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New Orleans District

# ARCHEOLOGICAL TESTING OF THE NORTH BEND SITE (16SMY132) AND SURVEY OF THE TODD AREA LEVEE, ST. MARY PARISH, LOUISIANA



FINAL REPORT

LOUISIANA GEOLOGICAL SURVEY
Louisiana State University
Baton Rouge





Prepared for

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In September 1991 the Louisiana Geological Survey conducted a cultural resources survey of the proposed Todd Area Levee Project located on the west side of Bayou Sale in St. Mary Parish. Additionally, testing was conducted at the North Bend Site (16SMY 132) located at the intersection of Bayou Sale and the Intracoastal Waterway. The work was performed for the U.S. Army Corps of Engineers, New Orleans District, pursuant to Contract DACW29-90-D-0016, Delivery Order No. 01. The levee area survey included intensive pedestrian survey within the project area, augmented with systematic shovel testing. No sites were located in the Todd Levee Area and construction is not expected to have any impact on cultural resources in that project area. Since buried landforms in the project area have the potential for containing prehistoric sites, it has been recommended that during or after construction the newly exposed surfaces and dredged materials be carefully examined for prehistoric materials. Testing at the North Bend site included three excavation units and a systematic series of posthole tests. The work showed that the archeological remains that are at the North Bend site are associated with the former North Bend Plantation, and may have a date range possibly as early as the 1830s and extending to the 1950s. The part of the project area on the west side of Bayou Sale will not affect any significant cultural resources. Testing in the project area on the

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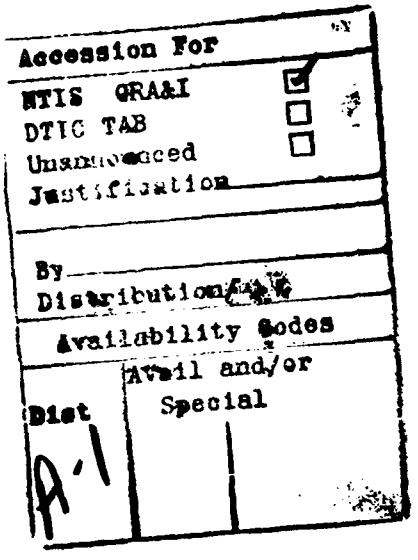
19. ABSTRACT

east side of Bayou Sale revealed the presence of part of a tenant house foundation, and intact historic midden deposits. Aerial photographs and maps suggest that there might be all or part of three additional tenant house foundations in the project area. The plantation complex as a whole lacks integrity, however, the area with the tenant house foundations may possess the quality of significance as defined by the National Register of Historic Places. Recommendations made were that the north bank of the Intracoastal Waterway be riprapped east of Bayou Sale to prevent further erosion of the site, and that levee construction be done so as to preserve the underlying cultural materials. Additionally, it is recommended that the proposed landward drainage ditch be monitored during excavation.



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

REPLY TO
ATTENTION OF:

September 22, 1993

Planning Division
Environmental Analysis Branch

To The Reader:

This cultural resource effort was designed, funded, and guided by the U.S. Army Corps of Engineers, New Orleans District, as part of our cultural resource management program. The report documents the results of a combined cultural resource survey and testing of the proposed West Bayou Sale Levee Project, Northbend and Maryland Reaches, St. Mary Parish, Louisiana.

We concur with the authors' recommendation that levee construction in the Todd Levee area will have no effect on prehistoric and historic cultural remains. We do not feel that monitoring and/or a post-construction site inspection is warranted. The Louisiana State Historic Preservation Officer has concurred with our position.

Site 16SMY132 (North Bend Plantation) has been heavily disturbed by erosion, dredge activity, and construction of the Cabot Carbon facility. The remains of several tenant structures, a sugar mill, and a cemetery are all that remain of the plantation complex. The authors' state that these remaining plantation features afford some research potential and that they may be eligible for nomination to the National Register of Historic Places. We feel that they are eligible for nomination under National Register Criteria, 36 CFR Section 60.4 (d), which states, properties that "have yielded or may be likely to yield information important in history or prehistory" are considered eligible for listing on the National Register of Historic Places.

The location and design of the North Bend portion of the levee project has not been determined at this time. When project plans and specifications are finalized, cultural resource impacts will be determined and a mitigation plan developed.

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

Robert A. Buisson, Jr.
R. A. Buisson, Jr.
Acting Chief, Planning Division

# ARCHEOLOGICAL TESTING OF THE NORTH BEND SITE (16SMY132) AND SURVEY OF THE TODD AREA LEVEE, ST. MARY PARISH, LOUISIANA

by

**Carl Kuttruff**
**Paul V. Heinrich**
**and**
**Melissa Wiedenfeld**

**1993**

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Louisiana State University
Baton Rouge, Louisiana 70803

Malcolm K. Shuman
Principal Investigator

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## ACKNOWLEDGEMENTS

I would like to acknowledge the hard work and expertise of the field crew which carried out the survey of the Todd Levee Area and the excavations at the North Bend Site: John Mayer, Chad Nunez, Michelle Hutchins and Natalie DesOrmeaux. Washing and cataloging of the artifacts was done by Natalie DesOrmeaux and Lori Buck. The writer was aided in later fieldwork at the North Bend Site variously by Malcolm Shuman, Dennis Jones, Michael Russo and Lisa Coleman. Sincere appreciation is extended to Michael Stout, U.S. Army Corps of Engineers, New Orleans District for his comments and suggestions about the project and the draft report, and for supplying numerous crucial maps and photographs of the project area. Thanks are also in order for Malcolm Shuman who served as Principal Investigator, and for his careful reading of this report. Appreciation is extended to the Cabot Carbon Corporation for their cooperation and assistance while we were in the field.

# CHAPTER 1

# INTRODUCTION

This report presents the results of archeological testing of the North Bend Site (16SMY132) to determine National Register significance of that site, and a cultural resource survey of the Todd Area Levee in St. Mary Parish Louisiana (Figure 1). The archeological site testing and survey that was preformed are in support of proposed improvements to the West Bayou Sale Levee, a feature of the Atchafalaya Basin, Levees West of Berwick project. In the vicinity of the North Bend Site, levee enlargement and foreshore protection are scheduled. Site impacts may result from the proposed foreshore protection which will involve bank grading and the placement of shell and rock on the bankline of the Gulf Intracoastal Waterway. The original report of this site resulted from only a brief examination, and further testing was necessary to determine its extent and significance.

In the Todd Area, the proposed work consists of levee enlargement with material obtained from adjacent borrow areas. The Todd Area had not been previously surveyed for cultural resources. Therefore, a survey of the area was necessary to determine whether cultural resources were present in the areas that would be affected by the proposed levee improvements.

A preliminary field investigation of the survey area and the North Bend Site was done on July 15, 1991. The major portion of the fieldwork was carried out between August 8, 1991, and August 21, 1991, in compliance with Contract DACW29-90-D-0016, Delivery Order No. 0001 of July 7, 1991. After the draft report was submitted and reviewed, and at the request of the Contracting Officer's Representative (COR), another day was spent at the site on April 29, 1992, making additional posthole tests along the alignment of the proposed drainage ditch behind where the levee would be built. In order to more accurately correlate the excavated structure with the ones shown on a 1930 Corps of Engineer construction map, parts of two additional days, January 27, 1993, and February 18, 1993, were spent at the site checking previous transit readings and making additional ones.

After the initial field examination of the study areas, but prior to the beginning of the fieldwork, archeological background research, geomorphological data, and historical background research were collected. An interim report outlining this information was then prepared and submitted to the U.S. Army Corps of Engineers, New Orleans District. That report detailed the archeological background research, the geomorphology and history of the area. Additionally it outlined the survey and excavation methodology and techniques that were to be used during the fieldwork.

This report presents a description of the study area, the geomorphology, prehistory and

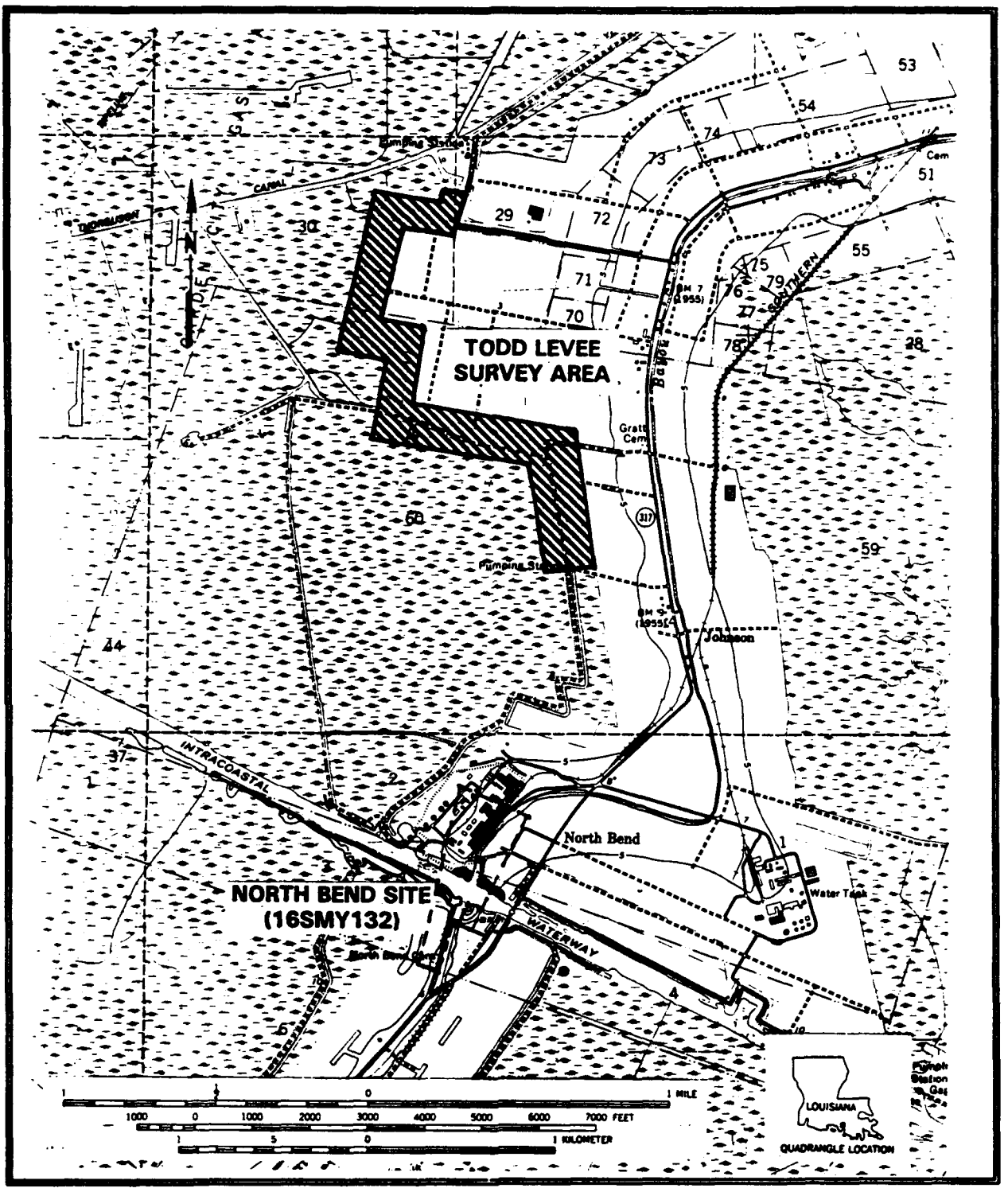


**Figure 1.** Map of the study area showing the locations of the North Bend Site (16SMY132) and the Todd Area Levee Survey. Base map is adapted from a portion of the North Bend, Louisiana 7.5 minute series topographic quadrangle, 1966, photorevised 1980.

