review of the Plaquemine, La. 7.5' topographic quadrangle identified this as the "Mt. Olive" Church and cemetery. According to Nakagawa, the cemetery dates from ca. 1890, however, the oldest grave

observed dated from 1931. The Mt. Olive Baptist Church Cemetery was not assessed.

The St. Raphael Cemetery (24-573) was identified within Section 60 of Township 9S, Range 13E. Nakagawa reported that the cemetery had been moved to its current location when the levee was constructed in 1929. The oldest grave marker observed at the cemetery dated from 1860. Nakagawa did not assess the significance of the St. Raphael Cemetery.

In addition to these two cemeteries, the staff of R. Christopher Goodwin & Associates, Inc., completed a review of the 7.5' USGS topographic quadrangles which included the Iberville Parish portion of the U.S. Army Corps of Engineers, New Orleans District project area. This review resulted in the identification of an unnamed additional historic cemetery within the 2 km (1.6 mi) of the currently proposed Alhambra to Hohen-Solms project item. The unnamed cemetery was noted on the Carville, La. (1974) 7.5' topographic quadrangle within Section 7 of Township 10S, Range 13E. This cemetery was not registered in the state archeological or historic preservation files.

Plaquemines Parish

A review of the standing structure survey files and the site record files housed at the Louisiana Department of Culture, Recreation and Tourism, Office of Cultural Development, Divisions of Historic Preservation and Archaeology failed to identify any previously recorded cemeteries within the Plaquemines Parish portion of the U.S. Army Corps of Engineers, New Orleans District project corridor; however, a review of the Venice, La. (1993) 7.5' USGS topographic quadrangle resulted in the identification of a single cemetery within 1 km (0.6 mi) of the currently proposed project area. The cemetery was noted in Section 6 of Township 21S, Range 31E, within the town of Venice, Louisiana. This cemetery was not registered in the state archeological or state historic preservation files.

CHAPTER VI

METHODS

Introduction

The methods used to supplement the Final Environmental Impact Statement, Mississippi Rivers and Tributaries, Mississippi River Levees and Channel Improvements are presented below. A multi-staged approach was utilized to gather, synthesize, and compile the data in both written and digital format. The first section of this chapter describes the data collection and synthesis procedures and to compile the text, as well as the procedures developed to transform the collected information into digital data. The remainder of the chapter describes the procedures used to transform the data into the REEGIS format.

Initial Data Collection and Synthesis

A variety of cultural resources data associated with the 2 km (1.2 mi) wide survey corridor was collected. This included the location, type, age, and context of each previously identified archeological site, standing structure, National Register of Historic Places property, and historic cemetery, located within the area of potential effect. This study also recorded the location of each previously conducted cultural resources survey identified within the area of potential effect. The majority of this data originated from the Louisiana Department of Culture, Recreation, and Tourism, Office of Cultural Development, Divisions of Archaeology and Historic Preservation in Baton Rouge, Louisiana.

Locational data pertaining to other important cultural resources was collected by inspecting the associated USGS 7.5' topographic quad-

ranges. The examination of the various topographic quadrangles provided a variety of important information, particularly locational data for historic and modern cemeteries located in the area. In addition to the USGS topographic quadrangles, a number of historic maps, including the Mississippi River Commission (MRC) maps (Appendix II), were examined for data relevant to this undertaking.

Creation of Electronic Data

All GIS data for this report were generated using the following software packages: Microsoft Access 97, Excel 97, AutoCad r14, Microstation 95, MGE-PC for Windows 95, MGE, Cartalinx v1.1, Idrisi for Windows v2.0, and ArcView 2.1. The various GIS data ultimately were converted into Intergraph MGE format utilizing the REEGIS schema and data dictionary developed by the River Database Work Group (see below). Although MGE-PC for Windows is a relatively widespread GIS platform, its roots in CAD contribute to some non-standard terminology and data organization. Therefore, a brief comparison of common GIS and MGE-based terminology is provided below to clarify some of these issues. According to *GIS the MGE Way: An Intergraph Technical Paper* (Intergraph Corporation 1995):

MGE is layer-based system in terms of the geographic data storage structures, allowing users to access the data by selecting and querying on features of interest. The layered implementation allows efficient storage structures for the geometry and linkages to the relational database records,

while remaining virtually transparent to the users. The layered implementation is accommodating to users that are just beginning the transition to GIS due to its similarity to manual mapping workflows.

In an MGE database, maps are grouped into related categories. A geographic element is represented on a map as a feature. Features are grouped into the same categories as the maps on which they appear. Therefore, a map of a particular category can only contain features that are associated with that same category, and the feature hierarchy within MGE (Figure 31) can model geographic reality by representing geographic themes as MGE categories, geographic feature types as MGE features, and unique occurrences as unique feature occurrences within the MGE database (graphics and attributes).

Layering by graphic level allows users to display any combination of features that have been placed on any map. In a manual GIS, a similar result is achieved with transparent overlays.

Each feature on a map can have a unique look because users specify its graphic attributes, which are collectively known as its symbology. However, non-graphic attributes of features do not appear graphically on a map and are stored in attribute tables.

Information in the attribute tables reflects instances of features. For example, the name of the owner of a building and the date a fire hydrant was last tested are examples of non-graphic attributes of a feature.

The Tri-Service Spatial Data Standards (TSSDS) group, a military inter-service data standards development group, has published data detailing implementation procedures for building a GIS in MGE (Figure 32). A portion of this document is included here to clarify the relationship between MGE and the TSSDS standard terminology (Tri-Service CADD/GIS Technology Center 1997).

The following terms are used by MGE to group and organize spatial and non-spatial data relevant to a task:

Project

The MGE project is the combination of geographic information (geographic objects and attribute data) from all sources. The project can be organized into indexes, which are design files containing index shapes that group features of categories into geographic themes. The indexes correlate to the Entity Sets in the TSSDS. Note: Setting up indexes and index files is optional; i.e., the category

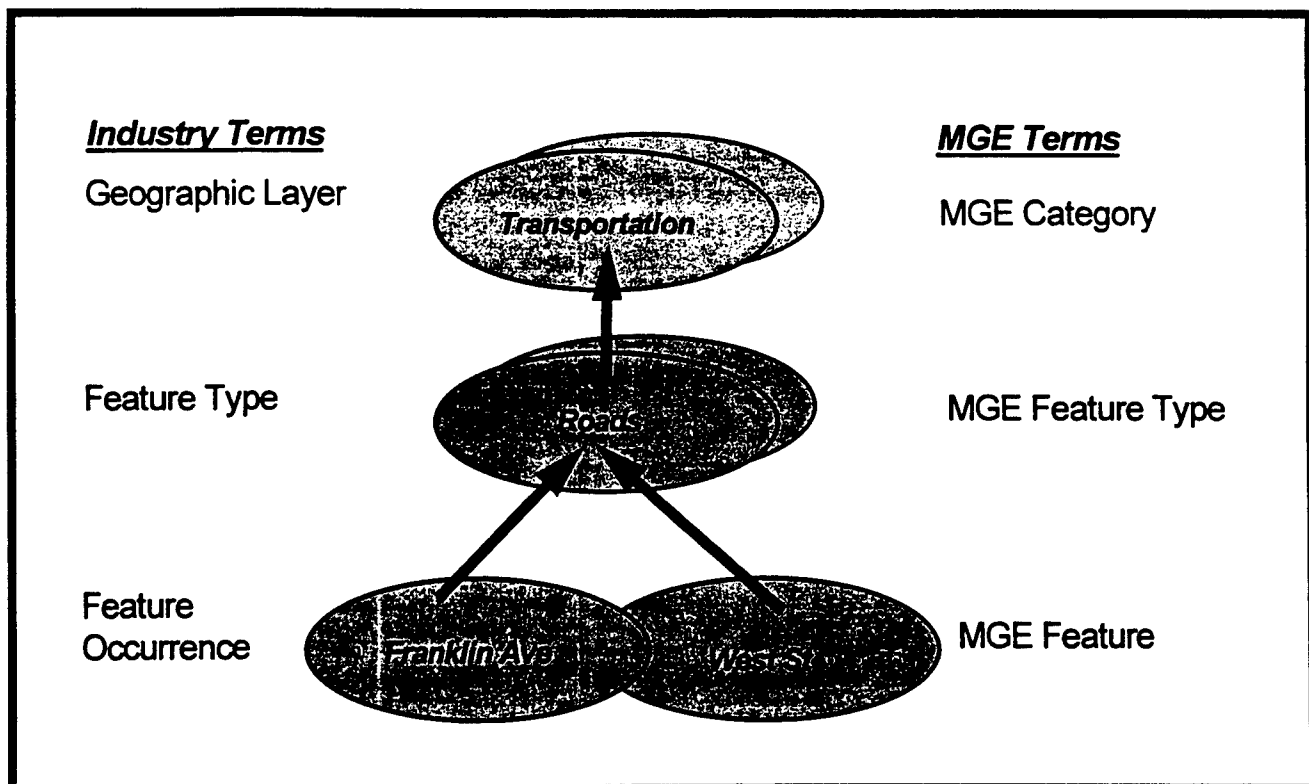


Figure 31. Geographic Feature Hierarchy.

table created by the TSSDS scripts does not have index values.

Maps

Geographic information in MGE is stored in the system as maps. These maps represent graphic information and relate to Entity Classes in the TSSDS. MGE stores graphic information in MicroStation Design Files (.dgn).

Categories

Categories, within MGE, represent a group of thematically or geographically related features or maps. In TSSDS, each category has one map.

Features

Features are spatially distributed geographic elements that make up a map. A geographic element in the TSSDS relates to an entity. By the TSSDS definition, these elements are represented on the map as points, lines, areas, text and attribute information which are all individual features, and may be associated with an attribute table. These elements are classified in the TSSDS as entities.

Attributes

Attributes are non-graphical information describing features and files, or relating to features and files. Attributes are stored in attribute tables.

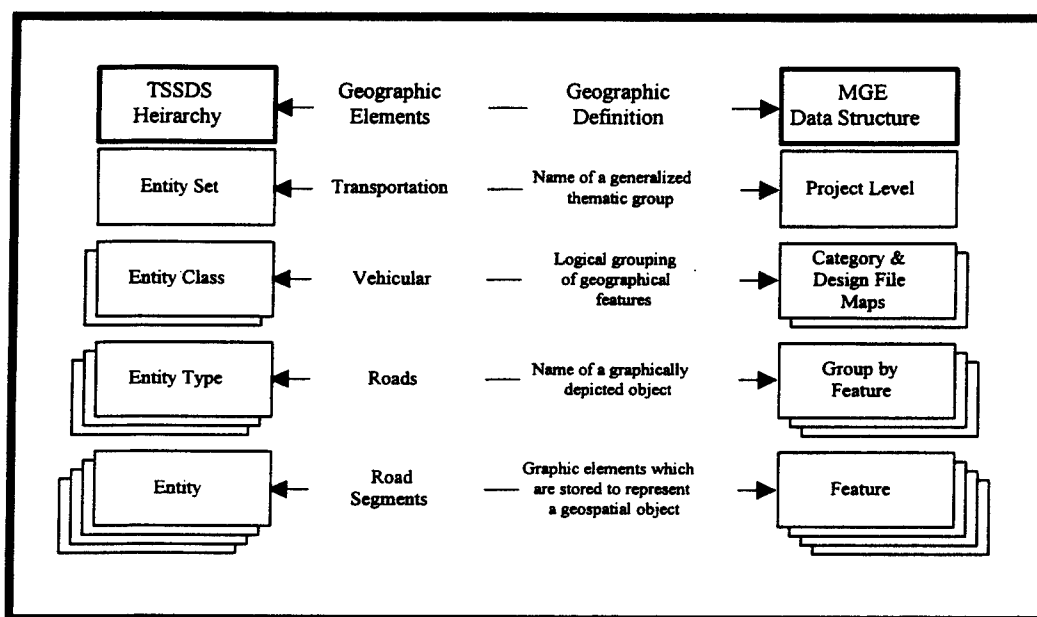


Figure 32. TSSDS/MGE Nomenclature Comparison.

REEGIS 4.0 Schema

A substantial effort was made in developing a suitable schema and locational data standards for the cultural resources information presented in this report. The cultural resources portion of the REEGIS 3.5 schema (River Database Workgroup 1997) contained only five features that described historical/archeological areas or point-mapped elements. The attribute table associated with these five features also was abbreviated, and it had been used previously only as a test case for mapping a number of historic structures located in the Vieux Carré area of New Orleans. Because of the complexity and the amount of

data required to complete this undertaking, it was necessary to develop more features and attributes tables to incorporate the required cultural resources information.

Initial discussions with REEGIS and U.S. Army Corps of Engineers personnel resulted in the modification of the REEGIS schema rather than the adoption of efforts designed to implement wholly the Tri-Service Spatial Data Standards (TSSDS). Although the TSSDS schema is not flawless, all requested changes to the REEGIS schema were developed using the current (version 1.75) TSSDS schema wherever possible. Additional schema information not already

included in the TSSDS 1.75 release was created in conformance to those standards. All changes and additions were submitted to REEGIS personnel and the data were provided in the REEGIS 4.0 schema (River Database Workgroup 1998). A brief summary of the various design sources is presented below.

REEGIS 3.5 Schema

This schema covered all information regarding the Mississippi River Valley. The primary focus, however, was on environmental and engineering issues, and therefore the schema provided only minimal information for archeological site areas and point locations (isolates). Table attributes with brief descriptions were included; however, there were no existing domains (lists of acceptable input values) for the archeological information. There were other features for structures and cemeteries, but they were oriented towards the management of extant buildings and not towards the preservation of historical/cultural resources. There was no provision to include cultural resources survey information even though this was a requirement specified in the Scope of Work (Appendix I).

Initial Rough Survey Schema

This schema was formulated so that R. Christopher Goodwin & Associates, Inc., could begin preparing the cultural resources data for digitization. Following this schema, all cultural resources surveys were included on a single map (.dgn) file with separate layers developed for the overlapping survey areas (necessary due to software limitations in some GIS platforms). Data fields and codes were based on a range of other GIS implementations and from an examination of the data obtained during the information collection phase of this undertaking.

TSSDS v.1.75 Schema

The TSSDS schema represents a current attempt by the U.S. Armed Forces (including the U.S. Army Corps of Engineers, New Orleans District) to provide a standardized GIS for a variety of data. Development and implementation of the TSSDS schema was and continues to be an ambitious project, and a great deal of time and effort has been expended on developing the schema. While this standardized coding scheme

has some deficiencies, it represented an appropriate starting point. The TSSDS schema contains a variety of unique categories, attribute tables, and domains for archeological/historical sites, historic structures, cemeteries, and archeological surveys.

Final Proposed Schema

The final schema represents an amalgamation of the three schemas described above. A full description of the feature, attribute, and domain data can be found in the REEGIS 4.0 schema. In brief, all features are assigned an environmental category (a single .dgn file containing all REEGIS environmental data), and this data included archeological/historical areas, archeological/historical point features, historic structure area features, historic structure point features, historic districts, cemeteries, and the boundaries/limits of previously completed cultural resources surveys. Attributes for new features, as well as additional attributes for extant REEGIS features, were modeled as closely as possible after the TSSDS schema and conventions. Finally, all domains were at most slight modifications from TSSDS values.

Transfer Accuracy Standards

All cultural resources and surveys locations initially were transferred from archeological site forms or standing structure forms to clean paper USGS 7.5' series standard topographical quadrangles prior to digitization. All map locations were digitized using the North American Universal Transverse Mercator projection based on the NAD27 datum. In accordance with the 1947 revision of the United States National Map Accuracy Standards, all digitization performed by R. Christopher Goodwin & Associates Inc., yielded RMS values less than or equal to 12.4 meters. It should be noted however that the locations of the cultural resources and the associated surveys are only as accurate as the information depicted on the paper maps and documentation housed at the Louisiana Department of Culture, Recreation, and Tourism, Office of Cultural Development, Division of Archeology and Division of Historic Preservation. In some instances cultural resources locations had to be estimated; details of this nature are encoded in the locational reliability field (loc_rel_d). All

subsequent reprojections of this data were performed using the U.S. National Geodetic Survey NADCON procedure as described by Dewhurst (1990) or the methods described by Snyder (1987).

Geologic Data Collection and Format

In order to generate the base maps required to complete the geomorphological interpretations described in Chapter II, it was necessary to integrate a number of data sources. These sources included the existing REEGIS themes for general river and alluvial soil type, SEIS Project Item location maps, and USGS 1:100,000 electronic DLGs (hydrographic and hypsographic themes). All map data was converted to the North American UTM projection using the NAD27 datum in order to be more compatible with extant paper maps. All coordinate transformations utilized the aforementioned methods. Alluvial soil unit data was obtained

from Stephen Cobb of the U.S. Army Corps of Engineers, Vicksburg District, project item and general river data were delivered separately by the U.S. Army Corps of Engineers, Vicksburg District, and hypsography and hydrography data were obtained from the USGS 1:100,000 scale SDTS files available on the USGS GeoData Internet site (USGS 1998).

Final Product Format (Electronic and Paper)

All electronic data delivered to the U.S. Army Corps of Engineers, New Orleans District conforms to the REEGIS 4.0 release as detailed below. An excerpt from the REEGIS Data Dictionary and Schema Version 4.0 (River Database Workgroup 1998) is provided below to clarify the design conventions of the REEGIS 4.0 Schema and Data Dictionary. In addition, the cultural resources portion of the schema is included as an appendix to this report (Appendix III).

REEGIS Design

Microstation design file specifications were standardized as follows:

Districts

master units: survey feet
sub units: 1,000
positional units: 1
global origin: 0,0,0

Lower Mississippi River

master units: meters
sub units: 1,000
positional units: 1
global origin: 0, 2800000, 0

Map projections, coordinate systems, and horizontal datums would be standardized as follows with conversion to NAD83 horizontal datum in the near future:

District

Datum

Coordinate System

New Orleans

NAD83

Louisiana State Plane, South

Since these recommendations were made, NAD 83 has become the standard horizontal datum as has Intergraph's Technical Desktop (TD) Pentium-based workstations, running the Windows NT operating system.

No CADD or GIS data standards were used exclusively in the development of the REEGIS data dictionary/schema. The Corps' CADD standards for symbology and cell libraries were used for

some features, but were too limited in scope to accommodate the diversity of graphic features found in REEGIS. The Tri-Service Spatial Data Standards (TSSDS) was used where applicable, but it did not address many river engineering and environmental features required for REEGIS. Topographic map features and symbols used by the U.S. Geological Survey for the National Mapping Program were followed when possible, particularly for the hydrology, topography, transportation utility, and structures categories.

REEGIS Organization

REEGIS is organized according to MGE requirements. Graphic data are divided into 28 categories, e.g., river engineering structures. Each category is comprised of graphic features, (Microstation graphic elements), that represent mapped objects, e.g., a levee. Only features from one category are contained in a map (.dgn) file. Features are linked to records in relational database (attribute) tables. For example, a dike feature would be linked to a table record having data about the structure, e.g., construction date, cost, and tons of stone. Supplemental data tables that are not linked to graphic features are also used.

Labels are assigned to most graphic features for visual identification features and for labeling output maps and other products. Most feature labels are values from a feature attribute table. For example, the label for a dike is the name column in the dike attribute table.

MGE domain tables are used for quality control. They contain either a numeric or character list or range of valid values for a variable. Data are checked against the domain tables for validity.

Data Dictionary

The purpose of this data dictionary/schema is to provide the means to standardize graphic and tabular data formats, units of measure, and information content of the REEGIS database across all MVD offices and districts. Rigorous application of the data dictionary will assure that common graphic symbology, relational database table formats, variables, and units of measure are used. In addition, the data dictionary will serve as a specification for data entry by contractors and in-house efforts.

The data dictionary and MGE project schema will be administrated by MVD in conjunction with the Data-base work group to assure uniform application and to minimize the potential for development of inconsistent versions of the schema at the various user sites. Changes to the schema will be coordinated among all user sites and, when finalized, will be forwarded to the respective database administrators for implementation.

The data dictionary is organized by MGE categories. For each category there is a table that lists the graphic features in the category and the corresponding Microstation symbology, feature codes, data types, and linked attribute tables. Followed by a table of feature definitions. The feature attribute tables are presented next. These contain a list of variables (columns) that comprise the table, data types domains, if any, variable definitions and table join relationships. Definition of attributes that are used throughout the database, e.g., river mile are contained in a separate table. Domain tables are listed at the end of the data dictionary.

REEGIS feature codes consist of six digit numbers. The first two digits represent the MGE category. Digits three and four are a unique number for each feature within a category, and digits five and six correspond to the Microstation design file level of the feature.

A nominal graphic feature in REEGIS, e.g., ACM Revetment, is comprised of up to three separate MGE features: a shape, line, or point representing the feature; a centroid (shapes only) to which the feature is linked to the attribute table; and a label (optional). Label features are linked to attribute tables so that tables column values, e.g., revetment name, may be used as the label. Table columns to be used as labels are indicated by an asterisk.

There are a few unused attributes and some overlap of fields in the hist_arch table; however, no changes were made to extant attributes in the REEGIS 3.5 schema. Additional information was merely added to the schema. Similarly, some of the domain values are not applicable to the REEGIS geographic region, but they were maintained from the original TSSDS domains for the sake consistency. Finally, it is possible that some domain table values will be added towards the end of the project. If this is done, this data will be submitted to the River Database Work Group upon completion of work.

CHAPTER VII

RESULTS

Introduction

This chapter presents the results of a cultural resources records review designed to support the preparation of a supplement to the Final Environmental Impact Statement (SEIS), Mississippi River and Tributaries, Mississippi River Levees and Channel Improvement. The original document was filed with the Council on Environmental Quality in 1976. Research conducted as a result of this investigation included archival review, a synthesis of relative information used to create an "historic context" suitable for guiding the identification, evaluation, and mitigation of a variety of cultural resources, and the preparation of the current report, which serves as an attachment to the SEIS.

A number of project areas were examined as a result of this undertaking; these consisted of the Fifth Louisiana District Levee Enlargement project item, the Baton Rouge Front Levee project item, the Reveille to Point Pleasant Levee Enlargement project item, the Carville to Marchand Levee Enlargement and Concrete Slope Pavement project item, the Hohen-Solms to Modesto Levee Enlargement project item, the Carrollton Levee Enlargement project item, the Alhambra to Hohen-Solms Concrete Slope Paving project item, the Jefferson Heights Concrete Slope Paving project item, the New Orleans District Floodwall project item, the Gap Closures West Bank Concrete Slope Paving project item, and the Gap Closures East Bank Concrete Slope Paving project item (Figures 2 - 5).

The Area of Potential Effect associated with this cultural resources investigation consisted of a 2.0 km (1.2 mi) wide corridor centered on each of the 11 previously identified

project items. The corridor extended for at least 1.0 km (0.62 mi) landside of each of the proposed project items and it encompassed an area that measured up to 1 km (0.62 mi) along the riverside portion of the project items (depending on distance to the river from the project item at any particular point). For the riverside portion of this undertaking, only the batture lands were investigated; the underwater component of the Mississippi River located adjacent to or in the vicinity of each of the proposed project items was not included in this investigation.

The literature and records review was designed to collect data pertaining to all known cultural resources identified within the 2.0 km (1.2 mi) wide corridor associated with each of the 11 proposed project items. This research was designed to identify all previously conducted cultural resources surveys, previously identified archeological sites and historic cemeteries, and previously recorded standing structures and National Register of Historic Places properties situated within the limits of each project corridor.

A records review of data currently available at the Louisiana Department of Culture, Recreation, and Tourism, Office of Cultural Development, Division of Archeology and Division of Historic Preservation in Baton Rouge, Louisiana identified 47 archeological sites, 142 standing structures, 4 historic period districts, and 6 historic cemeteries have been recorded within those portions of Ascension, East Baton Rouge, Iberville, Orleans, and Plaquemines Parishes encompassed by the area of potential effect. No previously recorded sites, standing structures, historic districts, or historic period cemeteries were identified within the Concordia Parish portions of the project corridor.

Many of these cultural resources identified as a result of this investigation were recorded as a result of cultural resources management surveys undertaken in accordance with Section 106 of the National Historic Preservation Act of 1966, as amended. The remainder were recorded through projects funded by the Louisiana Department of Culture, Recreation and Tourism, Office of Cultural Development, Divisions of Archaeology and Historic Preservation, and by various grants awarded from the State of Louisiana or from private funding sources.

All of the cultural resources discussed below are situated either wholly or partially within the project corridor identified by the U.S. Army Corps of Engineers, New Orleans District and adjacent to the Mississippi River and its main levee system. The main levee system encompasses approximately 2,586 km (1,607 mi) of earthen and concrete works designed to minimize the effects of river flooding on urban and rural areas. Approximately 838 km (521 mi) of the 2,586 km (1,607 mi) of earthen and concrete works comprising the main levee system, are located within the U.S. Army Corps of Engineers, New Orleans District. Only 24 km (15 mi), however, are covered under the current delivery order.

The project corridor has proven to be an attractive zone for both prehistoric and Anglo-American settlement. Throughout the centuries, the Mississippi River has been used as a transportation route that provided access to the rich agricultural lands that lay along its banks. Many of the previously recorded prehistoric and historic period archeological sites identified within the proposed project corridors are clustered along this major waterway.

Natural levee ridges suitable for prehistoric habitation within the current trunk channel of the Mississippi River date from approximately 4,000 years ago. This suggests that the occurrence of sites dating from the earlier Paleo-Indian or Archaic stages is doubtful. The earliest archeological sites identified along the rivers and levees encompassed by the proposed project items date from the Marksville Culture. Poverty Point groups, along with Tchefuncte, Marksville, Troyville-Coles Creek, Plaquemine, Mississippian, and Contact period Native

American Cultures settled along the lake margins, especially in the areas where they merged with bayous or rivers, major river levees situated along active or relict river channels, or coastal marshes. These sites, however, probably are buried beneath several meters of natural levee deposits. In addition, the higher and more favorable portions of the older, buried ridge may not necessarily coincide with the more recent natural levee deposits. Sites that may have been occupied along the distal flanks of the older natural levees, not an uncommon location for seasonal hunting and gathering camps, may be buried beneath interdistributary wetland deposits.

Prehistoric Sites Located within the Project Corridor

Although the natural levee along the Mississippi River clearly was occupied by Native American populations, only 7 (15 percent) of the 47 archeological sites recorded within the identified project corridors contained prehistoric components (Table 7). Of the seven sites identified, one site (14 percent) was located in Ascension Parish, two (29 percent) were located in East Baton Rouge Parish, and four sites (57 percent) were identified in Iberville Parish, Louisiana. These sites are discussed below by parish.

Previously Recorded Prehistoric Sites in Ascension Parish

Only a single prehistoric site, Site 16AN3, was located in the vicinity of the proposed Carville to Marchand project item in Ascension Parish, Louisiana. Site 16AN3 was reported in 1983 by Van Horn at approximately RM 185 on the left descending bank, and it was described as the former location of two prehistoric mounds of undetermined cultural affiliation (Table 7). According to the State of Louisiana Site Record Form, these mounds were identified on early topographic maps of the area. In addition, the site form noted that several historic period burials were present at the site. During pedestrian survey of the site area, however, it appeared that Site 16AN3 had previously been destroyed by prior construction. Site 16AN3 was not assessed at the time of survey, and no management recommendations concerning additional testing were contained on the examined site form.

Previously Recorded Prehistoric Sites in East Baton Rouge Parish

Only two prehistoric sites (16EBR25 and 16EBR79) were located in the vicinity of the proposed Baton Rouge Front Levee project item in East Baton Rouge Parish, Louisiana (Table 7). Site 16EBR25, the State Capitol Mound Site was recorded by Jones and Shuman in 1986, and it was characterized as a mound dating from the Late Coles Creek to Early Plaquemines period. Fieldwork conducted at this site included pedestrian survey augmented by shovel and auger testing, and unit excavation. According to the State of Louisiana Site Record Update Form filed by Whitmer in 1990, the mound produced both prehistoric period ceramic sherds and historic period artifacts. The State Capitol Mound Site was assessed as potentially significant.

Site 16EBR79, the State Capitol Grounds Site, is situated very near to Site 16EBR25. This site also contained a Late Coles Creek to Early Plaquemines period component. Fieldwork conducted at this site by Manheim and Whitmer (1991) of the Department of Geography and Anthropology, Louisiana State University, consisted of pedestrian survey augmented by shovel and auger testing, unit excavation, and magnetometer survey. Material recovered from the site included a variety of prehistoric period ceramic sherds. According to the State of Louisiana Site Record Update Form, Site 16EBR79 was included in the National Register of Historic Places in 1982.

Previously Recorded Prehistoric Sites in Iberville Parish

As a result of this undertaking, four prehistoric period sites (16IV126, 16IV147, 16IV148, and 16IV151) were identified within the vicinity of the proposed Alhambra to Hohen-Solms project corridor in Iberville Parish, Louisiana (Table 7). Site 16IV126 was recorded by Shenkel in 1976, and it was described as a Marksville and Troyville period midden eroding from an abandoned levee segment constructed along the Mississippi River. Fieldwork conducted at this site consisted only of pedestrian survey. Site 16IV126 was not assessed and no management recommendations were included on the submitted site form.

Site 16IV147 was recorded by Gendel in 1985, and it also was identified in the vicinity of the project corridor in Iberville Parish, Louisiana. Fieldwork conducted at this site consisted of pedestrian survey augmented by unit excavation, soil augering, and probing. Artifacts recovered from the site consisted primarily of prehistoric period ceramic sherds; however, these sherds could not be assigned to a specific cultural affiliation. According to the State of Louisiana Site Record Form submitted by Gendel in 1985, the majority of Site 16IV147 had eroded into the Mississippi River at the time of survey; only a small portion of the site remained. Site 16IV147 was assessed as not significant and no additional testing of the site was recommended.