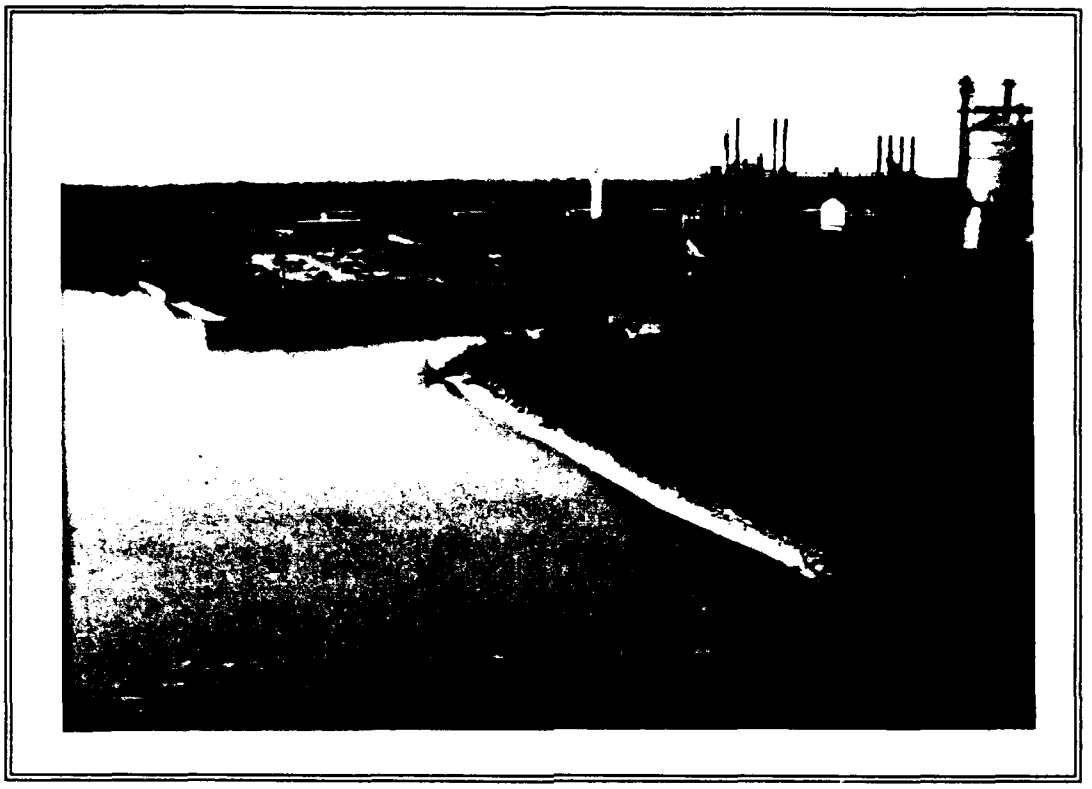

**Figure 2.** Photograph of the North Bend Site (16SMY132) taken from the Louisiana Highway 317 bridge over the Intracoastal Waterway. View is to the northwest. The Intracoastal Waterway is in the lower left; Bayou Sale and the dredged slip intersect the waterway near the center of the photograph. The North Bend Site is located on the north bank of the waterway on either side of Bayou Sale. The Cabot Corporation carbon black plant, offices, storage and parking facilities are shown in the background.

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history as they relate to the location, identification and evaluation of the culture history of the Todd Levee Survey Area and the North Bend Site. The methodology and the results of the Todd Area Survey and the test excavations at the North Bend Site are detailed.

The North Bend Site (16SMY132) was originally reported as a *Rangia* shell midden containing prehistoric materials located on the north bank of the Intracoastal Waterway in St. Mary Parish, Louisiana, just west of its intersection with Bayou Sale. The recent fieldwork and archival research now clearly show that the North Bend Site consists of the remains of portions of what was the North Bend Plantation, a late 19th and early 20th century sugar cane refinery with the associated plantation house and outbuildings, buildings associated with the mill, and tenant structures. The redefined site area is situated on both sides of Bayou Sale at the junction of that watercourse with the Intracoastal Waterway (Figures 1, 2 and 21). All of the remaining site is on the north side of that waterway. The original site has been severely altered or

**Figure 3.** Bankline of the east portion of the North Bend Site along the north side of the Intracoastal Waterway. View is to the west.

destroyed, in part, by the construction of the Intracoastal Waterway in the 1930s, by the construction of the Cabot Carbon plant in the early 1950s, the dredging of a slip off of the waterway into Bayou Sale, and erosion caused by wave action along the north site of the waterway (Figures 3 and 4).

The Todd Levee Survey Area is centered about 2.5 km north of the North Bend Site at the western margins of the exposed natural levee surface of Bayou Sale and the adjacent backswamp area. It consists of an area surrounding the western portion of the Todd Plantation and its sugar cane fields (Figures 1 and 12). At the time of the survey large portions of the backswamp area were inundated and the inland portion of the survey area was in mature sugar cane.

The remainder of this report is organized in the following manner: Chapter 2 presents the geomorphology of the Bayou Sale area in general, and in more specific detail for the North Bend Site and the Todd Levee Survey Area. It also includes the descriptions of the soil profiles along the north bank of the Intracoastal Waterway at the North Bend Site. Chapter 3 summarizes the history of archeological research in the surrounding coastal areas of Louisiana

**Figure 4.** Bankline of the west portion of the North Bend Site along the north side of the Intracoastal Waterway. View is to the east. The Highway 317 bridge is in the background. The shell lens in the upper left of the photograph is the shell road that is shown on the west side of Bayou Sale in Figures 23 and 24.

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and details those studies that are directly applicable to archeological expectations in the survey area and the interpretation of the archeological remains at the North Bend Site. Chapter 4 provides a brief history of St. Mary Parish and more detailed historical information on those sections of land covering the Todd Levee Survey Area and the North Bend Site.

Chapter 5 describes the Todd Levee Area, the survey research strategy and methodology, and the results of the archeological survey in that area. Chapter 6 presents the detailed description of the archeological testing and other work that was done at the North Bend Site. A description of the stratigraphy, features and artifacts recovered from that site is presented, as well as interpretations of its dating and use. The concluding chapter summarizes the results of the Todd Area Levee Survey and the testing program at the North Bend Site. Recommendations are made for further work and preservation.

# CHAPTER 2

# GEOMORPHOLOGY AND GEOARCHEOLOGY

This chapter is a review of the natural setting and geoarcheology of the Todd Levee Survey Area and Site 16SMY132. This review has three principal goals: (1) the description of the natural setting of the study areas, (2) a preliminary determination of the natural and cultural processes that have shaped the geomorphology of Site 16SMY132 and the Todd Levee Survey Area, and (3) a discussion of how these processes may have influenced the occurrence and preservation of archeological deposits present at Site 16SMY132 and within the survey area.

## PHYSIOGRAPHY

As defined by Hunt (1974), the study areas lie within the Mississippi Delta Plain of the Holocene deltaic plain physiographic region. The Mississippi Delta Plain is a compound geomorphic surface formed by the periodic progradation of delta complexes of the Mississippi and Red Rivers over the past 9,000 years (Autin et al. 1991). This surface consists of numerous coalesced or partially buried delta plains that represent the surface of individual delta complexes. The surfaces of each delta plain typically exhibit the classic radiating pattern of deltaic distributaries, as described in many studies (Kolb and Van Lopik 1966; Snead and McCulloh 1984).

The study area lies within a narrow strip of delta plain that lies against the Prairie Terrace called the "St. Mary Coastal Region" by Goodwin et al. (1991). The coastline of the region is deeply embayed by Vermillion and Cote Blanche Bays. Prominent points of land protrude into the water between the coast and Marsh Island to form narrow passes that define the boundaries of both bays. The natural levees of Bayou Cypremont and Bayou Sale formed these prominent points of land, and Point Cypremont and Point Chevreuil, respectively. Both Bayous Cypremont and Sale are major distributary channels associated with the partially submerged plains of the Bayou Teche delta complex (Coleman 1966). At each point, shoreline erosion is actively destroying the natural levees and archeological deposits associated with them.

Within the St. Mary Coastal Region, the diapiric movement of salt formed three islands with over 10 m of relief within an otherwise flat deltaic plain. These islands are landforms that are especially attractive for habitation, because they not only provide elevated, stable land, but also, in some instances, unique resources such as, saline springs, chert gravel, and fauna and flora normally absent from the delta plain. The islands generally consist of highly dissected loess-covered hills cored by uplifted Late Quaternary fluvial sediments (Autin 1984).

## STRATIGRAPHY

Geomorphic surfaces are a very important aspect of the stratigraphy of the Mississippi Delta Plain. Relatively flat geomorphic surfaces constructed by the aggradation of deltaic sediments comprise the entire surface of the Mississippi River Delta. Such a constructional geomorphic surface that is either an active or abandoned part of a modern deltaic system is designated as a "plain." The common plain that forms the constructional surface of a set of delta lobes fed from a common trunk channel is called a "delta plain." The subsurface deltaic sediments of, and the delta plain formed by a set of delta lobes fed from a common trunk channel constitutes a single delta complex. An individual delta lobe consists of a set of subdeltas where minor distributaries feed from a major distributary (Coleman and Gagliano 1964; Frazier 1967).

In this report, the term "delta plain" is reserved solely for the subaerial, constructional surface of a delta complex. Some recent studies, for example, Penland et al. (1987), confused geomorphic surfaces and subsurface sediments by incorrectly extending the definition of a "delta plain" to include both the surface of the delta and sediments that form this surface. This definition is considered incorrect, because a plain of any type is strictly a geomorphic surface consisting of level or nearly level land that lacks any reference to the deposits that form it (Goodwin et al. 1991).

### *Delta complexes*

A delta plain is the upper bounding discontinuity of a depositional sequence of delta sediments that lie between the upper and lower bounding discontinuities. The lower bounding discontinuity of these sedimentary sequences is defined by an erosional unconformity formed either by fluvial or marine processes. Because these sedimentary sequences can be defined and mapped by bounding discontinuities, they are, according to the formal nomenclature of stratigraphic nomenclature, alloformations (North American Commission on Stratigraphic Nomenclature 1983).

Because, these alloformations have not yet been formally named or defined as such, an informal allostratigraphic unit, the "complex," is used. A complex consists of a single geomorphic surface or temporally related surfaces, the unnamed and poorly described sediments associated with it, and a lower bounding discontinuity. Typically, the complex is named for the geomorphic surface which forms part of it. The use of the term "complex" is abandoned when it is named and described as a formal allostratigraphic unit (Autin et al. 1990, 1991).

As defined by Frazier (1967), a "delta complex" forms an allostratigraphic complex consisting of a lower bounding discontinuity, a regular sequence of deltaic facies, and an upper bounding sequence. The lower bounding discontinuity is either an erosional surface or an older constructional geomorphic surface. Typically, the deltaic sequence consists of a basal transgressive sand sheet, a middle unit of fine-grained progradational sediments, and an upper unit of aggradational natural levee and marsh sediments (Figure 5). The upper surface of a delta

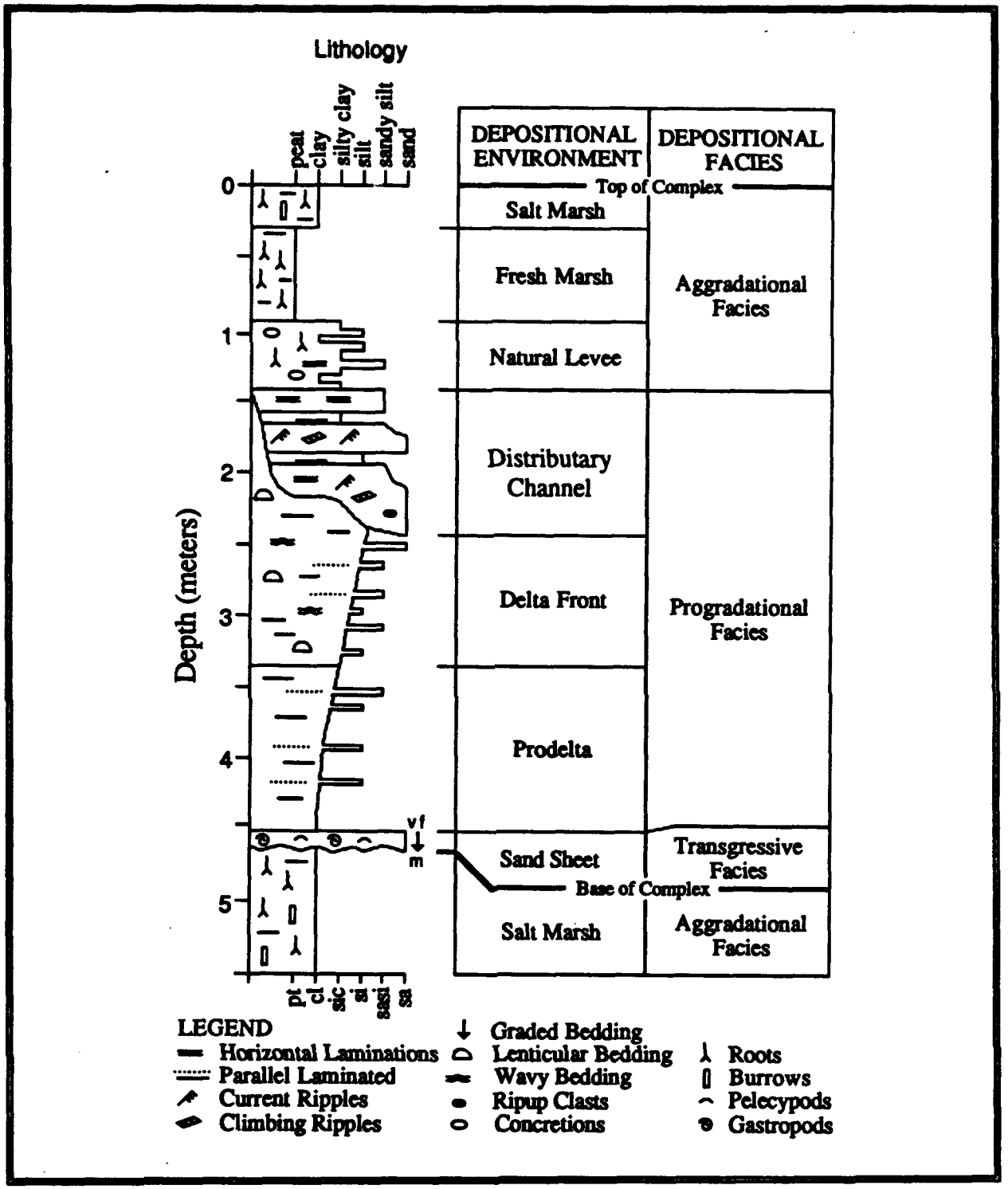


**Figure 5.** Depositional sequence and allostratigraphic boundaries within a typical shoal-water delta. From Heinrich 1992.

complex, the delta plain, is formed by aggradation sediments.

Currently, six delta complexes are generally recognized. They are the Outer Shoal, Maringouin, Teche, St. Bernard, Lafourche, and Plaquemine Delta Complexes (Goodwin et al. 1991). It has been proposed by Weinstein and Gagliano (1985) that the St. Bernard Delta Complex actually consists of two distinct delta complexes, the Metairie and La Loutre Delta Complexes. The partially submerged delta plain of the Teche Delta Complex forms the surface of the St. Mary Coastal Region. Bayous Cypremont and Sale are major distributary channels of individual delta lobes that form the delta plain of the Teche Delta Complex. Its delta plain is underlain by 10 to 20 m of interbedded deltaic peats and mud. These sediments record the periodic deposition of terrigenous deltaic sediments by first the Maringouin Delta Complex, and later the Teche Delta Complex, with the accumulation of peats within interdistributary bays. During periods of inactivity when the delta plain was covered by marsh, a blanket of peat accumulated across the entire subsiding delta plain (Coleman 1966).

## GEOMORPHIC TERRANES

Numerous studies of the sedimentology and geomorphology of the Mississippi River Delta have documented a consistent association between the constructional landforms and the sedimentary facies that underlie them. As a result, the distribution of individual landforms, and often soils, within a delta plain are directly related to the subsurface distribution of a specific depositional facies within the near subsurface (Coleman 1966, 1982; Fisk 1960; Kolb and Van Lopik 1966; Smith et al. 1986). Therefore, the near subsurface distribution of depositional facies are directly related to the distribution of landforms on the delta plain. Because depositional facies, by definition, are characterized by a restricted range of sediment types, the distribution of landforms and soils can be used to map the three-dimensional distribution of different types of deltaic sediments within the near subsurface. In addition, because depositional facies can be correlated directly with specific depositional environments, preliminary estimates can be made of the archeological potential of these deposits. The validity of this mapping can be tested and refined by reviewing data from existing geotechnical or sedimentological borings and from the drilling of vibracore or hand auger holes for a specific project. The terrane is the unit used to map the subsurface distribution of geologic materials on the basis of associated landforms (Berg et al. 1984). By definition, a terrane consists of a mappable portion of the land's surface that exhibits a distinctive assemblage of landforms which are underlain by a specific sedimentary facies. Bayou Sale consists of the abandoned distributary channel and natural levee terranes. Inland swamp, fresh marsh, and brackish marsh terranes also occur adjacent to and within the area of Bayou Sale. Although these terranes are inappropriately termed "depositional environments," Smith et al. (1986) describes the physiography, sedimentology, and subsurface deposits of each of these terranes.

## GEOLOGICAL HISTORY

About 20,000 years B.P., at the start of the Late Wisconsinan Substage, relative sea level was about 120 m below present sea level. As a result, the shoreline of the Gulf of Mexico lay

along the edge of the continental shelf, and the survey area consisted of subaerially exposed coastal plain. Subaerial exposure of these sediments resulted in the development of a prominent weathering horizon within these deposits. The weathering horizon is recognized by its low water content; stiff to very stiff consistency, numerous calcareous concretions, and oxidized mottled yellow and brown or reduced, light greenish gray colors (Fisk 1948; Fisk and McClelland 1956). This exposed coastal plain consisted of deltaic and fluvial sediments which probably accumulated about 30,000 years B.P., when sea level was approximately 25 to 30 m below present-day sea level (Suter et al. 1987).

Starting about 18,000 years B.P. and continuing into the Holocene, the melting of continental ice sheets caused sea level to rise. Between 18,000 and 10,000 years B.P, it rose from approximately 120 m below to about 30 m below modern sea level. By the start of the Holocene Epoch, 10,000 years B.P., sea level had risen to 30 m below present sea level. The average rate of eustatic sea level rise was about eight mm per year from 10,500 to 6,400 years B.P., and less than one mm per year from 6,400 years B.P. to present within the Gulf of Mexico. Sea level rose faster within the region of the Mississippi Delta, than within other parts of the Gulf of Mexico, because the rate of relative sea level rise resulted from both regional subsidence and eustatic sea level rise (Figure 6) (Coulombe and Bloom 1983; Frazier 1974; Suter et al. 1987). This rising sea level flooded the eastern portion of the Mississippi River Alluvial Valley. This resulted in the movement of the shoreline up the Mississippi Alluvial Valley to the latitude of Baton Rouge. As a result, a brackish water embayment occupied this part of the Mississippi River Valley about 6,000 to 5,000 years B.P. (Saucier 1963).

During this period of rising sea level, the Mississippi River deposited a series of delta complexes on the continental shelf and landward into south-central Louisiana of which the Maringouin Complex is the youngest. Because of the rapid rise in sea level between 9,000 and 12,000 years B.P., the Mississippi River initially formed only thin shoal-water deltas on what is now the Louisiana Continental Shelf. However, as they formed, the landward movement of the shoreline eroded these delta complexes and marine processes redistributed their sediments into broad sand sheets (Suter et al. 1985, 1987). Prior to the deposition of the Maringouin Delta Complex, the Mississippi River formed the Outer Shoal Delta Complex defined by Boyd et al. (1988) within south-central Louisiana. Possibly, its construction might be associated with a stillstand of sea level which occurred about 9200 to 8200 years B.P. according to Frazier (1974). Rising sea level submerged the surface of the Outer Shoal Delta Complex, designated the "Earlier Holocene Delta Plain" by Penland et al. (1987). The landward movement of the shoreline eroded the delta plain of this delta complex deeply enough to destroy most of the archeological deposits associated with it (Penland et al. 1987).

Between about 8000 and 6200 years B.P., the Maringouin Delta Complex prograded into open water and buried the submerged surface of the Outer Shoal Delta Complex as sea level continued to rise. At its maximum extent, the Maringouin Delta extended approximately 75 to 80 km south of Point Chevreuil on the coast of St. Mary Parish (Figure 7) (Penland 1990). The continued rise of sea level submerged and deeply eroded most of the surface of the Maringouin Delta Complex which is informally designated as the "Late Holocene Delta Plain" by Penland