Site 16IV148 was recorded by Gendel and Goodwin in 1985, and it also was located in the vicinity of the proposed Alhambra to Hohen-Solms project corridor in Iberville Parish, Louisiana. Fieldwork conducted at the site included pedestrian survey augmented by both shovel and auger testing. The site produced a variety of ceramic sherds assignable to a Coles Creek cultural affiliation. The State of Louisiana Site Record Form indicates that Site 16IV148 has been disturbed heavily by previous construction and that the site contained no evidence of intact cultural deposits. Site 16IV148 was assessed as not significant, and no additional testing of the site was recommended.

Finally, Site 16IV151 was recorded by Gendel and Goodwin in 1985, and it too was situated in the vicinity of the proposed Alhambra to Hohen-Solms project corridor in Iberville Parish, Louisiana. Fieldwork completed at this site consisted only of pedestrian survey. This investigation resulted in the identification of a surface scatter of cultural material, including a variety of non-diagnostic prehistoric period ceramic sherds. Additional subsurface testing in the form of shovel and auger tests failed to identify any additional cultural material. Site 16IV151 was assessed as not significant and no additional testing of the site was recommended.

Summary of the Prehistoric Sites Located within the Project Corridor

A total of seven previously identified prehistoric period sites was identified within the 2.0

km (1.2 mi) wide corridor centered on each of the 11 proposed project items encompassed by the U.S. Army Corps of Engineers, New Orleans District (Table 7). Only one of these sites (16EBR25) (14 percent) contained a single prehistoric component, a late Coles Creek-Early Plaquemine period mound. At least six of the sites (16AN3, 16EBR79, 16IV126, 16IV147, 16IV148, and 16IV151) (86 percent) contained both prehistoric and historic period components. A total of three of these sites (16AN3, 16IV147, and 16IV151) (50 percent) were listed as having an undetermined prehistoric cultural affiliation. Site 16EBR79 located in East Baton Rouge Parish produced evidence of a late Coles Creek-Plaquemine Period component, Site 16IV126 in Iberville Parish was characterized as a Marksville/Troyville period site, and Site 16IV148 was identified as a Coles Creek period cultural resource.

Historic Period Sites located within the Project Corridor

The Mississippi River between the Gulf Coast and the Mississippi State border has been settled extensively by Europeans since the late eighteenth century. This settlement resulted in the formation of numerous archeological sites, particularly those sites associated with former plantations. Since the initial settlement of the area, a variety of townships, industrial complexes, and other historic period settlements have developed. These developments undoubtedly impacted and/or destroyed many of the existing prehistoric sites in the area. Thus, it is likely that there is a disproportionately high number of historic versus prehistoric sites recorded in the vicinity of the 11 project items. Modern construction also has impacted the integrity of both the prehistoric and historic period sites located within the overall study area.

Previously Recorded Archeological Sites in Ascension Parish

Of the 11 previously recorded sites located in Ascension Parish only one (16AN3) (9 percent) is a multi-component site that contains both prehistoric and historic period components (Table 7). This site, discussed previously above, produced evidence of a prehistoric period mound and historic burials that date from an un-

known time period. Pedestrian survey of the site area indicated that the mound and the surrounding cultural deposits had been destroyed by industrial construction. Site 16AN3 was not assessed formally and no management recommendations were included on the submitted site form.

The remaining 10 sites (16AN19, 16AN20 - 16AN22, 16AN26, 16AN51, 16AN57 - 16AN59, and 16AN61) were all characterized as single component historic period sites. A number of these sites (16AN19, 16AN20 - 16AN22, 16AN26, and 16AN51) (60 percent) represented the remains of former plantations. Site 16AN19 was reported by Castille in 1977, and it was described as Noel Plantation. This site dated both from the late nineteenth to the twentieth centuries. Fieldwork at this site consisted only of windshield survey. Site 16AN19 was not assessed formally and no recommendations concerning additional testing were included on the examined site form.

Site 16AN20 also was reported by Castille in 1977, and it was described as New Hope Plantation. The plantation dated from both the nineteenth and twentieth centuries, and it consisted of the big house, the overseer's house, and six workers dwellings. The field methods utilized to examine the site were not specified on the State of Louisiana Site Record Form; however, the site reportedly possessed good archeological integrity. Site 16AN20 was assessed as potentially significant; however, no management recommendations or recommendations for additional fieldwork were included on the submitted site form.

Site 16AN21 was reported by Castille in 1977, and it was described as the Ascension Plantation. While it was reported that the site dated from the nineteenth century, efforts to identify structures within the plantation boundaries were unsuccessful. Site 16AN21 was not formally assessed and no recommendations concerning additional testing at the site were included on the completed site form.

Site 16AN22 also was reported by Castille in 1977, and it consisted of two structures possibly related to the Delicia or Arlington Plantations. The site dated from the late nineteenth - early twentieth century. No other information concerning this site was included on the State of

Louisiana Site Record Form. Site 16AN22 was assessed as potentially significant, however, no recommendations for additional testing of the site were included on the examined site form.

Site 16AN26 was reported in 1979, and it was described as the Ashland-Belle Helene Plantation. Fieldwork conducted at this site included pedestrian survey, shovel and auger testing, unit excavation, and backhoe trenching. According to the State of Louisiana Site Record Form, the Ashland-Belle Helene Plantation dated from ca. 1840 - 1930s. The main house of the Ashland-Belle Helene Plantation was listed to the National Register of Historic Places in 1979. The surrounding grounds were assessed as potentially significant. No recommendations concerning additional testing at the plantation were reported. In a letter dated June 21, 1995 from the Louisiana State Historic Preservation Office (SHPO) to the U.S. Army Corps of Engineers, New Orleans District Mr. Gerri Hobdy, the SHPO Officer, agreed that the Corps' plans to enlarge and improve a section of the Carville to Marchand levee and slope pavement would have no future impact on Site 16AN26.

Site 16AN51 was reported by Beavers and Lamb in 1990, and it was described as the ruins of the Southwood Plantation sugar mill. This site contained a number of brick foundations and a small section of a narrow gauge railroad track. These cultural features reportedly dated from the late nineteenth century. The remains of the Southwood Plantation sugar mill were assessed as potentially significant; however, no management recommendations or recommendations for additional testing were included on the examined site form.

Of the remaining four sites within Ascension Parish (16AN57 - 16AN59, and 16AN61), one site (16AN57) was classified as a historic component of unknown age, one site (16AN58) was characterized as a nineteenth century historic period site, one site (16AN59) was described as a nineteenth century sugar mill, and one site (16AN61) was classified as a brick tomb with skeletal remains. Each of these sites is described below.

Site 16AN57 was reported by Lindemuth and Lemke in 1995, and it was described as a historic period material scatter and concrete foundation that may represent the remains of a

cattle dipping vat. Pedestrian survey augmented by shovel testing produced a number of historic period ceramic sherds and brick fragments. Site 16AN57 was assessed as not significant. No additional fieldwork was recommended.

Site 16AN58 also was reported by Lindemuth and Lemke in 1995, and it too was described as a historic period material scatter. Pedestrian survey augmented by the excavation of a number of shovel tests resulted in the collection of an artifact assemblage that contained historic period ceramics, nails, brass lamp parts, and bottle glass. Site 16AN58 may have represented the remains of a former unidentified plantation site; however, this was not confirmed. This site was assessed as potentially significant and avoidance of the site during pipeline construction was recommended. Monitoring of the construction through the site was recommended if avoidance proved impossible.

Site 16AN59 was reported by Rivet in 1996, and it was described as a historic period material scatter associated with the ruins of a sugar mill. Pedestrian and metal detector survey resulted in the collection of agricultural, domestic, and personal artifacts. Site 16AN59 dated from ca. 1820 - 1920. Site 16AN59 was not assessed formally, however, additional subsurface testing to delineate the horizontal and vertical boundaries of the site was recommended.

Finally, Site 16AN61 was reported by Hays in 1997, and it was described as the remains of a historic tomb with associated human skeletal remains dating from the mid to late nineteenth century. Pedestrian survey of this site resulted in the identification of human skeletal elements, brick fragments, and coffin parts. Site 16AN61 was assessed as potentially significant and additional testing of the site was recommended.

Previously Recorded Archeological Sites in East Baton Rouge Parish

Of the 22 previously recorded sites located in East Baton Rouge Parish, two sites (16EBR25 and 16EBR79) (10 percent) were characterized as multi-component sites that contained both prehistoric and historic period components (Table 7).

Site 16EBR25 was reported by Jones and Shuman in 1986 and by Whitmer in 1991, and it was located on the grounds of the Louisiana

State Capitol. The site consisted of a prehistoric component that dated from the late Coles Creek/early Plaquemine period. The prehistoric component contained a mound and associated midden. The site also contained a historic component that dated to the nineteenth century. During the first half of the nineteenth century, the site was used as part of the Baton Rouge port. During the Civil War, the prehistoric mound was employed as an artillery and as a look-out post. In addition, the mound also was used as a cemetery for military officers and their families. Site 16EBR25 was assessed as potentially significant.

Site 16EBR79 was reported by Whitmer in 1991, and it also was located on the grounds of the Louisiana State Capitol. The site contained both a prehistoric component dating from the Coles Creek-Plaquemines period and a historic component, consisting of the Capitol Building and the surrounding grounds, that dated from 1779 - present. Site 16EBR79 included portions of the Powder Magazine (Old Arsenal), the Old Louisiana State University Campus, the Old Protestant and Old Military Cemeteries, Fort Baton Rouge, the New State Capitol, and the Capitol Lakes Area. This site was listed on the National Register of Historic Places in 1982.

The remaining 20 historic period sites located in the project corridor in East Baton Rouge Parish are single component historic period sites. These sites included Sites 16EBR8, 16EBR19, 16EBR24, 16EBR29, 16EBR41, 16EBR43 - 16EBR45, 16EBR55, 16EBR58, 16EBR59, 16EBR75, 16EBR81, 16EBR90 - 16EBR92, 16EBR99, 16EBR150, 16EBR151, and 16EBR155. All are single component historic sites. Site 16EBR8, the Old State Capitol, was recorded and listed in the National Register of Historic Places in 1974. Fieldwork at this significant cultural resource was limited to a pedestrian survey. Artifacts recovered from the site included mid to late nineteenth century ceramic sherds, glass, metal, bone, shell, brick, cement fragments, and slate. In addition, it was reported that the site also was associated with outbuildings scattered throughout the area, and that a possible prehistoric component also was present at the site. No other information about the prehistoric component was contained on the submitted site form. Since Site 16EBR8 was listed

to the National Register of Historic Places, it was recommended that the site be monitored during future construction or restoration work at the site or on the Old State Capitol grounds.

Site 16EBR19, the State Penitentiary Site, was recorded by Hahn in 1989, and it contained the remains of numerous brick foundations, as well as a number of late nineteenth - twentieth century historic period ceramic sherds, glass shards, and metal fragments. The foundations and historic artifacts were noted during auger testing and unit excavation. Additional testing of the site in 1991 included pedestrian survey and it revealed that large portions of the site had been destroyed by previous construction. The remaining portions of the site, however, were covered by standing structures and they had been preserved in place. The site apparently was not assessed and no recommendations concerning additional fieldwork were included on the examined site form.

Site 16EBR24, Fort Richmond, was reported by Paige in 1982, and it was described as a military fortification that dated from 1779 - 1810. While the size of the site and the methods of investigation were not reported on the submitted site form, a description of the collected cultural material was provided. Historic artifacts recovered from Site 16EBR24 included gunflints, cannon balls, a silver coin dating from 1789, and a variety of historic period ceramic sherds. While Site 16EBR24 was assessed as potentially significant, no recommendations for additional testing were included on the reviewed site form.

Site 16EBR29, the Civic Center Site, was recorded by Haag in 1974, and it was identified on a bluff that overlooks the City of Baton Rouge. The site contained several wells and privies associated with Catfish Town and Beauregard Town. Pedestrian survey and unit excavation produced a variety of glass shards, historic ceramic sherds, brick and mortar fragments, and faunal material dating from the eighteenth - twentieth century. Despite subsurface testing, the Civic Center Site, was not assessed and no recommendations for additional testing were included on the examined site form. Data contained on the State of Louisiana Site Record Form suggested that Site 16EBR29 has been destroyed.

Site 16EBR41 was reported by Paige in 1983, and it was described as the remains of Longwood Plantation. According to the State of Louisiana Site Record Form, the Longwood Plantation house dates from ca. 1790, and it was still standing at the time of survey. Unfortunately, no information concerning survey methods, site size, or material recovered from the site were reported on the Site Record Form. Site 16EBR41 was assessed as potentially significant, however, no recommendations for additional testing were provided on the examined site form.

Site 16EBR43, the Pentagon Barracks Site, was recorded by Louisiana State University in 1988. The site was characterized as four standing brick structures that were constructed in 1819; the buildings served as military barracks. Initial testing at Site 16EBR43 consisted of pedestrian survey and shovel testing. Artifacts recovered included historic ceramic sherds, glass shards, and brick fragments.

According to the State of Louisiana Site Record Update Form, the Pentagon Barracks Site was revisited by Wurtzburg in 1992. Reinvestigation of the site included unit excavation augmented by the excavation of several backhoe trenches. Fieldwork produced a variety of historic ceramic sherds, glass shards, metal fragments, and wood fragments. In addition, the excavations revealed a cistern located in the central plaza of the barracks compound. The Pentagon Barracks Site was listed on the National Register of Historic Places in 1973, thus, no additional testing of the site was recommended. The cistern and the surrounding deposits, however, were assessed as potentially significant.

Site 16EBR44 was recorded by Castille and Morgan in 1976, and it was described as a historic period material scatter located on a lot where a structure once stood. Fieldwork at Site 16EBR44 included pedestrian survey, but what (if any) cultural material was collected was not reported. Site 16EBR44 was not assessed formally and no recommendations pertaining to additional testing were included on the examined site form.

Site 16EBR45 was recorded by Castille in 1975, and it was characterized as a historic period material scatter of unknown temporal affiliation. Fieldwork consisted only of pedestrian

survey. No information pertaining to the cultural material collected from the site was reported on the Site Record Form, and though it was suggested that the site may represent the remains of a former residence. Site 16EBR45 was not assessed formally and no recommendations concerning additional testing at this site were included on the submitted site form.

Site 16EBR55 initially was recorded by Paige in 1983, and it was described as the possible location of Fort Bute. It was suggested that the site represented a ca. 1803 -1860 occupation; however, no information concerning site size or cultural material recovered was provided.

Additional testing of Site 16EBR55 was conducted by Hays in 1995. Pedestrian survey and shovel testing of the site area failed to produce any cultural material that could be associated with the fortification. The investigators suggested that Site 16EBR55 may have eroded into the Mississippi River. Site 16EBR55 was assessed as not significant and no additional testing of the site was recommended.

Site 16EBR58 initially was recorded by Paige in 1982, and it was reported to be the former location of the Florida Street Wharf. No information concerning survey methods, cultural material collected, or the cultural affiliation of the site was contained on the examined site form.

Additional testing of Site 16EBR58 was conducted by Hinks in 1992 and it consisted of the excavation of several auger tests and a single 1 x 2 m (3.3 x 6.6 ft) unit. These excavations resulted in the recovery of historic period ceramic sherds, glass shards, wire nails, iron fragments, brick fragments, coal, concrete, fragments of roofing slate, and oyster shell. The investigators suggested that Site 16EBR58 dated from ca. 1850s - 1920, even though the recovered cultural materials mostly post dated ca. 1940. No evidence of the Florida Street Wharf was identified during survey. Site 16EBR58 was assessed as not significant and no additional testing of the site was recommended.

Site 16EBR59 was recorded by Paige in 1983. The site was described as the former location of Zachary Taylor's House and it dated from between 1803 - 1860. The State of Louisiana Site Record Form for Site 16EBR59 noted that the site was in use as a gravel parking area,

and that it had been disturbed by modern construction. No information concerning survey methods or the cultural material recovered from the site (if any) was provided on the Site Record Form. Despite some modern disturbance, Site 16EBR59 was assessed potentially significant, however, no recommendations for additional testing were included on the examined site form.

Site 16EBR75 initially was reported by Rivet in 1990, and it was described as the possible location of a wharf or steamboat landing dating from the eighteenth to nineteenth centuries. Pedestrian survey of the site area resulted in the identification of the ruins of a wharf, as well as the remains of a steamboat paddlewheel axle and drive crank. During the initial survey, Site 16EBR75 was assessed as not significant; however, the investigators recommended that the site be recorded and documented further.

Reinvestigation of Site 16EBR75 by Hinks in 1992 indicated that the paddlewheel axle and drive crank were no longer present at the site. Instead, a large concrete slab with associated iron strapping, as well as modern materials, were noted at the site. According to information contained in the State of Louisiana Site Record Update Form, Site 16EBR75 was assessed as not significant and no additional testing of the site was recommended.

Site 16EBR81 was recorded by Hornbake in 1991, and it was described as a possible late eighteenth century Spanish domestic location. Pedestrian survey resulted in the collection of a number of historic period ceramic sherds, glass shards, 1 milk glass ointment jar, 1 brick, 1 glass bottle, 1 modern can lid, several porcelain electrical insulators, and 1 porcelain pipe connector. All of this material originated from a spoil pile identified on a construction site. Thus, it appeared that Site 16EBR81 had been destroyed. Site 16EBR81 was assessed as not significant; however, it was recommended that additional testing of the areas lying adjacent to the construction site be conducted prior to any proposed development.

Site 16EBR90 was recorded in 1992, and it was described as a historic period material scatter dating from the 1840s - 1930s. Pedestrian survey resulted in the collection of a number of historic ceramic sherds, glass shards, and nails. Site 16EBR90 was assessed as not significant.

Site 16EBR91 was recorded by Wurtzburg in 1992, and it was described as the remains of a foundation and privy that dated from the mid nineteenth to early twentieth centuries. Pedestrian survey augmented by probing and the excavation of a single unit resulted in the recovery of historic ceramic sherds, glass shards, nails, bone buttons, and a bone toothbrush. According to the State of Louisiana Site Record Form the privy extended to a depth of 1.55 m (61.2 in) below ground surface. Extensive disturbance relating to grading and construction of a parking lot had imported the cultural deposits. According to the Louisiana Site Record Form, Site 16EBR91 was assessed as not significant and no additional testing was recommended.

Site 16EBR92 was recorded by Dutton and Wurtzburg in 1992, and it was characterized as a dense scatter of historic material dating from 1790 - 1800. This site was discovered during the excavation of a construction trench. The trench produced approximately 554 gunflints manufactured mostly from English and French cherts, as well as a single military button. The site was interpreted as possibly the remains of a military cache. According to the Louisiana Site Record Form, Site 16EBR92 was disturbed by construction of a parking lot, leaving no intact cultural deposits. Site 16EBR92 was assessed as not significant and no additional testing was recommended.

Site 16EBR99 was recorded by Hinks in 1992, and it was described as the remains of the W.G. Coyle Company's upper coal yard. Pedestrian survey augmented by auger testing and unit excavation resulted in the collection of numerous historic ceramic sherds, glass shards, 1 .58 caliber Union bullet, numerous nails, unidentified iron objects, wooden boards and pilings, brick, coal, and modern debris. The site was characterized as an antebellum and Civil War landing. Due to extensive disturbance from prior pipeline and levee construction, Site 16EBR99 was assessed as not significant. No additional testing of the site was recommended.

Site 16EBR150 was recorded by Hays in 1996, and it was described as a late eighteenth century brick foundation located approximately 132 m (433.1 ft) south-southwest of the Site 16EBR43, the Pentagon Barracks Site. The excavation of both units and backhoe trenches at

Site 16EBR150 resulted in the collection of numerous historic period ceramic sherds, a black glass wine bottle, a British pharmaceutical bottle, a Spanish coin dating from 1783, two pewter American military buttons, and a number of rose head machine cut nails. It appeared that the foundation was military in origin. Site 16EBR was assessed as significant and avoidance of the site during future construction was recommended.

Site 16EBR151 also was recorded by Hays in 1996, and it was characterized as a historic period midden, a brick pier, and a wooden post that apparently the remains of a house. These items were noted during mechanical excavation of the site area. Recovered historic period cultural material included glass shards, metal, ceramic sherds, brick fragments, and gunflints. Site 16EBR151 was described as the remains of a nineteenth to twentieth century residence. Because of prior disturbance of the site area, Site 16EBR151 was assessed as not significant. No additional testing of the site was recommended.

Finally, Site 16EBR155 was recorded by Hays in 1996, and it was described as a brick and concrete foundation that dated from the late nineteenth to mid twentieth century. The site appeared to be the remains of a former Louisiana State University Campus building. The site was exposed during the construction of the Central Utilities Plant. No cultural material was collected from the site. Site 16EBR155 was assessed as not significant and no additional testing of the site was recommended.

Previously Recorded Archeological Sites in Iberville Parish

Of the nine previously recorded sites located in Iberville Parish, four sites (16IV26, 16IV147, 16IV148, and 16IV151) (45 percent) were multi-component in nature (Table 7). Site 16IV126 was recorded by Shenkel in 1976, and it was described as a prehistoric midden eroding from an abandoned segment of the levee. Although the field methods employed during survey and the artifacts recovered were not specified, it was suggested that the prehistoric component of Site 16IV126 dated from the Marksville and Troyville periods. In addition, survey resulted in the recovery of a number of unspecified artifacts dating from the late eight-

eenth century. Site 16IV126 was not formally assessed and no recommendations concerning additional testing of the site were provided on the submitted site form.

Site 16IV147 initially was recorded by Gendel in 1985, and it was described as a surface scatter of historic period artifacts of an undetermined cultural affiliation. Recovered material included historic ceramic sherds, bricks, and glass shards. It was suggested, however, based on mean ceramic dates of 1792.1 and 1779.7 that the site possibly represented the remains of a Colonial Period Arcadian farmstead. In addition, prehistoric sherds of an undetermined cultural affiliation also were recovered from the site.

Additional fieldwork was conducted at Site 16IV147 in 1987. This fieldwork consisted of shovel and auger testing, and the examination of eroding bluff line. The results of the reinvestigation indicated that Site 16IV147 consisted of a brick scatter and an area of thermally altered soil. It was suggested at that time that Site 16IV147 might possibly represent the remains of a nineteenth century furnace. Only a small portion of the site remained as of 1987, the rest having eroded previously into the Mississippi River. Site 16IV147 was assessed as not significant and no additional testing of the site was recommended.

Site 16IV148 was recorded by Gendel and Goodwin in 1985, and it contained both prehistoric and historic period components. Fieldwork included shovel and auger testing throughout the site area. Prehistoric artifacts recovered from Site 16IV148 included ceramic sherds dating primarily from the Coles Creek period. Historic artifacts recovered from the site included ceramic sherds and glass shards possibly dating from the late nineteenth century. Site 16IV148 had been impacted heavily and it appeared that no intact cultural deposits remained. Site 16IV148 was assessed as not significant and no additional testing of the site was recommended.

Site 16IV151 was recorded by Gendel and Goodwin in 1985, and it contained both a historic and a prehistoric component. Fieldwork consisted of pedestrian survey, shovel testing, and the excavation of a single auger test. Artifacts recovered from the prehistoric component of Site 16IV151 consisted only of non-

diagnostic ceramic sherds. Artifacts recovered from the historic component of the site included ceramic sherds, metal, and brick fragments. The historic component of the site dated from ca. 1859 based on the calculation of a mean ceramic date for the site. In addition, the historic component of the site appeared to represent the remains of the Celeste Plantation. All of the artifacts recovered from Site 16IV151 originated from the surface and no *in situ* cultural deposits were noted throughout the site area. Site 16IV151 was assessed as not significant and no additional testing of the site was recommended.

The remaining sites in Iberville Parish (16IV136, 16IV140, 16IV141, 16IV149, and 16IV150) contained only historic period artifacts. Of these five sites, three of them (16IV136, 16IV149, and 16IV150) (60 percent) consisted of historic material scatters dating from the nineteenth to twentieth centuries, 1 site (16IV140) (20 percent) was characterized as a military fortification, and 1 site (16IV141) (20 percent) was described as a plantation.

Site 16IV136 was recorded by Gagliano, McCloskey, and Castille in 1979, and it was described as a historic period material scatter. Fieldwork conducted at this site consisted only of pedestrian survey. Artifacts recovered from the site included historic period ceramic sherds, nails, brick fragments, coal, mortar, and a number of unspecified bone fragments. The artifacts recovered from Site 16IV136 ranged in age from ca. 1820 - 1920, but the material originated from disturbed contexts. Site 16IV136 was assessed as not significant and no additional testing of the site was recommended. A Site Record Update Form was completed for Site 16IV136 by Bureman in 1983, but no new information about the site was reported.

Site 16IV140 initially was recorded by Paige in 1983, and it was described as the possible location of a Spanish fort established in 1767. The location of this site was determined on the basis of prior historic map research. While pedestrian survey of the site area was conducted, on information pertaining to the methods employed or the artifacts recovered was contained on the submitted site form.

Site 16IV140 was revisited by Hays in 1995 and it was subjected to additional pedestrian survey. The 1995 fieldwork also failed to

produce cultural material associated with the 1767 Spanish fortification. It was hypothesized that the site had been destroyed previously by the meandering of the Mississippi River. Site 16IV140 was assessed as not significant and no additional testing of the site was recommended.

Site 16IV141 was recorded by Van Horn in 1983, and it was described as the former location of the Belle Grove Plantation House. The plantation house was constructed ca. 1850 and it was demolished following the end of World War II. Pedestrian survey of the site failed to produce any cultural material associated with the Belle Grove Plantation House. Site 16IV141 was assessed as not significant.

Site 16IV149 initially was recorded by Gendel in 1985, and it was characterized as an historic period sheet midden. Pedestrian survey augmented by the clearing of two bankline profiles resulted in the identification of an intact brick floor. While the majority of Site 16IV149 had eroded into the river, the remaining portion represented the location of an early nineteenth century Acadian farmstead. The analysis of the historic period ceramic sherds resulted in a mean ceramic date of 1815.96.

Site 16IV149 was revisited by Gendel in 1987. Additional fieldwork conducted at the site included auger testing augmented by the excavation of two 1 x 1 (3.3 x 3.3 ft) units and an examination of the exposed bankline. Artifacts recovered from the site included historic period ceramic sherds, coal, faunal remains, and brick fragments. It appeared that the site represented the redeposited remains of a ca. 1830s refuse deposit associated with Celeste Plantation. As of 1987, only a small portion of the midden remained intact and no structural features were identified as a result of this investigation. Site 16IV149 was assessed as not significant and no additional testing of the site was recommended.

Site 16IV150 was recorded by Gendel and Goodwin in 1985, and it was described as a historic period material scatter dating from the late eighteenth century. Fieldwork at Site 16IV150 consisted of pedestrian survey augmented by both shovel and auger testing. Pedestrian survey of the area produced a variety of historic ceramic sherds, glass shards, metal, and brick fragments. Shovel and auger testing, however, failed to produce any additional cultural mate-

rial. Site 16IV150 was assessed as not significant and no additional testing of the site was recommended.

Previously Recorded Archeological Sites in Orleans Parish

Only four historic period sites (16OR90, 16OR96, 16OR120, and 16OR121) have been previously recorded in Orleans Parish (Table 7). Site 16OR90 initially was recorded by Clemenson in 1983, and it was described as the remains of the Beka Plantation. The Beka Plantation was revisited by Yakubik in 1991. Reinvestigation at the site led to the identification of numerous historic cultural material scatters, the great house, slave quarters, and a sugar house. According to Yakubik (1991), the cultural deposits at the Beka Plantation were intact. The site was assessed as significant.

Site 16OR96 was recorded by Gendel and Goodwin in 1983, and it was described as historic period material scatter associated with a brick floor. Fieldwork, including backhoe trenching, resulted in the collection of a variety of faunal remains, historic ceramic sherds, and charcoal. The brick floor was characterized as the remains of a historic house. The presence of the faunal material and the charcoal suggested that the examined portion of Site 16OR96 coincided with the remains of the kitchen area. Site 16OR96 was assessed as potentially significant, and preservation of the site was recommended.

Site 16OR120 was recorded by Franks in 1988, and it was described as a surface scatter of historic period bottles. The site dated from the late nineteenth to early twentieth century and it was assessed as not significant. No additional testing of Site 16OR120 was recommended.

Site 16OR121 was recorded by Franks in 1988, and it was described as a portion of a road that led from the Beka Plantation (16OR90) to the plantation river landing. No cultural material was collected from the site; however, the road may date from the nineteenth century. Site 16OR121 was assessed as not significant and no additional testing of the site was recommended.

Previously Recorded Archeological Sites in Plaquemines Parish

Only one site (16PL48) was identified within the study corridor of the Lower Venice

2nd Lift project item in Plaquemines Parish (Table 7). Site 16PL48 was recorded by Gagliano and Castille in 1977, and it was described as a fishing village known as "The Jump." According to the State of Louisiana Site Record Form, an 1884 USGS map of the area depicted five structures in the vicinity of the site; however, no structural remains were identified during pedestrian survey of Site 16PL48. It was suggested that the site had been destroyed by construction of a modern industrial complex. Site 16PL48 was assessed as not significant and no additional testing was recommended.

Summary of the Historic Sites Located within the Project Corridor

This records review revealed that 44 percent of the historic period sites located within the limits of the overall project consisted of historic period material scatters (Table 7). These sites ranged in date from the eighteenth to the twentieth century and they produced a wide variety of artifacts.