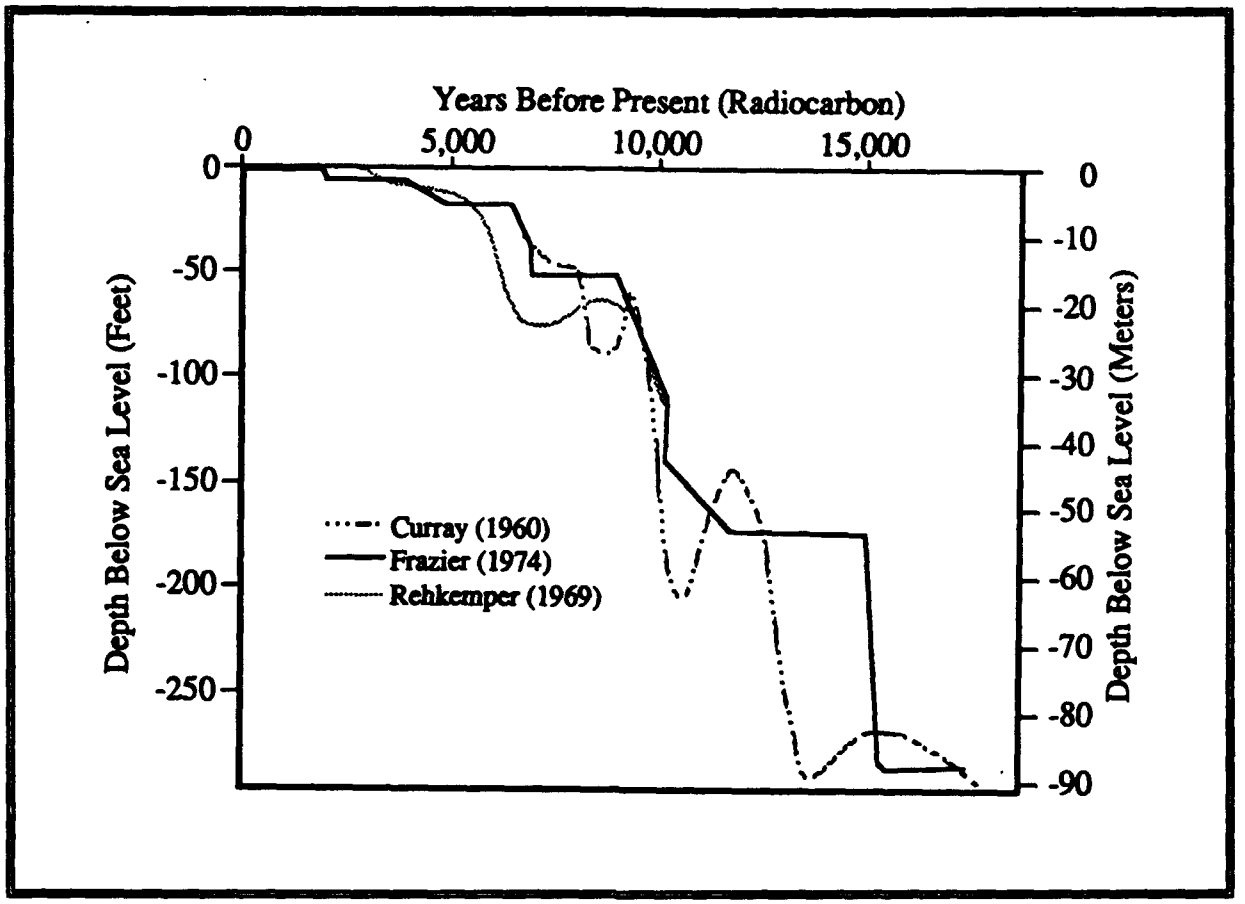


**Figure 6.** Late Wisconsinan-Holocene sea level fluctuations. Modified from Frazier (1974).

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et al. (1987). An irregular line of shell ridges of uncertain origin, the Bayou Penchant Shell Ridge of Goodwin et al. (1991) within Terrebonne Parish, might represent the eroded edge of the Maringouin Delta Complex (Weinstein and Gagliano 1985).

Between 5800 and 3900 years B.P., the Mississippi built the Teche Delta Complex after sea level had stabilized (Figures 6 and 7). Within St. Mary Parish, it buried the intact surface of the Maringouin Delta Complex. To the south and east, the Teche Delta Complex prograded into open Gulf waters, burying the submerged and eroded delta plain of the Maringouin Delta Complex (Smith et al. 1986; Weinstein and Gagliano 1985). Both the internal chronology and easternmost extent of the Teche Delta Complex are controversial. According to Weinstein and Gagliano (1985), the Mississippi River extended its channel eastward around the northern edge of the remnants of the Maringouin delta plain past St. Mary Parish into Terrebonne Parish. Within Terrebonne Parish, they propose that between 5,800 and 4,800 years B.P., the Mississippi River built the Teche Delta Complex to about 48 km west of Houma. According

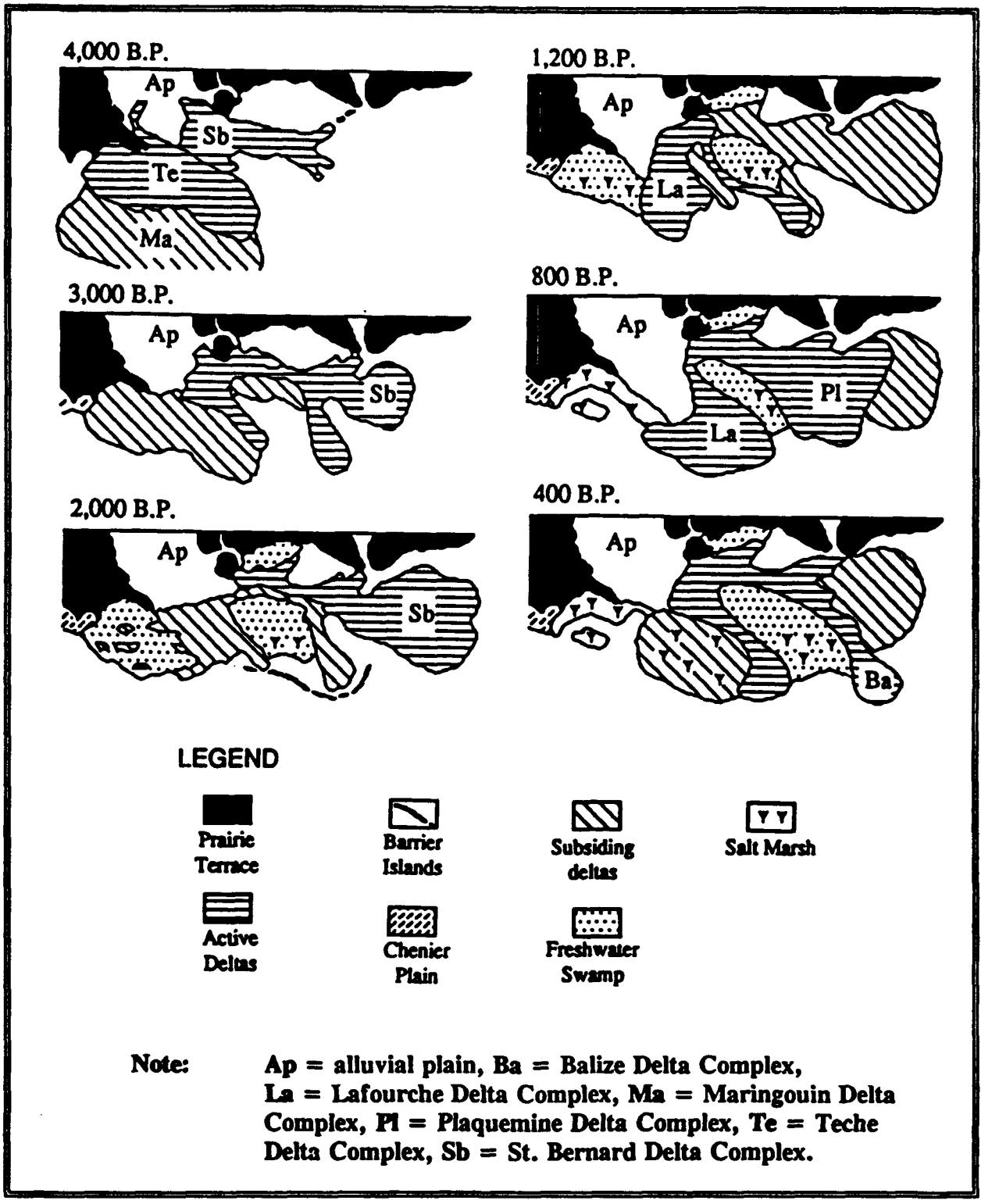


**Figure 7.** Paleogeography of the Mississippi River Delta. From Goodwin, et al. (1991).

to this model, as the Mississippi River changed its course between 4,800 and 3,900 years B.P., it built the Bayou Sale and Cypremont lobes of the Teche Delta Complex over the Maringouin delta plain within St. Mary Parish and adjacent areas. However, Smith et al. (1986) claim that the Bayou Sale and Cypremont delta lobes prograded between and 5,800 and 4,000 years B.P., and the eastern edge of the Teche Delta Complex prograded only as far as Houma between 4,500 and 3,500 years B. P. Because of a lack of published data, this dispute remains unresolved.

After 4,800 years B.P., the Mississippi constructed its remaining delta plains to the east of the study area (Figure 7). First, lobes of the Metairie Delta Complex prograded through the New Orleans area to about 70 km southeast of that city into the Gulf of Mexico. A lobe of this delta complex prograded to the northeast where it connected with a chain of southwest trending barrier islands, creating a brackish water bay ancestral to Lake Pontchartrain (Saucier 1963; Weinstein and Gagliano 1985). Then, from about 3,400 to 1,600 years B.P., the La Loutre Delta Complex of Weinstein and Gagliano (1985) formed two major delta lobes that prograded from the New Orleans area, creating most of St. Bernard Parish and forming Lake Pontchartrain. Between 4,800 and 2,000 years B.P., Bayou Lafourche slowly prograded southward from the New Orleans region creating the Lafourche delta complex and most of Terrebonne Parish. About 1,000 years B.P., the flow of the Mississippi River started to shift from Bayou Lafourche into what would become the channel of the modern Mississippi River. As water and sediment were diverted from Bayou Lafourche, the shoal-water Plaquemines Delta Complex prograded off the shelf edge to form the shelf-margin Balize Delta Complex (Weinstein and Gagliano 1985).

After the Teche-Mississippi River abandoned its Bayou Teche course about 3,700 years B.P., the Teche-Red River continued to flow down Bayou Teche for a period of time that has been a subject of considerable debate. Previous investigators, such as Fisk (1944) and Saucier (1974), have proposed that the Teche-Red River diverted from Bayou Teche to its present course through Moncla Gap at dates ranging from 2,400 to 500 years B.P. After reviewing the available archeological data, Pearson (1986) concluded that this diversion occurred between 2,000 and 1800 years B.P. (Weinstein and Kelley 1989). Because of the lack of any evidence for the presence of the characteristic "reddish-brown" alluvium and associated Buxin-Portland-Perry soils along Bayou Sale, Lytle et al. (1959) indicate that it ceased to function as a distributary before the abandonment of Bayou Teche by the Teche-Mississippi River.

## BAYOU SALE DISTRIBUTARY

The Todd Levee Survey Area and the North Bend Site (16SMY132) both lie on a segment of Bayou Sale near North Bend, Louisiana. The Todd Levee Survey Area lies within the distal edge of the natural levees of Bayou Sale, while Site 16SMY132 lies within the filled abandoned channel of Bayou Sale, over which the natural levees have been built up.

*Terranes*

Four different terranes have been mapped by Smith et al. (1986) within the stretch of Bayou Sale associated with the Todd Levee Survey Area and Site 16SMY132 (Figure 8; Smith et al. 1986). They are the abandoned distributary channel of Bayou Sale, its natural levees, the bordering inland swamp, and fresh marsh. In the Todd Levee Survey Area, large crevasse splays form an integral part of the natural levee terrane.

***Natural Levee Terrane.*** The natural levee terrane consists of the natural levees flanking either side of the abandoned channel of Bayou Sale (Figure 8). Within the project study area, individual natural levees extend 0.5 to 0.7 km from Bayou Sale before they disappear beneath the adjacent swamp. Their crests have an elevation of 2 to 2.5 m above mean sea level adjacent to Bayou Sale and they slope gently down to and, presumably beneath, the adjacent inland swamp. The width and height of the natural levees increase northward toward Bayou Teche and decrease southward (U. S. Geological Survey 1970, 1980a, 1980b; Van Lopik 1955).

Along Bayou Sale, the natural levee terrane either widens noticeably as bulges or extends out as points into the adjacent swamps (Figure 8). In the case of the bulges, the natural levees are typically 1.1 km wide, about double their normal width. The St. Mary Parish soil survey (Lytle et al. 1959) shows strips of sandy and silty soils, and the 1940 Soil Conservation Service (SCS) aerial photography exhibits tonal features with branching distributary patterns that extend perpendicular from Bayou Sale in association with such bulges. These soils and tonal patterns probably represent crevasse channels and the bulges are their crevasse splays. The 1940 SCS aerial photography shows an exceptionally well-developed crevasse channel system associated with the unusually large semicircular bulge, having a radii of 1.6 km at the Todd Levee Survey Area. The distribution of Cypremont fine sandy loam of the point that is east of the North Bend site (Lytle et al. 1959) shows the location of the associated crevasses.

The sediments which form the natural levees of Bayou Sale consist of well-consolidated silty clays with thin beds of silt and clay. The sediments within the upper part of the natural levee are highly oxidized, intensively burrowed, and massive. They also contain abundant calcareous and iron sesquioxide nodules plant remains. Within the lower part of the natural levee, these sediments exhibit abundant thin, parallel and wavy laminations that are commonly disturbed by root molds and other burrows (Coleman 1966).