In addition, four sites (16EBR59, 16EBR91, 16EBR155, and 16OR96) were identified that possess similarities to the historic period material scatters. Site 16EBR59 was in fact listed as the location of a possible historic residence. Site 16EBR91 consisted of a series of historic privies that were most likely associated with a domestic site. Site 16EBR155 contained a brick and concrete foundation, and it also may have served a domestic function. Finally, Site 16OR90 consisted of a brick floor revealed during mechanical excavation. This site also may represent the remains of a historic period residence.

In addition to the aforementioned historic residences, 10 plantation sites were identified within the proposed project corridors. These plantations included the Noel Plantation, the New Hope Plantation, the Delicia or Arlington Plantations, the Ashland Belle Helene Plantation, the Southwood Plantation and sugar mill ruins, the Belle Grove Plantation, the Beka Plantation, and two unidentified plantations. These sites are the second most common type of historic cultural resources located in the project corridor, and they ranged in date from the early nineteenth to the twentieth century. In addition to a variety of historic artifacts, architectural

features common to these plantation sites included great houses, overseers houses, slave quarters, kitchens, gins, sugar mills and barns. Given that plantation agriculture played such an important role in the economic development of the state, it is not too surprising that historic plantation sites were so common throughout the overall project area.

In addition, four military-related sites (16EBR24, 16EBR43, 16EBR55, and 16IV140) were identified within the project corridor. These sites included a single known fortification, two possible fortifications identified, and a barracks. The known fortification (16EBR24) dated from ca. 1779 - 1880. Of the two possible fortifications, one (16EBR155) dated from ca. 1803 - 1860. The other possible fortification (16IV140) simply dated from the historic period. Unfortunately, efforts to locate these two possible fortifications failed to identify any cultural material. It was suggested that both sites were no longer extant and that they had eroded into the Mississippi River. Finally, the historic barracks (16EBR43) has been excavated, and it dates from 1819 - present.

Other historic sites located within the proposed project items included three governmental sites (16EBR8, 16EBR19, and 16EBR79), a portion of a historic road (16OR121), a historic brick tomb with associated human remains (16AN61), and a historic fishing village known as "The Jump" (16PL48). The three governmental sites (16EBR8, 16EBR19, and 16EBR79) all were located in close proximity and within the area surrounding the State Capitol Building in Baton Rouge. They consisted of the Old State Capitol building, the Louisiana State Penitentiary, and the current State of Louisiana Capitol Grounds. These sites ranged in date from 1779 - present. The historic brick tomb with the associated human remains dated from the mid to late nineteenth century and the fishing village known as "The Jump" was established in the late nineteenth to early twentieth century. Unfortunately, "The Jump" has been destroyed.

All of the historic sites located within the various project corridors were located in the area situated immediately adjacent to the Mississippi River. The plantations were established near the river, not only to exploit the rich, arable bottomlands, but also to take advantage of the Mis-

issippi River as a mode of transportation for crops, supplies, and labor. Control of the Mississippi River of the many areas located adjacent to the river were easily defended, and the river itself provided a means for shipping food, supplies, weapons, horses, and soldiers over long distances in a relatively short period of time. In general, the Mississippi River served as an important economic artery throughout the historic period, and it continues to function as such today.

Standing Structures and Historic Districts Located within the Area of Potential Effect

A total of 142 individual standing structures and four historic districts were located within the 11 project items. These structures and districts were recorded by parish, and each is discussed separately below.

Ascension Parish

A total of 82 structures was located within the Alhambra to Hohen-Solms, the Hohen-Solms to Modeste, and the Carville to Marchand project item corridor in Ascension Parish (Table 8). Each of these was characterized by type and style. Structure types included the generic categories of residential, agricultural, commercial, and governmental. Structure styles included the more detailed descriptions of Queen Anne, Shotgun, Creole, Victorian, Greek Revival, Folk, Bungalow, and Classical Revival styles. Style also included the additional category of "not reported" where the structure style either was not determined or not entered on the standing structure forms.

Residential structures composed the majority of structures located in Ascension Parish. Of the 82 structures identified in Ascension Parish, 74 (90 percent) structures were characterized as residential. The remainder of the structures consisted of 4 agricultural structures (5 percent), 3 commercial structures (4 percent), and 1 governmental structure (1 percent).

Under style, the greatest number, 46 (56 percent) structures, were characterized as "not reported." The remaining 32 (44 percent) structures included 11 Shotgun style (13 percent), 7 Creole Cottage style (9 percent), 6 Creole style (7 percent), 4 Queen Anne style (5 percent), 3 Bungalow style (4 percent), 2 Folk style (3 per-

cent), 1 Victorian style (1 percent), 1 Greek Revival style (1 percent), and 1 Classical Revival style (1 percent) structure.

Of the 82 structures previously identified in Ascension Parish, only one structure (3-224, Mulberry Grove) was listed on the National Register of Historic Places. This structure was listed on the National Register of Historic Places in 1993 because it is one of only eight surviving examples of a Greek Revival plantation house in Ascension Parish, Louisiana. The remaining 81 structures have not formally been assessed.

East Baton Rouge Parish

In East Baton Rouge Parish standing structures are contained in two historic districts: the Spanish Town Historic District and the Beauregard Town Historic District (Table 8). Both districts are located in the City of Baton Rouge and are partially contained within the project corridor. Since these districts contain a large number of structures that are spread out through two separate portions of the city, they each were recorded as a separate unit rather than being divided into individual structure locations.

The Spanish Town Historic District was listed on the National Register of Historic Places in 1978. This district contains 268 structures, including residential, commercial, and governmental buildings (Table 8). These structures include Queen Anne, Shotgun, Creole, Greek Revival, Bungalow, and Classical Revival styles that date from 1823 - present. Unfortunately, the National Register of Historic Places nomination form for the district does not provide a breakdown of the exact number or the percentages of either the structure types or structure styles.

The largest number of houses in the Spanish Town Historic District (n=175) date from 1900 - 1930s and they comprise 66 percent of all the structures located in the district. Of the remaining structures, 6 (7 percent) date from before 1860, 37 (40 percent) from 1860 - 1899, 33 (35 percent) from 1940 - 1950, and 17 (18 percent) from post 1960. The majority of the structures located in the Spanish Town Historic District (n=175 or 65 percent) contain only one-story. Another 86 (32 percent) structures contain two-stories, while the remaining seven (3 percent) structures were classified as multi-story buildings.

The second historic district located in East Baton Rouge Parish, the Beauregard Town Historic District, was listed on the National Register of Historic Places in 1980. This district contains approximately 455 structures, including residential, commercial, religious, governmental, and educational buildings (Table 8). The district included examples of Queen Anne, Shotgun, Creole, Greek Revival, Bungalow, and Classical Revival structures. Unfortunately, the National Register of Historic Places nomination form did not provide a breakdown for the number or the percentages of either structure types or structure styles encompassed by the District.

The Beauregard District also includes the East Baton Rouge Courthouse and the Old Governor's Mansion. These two structures date from prior to the 1850s - present. A total of 327 residential structures in the Beauregard Historic District date from 1900 - 1930s and they comprise 72 percent of all structures encompassed by the district. Of the remaining structures, 9 (7 percent) date from before 1850, 27 (21 percent) from 1850 - 1875, 36 (28 percent) from 1875 - 1900, and 56 (44 percent) from post 1930.

Iberville Parish

A total of 60 structures was identified within the Reveille to Point Pleasant and the Alhambra to Hohen-Solms project corridor in Iberville Parish. These also were characterized by type and style. Residential structures composed the majority of the structures; 38 (64 percent) structures were classified as residential structures. In addition, 18 agricultural structures (28 percent), 2 commercial structures (4 percent), 1 religious structure (2 percent), and 1 structure of unknown function (2 percent) was identified within the 2.0 (1.2 mi) wide corridor Iberville Parish.

According to the standing structures form, 55 structures (92 percent) had "not reported" listed for architectural style. The remaining structures were characterized as shotgun (n=2 or 3 percent), French type (n=2 or 3 percent) and unknown (n=1 or 2 percent). Of these 60 structures, 59 were listed as not having been assessed formally. The remaining structure was listed as (24-660), it has an unknown National Register of Historic Places eligibility status.

Orleans Parish

In Orleans Parish, standing structures were identified in two historic districts within the City of New Orleans. These districts included the Uptown New Orleans Historic District and the Carrollton Historic District. Both districts partially were contained within the project corridor. Since both districts contained a large number of structures that were distributed throughout two separate portions of the city, they were each recorded as a separate unit rather than as individual structure locations.

The Uptown New Orleans Historic District was listed on the National Register of Historic Places in 1985. This district contained 10,716 structures. These structures include 14 structure types and 11 structure styles. The 14 structure types include Creole tradition (1 percent), raised cottages (2 percent), shotgun houses (48 percent), camel back houses (4 percent), one-story side-hall-plan houses (2 percent), multi-story side-hall-plan houses (2 percent), one-and-one-half-story center-hall plan houses (<1 percent), two-and-one-half-story center-hall plan houses (<1 percent), one-story asymmetrical-plan houses (9 percent), two-story asymmetrical-plan houses (17 percent), basement houses (10 percent), commercial buildings (3 percent), industrial buildings (<1 percent), and institutional buildings (1 percent).

A breakdown by structure types was provided in the National Register of Historic Places nomination form. Of the 10,716 structures identified, the Uptown New Orleans Historic District contained 31 (0.3 percent) Creole, 216 (2 percent) Greek Revival, 19 (0.2 percent) Gothic Revival, 1,634 (15 percent) Italianate, 743 (7 percent) Eastlake Shotgun, 574 (5 percent) Queen Anne, 1,164 (11 percent) Colonial Revival, 1,271 (12 percent) California, and 3,105 (29 percent) twentieth century eclectic style buildings. In addition, the district contained 1,959 (18.5 percent) structures classified as intrusions. The structures located in the Uptown New Orleans Historic District mostly dated from the early nineteenth century to the present, though the National Register of Historic Places nomination form for the district indicates that the historic district "... mainly represents the Victorian and early twentieth century architectural tastes with a historic period defined as c.

1820-1935." A breakdown of structure dates by time period was unavailable in the National Register of Historic Places nomination form.

The Carrollton Historic District was listed on the National Register of Historic Places in 1987. This district contained approximately 5,198 structures. These structures were divided into seven building types and eight building styles. The 7 structure types that made up the 5,198 structures, include 104 Creole cottages (2 percent), 2,339 shotgun houses (45 percent), 103 camel back houses (2 percent), 884 bungalows (17 percent), 156 side-hall houses (3 percent), 365 commercial buildings (7 percent), and 1247 "other" buildings (24 percent).

The 8 structure styles included 18 Greek Revival (<1 percent), 405 Italianate (8 percent), 154 Eastlake (3 percent), 1,953 bungalow (38 percent), 536 Colonial Revival (10 percent), 328 eclectic (6 percent), and 938 "plain & other" (18 percent) structures. In addition, the Carrollton Historic District contained 886 (17 percent) structures classified as intrusions. The structures contained in the Carrollton Historic District mostly dated from the late nineteenth century to the present, and more specifically the National Register of Historic Places nomination form for the district indicates that "the district's historic building stock, with few exceptions, represents the period c. 1880-1937."

Summary of the Standing Structures and Historic Districts Located within the Project Corridor

Unfortunately, the standing structures and historic districts contained within the various U.S. Army Corps of Engineers, New Orleans District project items have not been well documented. In general, the only information recorded for the majority of the standing structures is architectural type and style data. Architectural types found among the standing structures included residential, governmental, commercial, religious, and agricultural. Standing structure types were more varied, and they included Queen Anne, Shotgun, Creole, Victorian, Greek Revival, Folk, Bungalow, Classic Revival, and French Type. In addition, the standing structures located within the project corridors dated from between the early nineteenth century to the early twentieth century. The wide variety of standing

structures is a testament to the cultural diversity of the State of Louisiana.

Historic Period Cemeteries Located within the Area of Potential Effect

A total of six historic period cemeteries was recorded throughout the project area (Table 9). No state site numbers were assigned to any of these sites. These cemeteries included the St. Mary Baptist Church Cemetery (3-171) and St. Philip Baptist Church Cemetery (3-172); both were located in Ascension Parish. The Mt. Olive

Baptist Church Cemetery (22-554), the St. Raphael Cemetery (22-573), and an unnamed cemetery were located in Iberville Parish. Finally, an unnamed cemetery (17 percent) was identified in Plaquemines Parish. Of the six cemeteries noted, two (the unnamed cemetery in Iberville Parish and the unnamed cemetery in Plaquemines Parish) were assessed as having an unknown National Register of Historic Places eligibility status. The four remaining cemeteries have not been assessed formally.

CHAPTER VIII

SUMMARY AND RECOMMENDATIONS

Introduction

A cultural resources study sufficient to support preparation of a supplement to the Final Environmental Impact Statement, Mississippi River Tributaries, Mississippi River Levees and Channel Improvement project was undertaken by R. Christopher Goodwin and Associates, Inc. on behalf of the U.S. Army Corps of Engineers, New Orleans District. The current study included archival review, the development of "historic contexts" sufficient to evaluate the overall project area, and the preparation of this supplemental report that represents an attachment to the original Environmental Impact Statement.

The current study encompasses a total of 11 project items scattered throughout six parishes. These project items included the Fifth Louisiana District Levee Enlargement Project Item, the Baton Rouge Front Levee Project Item, the Reveille to Point Pleasant Levee Enlargement Project Item, the Carville to Marchand Levee Enlargement and Concrete Slope Pavement Project Item, the Hohen-Solms to Modesto Levee Enlargement Project Item, the Carrollton Levee Enlargement Project Item, the Alhambra to Hohen-Solms Concrete Slope Paving Project Item, the Jefferson Heights Concrete Slope Paving Project Item, the New Orleans District Flood-wall Project Item, the Gap Closures West Bank Concrete Slope Paving Project Item, and the Gap Closures East Bank Concrete Slope Paving Project Item.

This literature and records review was designed to collect data pertaining to all known cultural resources identified within a 2.0 km (1.2 mi) wide corridor that centered on each of the 11

proposed project items. This research included a review of previously conducted cultural resources surveys, previously identified archeological sites and cemeteries, previously recorded standing structures, and National Register of Historic Places properties situated within the project corridors. These data were collected from the Louisiana Department of Culture, Recreation, and Tourism, Office of Cultural Development, Division of Archeology and the Division of Historic Preservation in Baton Rouge, Louisiana. Once collected and synthesized, these data were plotted on 7.5' USGS topographic quadrangles, digitized, and converted into the REEGIS format.

Recommendations

The following section presents recommendations for all of the previously identified archeological sites, standing structures, historic districts, and cemeteries located within the 2.0 km (1.2 mi) wide corridor associated with each of the 11 proposed project items. The discussion is divided by parishes.

Ascension Parish

Ascension Parish contains 11 previously identified archeological sites located within the 2.0 km (1.2 mi) wide corridor centered on the existing levee alignments. These 11 sites have been subjected to varying degrees of investigation and National Register of Historic Places eligibility testing. Of the 11 sites identified, four (Sites 16AN3, 16AN19, 16AN21, and 16AN59) have not been assessed formally; three of the four sites (Sites 16AN3, 16AN21, and 16AN59) only have been subjected to pedestrian survey.

The fourth site (16AN19) was assessed via a "windshield" survey. Site 16AN3 was reported by Van Horn in 1983; it may have been destroyed and it is now covered by a parking lot and the plant site for Rubicon, Inc. Site 16AN3 does not possess the qualities of significance as defined by the National Register of Historic Places criteria of evaluation (36 CFR 60.4 [a-d]). No additional testing of Site 16AN3 is recommended.

Sites 16AN19, 16AN21, and 16AN59 are still intact; however, Site 16AN21 may have been impacted by the demolition of a house that previously stood at the site. Site 16AN19 and Site 16AN21 were reported by Castille in 1977 and Site 16AN59 was recorded by Rivet in 1996. Evaluation of Sites 16AN19, 16AN21, and 16AN59 may be required to assess their significance applying the National Register of Historic Places criteria of evaluation (36 CFR 60.4 [a-d]).

At least six of the previously identified archeological sites (Sites 16AN20, 16AN22, 16AN51, 16AN57, 16AN58, and 16AN61) associated with the Hohen-Solms to Modeste and the Carville to Marchand levee alignments in Ascension Parish have been assessed as potentially significant. Sites 16AN20 and 16AN22 were recorded by Castille in 1977. Site 16AN57 was reported by Beavers and Lamb in 1990. Sites 16AN57 and 16AN58 were recorded by Lindemuth and Lemke in 1995, and Site 16AN61 was recorded by Hays in 1997. While Sites 16AN20 and 16AN22 have been assessed as potentially significant, it is unclear what field methods were employed to reach such a determination. These sites have suffered only minimal disturbance and both appear to possess integrity. Evaluatory testing of Sites 16AN20 and 16AN22 applying the National Register of Historic Places criteria of evaluation (36 CFR 60.4 [a-d]) is recommended.

Sites 16AN51 and 16AN61 also were characterized as potentially significant cultural resources; they too were subjected only to pedestrian survey. While access to Site 16AN51 was limited, it appears that the site may retain research potential. Evaluatory testing or avoidance of this potentially significant cultural resource is recommended. Since Site 16AN61 consists of a historic brick tomb with associated human

skeletal remains, avoidance of this site is recommended. If avoidance of this site proves impossible, then an effort should be made to delineate the horizontal extent of the site.

Two of the previously identified archeological sites in Ascension Parish (16AN57 and 16AN58) were recorded during survey of a proposed pipeline corridor. Site 16AN57, scheduled for destruction during the construction of the proposed pipeline, was characterized as a historic period material scatter and concrete foundation. Pedestrian survey and subsurface testing of this site revealed that the site lacked integrity. It therefore was assessed as not significant. No additional fieldwork is recommended for Site 16AN57.

Site 16AN58, also scheduled for destruction to accommodate the construction of a pipeline, was characterized as a historic period material scatter. Site 16AN58 was assessed as potentially significant on the basis of a pedestrian survey and subsurface testing. Since the site was found to be potentially significant, it was avoided during the pipeline construction. As a result, Site 16AN58 remains potentially significant. Additional subsurface testing and evaluation of this potentially significant cultural resource is recommended.

Finally, one previously identified site (Site 16AN26 [Ashland-Belle Helene Plantation]) was listed on the National Register of Historic Places in 1979. This site initially was recorded by Haywood in 1979. The site was revisited by Hinks in 1989, by Babson in 1989, and by Yakubuk in 1994. The Ashland-Belle Helene Plantation Site consists of the plantation house and the surrounding archeological deposits. Previous fieldwork conducted at the site included pedestrian survey, shovel and auger testing, unit excavation, and backhoe trenching. It is recommended that impacts to this significant cultural resource be avoided.

In addition to the archeological sites identified above, 82 standing structures were recorded within the area of potential effect in Ascension Parish. A total of 66 of these structures was reported by Nakagawa in 1984 and 1985, while 15 of these structures were recorded by "P.B.M." in 1985. The remaining structure, 3-224 (Mulberry Grove) was reported by Nakagawa in 1984 and by the Division of Historical Preservation again

in 1993. With the exception of Structure 3-224 [Mulberry Grove] and the Ashland House, none of the historic buildings in Ascension Parish has been assessed formally. Therefore, an evaluation of standing structures 3-198 - 3-223, structures 3-225 - 3-262, and structures 3-620 - 3-635 should be completed to assess the significance of these standing structures applying the National Register of Historic Places criteria of evaluation (36 CFR 60.4 [a-d]). Since structure 3-224 (Mulberry Grove) and the Ashland House already are listed on the National Register of Historic Places, avoidance of these two structures is recommended.

Finally, two previously identified historic period cemeteries were located in Ascension Parish. Both were recorded by Nakagawa in 1984. These included the St. Mary Baptist Church Cemetery (3-171) and the St. Philip Baptist Church Cemetery (3-172). Neither cemetery has formally been assessed. Both locations contain human remains and both should be avoided during future construction activities.

East Baton Rouge Parish

East Baton Rouge Parish contains 22 previously identified archeological sites within the 2.0 km (1.2 mi) wide corridor centered on the Baton Rouge Front Levee alignment. These 22 sites have been subjected to varying degrees of archeological investigation. Of the 22 previously identified sites, four sites (Sites 16EBR19, 16EBR29, 16EBR44, and 16EBR45) have not been assessed formally. Two of these sites (16EBR44 and 16EBR45) only have been subjected to pedestrian survey. Both of these sites were classified as historic period cultural materials scatters.

Site 16EBR44 was recorded by Castille and Morgan in 1976, and Site 16EBR45 was reported by Castille in 1975. Sites 16EBR44 and 16EBR45 may contain intact deposits, but no information pertaining to research potential was provided on the State of Louisiana Site Record Forms. Additional subsurface testing and evaluation of these two potentially significant cultural resources is recommended.

Site 16EBR29, reported by Haag in 1974, also represents a historic period material scatter,

and its eligibility for listing to the National Register of Historic Places has not yet been assessed. Previously conducted fieldwork at this site consisted of pedestrian survey and unit excavation. The State of Louisiana Site Record Form for this site listed it as "demolished." It would appear that this site does not possess the qualities of significance as defined by the National Register of Historic Places criteria of evaluation (36 CFR 60.4 [a-d]). If this is indeed the case, then no additional testing of this site is recommended.

Site 16EBR19 is the Louisiana State Penitentiary Site. This site initially was recorded by Hahn in 1984; it was revisited by Wurtzburg in 1991. Previously conducted fieldwork at this site included pedestrian survey, auger testing, and unit excavation. This site has not been assessed formally. The site form, however, indicated that much of this site had been destroyed prior to 1989, and that the remainder of the site was scheduled for destruction soon thereafter. If the site has been destroyed, then no additional testing of Site 16EBR19 is required.

Of the 22 previously identified archeological sites located within the 2.0 km (1.2 mi) wide Area of Potential Effect in East Baton Rouge Parish, only five sites (16EBR24, 16EBR25, 16EBR41, 16EBR59, and 16EBR150) previously have been assessed as potentially significant for inclusion in the National Register of Historic Places. Site 16EBR24 was recorded by Paige in 1982, Sites 16EBR41 and 16EBR59 were reported by Paige in 1983, and Site 16EBR150 was recorded by Hays in 1996. Site 16EBR25 initially was recorded by Jones and Shuman in 1986; it was revisited by Whitmer in 1990. It is unclear what field methodologies were employed to examine Site 16EBR24 and 16EBR59. Site 16EBR24 was described as an historic fort dating from ca. 1779-1810. Site 16EBR59 was characterized as an early to mid 19th century historic residence. Since Site 16EBR24 may possess fair to good research potential, evaluatory testing of this potentially significant cultural resource is recommended.

Site 16EBR59 lies within a parking lot, and the site has been impacted considerably by prior construction. Despite these impacts, this site has

been assessed as potentially significant. Therefore, evaluatory testing of Site 16EBR59 is recommended.

One of the potentially significant sites identified in East Baton Rouge Parish (16EBR41) was classified as an historic plantation. This site has been subjected to pedestrian survey only. No information was provided on the site form concerning the status of this site. Reconnaissance survey and subsurface testing may be required to assess the eligibility of this cultural resource applying the National Register of Historic Places criteria of evaluation (36 CFR 60.4 [a-d]).

Site 16EBR150 was characterized as a late 18th century brick foundation and associated historic period material scatter. This site was assessed as potentially significant based on the results of mechanical trenching and unit excavation. Information contained on the submitted site form suggests that this site was covered with fill and preserved in place in January 1996. Since Site 16EBR150 retains intact cultural deposits that are sufficient for the study of eighteenth to nineteenth century life in Baton Rouge, it is recommended that it be avoided by future construction activities. If avoidance is impossible, then evaluatory testing of this potentially significant cultural resource may be required.

Finally, Site 16EBR25 also was assessed as potentially significant. This site was classified as a prehistoric mound that dates from the Late Coles Creek-Plaquemine period. Fieldwork conducted at the site included pedestrian survey, shovel testing, unit excavation, and soil coring. Information contained on the State of Louisiana Site Record Form suggests that Site 16EBR25 possesses good research potential. Evaluatory testing of this potentially significant cultural resource is recommended prior to any planned impacts to the site.

At least 10 of the 22 sites (16EBR55, 16EBR58, 16EBR75, 16EBR81, 16EBR90 - 16EBR92, 16EBR99, 16EBR151, and 16EBR155) have been assessed as not significant. At least six of these sites (16EBR75, 16EBR81, 16EBR90, 16EBR92, 16EBR151, and 16EBR155) were assessed as not significant only on the basis of pedestrian surveys; five of these six sites were characterized as historic period material scatters. The remaining site, Site

16EBR155, consisted of historic brick and cement foundations. Site 16EBR75 was described as a concrete slab with iron straps. Site 16EBR81, reported by Hornbaker in 1991, consisted of a historic period material scatter and it was assessed as having little or no research potential. Sites 16EBR90 and 16EBR92 were located at construction sites, and both sites have been destroyed. Site 16EBR90 was recorded by Wurtzburg and Wilkie in 1992, and Site 16EBR92 was reported by Dutton and Wurtzburg in 1992. Another site, Site 16EBR151, reported by Hays in 1996, was destroyed during the construction of a utility plant. Finally, Site 16EBR155, also reported by Hays in 1996, included brick and concrete foundation noted during construction monitoring throughout the site area. No cultural material was collected from Sites 16EBR151 and 16EBR155, and they both possessed little to no research potential. None of these sites possessed the qualities of significance as defined by the National Register of Historic Places criteria of evaluation (36 CFR 60.4 [a-d]). No additional testing of these six sites is recommended.

Both Sites 16EBR55 and 16EBR58 have been assessed as not significant. Site 16EBR55 initially was recorded by Paige in 1983; it was revisited by Hays in 1995. Site 16EBR58 was first reported by Paige in 1982; it was reinvestigated by Hinks in 1992. Site 16EBR55 was characterized as the location of a possible historic period fortification. This site apparently has eroded into the river and, therefore, it no longer exists. The area encompassing Site 16EBR58 was identified on the basis of documentary evidence alone, and its field location could not be verified during survey. Neither of these sites possessed the qualities of significance as defined by the National Register of Historic Places criteria of evaluation (36 CFR 60.4 [a-d]). No additional testing of Sites 16EBR55 and 16EBR58 is recommended.

Sites 16EBR91 and 16EBR99 also were assessed as not significant. Fieldwork at these two sites consisted of shovel and auger testing, soil probing, and unit excavation. Site 16EBR91, recorded by Wurtzburg in 1992, was described as a group of privies identified at a construction site in East Baton Rouge Parish. Site 16EBR99, reported by Hinks in 1992, was

characterized as a ca. 1810-1910 material scatter. Both sites have been destroyed and they possess no research potential. Neither site possesses the qualities of significance as defined by the National Register of Historic Places criteria of evaluation (36 CFR 60.4 [a-d]).

Only three (16EBR8, 16EBR43, and 16EBR79) of the 22 previously identified archeological sites located within the 2.0 km (1.2 mi) wide corridor centered on the existing levee alignments in East Baton Rouge Parish have been listed in the National Register of Historic Places. Site 16EBR8 was recorded by Holland in 1988 and Site 16EBR79 was reported by Whitmer in 1991. Site 16EBR43 initially was reported by Louisiana State University (n.d.) and it subsequently was revisited by Wurtzburg in 1992. Site 16EBR8 consists of the Old State Capitol building and surrounding archeological deposits. This site dates from the mid to late 19th century, and it was added to the National Register of Historic Places in 1971. Site 16EBR43 consists of a military barracks dating from 1819 to the present. This site was included in the National Register of Historic Places in 1973. Finally, Site 16EBR79 encompasses the Louisiana State Capitol Grounds. This site contains two components: a prehistoric Coles Creek-Plaquemine component and a historic component dating from 1779 to the present. Site 16EBR79 was listed in the National Register of Historic Places in 1982. It is recommended that these three sites be avoided during construction of the proposed improvements.

In addition to the 22 previously identified archeological sites, two historic districts fall within the 2.0 km (1.2 mi) wide Area of Potential Effect along the Baton Rouge Front Levee project item in East Baton Rouge Parish. These districts include the Spanish Town Historic District, reported by Thom, Jensen, and Fricker in 1977, and The Beauregard Historic District, recorded by Melby, Brown, and Fricker in 1979. The Spanish Town Historic District was listed in the National Register of Historic Places in 1978. The Beauregard Historic District was listed in the National Register of Historic Places in 1980. Since both districts are included in the National Register of Historic Places, impacts to both districts should be avoided during the implementation of planned project improvements.

Iberville Parish

Iberville Parish contains a total of nine previously identified archeological sites located within the proposed 2.0 km (1.2 mi) wide Area of Potential Effect. At least two of the sites (Sites 16IV126 and 16IV141) have not been assessed formally. Fieldwork at these two sites consisted only of pedestrian survey. Fieldwork at Site 16IV126, recorded by Shenkel in 1976, identified a multi-component resource that contained both a Marksville/Troyville period midden and a historic period material scatter dating from the 18th century. As of 1976, the site was reported as eroding into the Mississippi River. It is recommended that if the archeological deposits at Site 16IV126 are still intact, that the site be evaluated applying the National Register of Historic Places criteria of evaluation (36 CFR 60.4 [a-d]).

Site 16IV141, reported by Van Horn in 1983, was described as the former location of the Belle Grove Plantation. According to the State of Louisiana Site Record Form, the plantation house has been demolished; it does not possess the qualities of significance as defined by the National Register of Historic Places criteria of evaluation (36 CFR 60.4 [a-d]). Based on the Site Record Form, it is unclear if the surrounding archeological deposits also were impacted during demolition of the house. Subsurface investigations of Site 16IV141 are therefore recommended to determine if any intact cultural deposits remain at the site.

The remainder of the previously identified sites in Iberville Parish (n=7) have been assessed as not significant. Sites 16IV136 and 16IV140 were subjected only to pedestrian survey. Site 16IV136 initially was reported by Gagliano, McCloskey, and Castille in 1979; it was revisited by Bureman in 1983. Site 16EBR140 initially was recorded by Paige in 1983; it was revisited by Hays in 1995. Site 16IV136 was characterized as two historic period material scatters dating from the 19th to the 20th century. Site 16IV140 was characterized as a possible historic fortification. Site 16IV136 was destroyed during the grading of a now existing revetment and Site 16IV140 has eroded into the river. Neither of these sites possessed the qualities of significance as defined by the National Register of Historic Places criteria of evaluation (36 CFR 60.4 [a-d]).

No additional fieldwork is recommended for these sites.

Fieldwork at Site 16IV149, recorded by Gendel in 1985, consisted of pedestrian survey and soil probing. During survey, an early 19th century cultural material scatter was identified. This site possessed little research potential, and it therefore was assessed as not significant. This site does not possess the qualities of significance as defined by the National Register of Historic Places criteria of evaluation (36 CFR 60.4 [a-d]). No additional testing of Site 16IV149 is recommended.

Site 16IV147, reported by Gendel in 1985, consists of an undetermined prehistoric period component and a late 18th to early 19th century cultural materials scatter. After pedestrian survey, auger testing, soil probing, and unit excavation this site was determined to possess very little research potential; it was assessed as not significant. This site does not possess the qualities of significance as defined by the National Register of Historic Places criteria of evaluation (36 CFR 60.4 [a-d]). No additional testing of Site 16IV147 is recommended.

Finally, Sites 16IV148, 16IV150, and 16IV151 were subjected to pedestrian survey, shovel testing, and auger testing. These sites were recorded by Gendel and Goodwin in 1985. Site 16IV148 consisted of a prehistoric period Coles Creek component and a historic period material scatter of unknown age. Site 16IV150 was characterized as an historic period material scatter of unspecified age. Site 16IV151 consisted of a prehistoric period component of unknown cultural affiliation; it also provided evidence of a historic period cultural material scatter of unknown age. The research potential of these three sites was assessed as minimal and they all were assessed as not significant. Sites 16IV148, 16IV149, 16IV150 do not possess the qualities of significance as defined by the National Register of Historic Places criteria of evaluation (36 CFR 60.4 [a-d]). No additional testing of these three sites is recommended.

In addition to the nine previously identified archeological sites, 62 standing structures have been recorded within the 2.0 km (1.2 mi) wide project corridor centered on the Reveille to Point Pleasant and the Alhambra to Hohen-Solms project items in Iberville Parish. Of these 62

structures, seven were recorded by Nakagawa in 1983, 54 were reported by Nakagawa in 1984, and one was recorded by an unknown person. With the exception of one structure (Structure 24-660), none of the historic buildings in Iberville Parish has been assessed formally applying the National Register of Historic Places criteria of eligibility. Thus, Standing Structures 24-493 - 24-499, Structures 24-550 - 24-553, Structures 24-555 and 24-556, Structures 24-564 - 24-572, Structures 24-576 - 24-579, Structures 24-583 - 593, Structures 24-650 - 24-655, Structures 24-661 - 24-666, and Structure 24-753 - 24-762 should be evaluated prior to initiating any undertaking that may impact the significance of these structures. The current status of structure 24-660 was listed as unknown. It also should be evaluated applying the National Register of Historic Places criteria of evaluation (36 CFR 60.4 [a-d]).

Finally, three previously identified historic cemeteries exist within the proposed area of potential effect in Iberville Parish. Two of these cemeteries were recorded by Nakagawa in 1984. The remaining cemetery was recorded by an unknown person at an unknown date. These included the Mt. Olive Baptist Church Cemetery (24-554), the St. Raphael Cemetery (24-573), and an unnamed cemetery. The Mt. Olive Baptist Church Cemetery and the St. Raphael Cemetery were listed as not assessed, while the National Register of Historic Places eligibility status for the unnamed cemetery was given as unknown. Since all three of these locations contain human remains, they should be avoided during implementation of the planned undertaking.

Orleans Parish

Orleans Parish contains only four previously identified archeological sites located within the 2.0 km (1.2 mi) wide Area of Potential Effect. These four sites have undergone varying degrees of investigation. Sites 16OR120 and 16OR121, recorded by Franks in 1988, have been assessed as not significant. Fieldwork at both sites consisted only of pedestrian survey. Site 16OR120 was characterized as a late 19th to early 20th century artifact scatter, while Site 16OR121 was classified as a portion of an historic period road. The State of Louisiana Site

Record Forms suggest that neither site possesses research potential. These sites do not possess the qualities of significance as defined by the National Register of Historic Places criteria of evaluation (36 CFR 60.4 [a-d]). No additional testing is recommended for these sites.

One of the sites (16OR96) identified in Orleans Parish, however, was evaluated as potentially significant. This site, recorded by Gendel and Goodwin in 1983, consisted of a historic brick floor that dated from ca. 1830-1870. This feature was located during backhoe trenching and construction of the site. The site form indicates that the site was "preserved in place pending renovations." It is recommended that Site 16OR96 be avoided in the future. Additional subsurface testing of the site is recommended if avoidance proves impossible.

Finally, one site (16OR90) within the examined study area was assessed as significant. This site was classified as the ruins of the Beka Plantation, and it dates from the 19th to the early 20th century. Site 16OR90 initially was recorded by Clemensen in 1983; it was revisited in 1991 by Yakubik. Site 16OR90 was assessed as significant. Fieldwork at the site consisted of pedestrian survey, shovel testing, and unit excavation. Site 16OR90 should be preserved in place and if impacts to the site cannot be avoided, then data recovery of this significant cultural resource is recommended.

In addition to the four previously identified archeological sites, a total of two historic districts have previously been identified within the two-kilometer-wide (1.2 mi) corridor centered on the existing levee alignments Orleans Parish. These districts include the Uptown New Orleans Historic District and the Carrollton Historic District. The Uptown New Orleans Historic District was recorded by the Preservation Resource Center and the Division of Historic Pres-

ervation and it was listed in the National Register of Historic Places in 1985. The Carrollton Historic District was reported by the Division of Historic Preservation in 1987 and it was listed in the National Register of Historic Places in 1987. Since both districts have been included in the National Register of Historic Places, it is recommended that both be avoided during future construction activities associated with the existing levee alignments in Orleans Parish.

Plaquemines Parish

Only one previously identified archeological site (Site 16PL48) was identified within the 2.0 km (1.2 mi) wide corridor associated with the Lower Venice 2nd Lift project item. This site was recorded by Gagliano and Castille in 1977 and it was characterized as a late 19th to early 20th century fishing village. Previous investigations at Site 16PL48 included pedestrian survey and archival review; however no formal assessment of the National Register significance of this site was completed. The State of Louisiana Site Record Form for Site 16PL48 suggests that this cultural resource has been destroyed. If this is the case, then Site 16PL48 does not possess the qualities of significance as defined by the National Register of Historic Places criteria of evaluation (36 CFR 60.4 [a-d]), and no additional testing of the site is recommended.

Finally, a single previously identified historic cemetery exists within the 2.0 km (1.2 mi) wide Area of Potential Effect in Plaquemines Parish. This site is unnamed and its National Register of Historic Places eligibility status is listed as unknown. Since this site contains human remains, it is recommended that the site be avoided by future construction activities planned for the existing levee alignments by the U.S. Army Corps of Engineers, New Orleans District.

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APPENDIX I

SCOPE OF SERVICES

SCOPE OF WORK

CULTURAL RESOURCES STUDY SUPPORTING
SUPPLEMENT I TO THE FINAL ENVIRONMENTAL IMPACT STATEMENT,
MISSISSIPPI RIVER MAIN LINE LEVEE
Contract No. DACW29-97-D-0018

SCOPE OF SERVICES

1. General Statement of Work. Services to be provided under this scope are those required to conduct cultural resources studies sufficient to support preparation of a supplement to the Final Environmental Impact Statement (SEIS), Mississippi River and Tributaries, Mississippi River Levees and Channel Improvement, which was filed with the Council on Environmental Quality in 1976. This work will support compliance with both the National Environmental Policy Act of 1969, and the National Historic Preservation Act of 1966, as amended. The cultural resources studies will consist of: (1) archival research; (2) a synthesis of information following the general approach of devising "historic contexts" suitable for guiding later identification, evaluation, and mitigation actions needed for specific work location; and (3) preparation of a summary statement for use in the SEIS, along with a technical report suitable for reference or inclusion as an attachment to the SEIS. In addition, master maps will be plotted and GIS data will be digitized.

2. Project Background. It is assumed the contractor is generally familiar with the Mississippi River and Tributaries Project, authorized by Congress in the Flood Control Act of 1928. The four major elements of the project are: (1) levees for containing flood flows; (2) floodways for the passage of excess flows; (3) channel improvement and stabilization for the channel to aid navigation alignment, increase flood-carrying capacity, and protect the levees; and (4) tributary basin improvements such as dams and reservoirs, pumping plants, auxiliary channels, and the like. The main levee system involves approximately 1,607 miles of levees, floodwalls, and various control structures along the Mississippi River. Batture land is that alluvial land found between the levee and the river at low stage. Of this levee

system, 626 miles exist in the United States Army Corps of Engineers (USACE) Memphis District, 460 miles exist in the USACE Vicksburg District, and 521 miles exist in the USACE New Orleans District. The flood control plan is designed to control the "project flood" which would be larger than the record flood of 1927. At Cairo, Illinois, the project flood is estimated at 2,360,000 cubic feet per second (cfs). About 60 miles below Natchez, Mississippi, near Red River Landing, this would be 3,030,000 cfs. Downstream from that point, flood flow would be divided between the Atchafalaya River (Morganza and West Atchafalaya Floodways, and the Old River Control Structures) and the main channel of the Mississippi River (including diversion to Lake Pontchartrain and the Gulf of Mexico through the Bonnet Carré Spillway). Although a final Environmental Impact Statement (EIS) for this project was filed April 8, 1976, under provisions of the National Environmental Policy Act, the SEIS (see General Statement of Work, above) is required for all remaining levee and seepage control construction items. Of the total levee system described above, the amount of levees remaining to have final construction modifications involves approximately 60 miles of levee in the Memphis District, 220 miles of levee in the Vicksburg District, and an estimated 15 miles of levee in the New Orleans District. The SEIS will discuss and evaluate the various alternatives for avoiding, minimizing, and mitigating for unavoidable adverse impacts to significant environmental resources during construction of the remaining levee items. Environmental impacts, both beneficial and adverse, will be estimated and unavoidable impacts described. Uncompensated losses will be identified and compensatory mitigation alternatives developed. The Vicksburg District, in cooperation with New Orleans and Memphis Districts, will have overall management, coordination, funding, and scheduling of funding responsibilities throughout the SEIS process.

3. Study Area. The study area for this item of work consists of a total of approximately 15 miles of levees among the system covered by the New Orleans District. The cultural resources study will focus on levees depicted by maps provided separately. The area of potential effect for purposes of this SEIS and its cultural resources investigations shall be considered a 2-kilometer-wide corridor centered on the levee alignment. That is, investigations including records search will cover at least 1 km landside of the levees, and up to 1 km riverside (depending on

distance to river from levee at any particular point). The contractor is not tasked to investigate the underwater context of the Mississippi River where it exists close to the levee system. On the river side of the levee, only terrain typically considered batture lands and seasonally rather than permanently flooded, should be covered (up to 1 km distance out from the levee).

4. Contract Services. The contractor shall perform the following services.

a. (General) Supply the personnel, supplies, material, and other equipment and support necessary to conduct the cultural resources study described below. The studies shall be conducted in accordance with (1) the standards and guidelines established in 36 CFR Part 66, Recovery of Scientific, Prehistoric, Historic, and Archaeological Data: Methods, Standards and Reporting Requirements (Federal Register Vol. 42, No. 19 - Friday, January 18, 1977), and (2) Archeology and Historic Preservation; Secretary of the Interior's standards and guidelines (Federal Register Vol. 48, No. 190, September 29, 1983). The contractor shall be held accountable for the knowledge of the difficulty involved in this investigation.

b. Perform a comprehensive literature and records review of the known, existing archeological and historic data pertinent to the project area. This archival research will follow Department of Interior guidelines (see Federal Register Vol. 48, No. 190, September 29, 1983). Consultation shall include: (1) the pertinent State Historic Preservation Officers (SHPOs), State Archeologists, and Regional State Archeologists; (2) the most current listing of the NRHP; and (3) other knowledgeable persons, authorities, institutions, or other groups that might have specific information pertinent to the study. Federally recognized American Indian Tribes which might have information pertinent to the study area shall be consulted. All consultation shall be documented in the form of letters of communication suitable for reference or enclosure in the SEIS. Applicable state plans shall be consulted and used to direct the review. Research of historic sources should be a substantial effort within this review. The resources documented should include cemeteries which may be depicted on current or older USGS maps, county or parish maps or other records, etc., even if such cemeteries are not listed as cultural resources or archeological

sites at the respective SHPO or State Archeologist offices. All data will be recorded on maps reflecting the study area described earlier, and this data should include spatial depictions of areas or even spot locations where cultural resources studies of any nature have occurred. Areas previously surveyed for cultural resources shall be fully depicted with clear labels which can be correlated to dates, researchers, reports produced, sites found, etc., described in text and/or tables elsewhere. The Corps will provide blank USGS maps for the contractor. The cartographic information shall be provided both on traditional USGS quads (6 sets of hard copies) and in an electronic form suitable for use in the Corps' Regional Engineering and Environmental Geographic Information System (REEGIS).

c. The COR can provide coordination assistance to direct the contractor to communicate effectively with the New Orleans District's GIS specialists, to ensure the contractor understands the nature of electronic data required for the REEGIS data. As possible, the COR will provide existing electronic GIS base files, technical advice, etc. which may expedite the contractor's work. Much flexibility will be available for the contractor to innovate and design as needed to develop a data system compatible to the Corps REEGIS system. It is possible a GIS format presently in use by the State of Arkansas (University of Arkansas, Fayetteville) may be suited to meshing with the REEGIS to develop a format useful for data in this study. The goal is to have known surveyed areas and known cultural resources sites plotted in the REEGIS system in reference, at a minimum, to the 2-kilometer-wide band of research interest earlier described. The plotted survey areas and site locations should be keyed to crucial basic information: who surveyed what, when, and report title, source, etc. and essentials of the cultural site data such as title, estimated age, nature of evidence, National Register of Historic Places status, etc. The contractor should ensure the data produced is fully compatible with the Corps REEGIS system including a .dgn format suitable for use with the Intergraph System.

d. The contractor shall prepare a summary statement (including any appropriate maps, tables, or other illustrations) adequate for inclusion in the SEIS document. Following review of the SEIS, the contractor shall revise this statement, as needed. This will be a synthesis of information gained from the archival

and other research made with the two-fold aim of (1) providing an adequate synthesis of the general nature of cultural resources along with specific data obtained from the background and archival work (described above), and (2) providing adequate information to support future identification, evaluation, or mitigation of cultural resources in reference to the proposed levee construction. The concept of defining "historic contexts" in planning efforts (see Federal Register Vol. 48, No. 190, September 29, 1983) shall be at least generally followed in making the synthesis statement. The synthesis shall be written in such a way it strikes a balance between being useful for technical specialists while also presenting information comprehensible to laypersons not necessarily knowledgeable of the material cultural resources of the Lower Mississippi Valley. As a part of a SEIS, the synthesis' goal shall be to describe (at the prescribed level of study) the nature of known and expected cultural resources, potential impacts, and so forth to fully inform decision maker(s), various agencies, other groups, and the public involved in the NEPA process.

e. The contractor also shall produce a technical report suitable for reference or inclusion as an attachment to the SEIS. This report should be of a quality that meets or exceeds applicable state guidelines for archeological reports throughout the seven state area. Following final approval, 3 camera-ready masters of the final report shall be provided to the COR.

f. Fieldwork is not a part of the work required. However, travel will be required to conduct the records review and archival research. Thus, in the course of this traveling, the contractor may conduct minimal reconnaissance survey efforts or simple field inspection visits to get a better idea of the study area conditions. Such field inspections should enhance interpretation(s) of existing records, produce a better SEIS statement and useful photographs, and so forth. Before visiting any properties, the contractor shall coordinate such plans with the COR. No artifacts should be collected.

g. In reference to the study area, three sets of copies of all cultural resources site forms from each state's applicable SHPO and/or State Archeologist office(s) shall be made and provided to the COR.

5. Rights-of-Entry and Land Owner Contacts.

As required for the minimal field visits which might be conducted, the contractor shall be responsible for obtaining all rights-of-entry and clearances required. The Corps archeologist(s), however, shall be consulted regarding advice on persons to contact and procedures, and as stated in 4e above, this should take place before visiting any properties.

6. Report Requirements.

a. The contractor shall provide written progress reports to the Corps on an as-needed basis, as requested by the COR, but not more often than every two weeks (14 days).

b. A written preliminary report in the form of a management letter summary shall be submitted by the contractor following the basic completion of the study. This report will briefly state who performed work, when and where the work took place, and what were the results. It is understood this will be a provisional report, but it should be written in a manner suitable for transmittal and discussion with other planners, the SHPO's staff, etc. A WordPerfect 5.1 version computer file copy of text and any applicable tables of the preliminary report also shall be provided to the COR

c. The summary statement is described in Sections 4b and 4c earlier. As much as possible, it should be the form of text which can be pulled into a draft SEIS document. For example, it is likely there will be need for a summary statement that can function as a kind of abstract and summary of the findings of the technical report (see below) which will serve as an appendix or cited separate document. The summary statement shall be supplied in an electronic format compatible with WordPerfect.

d. The technical report is described in Sections 4d. A camera-ready master and 50 copies of the report shall be produced, in addition to submittal in the form of a master report copy including text and tables in electronic format useable in the WordPerfect system. The report shall be compiled under guidelines of (1) the standards and guidelines established in 36 CFR Part 66, Recovery of Scientific, Prehistoric, Historic, and

Archaeological Data: Methods, Standards and Reporting Requirements (Federal Register Vol. 42, No. 19 - Friday, January 18, 1977), (2) Archeology and Historic Preservation; Secretary of the Interior's Standards and Guidelines (Federal Register Vol. 48, No. 190, September 29, 1983), and (3) applicable portions of various state guidelines. Report text shall be double-spaced in the initial draft.

e. A brief, written summary or written guidelines and notes, as appropriate, to assist the Corps staff in using the GIS data submitted for the Corps REEGIS system.

7. Curation. The contractor is responsible for curation of all associated records, notes, maps, and other appropriate materials upon completion of this investigation. As no artifacts are to be collected, none will be curated. Preferably, this curation should be undertaken by an appropriate regional institution approved by the COR. It is most desirable to curate materials in a state associated with the majority of the information produced. This institution shall meet the qualifications outlined in 36 CFR 66.3.

8. Contractor's Additional Responsibilities.

a. The contractor shall be responsible for the validity of the material presented in the report of findings. In the event of controversy or court challenge, the contractor's principal investigator or representative may be called upon to testify on behalf of the Government in support of their findings.

b. Neither the contractor nor their representative shall release or publish any sketch, photograph, report, or any other material of any nature obtained or prepared under this contract without specific written approval of the COR. Unless with specific directives from the COR, the contractor shall not speak or otherwise communicate to the public on details related to the SEIS's draft content, procedures, or anticipated schedule. There are various legal proceedings underway or anticipated which make it imperative the contractor exercise thoughtful judgment while conducting the SEIS work.

c. The contractor shall make every attempt to correct the synthesis statement's and technical report's deficiencies (if any) noted by the COR.

d. It is the contractor's responsibility to ensure that all work required under this contract is completed in a timely and systematic fashion.

e. The contractor shall be required to attend any meetings convened by the COR to discuss project scheduling, coordination between the Vicksburg District and other districts, agencies or groups and the contractor, clarification of any problems, and any other related matters. Some meetings may be held at the office of the COR, or other locations as mutually agreed. All meetings are considered a part of the contract and no extra payment will be made for attendance.

9. Work Schedule. The milestones for work completion outlined below shall be met. Any deviations to this schedule will have the written approval of the COR.

<u>TASK</u>	<u>CALENDAR DAYS AFTER ISSUE OF NOTICE TO PROCEED</u>
Begin work.....	1
Submission of 3 copies of management letter report and magnetic file(s).....	21
Submission of ten copies of draft synthesis/summary statement for SEIS and magnetic file(s).....	30
Return of Corps comments on draft synthesis/summary (above).....	45
Submission of ten copies of final synthesis/summary statement for SEIS and magnetic file(s).....	90

Submission of ten copies of draft technical report (SEIS appendix or cited separate report) and magnetic file(s).....	90
Submission of 50 copies of final technical report	150
Submission of 3 copies of final master copy of technical report and magnetic file(s).....	150
Submission of hard copy maps showing all sites and previously surveyed areas (6 copies).....	150
Submission of GIS data (with notes) for Corps REEGIS system.....	150

10. Other Requirements.

a. If data obtained under this contract are required prior to contract completion, the contractor shall be required, upon written request, to furnish such data as are available in a usable form to the COR.

b. The contract may be modified for the time loss due to acts of nature beyond the control of the contractor.

c. The CO reserves the right to terminate the contract due to unsatisfactory performance by the contractor. In such an event, all materials, records, and data generated as a result of the contract will be turned over to the Corps.

11. Materials Furnished by Government.

a. U.S. Geological Survey 7.5 minute quadrangle maps of the project area.

b. Applicable reports, other maps, electronic media, other data reasonably available through the New Orleans District.

APPENDIX II

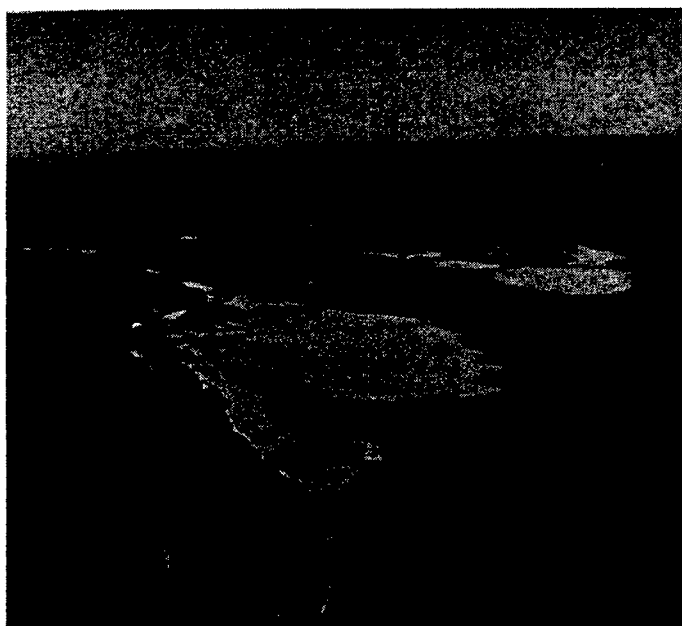
REEGIS SCHEMA

REGIONAL ENGINEERING AND ENVIRONMENTAL GEOSPATIAL INFORMATION SYSTEM

REEGIS

DATA DICTIONARY AND SCHEMA Version 4.0

OCTOBER 1998



Updated January 4, 1999

**U. S. ARMY CORPS OF ENGINEERS
MISSISSIPPI RIVER COMMISSION/
MISSISSIPPI VALLEY DIVISION
ST. PAUL DISTRICT
ROCK ISLAND DISTRICT
ST. LOUIS DISTRICT
MEMPHIS DISTRICT
VICKSBURG DISTRICT
NEW ORLEANS DISTRICT**

PREFACE

As part of an overall effort to automate various technical and project management aspects of the MR&T Channel Improvement Project, an Automated Hydrographic Surveying Committee was established in the Mississippi River Commission/Mississippi Valley Division (MVD) in 1990. The committee was tasked to make recommendations concerning the implementation of the Global Positioning System (GPS) for hydrographic surveying of the Mississippi River and construction activities, and for using Computer Automated Drafting and Design (CADD) systems for production of plans and specifications for river engineering structures. Committee work groups were formed to develop CADD procedures for designing and preparing plans and specifications for dike and revetment structures, to implement a GPS network along the Mississippi River, to implement GPS positioning of the revetment mat sinking and grading floating plants, and to develop an electronic navigation chart for the Mississippi River.

Early efforts of the committee revealed that a comprehensive database for river engineering, hydrographic surveying, environmental, and related information was required to integrate the overall automation effort. Consequently, a River Database Work Group consisting of members from MVD headquarters and each MVD District office was formed in the fall of 1992 to design the required database. Planning efforts of the Work Group began in January 1993 and culminated in publication of the River Engineering and Environmental Geospatial Information System (REEGIS) Data Dictionary, Version 1.0, in August 1993. This report contains Version 4.0 of the REEGIS Data Dictionary and relational database schema.

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**RIVER ENGINEERING AND ENVIRONMENTAL
GEOSPATIAL INFORMATION SYSTEM (REEGIS)
VERSION 4.0**

INTRODUCTION

1. The Mississippi River Commission/Mississippi Valley Division (MVD) of the U. S. Army Corps of Engineers and the St. Louis, Memphis, Vicksburg, and New Orleans Districts, are responsible for the design, construction, operation and maintenance of navigation and flood control projects on several large river systems. The Channel Improvement Feature of the Mississippi River and Tributaries Project on the Lower Mississippi and Atchafalaya Rivers and the Operation and Maintenance Project on the Middle Mississippi River are managed as a unit, comprising one of the nation's largest river engineering projects covering over 1,500 miles of the inland waterway system.
2. Efficient execution of the Mississippi River projects today and in the future will require automation of many technical and management functions using state-of-the-art technology. Hence, an Automated Hydrographic Surveying Committee was formed in 1990 to make recommendations for designing dikes and revetments using Computer Aided Drafting and Design (CADD) technology, and implementing the Global Positioning System (GPS) for hydrographic surveying and positioning of the revetment mat-sinking floating plant. In 1992, development of an electronic navigation chart was initiated, and in 1993 implementation of GPS positioning on the bank grading floating plants were began.
3. As automation proceeded, the need for a comprehensive geo-spatial database to integrate project design, construction, and management functions became evident. In November 1992, a River Database Work Group (WG) was formed to design such a database. The name selected for the database was the River Engineering and Environmental Geospatial Information System (REEGIS).
4. Two major efforts were already underway in MVD to develop a database for the Mississippi River. The Memphis District had developed GEMS, a customized software system for support of river engineering design tasks and archival of hydrographic surveys and as-built drawings. MVD had developed a grid cell GIS that contained land cover, alluvial soils, elevation, and aquatic habitat map layers along the Lower Mississippi River. The personal computer version of this GIS is called CERDS and the GRASS version is referred to as the Lower Mississippi River GIS (LMRGIS). Portions of both of these databases were incorporated into the REEGIS design.

REEGIS GOALS AND OBJECTIVES

5. REEGIS goals are to provide:
 - (1) Enhanced technical support and analysis capabilities for river engineering and environmental tasks.
 - (2) More efficient and cost effective management of navigation and flood control projects on the Mississippi and Atchafalaya Rivers through the application of CADD and GIS technology.

To fulfill these goals, REEGIS was designed to serve as the master database for all river engineering and environmental applications. While REEGIS is geared towards river engineering and related work, the diversity of information in the schema will allow it to be readily adapted to other river projects and applications.

6. Specific REEGIS objectives are:

- a. Consolidation of project-related river data into a single, standardized, multi-purpose geospatial database with integrated CADD and GIS functionality;
- b. Automated hydrographic survey mapping and data management;
- c. Facilities management for river engineering and flood control structures;
- d. Support of dike and revetment design with CADD;
- e. Automated navigation chart map production;
- f. Electronic navigation chart support;
- g. River engineering, geomorphic, and environmental study support; and
- h. Production of project technical and management reports.

REEGIS DESIGN

7. The WG recommended that REEGIS contain both geospatial (graphic) and aspatial (tabular) information and accommodate both precision engineering drawings and survey control data, as well as more generalized information such as land cover and soils maps. Data format standardization, maximum use of existing MVD databases, and optimum use of existing computer hardware and software were guidelines for database design. Standardized formats facilitate exchange of data among and within division and districts offices and field operational units, and provide specifications for data input contracts.

8. WG recommendations for design of REEGIS were as follows:

- a. Intergraph's Modular GIS Environment (MGE) would be the primary software platform;
- b. Intergraph's Clipper workstations and Intel-based microcomputers would be the hardware platforms;
- c. Separate seamless MGE projects would be developed for each Corps district;
- d. Existing data formats would be used whenever possible;
- e. A custom user-interface to automate work flows would be developed using GEMS as a prototype;
- f. The LMRGIS grid-cell database in GRASS format would be ported to REEGIS as MGE Grid Analyst files;
- g. Microstation design file specifications would be standardized as follows:

Districts

master units: survey feet
sub units: 1,000 (100 for Memphis District)
positional units: 1
global origin: 0,0,0

Lower Mississippi River

master units: meters
sub units: 1,000
positional units: 1
global origin: 0, 2800000, 0

h. Map projections, coordinate systems, and horizontal datums would be standardized as follows with conversion to NAD83 horizontal datum in the near future:

<u>District</u>	<u>Datum</u>	<u>Coordinate System</u>
St. Paul	NAD83	UTM Zone 15
Rock Island	NAD83	UTM Zone 15
St. Louis	NAD83	Missouri State Plane, East
Memphis, North	NAD83	UTM Zone 16
Memphis, South	NAD83	UTM Zone 15
Vicksburg	NAD83	Mississippi State Plane, West
New Orleans	NAD83	Louisiana State Plane, South
Lower Mississippi River	NAD27	UTM Zone 15

i. A REEGIS data dictionary/schema would be developed to standardize relational database table formats, units of measure, and graphic symbology.