Unfortunately, published data concerning the thickness of the natural levees of Bayou Sale is lacking. Unpublished work by Fonda Kearns (personal communication 1991) strongly indicates that the natural levee deposits of the Teche Delta Complex lie directly upon natural levee deposits of the Maringouin Delta Complex as hypothesized by Van Lopik (1955). Examination of foundation borings for the North Bend Intracoastal Canal Bridge, Structure No. 02430200001, indicate that the combined thickness of the natural levee deposits of the Teche and Maringouin Delta Complexes is approximately 24 m. Within the area of the North Bend site, the natural levee deposits overlie narrow point bar deposits associated the abandoned channel of Bayou Sale (Smith et al. 1986).

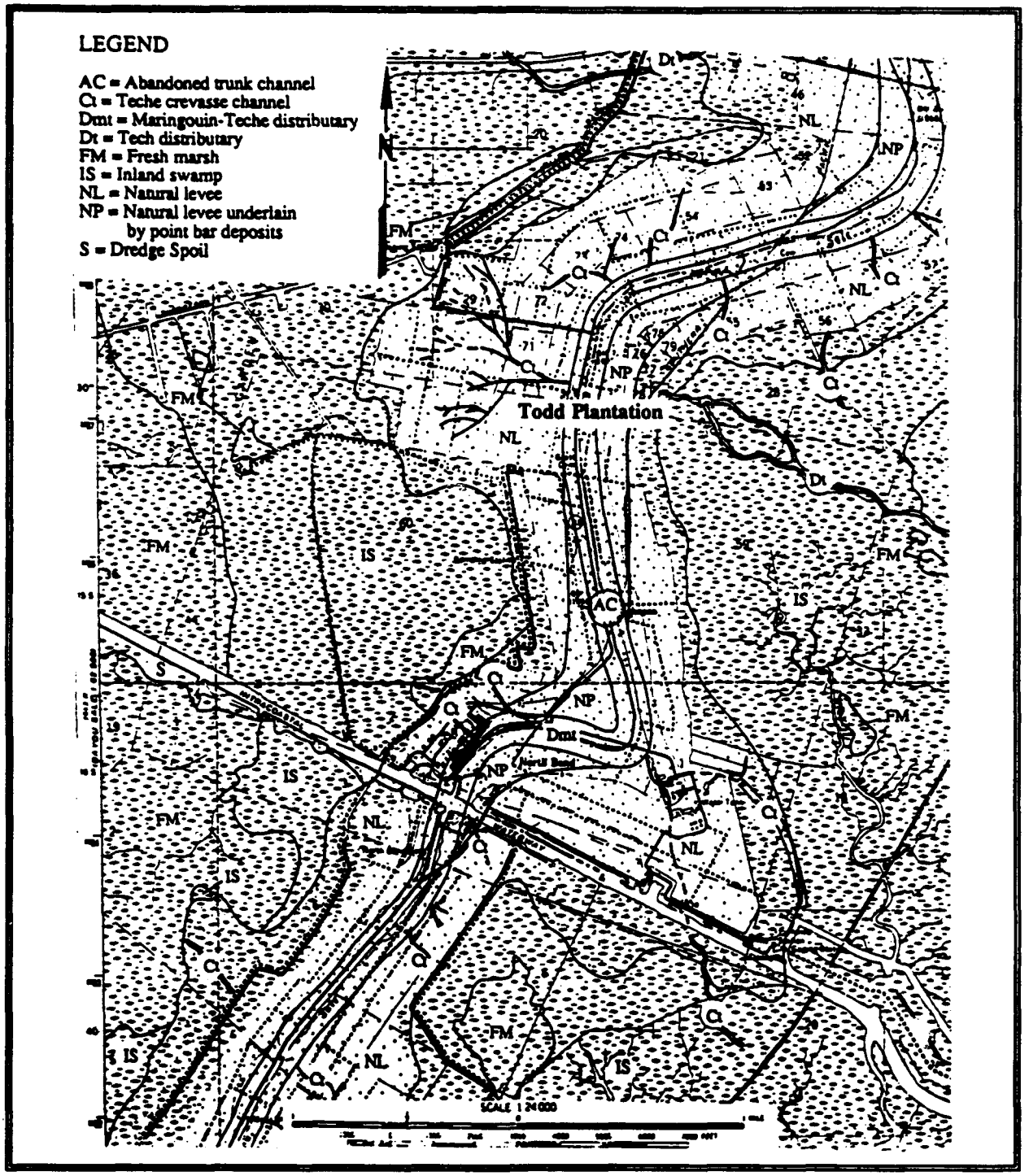


**Figure 8.** Terranes of Bayou Sale within the Todd Survey Area and the North Bend Site (16SMY132). A large bulge in the natural levee is located on the west side of Bayou Sale in the Todd Plantation area, and a point in the natural levee is present east of the North Bend Site. Modified from Smith et al. (1986:Plate 33).

Where underlain by point bar deposits of the Teche Delta Complex (Figure 4), older deltaic deposits are missing from beneath the natural levee terrain. Examination of foundation borings for the North Bend Intracoastal Canal Bridge demonstrates that the localized meandering of Bayou Sale, which created the point bar deposits, has eroded the underlying deltaic deposits to a depth of 24 m. As a result, the aggradational facies and any associated archeological deposits of both the Teche and Maringouin Complexes would have been removed by erosion within the areas occupied by point bars. The point bar deposits apparently rest directly on a sheet of older, gray, fine-grained sands of undetermined thickness, origin, and age.

Soils of the Baldwin, Cypremont, Iberia, and Jeanerette soil series have developed within the very gently sloping to nearly level surface of the natural levees. Typically Cypremont and Baldwin soils with sandy and silty topsoils have developed within the frontslopes and crests, locally called the "front lands" of the natural levees. Baldwin soils with silty and fine grained topsoils have developed within the silt loam, silty clay loam, and clay within the backslope of the natural levees. The lengthy subaerial exposure of these soils between floods has allowed the profiles of these soils to dewater and consolidate by desiccation. This subaerial exposure has also created an oxidizing environment favorable for the formation of iron sesquioxide cements and nodules within their profiles. The Iberia and Jeanerette soils dominate the lower backslopes and crevasse splays of the natural levees (Lytle et al. 1959). Narrow, often bifurcating, strips of either Baldwin, Cypremont or Jeanerette soils, with sandy or silty topsoils that extend perpendicularly across the natural levees, have developed within the fill of relict crevasse channels (Figure 8).

Faunal and floral materials typically are either poorly preserved or lacking from archeological deposits associated with the natural levees of Bayou Sale. The acidic, well-drained soils, and the degree of profile development of the Baldwin and Cypremont series observed by Lytle et al. (1959) indicate that materials such as bone, shell, and organic material will be poorly preserved, if at all, within these soils. Typically, the moderately well-drained natural levee sediments are well-oxidized, resulting in the severe degradation of any organic matter that may be present within them. The acidity of the soils developed within these natural levees work against the preservation of any bone material buried within these deposits. Only in the presence of abundant shell, such as in shell middens, will bone be preserved within these sediments.

Little is known about the native vegetation community that existed on the natural levee terrane of Bayou Sale area prior to its occupation by European settlers. Presumably, it was like the present-day plant communities found on natural levees of distributaries elsewhere in the Mississippi Delta Plain. If so, then these natural levees were covered by an oak forest floral assemblage. The principal trees within the oak forest would have been water oak, cottonwood, sweetgum, American sycamore, redgum, black willow, hackberry, swamp privet, water and honey locusts, and silver maple. The flora of these forests would have included shrubs such as buttonbush, wax myrtle, palmetto, marsh elder, baccharis, and elderberry, and vines, including poison ivy and ratten (Penfound and Hathaway 1938). Within historic times, the rich native oak forests were replaced by extensive fields of sugar cane on land high enough not to need complete reclamation or drainage by pumps (Lytle et al. 1959).

Similarly, little is known about the fauna present within the prehistoric oak forests that grew upon the natural levees of Bayou Sale. However, these forests as elsewhere in the Mississippi River Delta undoubtedly supported a variety of mammals, birds, and reptiles. The animals present within the forests of the natural levees certainly included opossums, raccoons, rabbits, white-tail deer, weasels, muskrats, snakes, and various frogs (Penfound and Hathaway 1938).

***Abandoned Distributary Channel Terrane.*** The abandoned distributary channel terrane consists of the abandoned, almost completely filled channel of Bayou Sale (Figure 8). The historic channel of Bayou Sale was described by Cathcart in 1819 as "...nothing more than a winding gully fifteen feet wide, and twelve to eighteen inches deep filled with Cypress knees..." as quoted in Van Lopik (1955). According to Smith et al. (1986), the formerly active channel of Bayou Sale was about 200 to 250 m wide when fully active. The original channel is filled with as much as 12 m of thin to very thick beds of clean, well-sorted sand, interbedded with thin beds of silty clay. This deposit is overlain by less than 1.5 m of black, organically-rich clay (Coleman 1966). The edges of the abandoned channel are covered by thin natural levee deposits (Smith et al. 1986).

Lytle et al. (1959) map most of the abandon distributary channel terrane as "local alluvium, poorly drained" with Cypremont soils forming its edges. The local alluvium, they note, consists of poorly drained, boggy channel fill derived from the erosion of the adjacent levees. The Cypremont soils are developed within natural levee deposits which accumulated along the edge of the channel during the period of waning flow that occurred during the abandonment of this distributary channel. The lack of Buxin-Portland-Perry soils within the abandoned channel of Bayou Sale indicates that it was abandoned prior to the complete diversion of the Mississippi River from its former Bayou Teche course.

***Inland Swamp and Fresh Marsh Terranes.*** Inland swamp forms the Teche delta plain adjacent to North Bend Site (16SMY132) on the natural levees of Bayou Sale and covers a substantial portion of the Todd Levee Survey Area (Figure 8). Inland swamp consists of delta plain that annually receives fresh water from overflow during seasonal flooding and is sufficiently far inland such that salt water intrusion rarely occurs (Smith et al. 1986).

Along the edge of the natural levee, the soils are mapped simply as "swamp, clays, and swampy clays." These soils consist of a layer of peat or organically-rich mud, called "muck," covering oxidized, well-consolidated natural levee deposits (Lytle et al. 1959). These soils define areas where a thin layer of swamp and marsh deposits cover the natural levee of Bayou Sale as a result of subsidence of the delta plain below sea level.

Away from the natural levee, the area is mapped as "swamp or brackish marsh peat." In those areas, over 0.9 m of peat covers an underlying subsoil of organically-rich plastic clay. The upper layer of peat is typically 0.9 to 1.2 m thick and can range in thickness from 0.9 to over 3 m thick (Lytle et al. 1959). Typically, the upper layer consists of massive, highly bioturbated peats with thin interbeds of laminated clay and silty clay. The peat contains

scattered leached and corroded gastropod shells and the clay contains small carbonate nodules (Coleman 1966). The area mapped as "swamp or brackish marsh peat" consists of a delta plain whose original surface, including the radiating system of minor deltaic distributaries, has been deeply buried by the accumulation of swamp and marsh deposits (Smith et al. 1986).

The constantly waterlogged condition of soils within the inland swamps and fresh marsh prohibits the consolidation of these sediments by desiccation. As a result they remain semifluid and retain the organic matter that accumulates to form them. The high percentage of organic matter in the soils of freshwater swamps results from the continual addition of organic material to these soils by the native flora and the preservation of the organic matter by the eutrophic conditions typical of freshwater swamps (Kosters 1987, 1989).

The inland swamp consists of wetland covered by water tolerant trees and aquatic understory plants. Shallow water covers this area throughout most or all of the growing season. Some of the trees common to the inland swamp are bald cypress, tupelo gum, black willow, swamp red maple, water ash, and water oak. In addition, shrubs such as palmetto, buckrush, and snowbell are present. Numerous grasses are also present, the most common being alligator weed, common rush, maiden cane, swamp knotweed, pickerel weed, bulltongue, and cattail (Lytle et al. 1959; Penfound and Hathaway 1938).

Small patches of fresh marsh occur within the Teche Delta Plain near the North Bend Site and adjacent to the Todd Levee Survey Area. The fresh marsh consists of perennially water-covered delta plain covered by floating marsh. The floating marsh consists of a vegetative mat typically 10 to 35 cm thick, underlain by 1 to 4.5 m of finely divided muck grading downward into clay. The fresh marsh consists primarily of roseau, saw grass, beef tongue, pallie fine, bull whip, alligator weed, and water hyacinth (Smith et al. 1986).

This rich flora of the inland swamp and fresh marsh supports a rich fauna. It provides habitat for large numbers of crawfish, bull frogs, leopard frogs, water snakes, ducks, squirrels, alligators, wading birds, raccoons, mink, and otter. When the inland swamp is dry, it is used by swamp rabbits, nutria, turkeys, and white-tailed deer. Within it, small ponds and perennial streams contain abundant freshwater fish (Lytle et al. 1959; Penfound and Hathaway 1938).

### *Geologic History of Bayou Sale*

Van Lopik (1955) and Smith et al. (1986) have postulated that Bayou Sale and Bayou Cypremont initially formed as major distributaries of the Maringouin Delta Complex. Mapping by Smith et al. (1986) and others shows that three major Maringouin distributaries, the Sale 4, the North Bend 2, and the Clausen-Possum Point 1 distributaries underlie the study area. Bayou Sale occupies the primary feeder channel, the Sale 3 distributary, of the Maringouin Delta Complex (Figure 9). This hypotheses interprets the unusual point formed by the natural levee of Bayou Sale at North Bend and the unusually large crevasse splay within the Todd Levee Survey Area as overlying former confluences of the Sale 3 distributary with, respectively, the North Bend 2 and Sale 4 distributaries (Van Lopik 1955; Smith et al. 1986). Unpublished

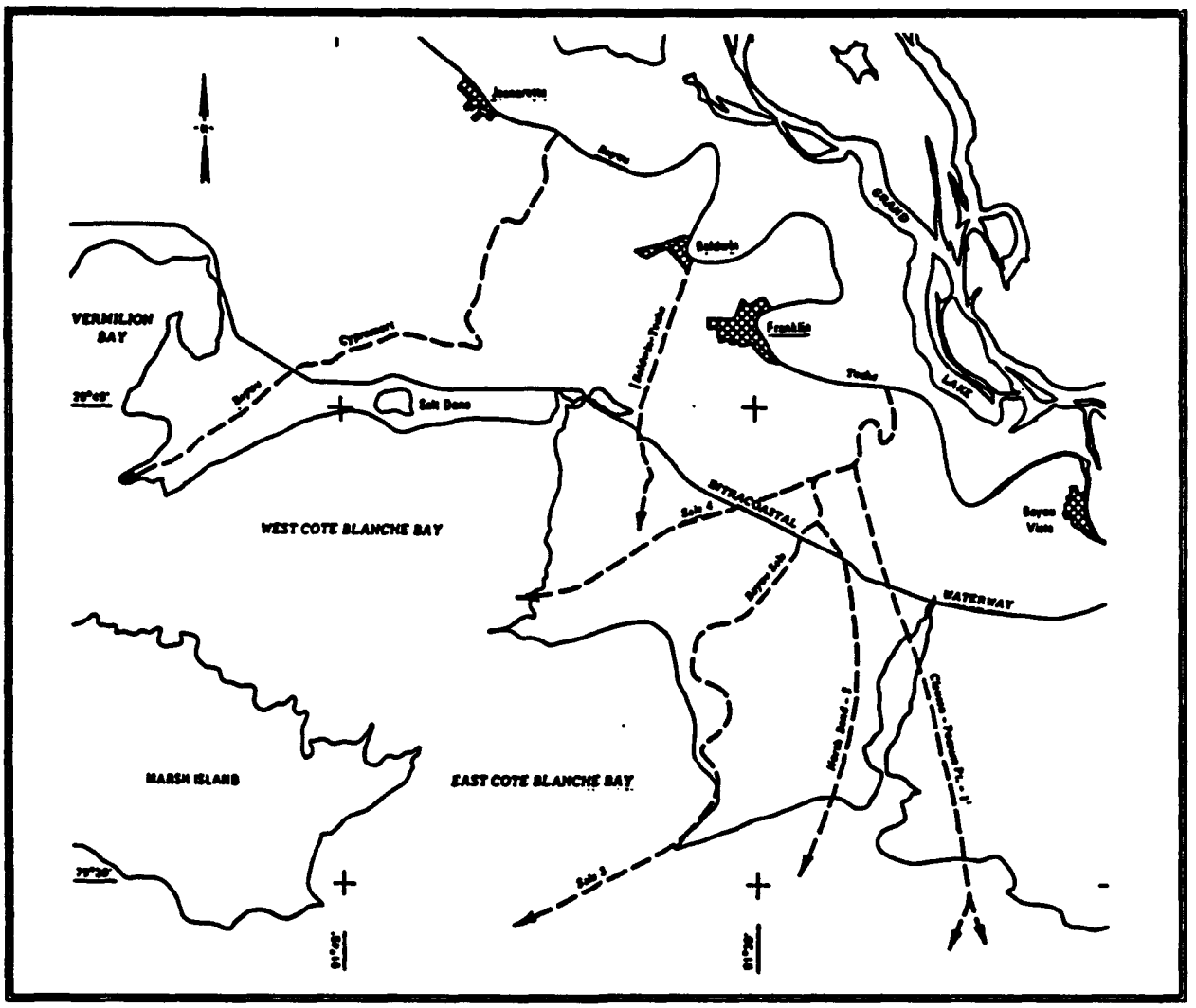


**Figure 9.** Major courses and distributaries of the Maringouin and Teche Delta Complexes within the St. Mary Geomorphic Region. From Smith et al. (1986:69).

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research by Fonda Kearns (personal communication 1991) confirms the model of Van Lopik (1955) and the work of Smith et al. (1986).

Probably between 7,000 and 6,100 years B.P., the delta lobes of the Maringouin Delta Complex prograded and constructed a delta plain within the study area. This "proto-Sale" delta lobe constructed an extensive distributary system consisting of a major trunk distributary channel with well developed secondary distributary channels. These channels were probably abandoned with the Maringouin Delta Complex as delta activity shifted to the west.

Bayou Sale reoccupied the proto-Sale trunk distributary channel of the Maringouin Delta Complex, apparently sometime after 4,700 years B.P. (Coleman 1966). Because the diversion of the Mississippi River to the St. Bernard Delta Complex was in progress at this time, the flow down Bayou Sale was likely insufficient for it to either completely reoccupy or maintain the associated distributary channels of the Maringouin Delta Complex. As a result, Bayou Sale was reoccupied while the other distributaries remained abandoned. Eventually, they subsided and were buried beneath the aggrading swamps and marshes of the delta plain (Van Lopik 1955; Smith et al. 1986). At the Todd Levee Survey Area and at North Bend, large crevasse channels appeared to have developed over the abandoned channels of both the Sale and North Bend distributaries and buried both former junctions beneath crevasse splays.

By 3,700 to 3,500 years B.P., the Mississippi River had abandoned the Teche Delta Complex. By this time, Bayou Sale had been abandoned as an active distributary and was probably partially filled during its abandonment. Since then, Bayou Sale and its delta plain have subsided slowly into East Cote Blanche Bay and the Gulf of Mexico (Coleman 1966).

## GEOARCHEOLOGY

The majority of archeological deposits present within the Mississippi Delta Plain are found upon subaerial or partially submerged natural levees of major bayous and rivers. They apparently represent the predominant location for human settlement and other activities on delta plains. Natural levees apparently were occupied very heavily by prehistoric people because they were the only common landform within a deltaic plain on which to dwell comfortably and to exploit a rich deltaic ecosystem. Also, after agriculture was established, the surface of a natural levee was the only common source of arable land available on a delta plain. In addition, natural levees might have been popular because; (1) natural levees provided habitat for terrestrial game which was exploited as a food source; (2) they provided a source of raw materials; (3) their proximity to open water provided both subsistence and transportation; and (4) they provided a location safe from natural hazards such as flooding and hurricane storm surge (Britsch and Smith 1989; Kniffen 1936; Weinstein and Kelley 1989).

### *Distribution of Archeological Deposits on Natural Levees*

Within the delta plain, archeological deposits occur at specific locations along the natural levees of distributaries. Major sites are strategically situated at the confluence of distributary channels with the trunk channel of deltaic complexes. Factors concerning comfort, transportation, and subsistence apparently determined the location of major archeological sites at these confluences. Sites are also commonly located at the ends of crevasse distributaries that extend from a major distributary (Gagliano 1984; Weinstein and Kelley 1989).

According to Gagliano, the smaller sites were located at specific locations on natural levees between the major confluences. For example, smaller habitation sites occur at the confluence of a distributary with a crevasse splay or other minor distributary. In addition, natural levees at the heads of major delta lobes, the end of distributaries of crevasse

distributaries and splays, the mouths of active distributaries, and accretion ridges at the mouths of distributaries, were preferred locations for prehistoric settlement. The inhabitants of these sites were restricted to the exploitation of the biological resources of the adjacent swamp (Britsch and Smith 1989; Gagliano 1984; Wiseman et al. 1979).

***Bayou Sale Site Distribution***

To understand the specific distribution and types of sites along Bayou Sale, the site files at the Louisiana Division of Archaeology were briefly examined. Ten prehistoric sites and two historic sites have been recorded in this area. For each site, the associated landform was determined from Smith et al. (1986) and the soil type was checked using Lytle et al. (1959). The type, and cultural affiliation of the site was also determined using data from the site files.

From this survey, it is clear that the majority of archeological sites occur within the natural levee terrane of Bayou Sale as predicted by the previously discussed studies. Of the 10 recorded prehistoric sites, seven of them are either buried sites or surface sites associated with the natural levees of Bayou Sale (Smith et al. 1985). Four of these seven sites, are surface sites which lie on the crest of the natural levee. Of the four surface sites, one consists of a scatter of lithics only (16SMY159), and two are represented by lithics and sherds (16SMY157 and 16SMY158). The remaining known surface site, Site 16SMY06, consists of an earth midden and possible earth mound that lies on the natural levee deposits within the abandoned distributary channel terrane of Bayou Sale. Two of the sites (16SMY17 and 16SMY155) are transgressive beaches formed by erosion of buried shell middens within the distal, partially buried edges of natural levees and crevasse splays. Dredging exposed a shell midden, Site 16SMY118, buried within natural levee deposits along the edge of the abandoned channel of Bayou Sale.

All of the known sites within the natural levee terrane have either been damaged or destroyed. Sugar cane cultivation has reduced all of the three known sites lying upon the crest of the natural levee to badly dispersed surface scatters. The midden and possible mound at Site 16SMY06 have both survived being severely damaged by farming only because they currently lie within a private lot. However, the construction of a private residence and gardening probably have damaged the site to some extent. Shoreline erosion has apparently reduced both Site 16SMY17 and Site 16SMY155 to transgressive shell lags. Dredging has destroyed Site 16SMY118 and damaged Site 16SMY66. The historic North Bend Plantation Site (16SMY132), as documented in later sections of this report, has been extensively damaged by Intracoastal Waterway construction, wave action and industrial plant construction.