Since these recommendations were made, NAD 83 has become the standard horizontal datum as has Intergraph's Technical Desktop (TD) Pentium-based workstations, running the Windows NT operating system.

9. No CADD or GIS data standards were used exclusively in the development of the REEGIS data dictionary/schema. The Corps' CADD standards for symbology and cell libraries were used for some features, but were too limited in scope to accommodate the diversity of graphic features found in REEGIS. The Tri-Service Spatial Data Standards (TSDS) was used where applicable, but it did not address many river engineering and environmental features required for REEGIS. Topographic map features and symbols used by the U. S. Geological Survey for the National Mapping Program were followed when possible, particularly for the hydrology, topography, transportation, utility, and structures categories.

REEGIS ORGANIZATION

10. REEGIS is organized according to MGE requirements. Graphic data are divided into 28 categories, e.g., river engineering structures. Each category is comprised of graphic features, (Microstation graphic elements), that represent mapped objects, e.g., a levee. Only features from one category are contained in a map (.dgn) file. Features are linked to records in relational database (attribute) tables. For example, a dike feature would be linked to a table record having data about the structure, e.g., construction date, cost, and tons of stone. Supplemental data tables that are not linked to graphic features are also used.

11. Labels are assigned to most graphic features for visual identification features and for labeling output maps and other products. Most feature labels are values from a feature attribute table. For example, the label for a dike is the name column in the dike attribute table.

12. MGE domain tables are used for quality control. They contain either a numeric or character list or range of valid values for a variable. Data are checked against the domain tables for validity.

CUSTOMIZED FEATURES

User Interface

13. A menu-driven user interface is being developed to simplify REEGIS use and to automate routine work flows. Functions for automated mapping, querying and report generation, Master Plan production, channel geometry computations, management of hydrographic survey data and photographs will be included in the interface. The user will also be able to invoke standard MGE, InRoads and ACM revetment design routines from the REEGIS menu. The REEGIS interface is based on the Microstation Development Language and operates in the Unix and Windows NT environments.

Hydrographic Survey Management Systems

14. These systems were being developed because MGE *per se* cannot accommodate storage and retrieval of a time series of hydrographic surveys. Separate systems were being developed for general hydrographic surveys, revetment surveys, dike surveys, and dredging surveys. Each system consists of a master relational database table containing data about each survey joined to a digital elevation model (DEM) table with data about TIN, GRID, and contour models that have been developed for each survey. A specific survey or DEM can be selected by date, river mile, contractor, or type. The ASCII XYZ file for a selected survey can be directly loaded into InRoads or Terrain Modeler for DEM development and contouring; resulting DEMs are automatically incorporated into the database. Functions to produce revetment cross-section and dike profile plots and to compute dredged material volumes from TIN models are provided. Supporting vertical and horizontal survey control data are also contained in REEGIS.

Facilities Management

15. Facilities management of river engineering and flood control structures is provided for in REEGIS. Graphic features for dikes, revetments, levees, and other structures are linked to attribute tables containing information on material quantities, cost, contractors, construction dates, and maintenance. These data will be continuously updated. MGE Query and Overview functions are used to obtain data on engineering structures and generate reports. The name of design files containing as-built engineering drawings are also stored in attribute tables. Once a structure has been located via graphic or SQL queries, a function is provided to view the drawing. A separate REEGIS category is devoted to management and annual updating of the Master Plan. River engineering structures are coded according to whether they exist or the year they are scheduled to be constructed and costs, and the design channel alignment is depicted.

Automated Mapping

16. Functions for hardcopy production of hydrographic survey maps, navigation map folios, Master Plan, and other map products are provided. For each mapping application, separate index maps consisting of shapes corresponding to each map sheet are used to extract graphic data using MGE functions. A separate design file for each map sheet is produced by merging the extracted graphic data, a base map design file, and, in the case of hydrographic surveys, a .dgn file containing color-coded elevation contours and soundings. Intergraph's Map Finisher software will be used to produce final map files for printing locally or for postscript printing from color separate digital files.

P&S CADD Drawings

17. Plans and Specifications (P&S) drawings for river engineering structures are produced using Microstation CADD and InRoads software. The REEGIS database will contain information needed to produce the final P&S CADD drawings. MGE Query and Overview functions will be used to retrieve this information.

ECDIS Navigation Chart

18. An electronic navigation chart for the Mississippi and Atchafalaya Rivers has been developed by MVD as part of a national test-bed being coordinated by NOAA. It is anticipated that the system will be used initially for MVD motor vessels and dredges. Intergraph Corporation's ECDIS software was selected for this effort. ECDIS uses the International Hydrographic Organization (IHO) DX90 standard data format with data contained in Microstation design files. Information required by ECDIS will be maintained and updated in REEGIS. A translator is being developed to extract data from REEGIS, convert it to DX90 format and, finally convert the DX90 data to Intergraph ECDIS. In addition, a translator for converting REEGIS data to the Defense Mapping Agencies' navigation chart vector format is being developed.

River Studies Support

19. The information in REEGIS will enhance capabilities to conduct system-wide, reach, and site-specific river studies. Temporal changes in river geomorphology and aquatic habitats, river response to river engineering structures, relationships between maintenance dredging and dike and revetment construction, and evaluations of endangered species distributions and habitats are examples of the types of investigations that REEGIS will support. The time series of hydrographic surveys, geomorphic and habitat maps in REEGIS will provide expanded capabilities to quantify long-term river trends. Special functions for computing channel hydraulic geometry parameters from TIN models are also included.

Standard Color Table and Cell Library

20. A standard REEGIS color table for graphic features has been developed. Colors 0-7 in the color table are the standard Microstation color table colors; colors 41-47 are used for color-coding Channel Improvement Master Plan features according to the year they are scheduled for construction. The remaining colors are discretionary and represent a wide range of hues and tones. A REEGIS cell library has been developed consisting of selected cells contained in standard Corps of Engineers' cell libraries and custom cells.

Data Dictionary

21. The purpose of this data dictionary/schema is to provide the means to standardize graphic and tabular data formats, units of measure, and information content of the REEGIS database across all MVD offices and districts. Rigorous application of the data dictionary will assure that common graphic symbology, relational database table formats, variables, and units of measure are used. In addition, the data dictionary will serve as a specification for data entry by contractors and in-house efforts.

22. The data dictionary and MGE project schema will be administrated by MVD in conjunction with the Data- base work group to assure uniform application and to minimize the potential for development of inconsistent versions of the schema at the various user sites. Changes to the schema will be coordinated among all user sites and, when finalized, will be forwarded to the respective database administrators for implementation.

23. The data dictionary is organized by MGE categories. For each category there is a table that lists the graphic features in the category and the corresponding Microstation symbology, feature codes, data types, and linked attribute tables. Followed by a table of feature definitions. The feature attribute tables are presented next. These contain a list of variables (columns) that comprise the table, data types domains, if any, variable definitions and table join relationships. Definition of attributes that are used throughout the database, e.g., river mile, are contained in a separate table. Domain tables are listed at the end of the data dictionary.

24. REEGIS feature codes consist of six digit numbers. The first two digits represent the MGE category. Digits three and four are a unique number for each feature within a category, and digits five and six correspond to the Microstation design file level of the feature.

25. A nominal graphic feature in REEGIS, e.g., ACM Revetment, is comprised of up to three separate MGE features: a shape, line, or point representing the feature; a centroid (shapes only) to which the feature is linked to the attribute table; and a label (optional). Label features are linked to attribute tables so that tables column values, e.g., revetment name, may be used as the label. Table columns to be used as labels are indicated by an asterisk.

TABLE 1

REEGIS CATEGORY DEFINITIONS

ALLUVIAL SOILS GRID: Alluvial environments of deposition maps in 50-meter grid cell format.

ALLUVIAL SWALES GRID: Alluvial environments of deposition maps of major swales and natural levee deposits in 50-meter resolution grid cell format.

AQUATIC HABITAT GRID: Aquatic habitat/fluvial landform maps in 50-meter resolution grid cell format.

CHANNEL IMPROVEMENT MASTER PLAN: The Master Plan for river engineering projects depicting existing and future river engineering structures, cost, construction dates, and channel alignments.

CULTURAL RESOURCES: Historical and Archeological locations.

ENDANGERED SPECIES: Endangered species sampling locations.

DREDGING: Channel maintenance dredging and dredged material disposal sites and data.

ELEVATION GRID: Elevation grid cell files at 50-meter resolution representing various Comprehensive Hydrographic Surveys of the Mississippi River and floodplain.

ENVIRONMENTAL: General environmental features of the river system, archeological sites, landfills, land use, and water quality sampling sites.

FISH AND WILDLIFE: General fish and wildlife habitat and species data, including endangered species, and field sampling locations.

FLOOD CONTROL STRUCTURES: Flood control structures such as water control structures.

GENERAL RIVER FEATURES: General features of the river system, e.g., banklines, islands, river miles, and floodplain lakes.

GEOLOGY: Geologic, geomorphic, and geotechnical features.

HYDROGRAPHY: Hydrographic survey data including a xyz ascii files, contour maps, and digital elevation models.

HYDROLOGY: Streams, watersheds, gaging stations, flood zones, and other general hydrologic features.

LAND COVER GRID: Land cover maps of the leveed floodplain of the Lower Mississippi River in grid cell format at 50-meter resolution for 1982 and 1992.

TABLE 1 (cont'd)

REEGIS CATEGORY DEFINITIONS

LEVEE STRUCTURES: Various river engineering structures and features comprising the levee systems.

NAVIGATION FACILITIES: Navigation facilities, aids to navigation, and navigation traffic accident data.

NAVIGATION AIDS: Navigation lights, markers, buoys, and other navigation safety and chart features.

STRUCTURES: Buildings, warehouses, dwellings, and similar types of structures.

POLITICAL AREAS: Boundaries of various political units such as states, counties, and cities.

RIVER ENGINEERING STRUCTURES: River engineering structures such as dikes and revetments.

SURVEY CONTROL: Horizontal and vertical control points and baseline traverses used in the design and construction of river engineering structures and in hydrographic surveying.

TOPOGRAPHY: Elevation data (contours and spot elevations) for land areas.

TRANSPORTATION: Transportation facilities such as roads and railroads.

UTILITIES: Utility facilities such as pipelines and power transmission lines.

REAL ESTATE: Townships, sections, and parcel ownership's.

MULTI-MEDIA: Supplemental Extensions to REEGIS schema to support VistaMap multi-media capabilities.

TABLE 2
CATEGORY FILE NAMING CONVENTIONS

Category	File Naming
Alluvial Soils Grid	as____.grd
Alluvial Swales Grid	aw____.grd
Aquatic Habitat Grid	aq____.grd
Channel Improvement Master Plan	ci____.dgn
Dredging	dr____.dgn
Elevation Grid	el____.grd
Environmental	en____.dgn
Fish and Wildlife	fw____.dgn
Flood Control Structures	fl____.dgn
General River Features	gr____.dgn
Geology	ge____.dgn
Hydrography	hy____.dgn
Hydrology	hg____.dgn
Land Cover Grid	lc____.grd
Levee Structures	ls____.dgn
Navigation Facilities	nf____.dgn
Navigation Aids	na____.dgn
Structures	st____.dgn
Political Areas	pa____.dgn
River Engineering Structures	re____.dgn
Survey Control	sc____.dgn
Topography	to____.dgn
Transportation	tr____.dgn
Utilities	ut____.dgn
Real Estate	rl____.dgn
Multi-Media	mm____.dgn

TABLE 34

CATEGORY NAME: cultural resources

Feature Name	Feature Code	Table	Feature Type	Level	Style	Weight	Color	Cell	Digcmd
historical/archeological area bdry	290101		boundary	1	0	1	1		place shape
historical/archeological ctrd	290102	hist_arch	centroid	2	0	2	1		place point
historical/archeological area lbl	290103	hist_arch	label	3	0	1	1		place text
historical/archeological site	290204	hist_arch	point	4	0	3	2		place point
historical/archeological site lbl	290205	hist_arch	label	5	0	1	2		place text
historical/archeological survey ctrd	290409	hist_surv	centroid	9	0	2	4		place point
historical/archeological survey bdry	290410		boundary	10	0	1	4		place shape
historical/archeological survey lbl	290411	hist_surv	label	11	0	1	4		place text
historical/archeological cemetery ctrd	290512	hist_cem	centroid	12	0	2	5		place point
historical/archeological cemetery bdry	290513		boundary	13	0	1	5		place shape
historical/archeological cemetery lbl	290514	hist_cem	label	14	0	1	5		place text
historical/archeological structures ctrd	290615	hist_stru	centroid	15	0	2	6		place point
historical/archeological structures bdry	290616		boundary	16	0	1	6		place shape
historical/archeological structures lbl	290617	hist_stru	label	17	0	1	6		place text
historical/archeological structures point	290618	hist_stru	point	18	0	3	6		place point
historical/archeological structures point lbl	290619	hist_stru	label	19	0	1	6		place text
historical/archeological district ctrd	290720	hist_dist	centroid	20	0	2	7		place point
historical/archeological district bdry	290721		boundary	21	0	1	7		place shape
historical/archeological district lbl	290722	hist_dist	label	22	0	1	7		place text

CULTURAL RESOURCES CATEGORY

This is a category containing general cultural resource features.

FEATURE DEFINITIONS

historical/archeological area: An area that contains historical or archeological features such as buildings, forts, burial mounds, or battlefields that can be defined as a land or water area.

TABLE 35

FEATURE ATTRIBUTE TABLE: hist_arch

fname	fcode	ftype	category
historical/archaeological ctrd	290102	centroid	environmental
historical/archaeological area lbl	290103	label	environmental
historical/archaeological site	290204	point	environmental
historical/archaeological site lbl	290205	label	environmental
ATTRIBUTE	NULLS	TYPE	DOMAIN
mslink	no	integer	
mapid	yes	integer	
river_id	yes	smallint	
up_river_mile	yes	real	
dn_river_mile	yes	real	
hnumber	yes	char(10)	
hname	yes	char(20)	
hclass	yes	char(50)	
setting	yes	char(30)	d_arctun
age_dating	yes	char(30)	
culture	yes	char(30)	d_dlgmth
register_no	yes	char(15)	d_culaff
settlement_date	yes	timestamp	
agency_id	yes	smallint	
owner_id	yes	smallint	
elevation	yes	real	
harea	yes	real	
hdescription	yes	char(240)	
project_code	yes	char(6)	
start_cen	yes	smallint	
start_dec	yes	smallint	
start_yr	yes	smallint	
end_cen	yes	smallint	
end_dec	yes	smallint	

TABLE 35 (cont'd)

FEATURE ATTRIBUTE TABLE: hist_arch

ATTRIBUTE	NULLS	TYPE	DOMAIN
end_yr	yes	smallint	
mgt_id	yes	integer	
utm_zone	yes	smallint	
loc_rel_d	yes	char(16)	d_locrel
site_typ_d	yes	char(16)	d_sitsitt
disturb_d	yes	char(16)	d_culdis
nreg_sit_d	yes	char(16)	d_regstt
nreg_con_d	yes	char(16)	d_regcon
human_skel_d	yes	char(10)	d_h_skel
recorded_by	yes	char(120)	
record_date	yes	timestamp	
update_date	yes	timestamp	
rec_rep_d	yes	char(16)	d_recprep
comments	yes	char(50)	

JOIN: hist_arch.owner_id=owner_id
 hist_arch.agency_id=agency.id
 hist_arch.river_id=river.id

TABLE 35 (cont'd)

HISTORICAL/ARCHEOLOGICAL ATTRIBUTE TABLE DEFINITIONS

hnumber:	The unique site designation number.
hname:	Official name of the area/site.
setting:	The environmental setting of the area/site.
age_dating:	The method used to age or date the area/site.
culture:	The cultural affiliation of the site/area.
register_no:	The National Register of Historical Places number.
settlement_date:	Date the area/site was settled or first used.
agency_id:	Unique identification code for the agency responsible for maintaining the area/site.
owner_id:	Unique code of site owner.
harea:	The area of the area/site in acres.
hdescription:	General description of the area/site.
hclass:	The class of the archeological site or area.
elevation:	Elevation of the site in feet, NGVD.
start_cen:	The century portion of the conventional date when the site/isolate was first occupied. (for 1734 BC=-1700)
start_dec:	The decade portion of the conventional date when the site/isolate was first occupied. (for 1734 BC=-30)
start_yr:	The year portion of the conventional date when the site/isolate was first occupied. (for 1734 BC=-4)

TABLE 35 (cont'd)

HISTORICAL/ARCHEOLOGICAL ATTRIBUTE TABLE DEFINITIONS

end_cen: The century portion of the conventional date when the site/isolate was last occupied. (for AD 1836=1800)

end_dec: The decade portion of the conventional date when the site/isolate was last occupied. (for AD 1836=30)

end_yr: The year portion of the conventional date when the site/isolate was last occupied. (for AD 1836=6)

mgt_id: A unique management code specific to each project.

utm_zone: UTM zone used for coordinate data.

loc_rel_d: An indication of the reliability of the site(s) or isolate(s) recorded location.

site_typ_d: The normal archaeological status of the site or isolate.

disturb_d: The level of disturbance of the site or isolate.

nreg_stt_d: Status of placement of site on the National Register of Historic Places.

nreg_con_d: Other issues to consider for placement on the National Register of Historic Places.

human_skel_d: Presence of human skeletal elements.

recorded_by: From original site or isolate record.

record_date: From original site or isolate record.

update_date: Most recent site or isolate update.

rec_rep_d: The type of agency serving as the repository of the records for the investigation of the site.

TABLE 36

FEATURE ATTRIBUTE TABLE: hist_dist

ATTRIBUTE	NULLS	TYPE	DOMAIN
mslink	no	integer	
mapid	yes	integer	
river_id	yes	smallint	
up_river_mile	yes	real	
down_river_mile	yes	real	
agency_id	yes	smallint	
project_code	yes	char(6)	
setting	yes	char(30)	
dist_design	yes	char(10)	
dist_name	yes	char(16)	
arch_sty_d	yes	char(16)	d_strsty
affil_d	yes	smallint	d_culafi
start_cen	yes	smallint	
start_dec	yes	smallint	
start_yr	yes	smallint	
end_cen	yes	smallint	
end_dec	yes	smallint	
end_yr	yes	smallint	
dist_desc	yes	char(60)	
disturb_d	yes	char(16)	d_culdis
nreg_con_d	yes	char(16)	d_regcon
nreg_stt_d	yes	char(16)	d_regstt
register_no	yes	char(15)	
utm_zone	yes	smallint	
area_size	yes	integer	
recorderd_by	yes	char(120)	
record_date	yes	timestamp	
update_date	yes	timestamp	
rec_rep_d	yes	char(16)	d_recrep
comments	yes	char(50)	

TABLE 36 (cont'd)

HISTORICAL/ARCHEOLOGICAL DISTRICT ATTRIBUTE TABLE DEFINITIONS

agency_id: Unique identification code for the agency responsible for maintaining the area/site.

setting: The environmental setting of the district.

dist_desig: This designation is assigned by the agency with jurisdiction over the district.

dist_name: Name of the historic district.

arch_sty_d: The architectural style of the district.

affil_d: The cultural prehistoric or historic period with which the district is affiliated.

start_cen: The century portion of the conventional date when the district was first established. (for 1836=1800)

start_dec: The decade portion of the conventional date when the district was first established. (for 1836=30)

start_yr: The year portion of the conventional date when the district was first established. (for 1836=6)

end_cen: The century portion of the conventional date when the was last used. (for 1836-1800)

end_dec: The decade portion of the conventional date when the district was last used. (for 1836=30)

end_yr: The year portion of the conventional date when the district was last used. (for 1836=6)

dist_desc: Brief description of the historic significance of the district.

disturb_d: The level of disturbance of the district.

nreg_con_d: Other issues to consider for placement on the National Register of Historic Places.

nreg_stt_d: Status of placement of the district on the National Register of Historic Places.

TABLE 36 (cont'd)

HISTORICAL/ARCHEOLOGICAL DISTRICT ATTRIBUTE TABLE DEFINITIONS

register_no: The National Register of Historic Places number.

utm_zone: UTM zone used for coordinate data.

area_size: The size of the area in square meters.

recorded_by: From original record form.

record_date: From original record form.

update_date: Most recent record update.

rec_rep_d: The type of agency serving as the repository of the records for the investigation of the district.

TABLE 37

FEATURE ATTRIBUTE TABLE: hist_stru

ATTRIBUTE	NULLS	TYPE	DOMAIN
mslink	no	integer	
mapid	yes	integer	
river_id	yes	smallint	
up_river_mile	yes	real	
down_river_mile	yes	real	
agency_id	yes	smallint	
owner_id	yes	smallint	
project_code	yes	char(6)	
setting	yes	char(30)	
str_desig	yes	char(10)	
str_name	yes	char(20)	
feat_typ_d	yes	char(16)	d_culfet
arch_siy_d	yes	char(16)	d_strsty
affil_d	yes	char(16)	d_culafi
start_cen	yes	smallint	
start_dec	yes	smallint	
start_yr	yes	smallint	
end_cen	yes	smallint	
end_dec	yes	smallint	
end_yr	yes	smallint	
str_desc	yes	char(60)	
street_num	yes	real	
street_name	yes	char(25)	
location	yes	char(60)	
disturb_d	yes	char(16)	d_culdis
neg_sit_d	yes	char(16)	d_regstt
neg_con_d	yes	char(16)	d_regcon
register_no	yes	char(15)	
utm_zone	yes	smallint	
area_size	yes	integer	
recorded_by	yes	char(120)	

TABLE 37 (cont'd)

FEATURE ATTRIBUTE TABLE: hist_sfru

ATTRIBUTE	NULLS	TYPE	DOMAIN
record_date	yes	timestamp	
update_date	yes	timestamp	
rec_rep_d	yes	char(16)	d_recrep
comments	yes	char(50)	

TABLE 37 (cont'd)

HISTORICAL/ARCHEOLOGICAL STRUCTURE ATTRIBUTE TABLE DEFINITIONS

agency_id: Unique identification code for the agency responsible for maintaining the structure.

owner_id: Unique code of structure owner.

setting: The environmental setting of the structure.

str_design: This designation is assigned by the agency with jurisdiction over the structure.

str_name: Name of the historic structure.

feat_typ_d: Type of cultural resource feature (point features only).

arch_sty_d: The architectural style of the structure.

affil_d: The cultural prehistoric or historic period with which the structure is affiliated.

start_cen: The century portion of the conventional date when the structure was first built. (for 1836=1800)

start_dec: The decade portion of the conventional date when the structure was first built. (for 1836=30)

start_yr: The year portion of the conventional date when the structure was first built. (for 1836=6)

end_cen: The century portion of the conventional date when the structure was last used. (for 1836=1800)

end_dec: The decade portion of the conventional date when the structure was last used. (for 1836=30)

end_yr: The year portion of the conventional date when the structure was last used. (for 1836=6)

str_desc: Description of the condition of the structure.

street_num: Structure street address number.

TABLE 37 (cont'd)

HISTORICAL/ARCHEOLOGICAL STRUCTURE ATTRIBUTE TABLE DEFINITIONS

street_nam:	The name of the street on which the structure is located.
location:	If no address available.
disturb_d:	The level of disturbance to the historic structure.
nreg_stt_d:	Status of placement of structure on the National Register of Historic Places.
nreg_con_d:	Other issues to consider for placement on the National Register of Historic Places.
register_no:	The National Register of Historic Places number.
utm_zone:	UTM zone used for coordinate data.
area_size:	The size of the area in square meters.
recorded_by:	From original structure record.
record_date:	From original structure record.
update_date:	Most recent record update.
rec_rep_d:	The type of agency serving as the repository of the records for the investigation of the structure.

TABLE 38

FEATURE ATTRIBUTE TABLE: hist_surv

ATTRIBUTE	NULLS	TYPE	DOMAIN
mslink	no	integer	
mapid	yes	integer	
river_id	yes	smallint	
up_river_mile	yes	real	
down_river_mile	yes	real	
agency_id	yes	smallint	
owner_id	yes	smallint	
project_code	yes	char(6)	
contract	yes	char(20)	
del_order	yes	char(20)	
setting	yes	char(30)	
area_num	yes	char(10)	
investigator	yes	char(30)	
publisher	yes	char(50)	
field_date	yes	timestamp	
rep_date	yes	timestamp	
rep_name	yes	char(240)	
surv_desc	yes	char(60)	
res_sum	yes	char(240)	
area_size	yes	integer	
inv_typ1_d	yes	char(16)	d_arcin
inv_typ2_d	yes	char(16)	d_arcin
inv_typ3_d	yes	char(16)	d_arcin
inv_typ4_d	yes	char(16)	d_arcin
rec_rep_d	yes	char(16)	d_rec
utm_zone	yes	smallint	
comments	yes	char(50)	

TABLE 38 (cont'd)

HISTORICAL/ARCHEOLOGICAL SURVEY ATTRIBUTE TABLE DEFINITIONS

contract:	USACE Contract/Purchase Order Number.
del_order:	USACE Delivery Order number.
setting:	The environmental setting of the survey area.
area_num:	A code used to identify the survey area.
investgator:	Name of the investigator for this survey area (primary author).
publisher:	Company/Agency/Individual that produced the report.
field_date:	Initial date of fieldwork.
rep_date:	Date of final report.
rep_name:	Report name (truncate, do not abbreviate).
surv_desc:	Description of the cultural resource survey area.
res_sum:	Summary of the findings in this survey area.
area_size:	The size of the area in square meters.
inv_typ1_d:	Primary survey methodology employed in the survey area.
inv_typ2_d:	Secondary survey methodology employed in the survey area.
inv_typ3_d:	Tertiary survey methodology employed in the survey area.
inv_typ4_d:	Quaternary survey methodology employed in the survey area.

TABLE 38 (cont'd)

HISTORICAL/ARCHEOLOGICAL SURVEY ATTRIBUTE TABLE DEFINITIONS

rec_rep_d: The type of agency serving as the repository of the records for the investigation of the report.

utm_zone: UTM zone used for coordinate data.

TABLE 39

FEATURE ATTRIBUTE TABLE: hist_cem

ATTRIBUTE	NULLS	TYPE	DOMAIN
mslink	no	integer	
mapid	yes	integer	
river_id	yes	smallint	
up_river_mile	yes	real	
down_river_mile	yes	real	
agency_id	yes	smallint	
owner_id	yes	smallint	
project_code	yes	char(6)	
setting	yes	char(30)	
cem_desig	yes	char(10)	
feat_name	yes	char(20)	
denom_d	yes	char(16)	d_cemtyp
start_cen	yes	smallint	
start_dec	yes	smallint	
start_yr	yes	smallint	
end_cen	yes	smallint	
end_dec	yes	smallint	
end_yr	yes	smallint	
cem_desc	yes	char(60)	
street_num	yes	real	
street_name	yes	char(25)	
location	yes	char(60)	
disturb_d	yes	char(16)	d_culdis
nreg_sit_d	yes	char(16)	d_regstt
nreg_con_d	yes	char(16)	d_regcon
register_no	yes	char(15)	
utm_zone	yes	smallint	
area_size	yes	integer	
recorded_by	yes	char(120)	
record_date	yes	timestamp	
update_date	yes	timestamp	

TABLE 39 (cont'd)

FEATURE ATTRIBUTE TABLE: hist_cem

ATTRIBUTE	NULLS	TYPE	DOMAIN
rec_rep_d	yes	char(16)	d_recrep
comments	yes	char(50)	

HISTORICAL/ARCHEOLOGICAL CEMETERIES ATTRIBUTE TABLE DEFINITIONS

agency_id: Unique identification code for the agency responsible for maintaining the cemetery.

owner_id: Unique code of cemetery owner.

setting: The environmental setting of the cemetery.

cem_desig: Designation is assigned by the agency with jurisdiction over the cemetery.

feat_name: Any formal or commonly used name for the cemetery.

denom_d: Denomination of affiliation of the cemetery.

start_cen: The century portion of the conventional date when the cemetery was first established. (for 1836=1800)

start_dec: The decade portion of the conventional date when the cemetery was first established. (for 1836=30)

start_yr: The year portion of the conventional date when the cemetery was first established. (for 1836=6)

end_cen: The century portion of the conventional date when the cemetery was last established. (for 1836=1800)

end_dec: The decade portion of the conventional date when the cemetery was last established. (for 1836=30)

TABLE 39 (cont'd)

HISTORICAL/ARCHEOLOGICAL CEMETERIES ATTRIBUTE TABLE DEFINITIONS

end_yr:	The year portion of the conventional date when the cemetery was last established. (for 1836=6)
cem_desc:	General description of the cemetery.
street_num:	Cemetery street address number.
street_nam:	The name of the street on which the cemetery is located.
location:	If no address available.
disturb_d:	The level of disturbance of the cemetery.
nreg_stt_d:	Status of placement of cemetery on the National Register of Historic Places.
nreg_con_d:	Other issues to consider for placement on the National Register of Historic Places.
register_no:	The National Register of Historic Places number.
utm_zone:	UTM zone used for coordinate data.
area_size:	The size of the area in square meters.
recorded_by:	From original record form.
record_date:	From original record form.
update_date:	Most recent record update.
rec_rep_d:	The type of agency serving as the repository of the records for the investigation of the cemetery.