Only three of the 10 recorded prehistoric sites have been found within the swamp and marsh immediately surrounding Bayou Sale. These shell midden sites were buried beneath younger swamp and marsh deposits. Site 16SMY40 with an undetermined Neo-Indian occupation, and Site 16SMY153 dating to the Coles Creek period, were discovered by dredging. Site 16SMY154, with Tchefuncte, Marksville and Coles Creek occupations, was exposed by shoreline erosion. Site 16SMY153 is clearly associated with a partially buried Teche distributary (Smith et al. 1986). The buried landforms with which the other two sites were associated is

undetermined. Work by Smith et al. (1986) and Weinstein and Kelley (1989) would suggest that all sites were likely located on natural levees of abandoned distributaries, and buried by the aggradation of swamp and marsh deposits. Examples of such sites are the Bois D'Arc #1 (16TR211) and Bois D'Arc #2 16TR212) sites, recorded by Weinstein and Kelley (1989).

***Site Preservation Processes***

Within the Bayou Sale area, burial by sediments appears to be the primary way by which archeological deposits were preserved. Archeological deposits along the former edge of the abandoned distributary channel of Bayou Sale were probably initially buried by overbank sediments during the abandonment of this distributary channel, and later by sediment eroded off the crest of the adjacent natural levees. The archeological deposits present along the outer edges of natural levees of Bayou Sale and at the end of crevasse channels have been buried and preserved beneath a variable thickness of swamp and marsh deposits. The archeological deposits associated with the smaller distributary channels of the Teche Delta Plain have been preserved by being buried by more than a meter of swamp and marsh sediments.

Although known examples are lacking, buried archeological deposits theoretically might be found at two other locations. Because its natural levees continuously aggraded when Bayou Sale was active, any archeological deposits on these levees would have been buried. Thus, it is theoretically possible, although unproven, that archeological deposits might be present within the main natural levee. The buried natural levee surfaces of the distributaries of the Maringouin Delta Complex were once stable and exposed for hundreds of years, during which they were used by Archaic peoples, resulting in the formation of archeological deposits on those surfaces. When buried by Bayou Sale, the archeological deposits on the surface of the older proto-Sale would have been preserved (Figure 10). The buried confluences of the proto-Sale with its Sale and North Bend distributaries are high probability locations for buried archeological remains.

***Site Destructional Processes***

As subsidence and sea level rise submerge a delta plain, the landward migration of the shoreline, called a "transgression," will destroy the delta plain and most, if not all, of the aggradation deposits that form it. Initially, it consists of submergence of barrier islands and erosion along the shoreline (Penland et al. 1985). Sites 16SMY17 and 16SMY155 typify the transgressive beach deposits formed by the erosion of shell middens associated natural levee and marsh terranes. Sites, such as earth middens, typically would fail to form such beaches when eroded and would be easily, but not always, overlooked. As the transgression occurs, shoreface erosion deeply erodes the upper part of a deltaic complex, forming the relatively flat erosional surface called a "ravinement surface." The eroded deltaic and archeological deposits will be winnowed and redeposited by shoreface and shallow marine processes to form a sheet sand or shelf sand shoal (Penland et al. 1985, 1987).

Because the natural levees of Bayou Sale are the only dry land within an otherwise flooded or waterlogged deltaic plain, they have been the focus of modern residential and Figure

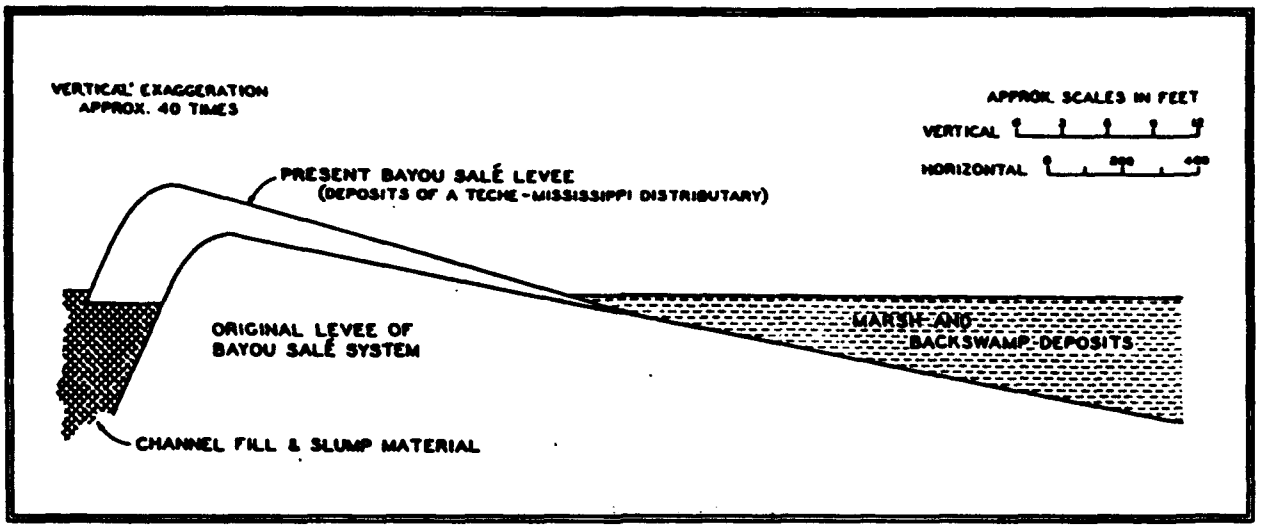


**Figure 10.** Diagrammatic cross section of the natural levee of Bayou Sale. From Van Lopik (1955:Figure 22).

industrial development. The construction of residences and industrial plants on the natural levees will directly disturb any surface and subsurface archeological deposits. In addition, roads, railroads, pipelines, and buried cables have also disturbed large swaths of the natural levees of Bayou Sale.

Most of the surface of the natural levees of Bayou Sale has been extensively developed for the production of sugar cane. The primary disturbance results from plowing and the creation of furrows or "row middles" and rows on which the sugar cane is grown. Both the rows and row middles are 150 cm across and have a relief of 40 to 50 cm. They are formed by cutting row middles 20 to 25 cm below ground surface and by building up the associated ridges by 20 to 25 cm. In addition, plowing as deep as 60 cm is conducted to condition the soil by breaking up hardpans, and to improve permeability. Finally, the extensive network of drainage canals and ditches needed for drainage probably destroyed or severely impacted any archeological deposits that they crossed (Goodwin et al. 1991; Lytle et al. 1959). However, significant portions of many sugar farms were used for the storage and repair of equipment, construction of housing for the owner and farm workers, and other uses. Because these areas were not modified for the planting of sugar cane, the land surface has in many cases been only slightly modified. As a result, significant and relatively intact archeological deposits may occur in these areas. Dredging within filled distributary channels, inland swamps, and various marshes has exposed archeological deposits. However, the archeological deposits discovered by dredging have been typically either severely damaged or destroyed by the process of discovery. The erosion of the banks of these canals can totally obliterate what would have remained of the archeological deposits exposed by dredging (Wiseman et al. 1979).

### *Associations Between Landform and Archeological Deposits*

Because each terrane, by definition consists of specific landforms which are underlain by a common sequence of sediments, distinct associations between archeological deposits and terrane type occur. These associations occur because the landforms and depositional environments that characterize a terrane distinctly controlled the prehistoric usage made of them. As a result, different distributions and types of archeological deposits will characterize the different terranes. In addition, the common depositional facies and history that characterize a terrane can be used to infer the degree of site preservation and destruction within a terrane.

***Abandoned Distributary Channel Terrane.*** Within the abandoned distributary terrane, the highest potential for both surface and buried archeological deposits exists within the edges of this terrane. The known buried and surface sites have been found within this terrane along its edges associated with thin natural levee deposits. Shell middens discovered by dredging indicate that archeological deposits along the edge of this channel might have been buried by sediments washed from the crests and sideslopes of the natural levees. Because of the wet, swampy nature of the central portion of this terrane it is unlikely that prehistoric archeological deposits will be found on it, or in the channel fill underling this terrane. However, portions of the channel of Bayou Sale appear to have been used for the disposal of historic trash. As a result, thick sequences of historic archeological deposits are very likely present at specific locales within the modern channel of Bayou Sale.

***Natural Levee Terrane.*** Both surface and buried archeological deposits can be expected to occur within the natural levee terrane. Surface historic and prehistoric sites occur along the crests of the natural levees. Unfortunately, these are also the areas which have been greatly disturbed by agriculture and industrial development. Only in areas which have not been planted with sugar cane are intact surficial historic and prehistoric archeological deposits likely to be present. However, even in plowed areas, portions of deep sites and subsurface features may remain intact below the plow zone.

A few scattered, archeological deposits are possibly shallowly buried along the edges of the natural levees and crevasse splays. These archeological deposits should consist mainly of remains from small temporary extraction locales. Once abandoned, the archeological deposits within this area would have been buried initially by overbank sediments while Bayou Sale was active, and later by sediments washed downslope from the natural levee.

Within the natural levee terrane of Bayou Sale, a strong potential exists for the occurrence of buried Archaic sites. The natural levees of the major distributaries of the Maringouin Delta Complex were exposed for hundreds of years before being buried by the natural levees of Bayou Sale. As a result, these surfaces almost certainly accumulated numerous archeological deposits as a result their usage during Archaic times. In fact, Van Lopik (1955:103-104, 110) has noted reports of "pre-Tchefuncte" sites, not recorded within state site files, and interpreted their locations as being associated with distributaries of the Maringouin Delta Complex. Similar intact, but buried, archeological deposits can be expected to occur on

the buried natural levees of the Maringouin Delta Complex in the study area.

***Inland Swamp and Fresh Marsh Terranes.*** Within the inland swamp and fresh marsh terranes, the archeological deposits are deeply buried and widely scattered. The available data suggest that the archeological deposits present within these terranes are associated with the natural levees of the minor and major distributaries of the Teche Delta Complex. If so, they lie under 0.9 m to over 3 m of peat that buries the original delta plain. The inland swamp terrane adjacent to the natural levee terrane likely contains buried archeological deposits similar to those found on the adjacent natural levee. These archeological deposits would be buried under a layer of peat or organically rich mud, and lie on oxidized, well-consolidated natural levee deposits. They would occur within the areas mapped as "swamp, clays, and swampy clays" by Lytle et al. (1959). The little data available suggests that these archeological deposits are too deeply buried to be detected by shovel tests. Rather they will only be observable where borrow pits and other excavations have brought these deposits to the surface.

## TODD SURVEY AREA

The Todd Levee Survey Area crosses a large crevasse splay of the Bayou Sale Distributary of the Teche Delta Complex. Currently, this large crevasse splay extends a maximum of 1.5 km from the modern channel of Bayou Sale. Presumably, as a result of regional subsidence, the adjacent inland swamp has buried its most distal edges beneath organically-rich sediments. On 1941 Soil Conservation Service aerial photography of St. Mary Parish, the primary crevasse channels of this splay appear as a radiating pattern of branching, dark distributaries. They are diagramed in Figure 8. Shovel tests dug in these channels during the present investigations encountered loose, fine sand.

Work by Smith et al. (1986) clearly demonstrates that this crevasse splay of the Teche Delta Complex overlies the confluence of the Sale 3 and Sale 4 distributaries of the major Maringouin Delta Complex. Both the Sale 3 and Sale 4 distributaries were major distributaries. Each of these distributaries possibly fed a single delta lobe of the Maringouin Delta Complex. Because the confluences of major distributaries within a delta complex typically were the preferred location for the development of major settlements, a very high potential exists for the presence of (Middle ?) Archaic period archeological remains buried beneath the crevasse deposits within the Todd Levee Survey Area. As previously noted, the surface of this confluence was probably available for occupation for hundreds of years prior to being buried by the natural levees of Bayou Sale. Because they have been buried by thick crevasse deposits of the Teche Delta Complex, this part of the Maringouin delta plain and its archeological deposits should be intact and undisturbed.