TABLE 40

DOMAIN TABLE: d_arcfun ATTRIBUTE: h_class

h_class	Definition
AGRICULTURAL	agricultural site
BASE_CAMP	base camp
BEDROCK_MORTAR	bedrock mortar
BONE_BED	bone bed
BURIAL	burial
CACHE	cache
CAIRNS	cairns
CEMETERY	cemetary
CEREMONIAL	ceremonial center
CHIPPING	chipping station
CISTERN	cistern
CLIFF_DWELLING	cliff dwelling
CORRALS	corrals/drivelines
DEBITAGE_SCAT	debitage scatter (all types)
DEPRESSION	depression
EARTH_MIDDEN	earth midden
EARTHEN_RING	earthen ring
FAUNAL_PROCESS	faunal processing site
FIRE_ROCK	fire cracked rock concentration
FISH_PROCESS	fish processing site
HAZY	hazy
HEARTH	hearth
HISTORIC_CAMP	historic components present
HOGAN	hogan
HOUSE_PIT	house pit
HUNTING_STATION	hunting station
JUMP	jump
KILN	kiln
KIVA	kiva
LAMBING_PEN	lambing pen
LODGE	lodge

TABLE 40 (cont'd)

DOMAIN TABLE: d_arcfun ATTRIBUTE: h_class

h_class	Definition
LONGHOUSE	longhouse
MEDICINE_WHEEL	medicine wheel
MESCAL_PIT	mescal pit
MILLING_STATION	milling station
MOUND_EARTHWORK	mound/earthwork
MULTIROOM_STR	multiroom structure
NONE_NOTED	none noted
OTHER	other
OVEN	oven
PETROGLYPHS	petroglyphs
PICTOGRAPHS	pictographs
PIT_GENERAL	pit (function unknown)
PITHOUSE	pithouse
PLANT_PROCESS	plant processing site
PLAZA	plaza
PREHISTORIC	prehistoric (unknown)
PUEBLO	pueblo
QUARRY	quarry (all types)
ROCK_ART	rock art
ROCK_CONCENTRAT	rock concentration
ROCK_RING	rock ring
ROOM_BLOCK	room block
SHELL_MIDDEN	shell midden
SINGLE_ARTIFACT	single artifact
SINGLE_ROOM_STR	single room structure
SOIL_STAINS	soil stains
STORAGE_PIT	storage pit
STRUCTURE_UNK	structure - type unknown
SWEATHOUSE	sweathouse
TALUS_PIT	talus pit
TBD	to be determined

TABLE 40 (cont'd)

DOMAIN TABLE: d_arcfun ATTRIBUTE: h_class

h_class	Definition
TEMPORARY_CAMP	temporary camp
TIPI_RING	tipi ring
TRAILS_ROADS	trails/roads
UNKNOWN	unknown
VILLAGE	village
WATER_CONTROL	water control features - pond, canals, irrigation, dams
WATERCRAFT	watercraft
WEIR	weir
WICKIUP_RAMADA	wickiups/ramadas

TABLE 41

DOMAIN TABLE: d_culaf1 ATTRIBUTE: culture

culture	Definition
ADENA	Adena (se)
ALEXANDER	Alexander (se)
APPALACHIAN	Appalachian
ARCHAIC_EARLY	Archaic - early
ARCHAIC_LATE	Archaic - late
ARCHAIC_MIDDLE	Archaic - middle
ARCHAIC_UNK	Archaic - undifferentiated
ARKANSAS_RIVER	Arkansas river (sw/se)
BASKETMAKER_1	Basketmaker 1 (sw)
BASKETMAKER_2	Basketmaker 2 (sw)
BASKETMAKER_3	Basketmaker 3 (sw)
BASKETMAKER_UNK	Basketmaker (undifferentiated)(sw)
BAYTOWN	Baytown (se)
BLACK_FREEDMAN	Black Freedman
CADDO_1	Caddo 1 (se)
CADDO_2	Caddo 2 (se)
CADDO_3	Caddo 3 (se)
CANYON	Canyon (nw)
CASCADE	Cascade (nw)
CAYUSE	Cayuse (nw)
COCHISE	Cochise
COLES_CREEK	Coles Creek (se)
DALTON	Dalton (se)
EURO_AMERICAN	Euro-American
FOURCHE_MALINE	Fourche Maline (sw/se)
FREMONT	Fremont (se)
FRENCHMAN_SPG	Frenchman Springs (nw)
GULF_FORMATION	Gulf Formational (se)
HABIUKUT	Habiukut (sw/se)
HARDAY_NW	Harday (nw)
HARDAY_SE	Harday (se)

TABLE 41 (cont'd)

DOMAIN TABLE: d_culafi ATTRIBUTE: culture

culture	Definition
HISTORIC_COMP	Historic components
HOPEWELL	Hopewell (se)
ISSAQUENNA	Issaquenna (se)
LOMOKA	Lomoka (se)
MARKSVILLE	Marksville (se)
MILLER_1	Miller 1 (se)
MILLER_2	Miller 2 (se)
MISSISSIPPIAN	Mississippian (se)
MOGOLLON_1	Mogollon 1 (sw)
MOGOLLON_2	Mogollon 2 (sw)
MOGOLLON_3	Mogollon 3 (sw)
MOGOLLON_4	Mogollon 4 (sw)
MOGOLLON_5	Mogollon 5 (sw)
MORROW_MOUNTAIN	Morrow Mountain (se)
OSHARA	Oshara (sw)
PALEO_IND_CLOV	Paleo-Indian - Clovis
PALEO_IND_FOL	Paleo-Indian - Folsom
PALEO_IND_UNK	Paleo-Indian - undifferentiated
PHILLIPI_NW	Phillipi (nw)
PLAQUEMINE	Plaquemine (se)
POVERTY_POINT	Poverty Point (se)
PREHISTORIC_UNK	Prehistoric unknown
PUEBLO_1	Pueblo 1 (sw)
PUEBLO_2	Pueblo 2 (sw)
PUEBLO_3	Pueblo 3 (sw)
PUEBLO_4	Pueblo 4 (sw)
PUEBLO_UNK	Pueblo (undifferentiated)(sw)
QUINTON_NW	Quinton (nw)
RED_OCHRE	Red Ochre
SAN_DIEQUITO	San Diequito (ca)

TABLE 41 (cont'd)

DOMAIN TABLE: d_culafi ATTRIBUTE: culture

culture	Definition
SAN_PATRICE	San Patrice (se)
SAVANNAH_RIVER	Savannah River (se)
SEA_ISLANDER	Sea Islander
SHAKER	Shaker
SPIRO	Spiro (sw/se)
TBD	To be determined
TCHEFUNCTE	Tchefuncle (se)
TROYVILLE	Troyville (se)
TUCANNON	Tucannon (nw)
VANTAGE	Vantage (nw)
WHEELER	Wheeler (se)
WILDCAT	Wildcat (nw)
WINDUST	Windust (nw)
WISTER	Wister (sw/se)
WOODLAND_EARLY	Woodland - early (se/ne)
WOODLAND_LATE	Woodland - late (se/ne)
WOODLAND_MID	Woodland - middle (se/ne)

TABLE 42

DOMAIN TABLE: d_dlgmth ATTRIBUTE: age_dating

age_dating	Definition
ARCHAEOMAGNETIC	Archaeomagnetic
BIOLUMINESCENCE	Bioluminescence
BIOSILICATES	Biosilicates
C-14	C-14 radioactive
CERAMIC_DATING	Ceramic dating
CHRONOMETRIC	Absolute/chronometric
FAUNAL_SAMPLING	Faunal sampling
MICRO_BOTANICAL	Micro-botanical sampling
NONE	None
OTHER	Other
POLLEN_SAMPLING	Pollen sampling
PROJECTILE_PT	Projectile point technique inference
RELATIVE	Relative
RESEARCH_EXP	Research/experience
SERIATION	Seriation
SOIL_SAMPLING	Soil sampling
TBD	To be determined
THERMOLUMIN	Thermoluminescence
TREE_RING	Tree ring

TABLE 43

DOMAIN TABLE: d_strsty ATTRIBUTE: arch_sty_d

arch_sty_d	Definition
ARTDECO	Modern movement - Art Deco
BEAUXARTS	Late 19/20th - Beaux Arts
BUNGALOW	Late 19/20th U.S. - Bungalow
CHICAGO	Late 19/20th U.S.-Chicago
CLASSIC	Late 19/20th Classical Revival
COLONIAL	Late 19/20th Colonial Revival
COLONIAL_01	Colonial - unspecified
COLONIAL_02	New England Colonial
COLONIAL_03	Southern Colonial
COLONIAL_04	Spanish Colonial
COLONIAL_05	Dutch/Flemish Colonial
COLONIAL_06	Early Georgian Colonial
COLONIAL_07	Late Georgian Colonial
COLONIAL_08	French Colonial
COLONIAL_09	Colonial postmedieval English
COMMERCIAL	Late 19/20th U.S. Commercial
CUMBERLAND	Cumberland
EASTLAKE	Late Victorian/stick Eastlake
EGYPT	Egyptian Revival
EXOTIC	Mid 19th Exotic Revival
FEDERAL	Early Republic/Federal
FRENCH	Late 19/20th French RenaissReviv
GEORGIAN	Georgian Revival
GOTHIC_01	Late Victorian Gothic
GOTHIC_02	Mid 19th Gothic Revival
GOTHIC_03	Early 19th Gothic Revival

TABLE 43 (cont'd)

DOMAIN TABLE: d_strsty ATTRIBUTE: arch_sty_d

arch_sty_d	Definition
GOTHIC_04	Late 19/20th Gothic Revival
GREEK	Mid 19th Greek Revival
IHOUSE	Southern I House
INTERNATIONL	Modern movement - International
ITALIAN	Late 19/20th Italian RenaisReviv
ITALIANATE	Late Victorian Italianate
ITALIANVILLA	Mid 19th Italian Villa
LOGHOUSE	Log Dwelling
MISSION_SPANISH	Late 19/20th Spanish Revival
MIXED	Mixed
MODERNE	Modern movement - Moderne
MOORISH	Moorish Revival
NEOCLASSIC	Neoclassical Revival
NONE	No style listed
OCTAGON	Mid 19th Octagon
OTHER	Other
PEN_01	Single Pen
PEN_02	Double Pen
PLANTATION	Lowland South Plantation
PRAIRIE	Late 19/20th U.S. Prairie School
PUEBLO	Late 19/20th U.S. Pueblo Revival
QUEENANNE	Late Victorian - Queen Anne
RANCH	Modern movement - Ranch
REGENCY	Regency
REPUBLIC	Early Republic/Early Classic Revival
REVIVAL	Mid-19th Century Revival
ROMANESQUE	Late Victorian - Romanesque

TABLE 43 (cont'd)

DOMAIN TABLE: d_strsty ATTRIBUTE: arch_sty_d

arch_sty_d	Definition
SHINGLE	Late Victorian - Shingle
SHOTGUN	Shotgun
SKYSCRAPER	Late 19/20th U.S. Skyscraper
SULLIVAN	Late 19/20th U.S. Sullivan
TBD	To be determined
TUDOR	Late 19/20th Tudor Revival
TUDORELIZA	Tudor/Elizabethan
UNKNOWN	Unknown
VICTEMPIRE2	Late Victorian - Second Empire
VICTORIAN	Late Victorian
VICTRENAISS	Late Victorian - Renaissance
WESTERN	Western Stick

TABLE 44

DOMAIN TABLE: d_culafl ATTRIBUTE: affil_d

affil_d	Definition
ADENA	Adena (se)
ALEXANDER	Alexander (se)
APPALACHIAN	Appalachian
ARCHAIC_EARLY	Archaic - early
ARCHAIC_LATE	Archaic - late
ARCHAIC_MIDDLE	Archaic - middle
ARCHAIC_UNK	Archaic - undifferentiated
ARKANSAS_RIVER	Arkansas river (sw/se)
BASKETMAKER_1	Basketmaker 1 (sw)
BASKETMAKER_2	Basketmaker 2 (sw)
BASKETMAKER_3	Basketmaker 3 (sw)
BASKETMAKER_UNK	Basketmaker (undifferentiated) (sw)
BAYTOWN	Baytown (se)
BLACK_FREEDMAN	Black Freedman
CADDQ_1	Caddo 1 (se)
CADDQ_2	Caddo 2 (se)
CADDQ_3	Caddo 3 (se)
CANYON	Canyon (nw)
CASCADE	Cascade (nw)
CAYUSE	Cayuse (nw)
COCHISE	Cochise
COLES_CREEK	Coles Creek (se)
DALTON	Dalton (se)
EURO_AMERICAN	Euro-American
FOURCHE_MALINE	Fourche Maline (sw/se)
FREMONT	Fremont (se)

TABLE 44 (cont'd)

DOMAIN TABLE: d_culafi ATTRIBUTE: affil_d

affil_d	Definition
FRENCHMAN_SPG	Frenchman Springs (nw)
GULF_FORMATION	Gulf Formational (se)
HABIUKUT	Habiukut (sw/se)
HARDAY_NW	Harday (nw)
HARDAY_SE	Harday (se)
HISTORIC_COMP	Historic components
HOPEWELL	Hopewell (se)
ISSAQUEENNA	Issaquenna (se)
LOMOKA	Lomoka (se)
MARKSVILLE	Marksville (se)
MILLER_1	Miller 1 (se)
MILLER_2	Miller 2 (se)
MISSISSIPPIAN	Mississippian (se)
MOGOLLON_1	Mogollon 1 (sw)
MOGOLLON_2	Mogollon 2 (sw)
MOGOLLON_3	Mogollon 3 (sw)
MOGOLLON_4	Mogollon 4 (sw)
MOGOLLON_5	Mogollon 5 (sw)
MORROW_MOUNTAIN	Morrow Mountain (se)
OSHARA	Oshara (sw)
PALEO_IND_CLOV	Paleo-Indian - Clovis
PALEO_IND_FOL	Paleo-Indian - Folsom
PALEO_IND_UNK	Paleo-Indian - undifferentiated
PHILLIPI_NW	Phillipi (nw)
PLAQUEMINE	Plaquemine (se)
POVERTY_POINT	Poverty Point (se)

TABLE 44 (cont'd)

DOMAIN TABLE: d_culafl ATTRIBUTE: affil_d

affil_d	Definition
PREHISTORIC_UNK	Prehistoric unknown
PUEBLO_1	Pueblo 1 (sw)
PUEBLO_2	Pueblo 2 (sw)
PUEBLO_3	Pueblo 3 (sw)
PUEBLO_4	Pueblo 4 (sw)
PUEBLO_UNK	Pueblo (undifferentiated) (sw)
QUINTON_NW	Quinton (nw)
RED_OCHRE	Red Ochre
SAN_DIEQUITO	San Diequito (ca)
SAN_PATRICE	San Patrice (se)
SAVANNAH_RIVER	Savannah River (se)
SEA_ISLANDER	Sea Islander
SHAKER	Shaker
SPIRO	Spiro (sw/se)
TBD	To be determined
TCHEFUNCTE	Tchefuncte (se)
TROYVILLE	Troyville (se)
TUCANNON	Tucannon (nw)
VANTAGE	Vantage (nw)
WHEELER	Wheeler (se)
WILDCAT	Wildcat (nw)
WINDUST	Windust (nw)
WISTER	Wister (sw/se)
WOODLAND_EARLY	Woodland - early (se/ne)
WOODLAND_LATE	Woodland - late (se/ne)
WOODLAND_MID	Woodland - middle (se/ne)

TABLE 45

DOMAIN TABLE: d_arcinv ATTRIBUTE: inv_typ1_d

inv_typ1_d	Definition
AERIAL_100	Aerial survey - 100%
AERIAL_JUDGMENT	Aerial survey - judgmental
AERIAL_SAMPLE	Aerial survey - sample
AERIAL_UNKNOWN	Aerial survey - methodology unknown
AMATEUR_REPORT	Amateur report
AUGER_100	Auger test survey - 100%
AUGER_JUDGE	Auger test survey - judgmental
AUGER_SAMPLE	Auger test survey - sample
AUGER_UNKNOWN	Auger test survey - methodology unknown
AUTOMOBILE	Automobile survey
BANKLINE_100	Bankline survey - 100%
BANKLINE_JUDGMT	Bankline survey - judgmental
BANKLINE_SAMPLE	Bankline survey - sample
BANKLINE_UNKN	Bankline survey - methodology unknown
COLLECTED	Collected/collections
EQP_EXCAVATION	Heavy equipment excavation
EXCAVATED	Excavated
FULL_MITIGATION	Full mitigation
INFORM_AMATEUR	Informed amateur
LITERATURE_100	Literature survey - 100%
LITERATURE_JUDG	Literature survey - judgmental
LITERATURE_SMP	Literature survey - sample
LITERATURE_UNK	Literature survey - methodology unknown
MINING	Mining
PARTIAL_MITIG	Partial mitigation
REMOTE_100	Remote sensing survey - 100%
REMOTE_JUDGMENT	Remote sensing survey - judgmental

TABLE 45 (cont'd)

DOMAIN TABLE: d_arcinv ATTRIBUTE: inv_typ1_d

inv_typ1_d	Definition
REMOTE_SAMPLE	Remote sensing survey - sample
REMOTE_UNKNOWN	Remote sensing survey - methodology unknown
SERENDIPITY	Serendipity
SHOVEL_100	Shovel test survey - 100%
SHOVEL_JUDGE	Shovel test survey - judgmental
SHOVEL_SAMPLE	Shovel test survey - sample
SHOVEL_UNKNOWN	Shovel test survey - methodology unknown
SURFACE_100	Surface survey - 100%
SURFACE_JUDGE	Surface survey - judgmental
SURFACE_SAMPLE	Surface survey - sample
SURFACE_UNKNOWN	Surface survey - methodology unknown
TESTED	Tested
UNDERWATER_100	Underwater survey - 100%
UNDERWATER_JUDG	Underwater survey - judgmental
UNDERWATER_SMP	Underwater survey - sample
UNDERWATER_UNK	Underwater survey - methodology unknown
UNDISTURBED	Undisturbed (surveyed, no collections)
UNKNOWN	Survey methodology unknown

TABLE 46

DOMAIN TABLE: d_arcinv ATTRIBUTE: inv_typ2_d

inv_typ2_d	Definition
AERIAL_100	Aerial survey - 100%
AERIAL_JUDGMENT	Aerial survey - judgmental
AERIAL_SAMPLE	Aerial survey - sample
AERIAL_UNKNOWN	Aerial survey - methodology unknown
AMATEUR_REPORT	Amateur report
AUGER_100	Auger test survey - 100%
AUGER_JUDGE	Auger test survey - judgmental
AUGER_SAMPLE	Auger test survey - sample
AUGER_UNKNOWN	Auger test survey - methodology unknown
AUTOMOBILE	Automobile survey
BANKLINE_100	Bankline survey - 100%
BANKLINE_JUDGMT	Bankline survey - judgmental
BANKLINE_SAMPLE	Bankline survey - sample
BANKLINE_UNKN	Bankline survey - methodology unknown
COLLECTED	Collected/collections
EQP_EXCAVATION	Heavy equipment excavation
EXCAVATED	Excavated
FULL_MITIGATION	Full mitigation
INFORM_AMATEUR	Informed amateur
LITERATURE_100	Literature survey - 100%
LITERATURE_JUDG	Literature survey - judgmental
LITERATURE_SMP	Literature survey - sample
LITERATURE_UNK	Literature survey - methodology unknown
MINING	Mining
PARTIAL_MITIG	Partial mitigation
REMOTE_100	Remote sensing survey - 100%
REMOTE_JUDGMENT	Remote sensing survey - judgmental

TABLE 46 (cont'd)

DOMAIN TABLE: d_arcinv ATTRIBUTE: inv_typ2_d

inv_typ2_d	Definition
REMOTE_SAMPLE	Remote sensing survey - sample
REMOTE_UNKNOWN	Remote sensing survey - methodology unknown
SERENDIPITY	Serendipity
SHOVEL_100	Shovel test survey - 100%
SHOVEL_JUDGE	Shovel test survey - judgmental
SHOVEL_SAMPLE	Shovel test survey - sample
SHOVEL_UNKNOWN	Shovel test survey - methodology unknown
SURFACE_100	Surface survey - 100%
SURFACE_JUDGE	Surface survey - judgmental
SURFACE_SAMPLE	Surface survey - sample
SURFACE_UNKNOWN	Surface survey - methodology unknown
TESTED	Tested
UNDERWATER_100	Underwater survey - 100%
UNDERWATER_JUDG	Underwater survey - judgmental
UNDERWATER_SMP	Underwater survey - sample
UNDERWATER_UNK	Underwater survey - methodology unknown
UNDISTURBED	Undisturbed (surveyed, no collections)
UNKNOWN	Survey methodology unknown

TABLE 47

DOMAIN TABLE: d_arclnv ATTRIBUTE: inv_typ3_d

inv_typ3_d	Definition
AERIAL_100	Aerial survey - 100%
AERIAL_JUDGMENT	Aerial survey - judgmental
AERIAL_SAMPLE	Aerial survey - sample
AERIAL_UNKNOWN	Aerial survey - methodology unknown
AMATEUR_REPORT	Amateur report
AUGER_100	Auger test survey - 100%
AUGER_JUDGE	Auger test survey - judgmental
AUGER_SAMPLE	Auger test survey - sample
AUGER_UNKNOWN	Auger test survey - methodology unknown
AUTOMOBILE	Automobile survey
BANKLINE_100	Bankline survey - 100%
BANKLINE_JUDGMT	Bankline survey - judgmental
BANKLINE_SAMPLE	Bankline survey - sample
BANKLINE_UNKN	Bankline survey - methodology unknown
COLLECTED	Collected/collections
EQP_EXCAVATION	Heavy equipment excavation
EXCAVATED	Excavated
FULL_MITIGATION	Full mitigation
INFORM_AMATEUR	Informed amateur
LITERATURE_100	Literature survey - 100%
LITERATURE_JUDG	Literature survey - judgmental
LITERATURE_SMP	Literature survey - sample
LITERATURE_UNK	Literature survey - methodology unknown
MINING	Mining
PARTIAL_MITIG	Partial mitigation
REMOTE_100	Remote sensing survey - 100%
REMOTE_JUDGMENT	Remote sensing survey - judgmental

TABLE 47 (cont'd)

DOMAIN TABLE: d_arcinvs ATTRIBUTE: inv_tvp3_d

inv_tvp3_d	Definition
REMOTE_SAMPLE	Remote sensing survey - sample
REMOTE_UNKNOWN	Remote sensing survey - methodology unknown
SERENDIPITY	Serendipity
SHOVEL_100	Shovel test survey - 100%
SHOVEL_JUDGE	Shovel test survey - judgmental
SHOVEL_SAMPLE	Shovel test survey - sample
SHOVEL_UNKNOWN	Shovel test survey - methodology unknown
SURFACE_100	Surface survey - 100%
SURFACE_JUDGE	Surface survey - judgmental
SURFACE_SAMPLE	Surface survey - sample
SURFACE_UNKNOWN	Surface survey - methodology unknown
TESTED	Tested
UNDERWATER_100	Underwater survey - 100%
UNDERWATER_JUDG	Underwater survey - judgmental
UNDERWATER_SMP	Underwater survey - sample
UNDERWATER_UNK	Underwater survey - methodology unknown
UNDISTURBED	Undisturbed (surveyed, no collections)
UNKNOWN	Survey methodology unknown

TABLE 48

DOMAIN TABLE: d_arcinv ATTRIBUTE: inv_typ4_d

inv_typ4_d	Definition
AERIAL_100	Aerial survey - 100%
AERIAL_JUDGMENT	Aerial survey - judgmental
AERIAL_SAMPLE	Aerial survey - sample
AERIAL_UNKNOWN	Aerial survey - methodology unknown
AMATEUR_REPORT	Amateur report
AUGER_100	Auger test survey - 100%
AUGER_JUDGE	Auger test survey - judgmental
AUGER_SAMPLE	Auger test survey - sample
AUGER_UNKNOWN	Auger test survey - methodology unknown
AUTOMOBILE	Automobile survey
BANKLINE_100	Bankline survey - 100%
BANKLINE_JUDGMT	Bankline survey - judgmental
BANKLINE_SAMPLE	Bankline survey - sample
BANKLINE_UNKN	Bankline survey - methodology unknown
COLLECTED	Collected/collections
EQP_EXCAVATION	Heavy equipment excavation
EXCAVATED	Excavated
FULL_MITIGATION	Full mitigation
INFORM_AMATEUR	Informed amateur
LITERATURE_100	Literature survey - 100%
LITERATURE_JUDG	Literature survey - judgmental
LITERATURE_SMP	Literature survey - sample
LITERATURE_UNK	Literature survey - methodology unknown
MINING	Mining
PARTIAL_MITIG	Partial mitigation
REMOTE_100	Remote sensing survey - 100%
REMOTE_JUDGMENT	Remote sensing survey - judgmental

TABLE 48 (cont'd)

DOMAIN TABLE: d_arcinv ATTRIBUTE: inv_typ4_d

inv_typ4_d	Definition
REMOTE_SAMPLE	Remote sensing survey - sample
REMOTE_UNKNOWN	Remote sensing survey - methodology unknown
SERENDIPITY	Serendipity
SHOVEL_100	Shovel test survey - 100%
SHOVEL_JUDGE	Shovel test survey - judgmental
SHOVEL_SAMPLE	Shovel test survey - sample
SHOVEL_UNKNOWN	Shovel test survey - methodology unknown
SURFACE_100	Surface survey - 100%
SURFACE_JUDGE	Surface survey - judgmental
SURFACE_SAMPLE	Surface survey - sample
SURFACE_UNKNOWN	Surface survey - methodology unknown
TESTED	Tested
UNDERWATER_100	Underwater survey - 100%
UNDERWATER_JUDG	Underwater survey - judgmental
UNDERWATER_SMP	Underwater survey - sample
UNDERWATER_UNK	Underwater survey - methodology unknown
UNDISTURBED	Undisturbed (surveyed, no collections)
UNKNOWN	Survey methodology unknown

TABLE 49

DOMAIN TABLE: d_locrel ATTRIBUTE: loc_rel_d

loc_rel_d	Definition
EXCELLENT	Excellent-site precisely located on USGS quad map
GOOD	Good-site transferred from other map source to USGS quad map-good support
NONE	Poor-site map located-no supporting information
QUAD_ONLY	Site located to quad map only
UNKNOWN	Unknown

TABLE 50

DOMAIN TABLE: d_sitstt ATTRIBUTE: site_type_d

site_type_d	Definition
COLLECTION	Collected/collections
EXCAVATED	Excavated
PARTMITIGATE	Partial mitigation
TBD	To be determined
TESTED	Tested
UNDISTURBED	Undisturbed (surveyed - no collections)
UNKNOWN	Unknown

TABLE 51

DOMAIN TABLE: d_culdis ATTRIBUTE: disturb_d

disturb_d	Definition
DESTROYED	Destroyed
MAJORIMPACT	Major impact (51-99%) disturbed
MINORIMPACT	Minor impact (1-25%) disturbed
MODERIMPACT	Moderate impact (26-50%) disturbed
NONE	None
TBD	To be determined
UNKNOWN	Unknown

TABLE 52

DOMAIN TABLE: d_regstt ATTRIBUTE: nreg_stt_d

nreg_stt_d	Definition
ELIGIBLE	Determined eligible (SHPO determination)
LISTED	Listed
NATLANDMARK	National Landmark
NATUSRELIGN	Native American religious site
NOMINATED	Nominated
NOTELIGIBLE	Not eligible (SHPO determination)
PARTOFNRHP	Part of NRHP district
PENDINGNOMIN	Pending nomination
RECOMMENDNO	Recommended ineligible (recorders recommendation)
RECOMMENDYES	Recommended eligible (recorders recommendation)
REMOVEDELIGB	Removed from eligible listing
REMOVEDNRHP	Removed from NRHP, NHL listing
TBD	To be determined
UNKNOWN	Unknown

TABLE 53

DOMAIN TABLE: d_recsep ATTRIBUTE: rec_rep_d

nreg_stt_d	Definition
EDUCAT_INST	Educational institution
FEDERAL	Federal agency
MUNICIPAL_GOV	County/Parish municipal government
PRIVATE_CONT	Private contractor
PRIVATE_EDUCAT	Private educator
PRIVATE_INDIV	Private individual
SHPO	State Historic Preservation Office
STATE	State agency
UNKNOWN	Unknown

TABLE 54

DOMAIN TABLE: d_h_skel ATTRIBUTE: human_skel_d

human_skel_d	Definition
PRESENT	Human skeletal elements present
ABSENT	Human skeletal elements not present
POSSIBLE	Human skeletal elements possibly present
UNKNOWN	Unknown

TABLE 55

DOMAIN TABLE: d_regcon ATTRIBUTE: nreg_con_d

nreg_con_d	Definition
BIRTHPLACE	Birthplace
COMMEMORATIVE	Commemorative property
GRAVE	Grave
RECONSTRUCTED	Reconstructed structure
RELIGION	Religion associated
REMOVED	Removed from original location
UNDER_50_YRS	Less than fifty (50) years and achieved significant

TABLE 56

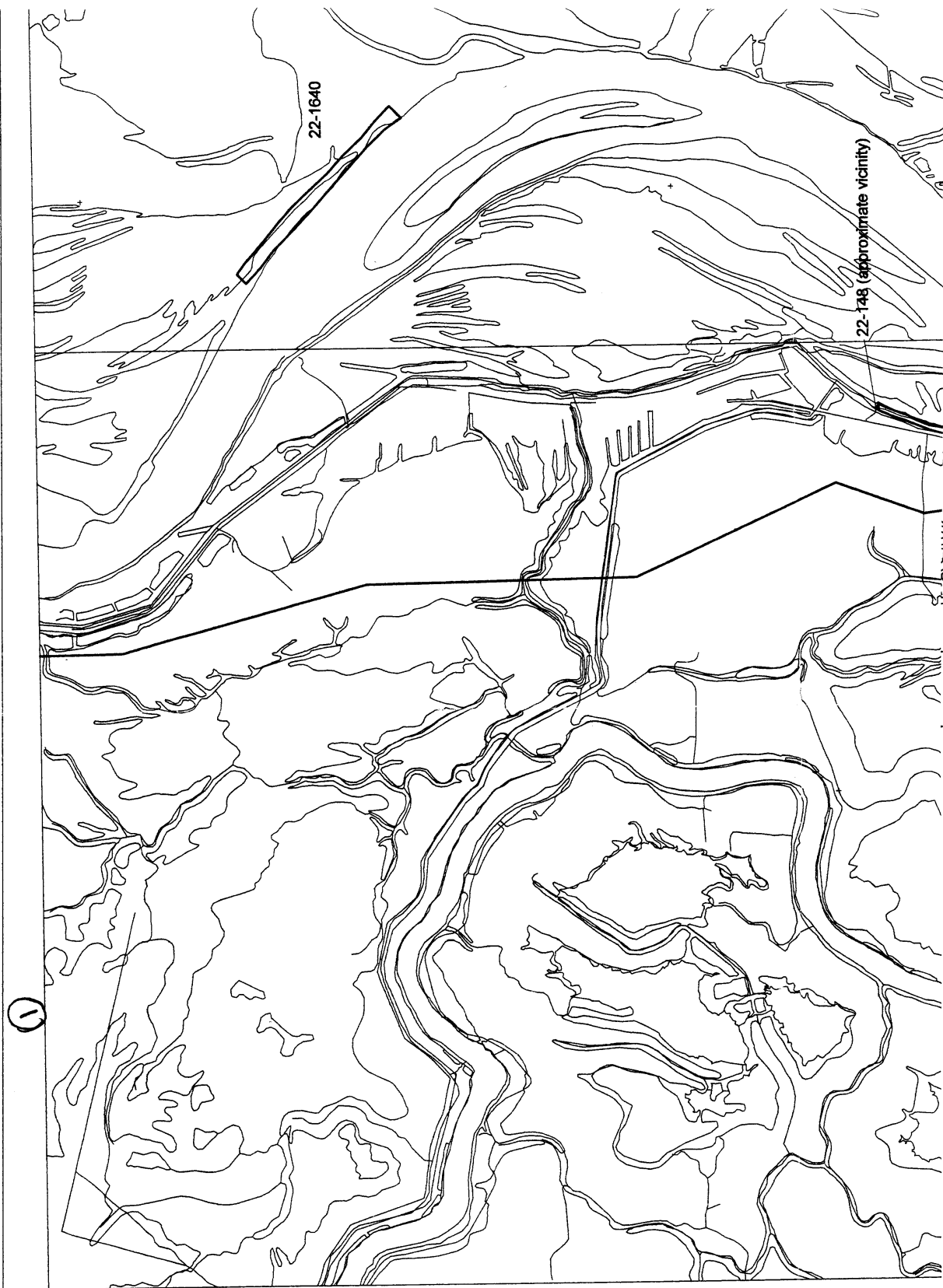
DOMAIN TABLE: d_culfet ATTRIBUTE: feat_typ_d

feat_typ_d	Definition
INTERPRETIVE	Interpretive sites
LANDMARKS	Landmarks of historical significance
MARKERS	Markers for locations of historic events
MEMORIALS	Memorials to deaths or acts of heroism
MONUMENT	Historical monuments or displays
MUSEUMS	Places where artifacts are kept
TBD	To be determined
UNKNOWN	Unknown

TABLE 57

DOMAIN TABLE: d_cemtyp ATTRIBUTE: denom_d

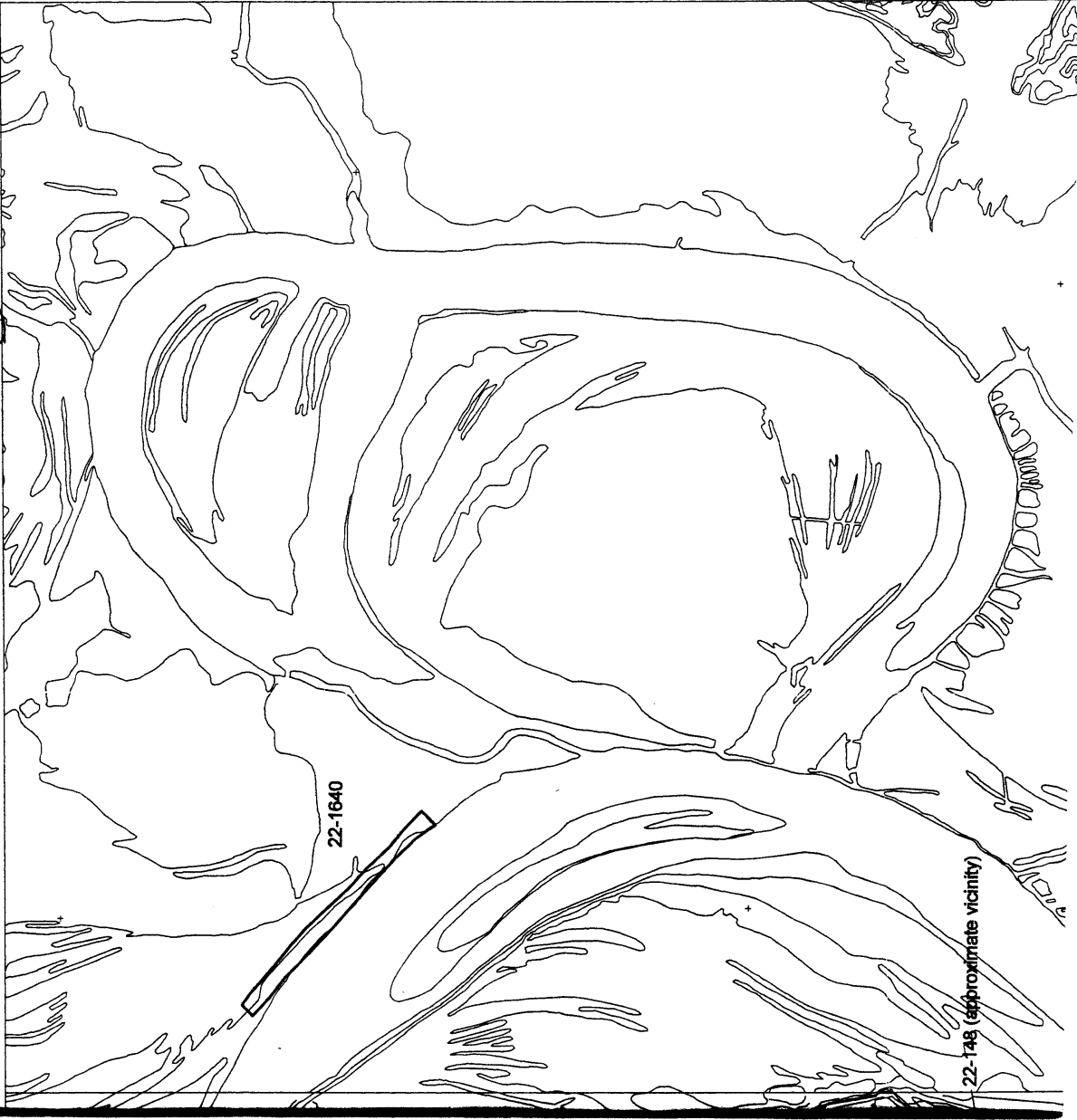
denom_d	Definition
CHRISTIAN	Affiliated with a Christian church
JEWISH	Affiliated with a Synagogue
MUSLIM	Affiliated with the ISLAMIC religion
NATIONAL	Any Federal of National Memorial cemetery
OTHER	Other, not otherwise listed
PRIVATE	Privately owned cemetery or gravesite
TBD	To be determined
UNKNOWN	Unknown

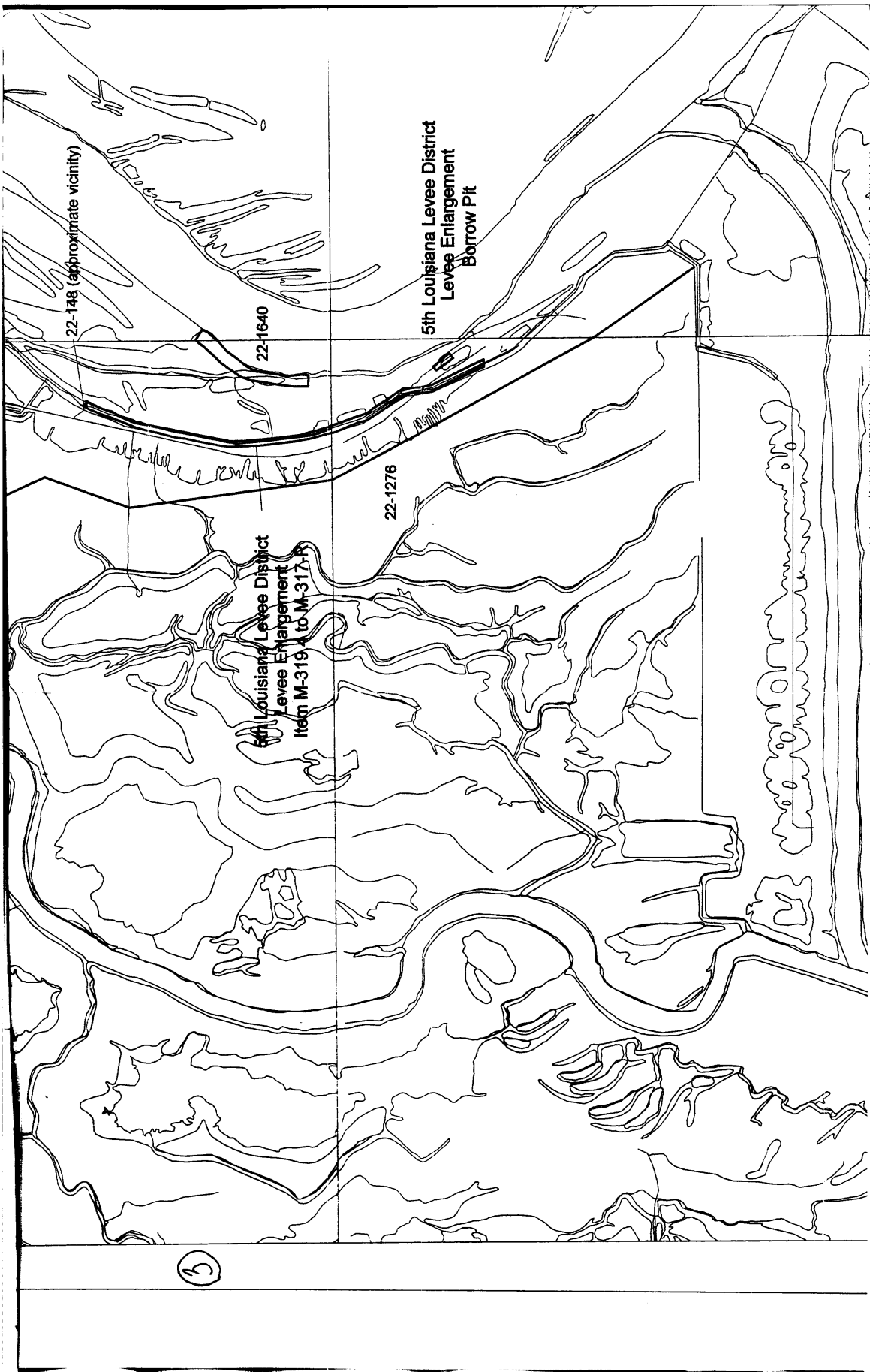


3

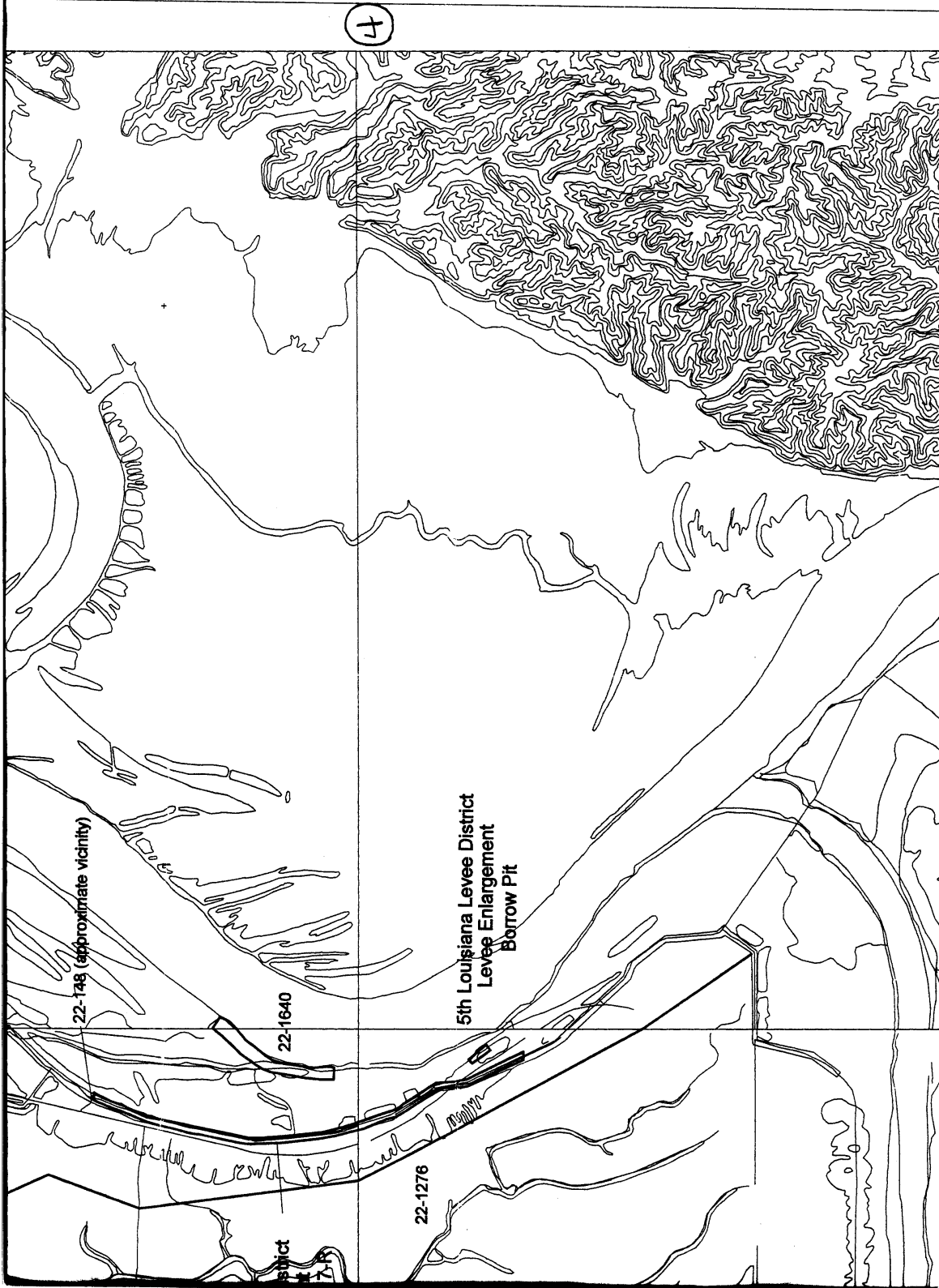
22-1640

22-148 (approximate vicinity)





6



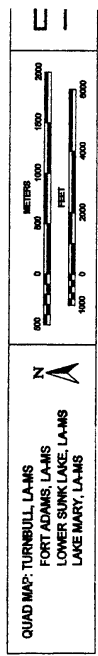
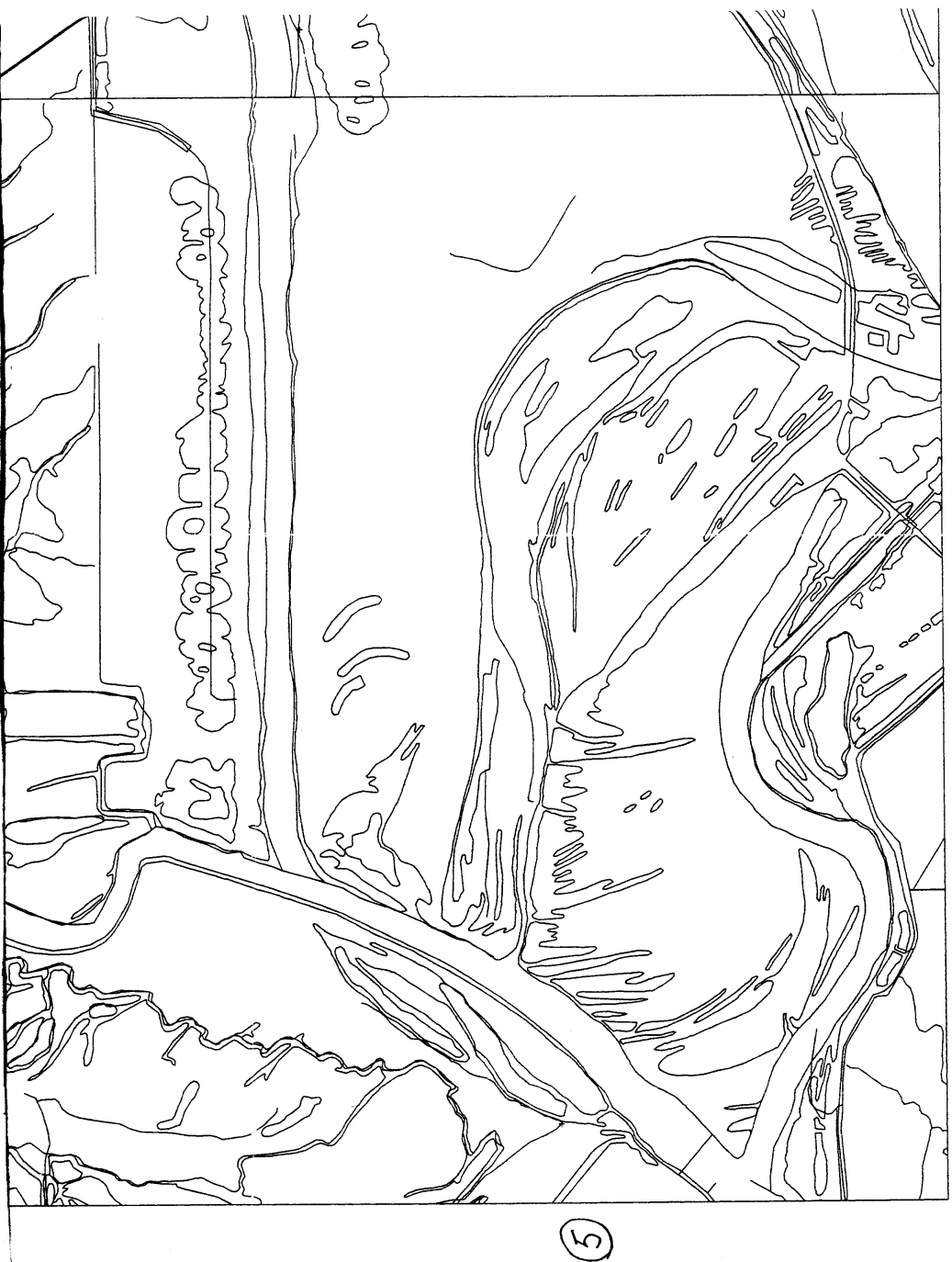
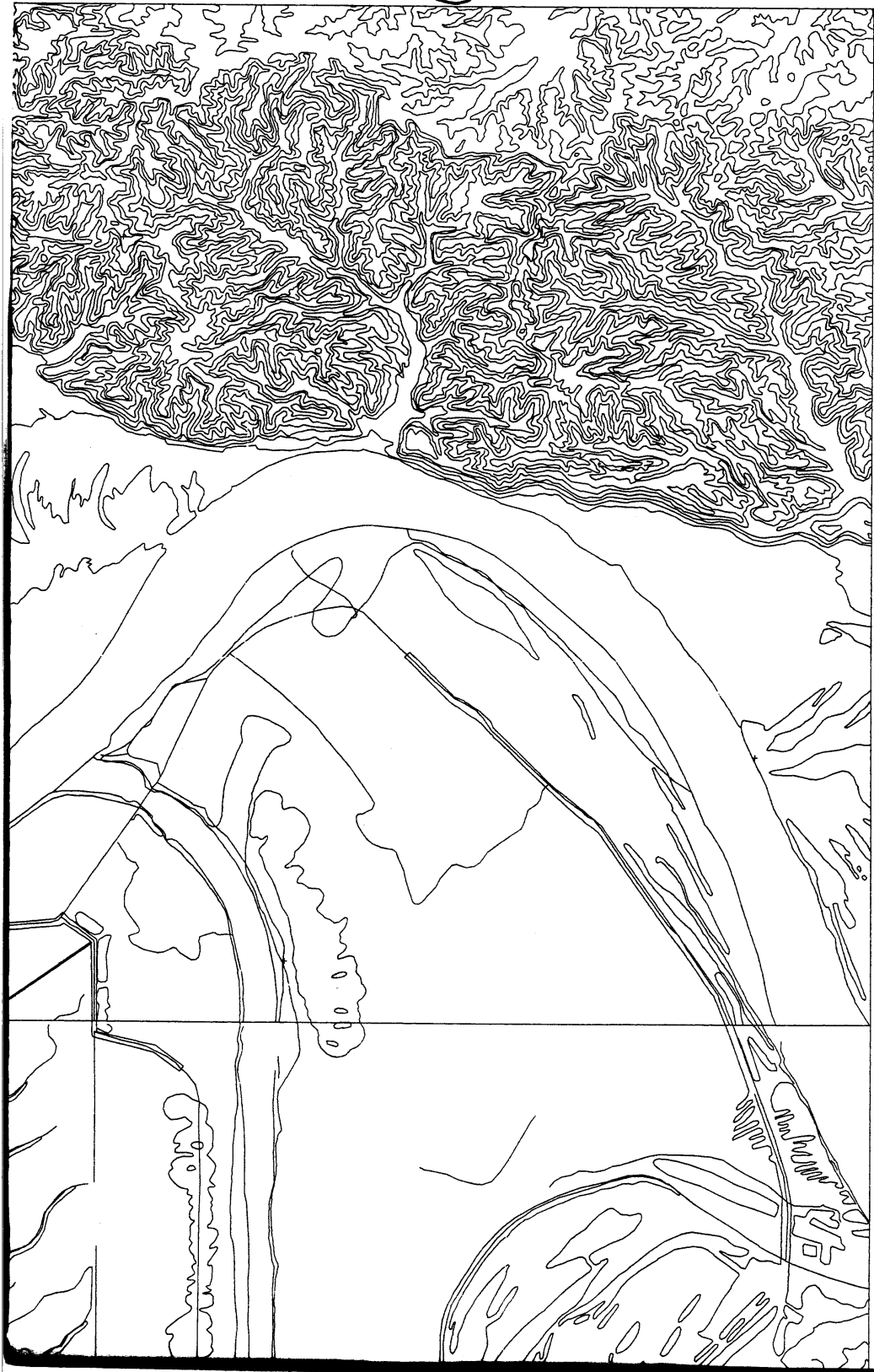


Figure 2. Map of 1996 digital 7.5' series topographic quadrangles, Fort Adams, Louisiana-Mississippi, Lake Mary, Louisiana-Mississippi, Lower Sunk Lake, Louisiana, and Turnbull Island, Louisiana, depicting location of SEIS project items and associates cultural resources loci, surveys, historic cemeteries, and historic period standing structures.

6



LAAMS
LAAMS
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LAAMS

PROJECT ITEM

PREVIOUSLY CONDUCTED ARCHEOLOGICAL SURVEY

0 500 1000 1500 2000

METERS

0 1000 2000

FEET

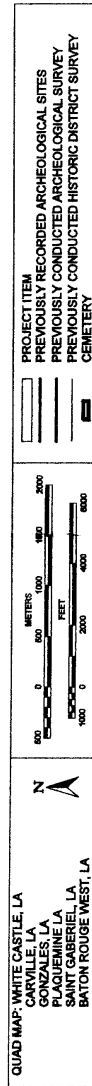
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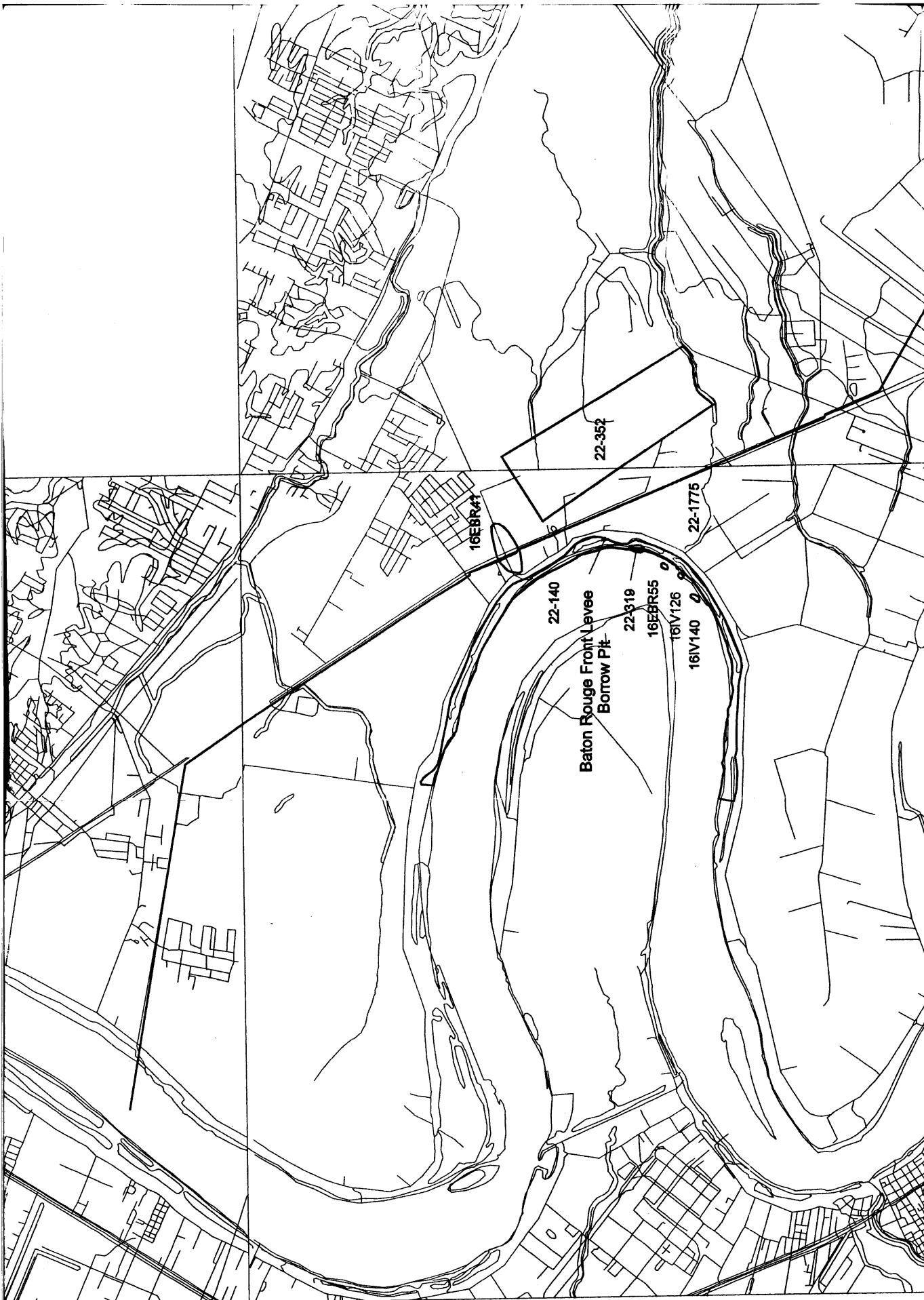
Mississippi, Lake Mary, Louisiana-Mississippi, Lower Sunk
and associates cultural resources loci, surveys, historic



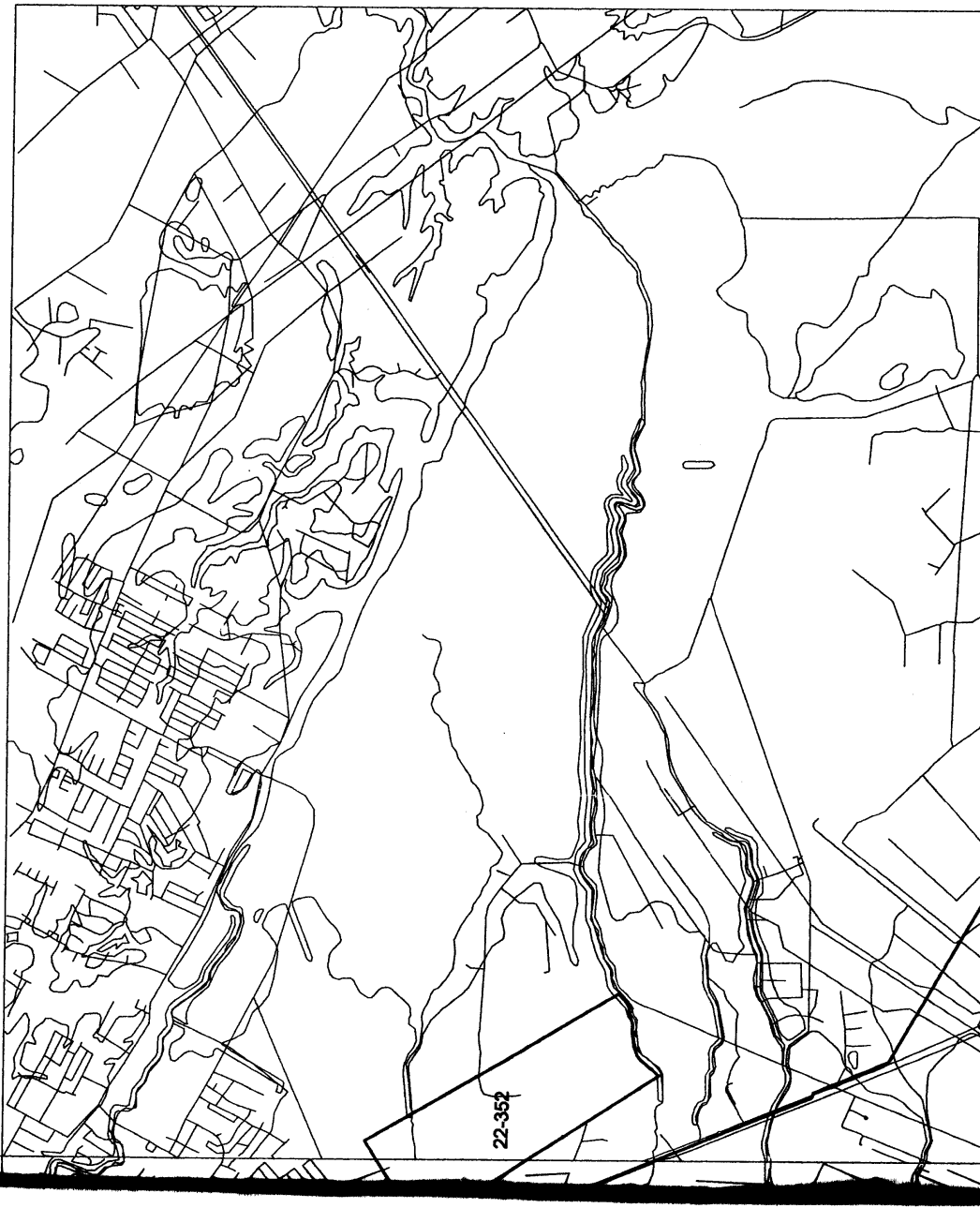
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2

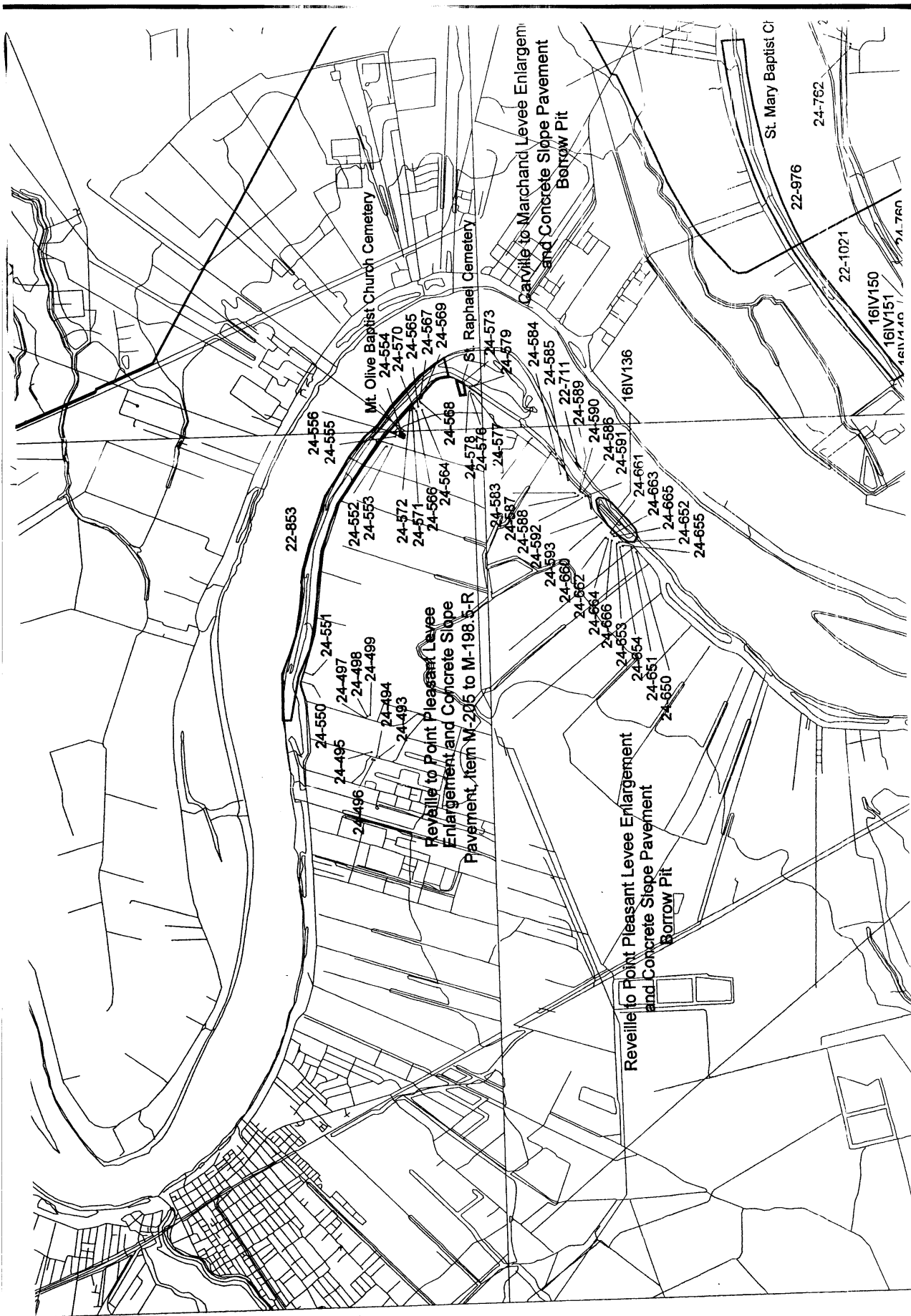




⊕



22-352



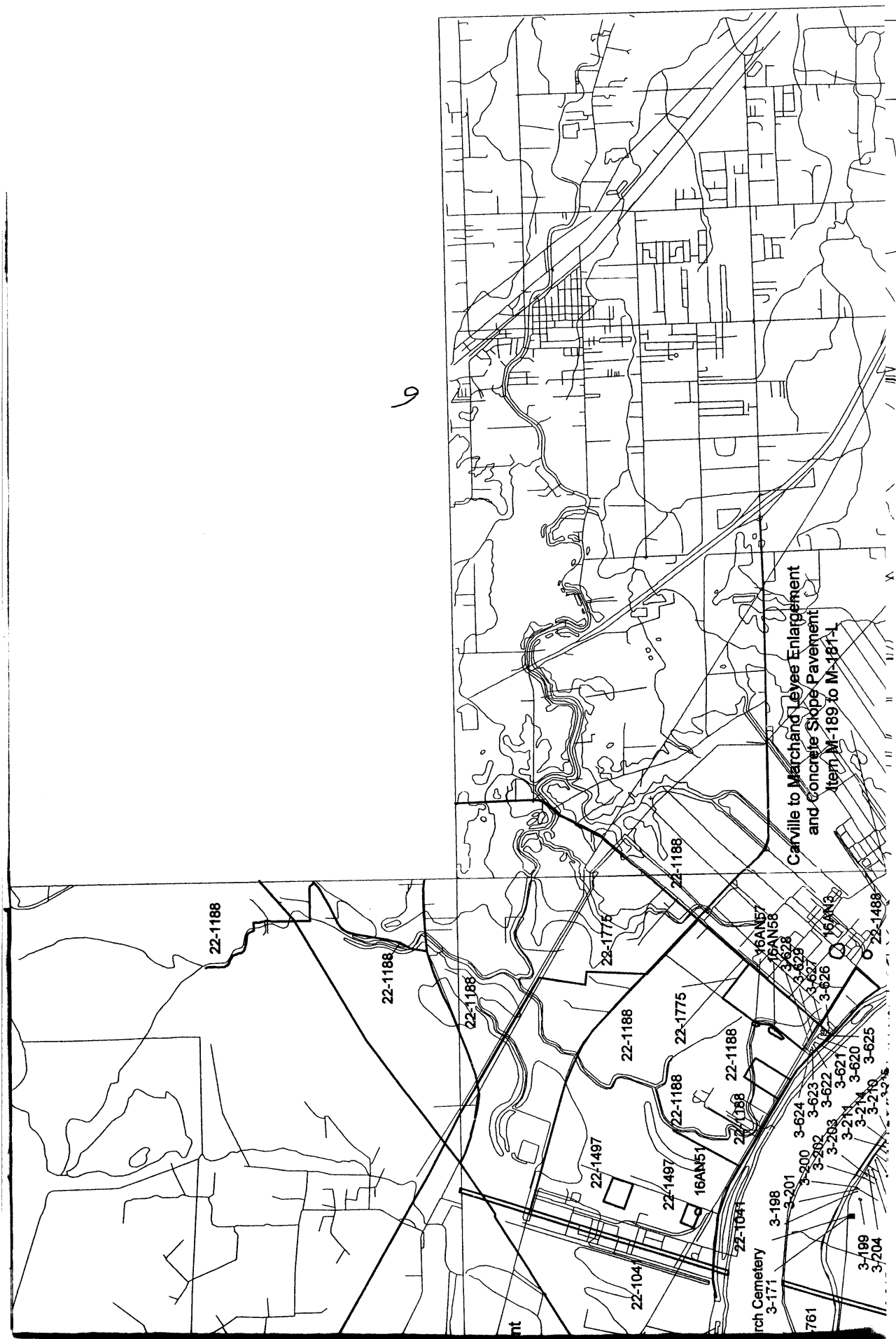
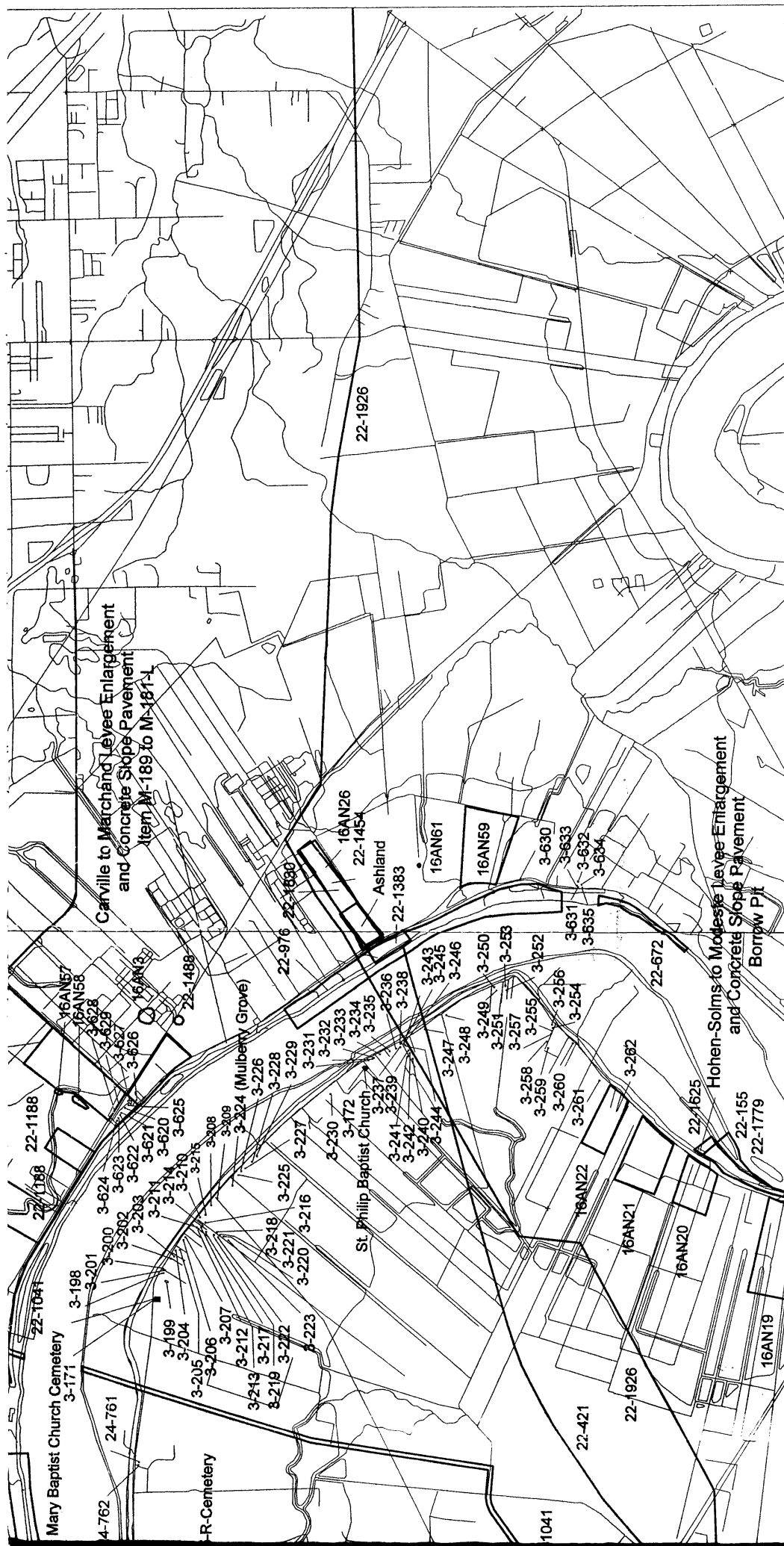
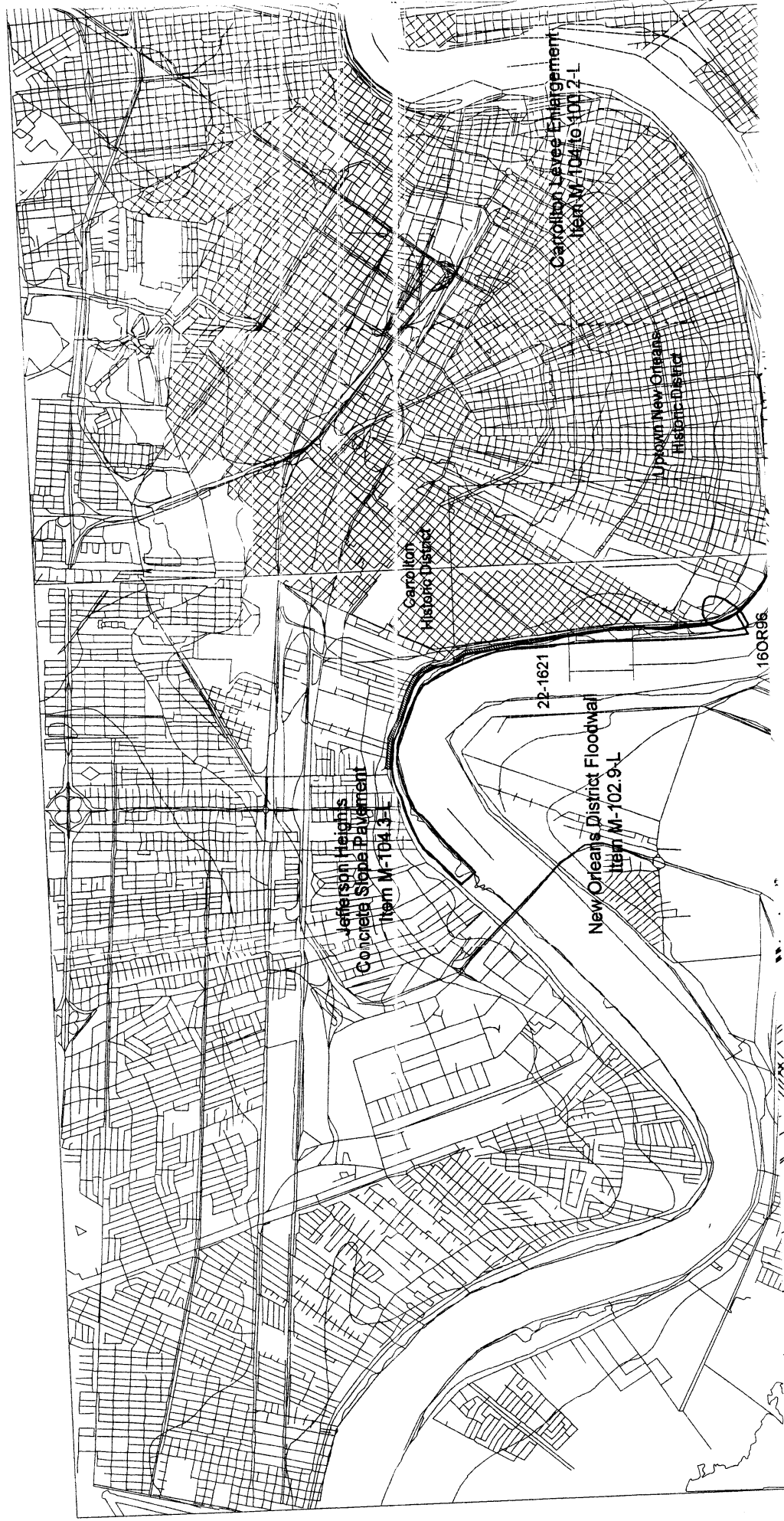
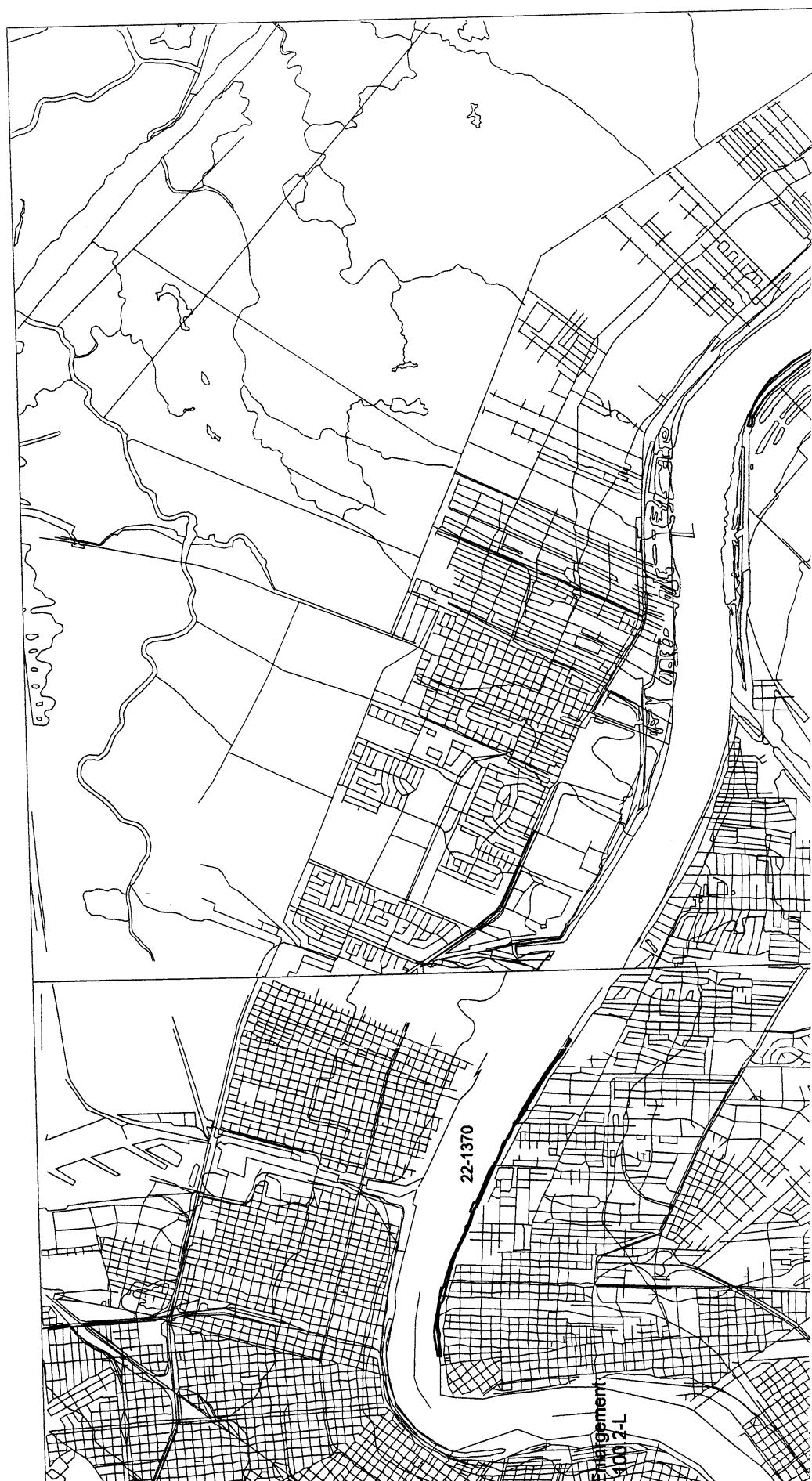




Figure 3. Map of 1996 digital 7.5' series topographic quadrangles, Baton Rouge West, Louisiana, Carville, Louisiana, Gonzales, Louisiana, Plaquemine, Louisiana, Saint Gabriel, Louisiana, and White Castle, Louisiana, depicting location of SEIS project items and associates cultural resources loci, surveys, historic cemeteries, and historic period standing structures.









3



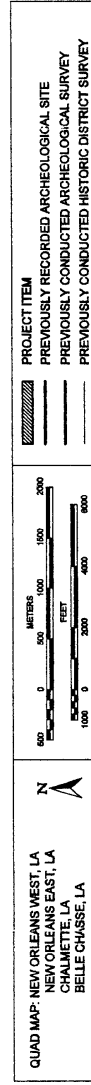
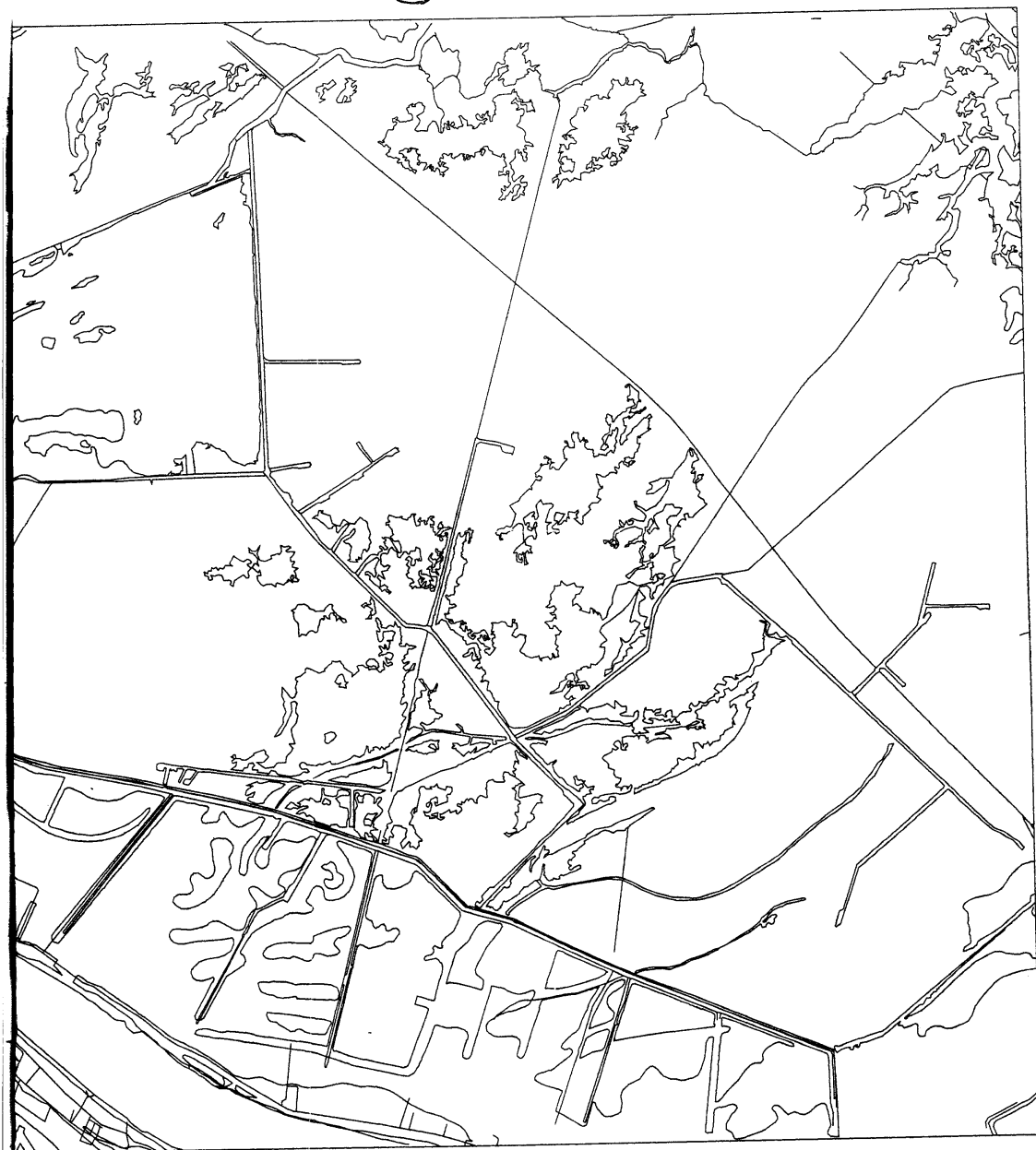


Figure 4. Map of 1996 digital 7.5' series topographic quadrangles, Belle Chasse, Louisiana, Chalmette, Louisiana, New Orleans East, Louisiana, and New Orleans West, Louisiana, depicting location of SEIS project items and associates cultural resources loci, surveys, historic cemeteries, and historic period standing structures.



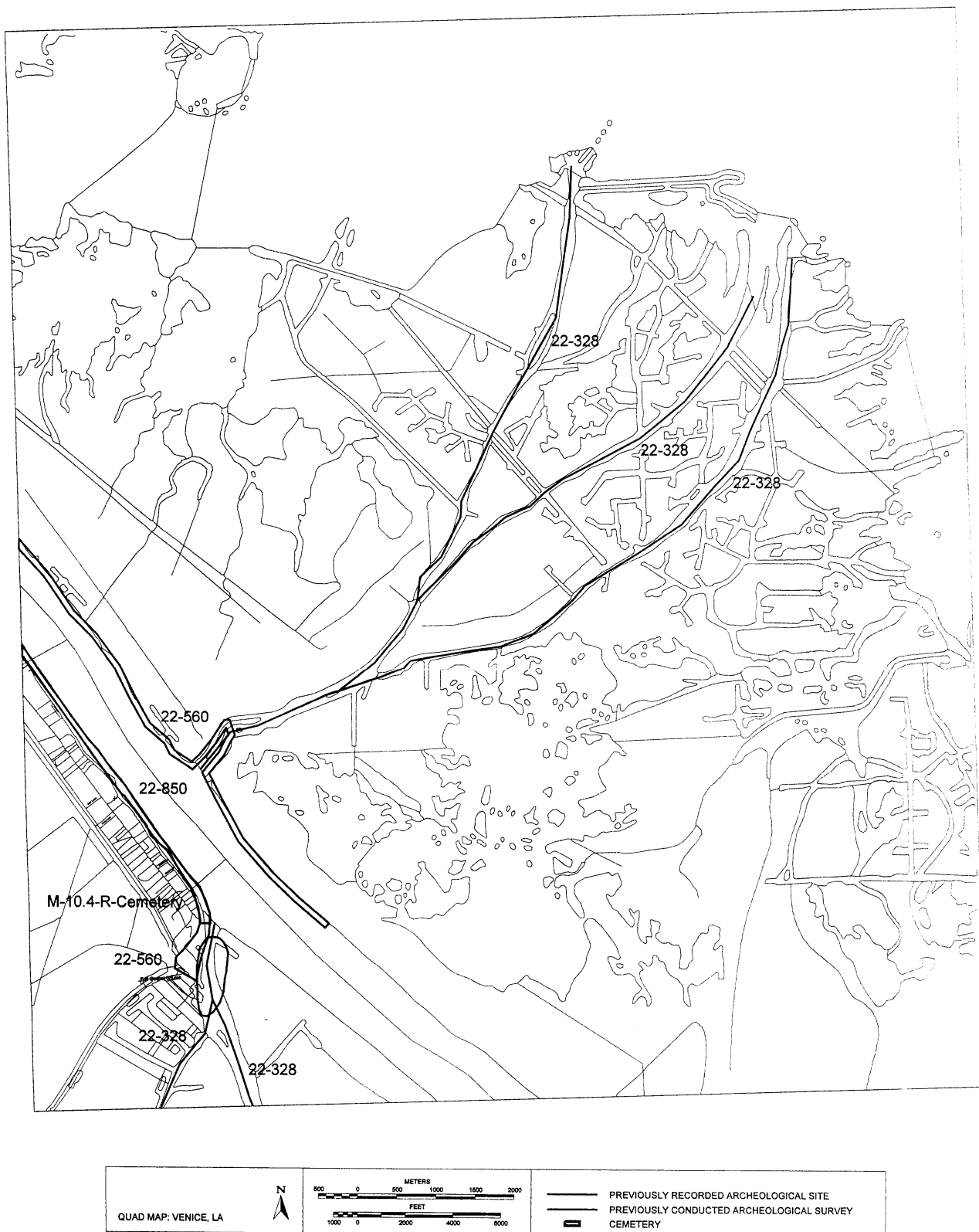


Figure 5. Map of 1996 digital 7.5' series topographic quadrangle, Venice, Louisiana, depicting location of SEIS project items and associates cultural resources loci, surveys, historic cemeteries, and historic period standing structures.