The lack of archeological deposits encountered during shovel testing fails to disprove the potential existence of buried archeological deposits. The available data indicate that this delta plain and any associated archeological deposits lie well below the level of shovel testing, which probed only the surficial sediments of the crevasse splay of the Teche Delta Complex. Unfortunately, the surface of the Maringouin Delta Complex and any associated archeological

deposits might lie within the range of disturbance caused by the excavation of borrow pits.

## NORTH BEND SITE (16SMY132)

The research on the geomorphology, stratigraphy, and sedimentology of Site 16SMY132 consisted of an examination of the available geological data and a field study of the North Bend Site. For this work, studies by Kolb (1955) and Smith et al. (1986), Soil Conservation Service aerial photography, and foundation borings for the North Bend Intracoastal Canal Bridge, Structure No. 02430200001, were consulted. Attempts were made to use another study of the subsurface stratigraphy and sedimentology of Bayou Sale by Kearns (1985), but neither it nor similar material was available from its author or other sources.

Field studies were conducted at Site 16SMY132. First, a walkover of the north bank of the Intracoastal Canal on both sides of the abandoned channel of Bayou Sale was conducted. From this walkover, notes were made concerning the preservation of the original surface morphology of the natural levees of Bayou Sale. Then, the eroding northern banks of the Intracoastal Canal were examined and described. This examination that was made included making descriptions of the gross stratigraphy and sedimentology and as well as detailed sections of representative profiles of the strata exposed in the canal banks.

For the detailed description of the representative sections of strata, this study followed standard geomorphological procedures similar to those practiced by Bousman et al. (1988). For the description of the soils and sediments, this study used the geologically neutral concept of "zone" in order to avoid prejudicing their interpretation by the application of generic labels such as "soil," "sediment," and "stratum" to whatever stratigraphy was observed in a given profile. According to the definition of "zone" given by Gary et al. (1972), zones are based on any differences in color, texture, cohesiveness, structure, boundaries, particle composition, and sorting. This versatile concept allows for the definition of any perceived "layer" in a profile as a zone whether it results from pedogenesis, sedimentary processes, cultural activity, or an unidentified process, as long as it is readily distinguishable from adjacent zones. After careful consideration of the available field evidence, a zone was assigned a specific generic label. The color of each zone was determined when moist by a Munsell Soil Color Chart. The texture of the sediment of a zone was estimated by "feel" following the guidelines of Olson (1976). After description and analysis, standard soil horizons as defined by Olson (1976) and Soil Survey Staff (1988) were applied.

### *Geomorphology*

The examination of Soil Conservation Service aerial photography, historic topographic maps, and the site itself demonstrated that the historic channel of Bayou Sale and its natural levees within Site 16SMY132 had been significantly modified within historic and modern times. The natural levee along the western, right descending bank, of Bayou Sale has been substantially altered by land leveling associated with the adjacent carbon black plant and the deposition of dredge spoil adjacent to the Intracoastal Waterway. Immediately adjacent to the Intracoastal

Canal, the historic channel of Bayou Sale has been filled and leveled. A modern slip dredged from the north bank of the Intracoastal Canal, has destroyed the eastern edge of its former channel and its left descending bank. A thick blanket of shell covers the natural levee of the eastern, left descending bank, of Bayou Sale. The 1940 Soil Conservation Service aerial photography and earlier photographs (see Figures 23 and 25) indicate that this portion of Site 16SMY132 was used for a sugar mill, its subsidiary structures, and housing. It apparently had not been cultivated for sugar cane prior to be covered by shell.

***Stratigraphy***

The standard archeological lithostratigraphic unit, designated as the "layer" by Stein (1990), used in archeological stratigraphy could not be defined for Site 16SMY132. Within individual profiles, the gross lithology of the zones tended to be very similar, although distinct unconformities separating individual zones could be recognized. In addition, individual zones exhibited significant lateral variations in lithology within the cutbank exposures as a result of either the sedimentological, pedological, or cultural processes which formed them. Because of this frequent lack of vertical textural variations and often extreme lateral variations within texture, generic lithostratigraphic units, such as the layer, could not be defined. Therefore the generic stratigraphic units at Site 16SMY132 were defined on the basis of significant bounding unconformities.

Because these stratigraphic units are based on unconformities, rather then lithology, they cannot be called "layers" as defined by Stein (1990). Since they are true allostratigraphic units as defined by the North American Commission on Stratigraphic Nomenclature (1983), these stratigraphic units are termed "allolayers" for purposes of this section of this report. An allolayer is a three-dimensional body of sediment that can be defined and identified on the basis of laterally persistent bounding discontinuities that can be mapped on the scale appropriate to an archeological site. An allolayer is the allostratigraphic equivalent of the lithostratigraphic unit, the layer, of Stein (1990).

Along the north bank of the Intracoastal Canal which cuts perpendicularly through the natural levees of the eastern, left descending bank, of Bayou Sale at Site 16SMY132, three allolayers separated by well-defined unconformities could be recognized. From oldest to youngest, they were Allolayer 1, Allolayer 2, and Allolayer 4. Along the north bank of the Intracoastal Canal which cuts through the natural levees of the western, right descending bank of Bayou Sale, only two allolayers separated by well-defined unconformities could be recognized. From oldest to youngest, they were Allolayer 1 and Allolayer 3. Within the channel fill of Bayou Sale that is exposed along the Intracoastal Canal, Allolayer 3 overlies an expanded section of Allolayer 2.

***Allolayer 1.*** The exposed upper boundary of Allolayer 1 consists either of the natural surface of the natural levee of Bayou Sale or an artificial unconformity created by the removal of natural levee deposits by earthmoving machinery. Except for some minor (probably garden) plowing, the upper contact of this allolayer within exposures of the eastern natural levee is the

former surface of the natural levee. The intact profile of the topsoil developed within Allolayer 1 demonstrates the lack of significant disturbance prior to burial in historic times. Within exposures of the western natural levee along the Intracoastal Canal, the upper contact of Allolayer 1 is a flat, sharp unconformity. Its flatness and the truncated profile of the topsoil developed within Allolayer 1 indicate that the original surface of the natural levee has been destroyed by the removal of about 50 to 70 cm of its surface. The bottom and lateral contacts of Allolayer 1 are concealed below the level of the Intracoastal Canal (Appendix 1).

Proximal to the former channel of Bayou Sale, Allolayer 1 consists of brown mottled yellowish brown silt loam and sandy loam in which the more recent soil is developed. Away from Bayou Sale, these sediments grade laterally into light brownish gray to grayish brown silty clay containing 6 to 7 cm diameter burrows. These burrows are filled with very dark gray silty clay loam from the A Horizon of the soil developed within Allolayer 1. The exposed sediments of Allolayer 1 are massive, except for the soil structure related to the more recently developed soil and burrows. Pedogenesis associated with, and plowing of the original natural levee topsoil, has altered the color and texture of the upper part of Allolayer 1 (Appendix 1).

***Allolayer 2.*** The sediments of Allolayer 2 occur as lenses lving on the surface of Allolayer 1 within the eastern natural levee and as a thick fill of the former channel of Bayou Sale. Within the banks cutting the eastern natural levee of Bayou Sale, Allolayer 2 consists of a thin, 12 cm thick lens of silt loam and intact brick foundation lying on the surface of Allolayer 1. This lens of Allolayer 2 lies on the surface of Allolayer 1. It is overlain by and slightly cut into by the base of Allolayer 4 (Appendix 1).

Over a meter of Allolayer 2 fills the former channel of Bayou Sale. The upper 40 cm of Allolayer 2 consists of a zone of very dark gray silt loam which contains a zone of cinders and scattered cinders overlying black silt loam containing abundant fragments of brick and charcoal. The lower 60 cm of Allolayer 2 exposed above water level in the Intracoastal Canal consists of a zone of very dark gray silt loam overlying grayish brown silt loam. Both zones contain abundant fine root molds. At water level, the lowermost zone contains the remains of a wagon, wooden beams and planks, and other historic artifacts (see Figure 22). An erosional surface blanketed by an erosional shell lag at the base of Allolayer 3 forms the upper bounding unconformity of Allolayer 2. Presumably, it lies on Allolayer 1, but its lower boundary is concealed (Appendix 1).

***Allolayer 3.*** Allolayer 3 forms the modern ground surface west of a slip dredged into the north bank of the Intracoastal Canal, enlarging Bayou Sale. In this area, it covers a portion of the former channel of Bayou Sale and the remnants of its western natural levee. Where Allolayer 3 overlies the western natural levee, the right descending bank, of Bayou Sale, this allolayer consists of distinct black to brown zones of silt loam and silty clay. These zones typically are stained by carbon black and are massive, except for some incipient soil structure. Along the banks of the Intracoastal Canal, it contains a shell bed whose geometry and content of historic artifacts indicates that it is an historic road bed which can be seen in Figures 4, 23 and 24. Allolayer 3 rests upon the truncated surface of Allolayer 1 (Appendix 1).

Within the filled channel of Bayou Sale, Allolayer 3 consists of a meter of light yellowish brown sand and loamy sand interbedded and interlaminated with dark gray silt loam and silty clay. Individual zones often are disrupted by soft sediment deformation structures. They overlie a five cm thick black, massive silt loam. The base of Allolayer 3 is a two to three cm thick zone of grain-supported, well-sorted, tightly packed, imbricated, water-rolled, fragmented, *Rangia* shell bed with a gray silty clay loam matrix. This zone lies on the erosion surface cut into Allolayer 2. To the west this erosional surface merges with the artificial unconformity against which Allolayer 2 pinches out along the west edge of the channel (Appendix 1).

Adjacent to the dredged slip, 17 cm of silt loam lie between the shell beds of Allolayer 4 and the underlying surface of Allolayer 1 and the modern soil developed within it. The silt loam consists of a zone of brown silt loam with incipient soil structure and clods of other zones overlying a zone of very dark grayish brown, massive silt loam. These zones are cut out immediately to the east by Allolayer 4. These zones appear to belong to Allolayer 3 (Appendix 1).

***Allolayer 4.*** Allolayer 4 consists of two shell beds separated by a discontinuous, 7 to 12 cm thick layer of dark grayish brown silty clay. Both shell beds consist of either grain-supported *Rangia* or oyster shell. The *Rangia* are typically well-sorted, unrolled, and tightly packed with a parallel fabric. The oyster shell is tightly packed with a parallel fabric and splintered in place by crushing. Allolayer 4 forms a broad sheet 20 to 50 cm thick along the edge of the slip and the bank of the Intracoastal Canal east of the slip. The base of Allolayer 4 cuts slightly into the underlying allolayers. However, it does not significantly disturb these deposits.

***Discussion***

The sediments of Allolayer 1 represent natural levee deposits of the Teche Delta Complex in which the now-buried solum of topsoil developed after the abandonment of Bayou Sale as a distributary. Within the portion of the western natural levee occupied by Site 16SMY132 on the right descending bank of Bayou Sale, the original surface of this natural levee has been destroyed by land modification, and the underlying deposits of Allolayer 1 disturbed. Prior to the dumping of Allolayer 4 on top of Allolayer 1, the uppermost 0.5 to 1 m, and possibly more, of Allolayer 1 had been stripped off. This created an unconformity that truncates all except the base of the more recently developed soil within this area. Within the portion of the eastern natural levee occupied by Site 16SMY132, on the left descending bank of Bayou Sale, the original surface of the natural levee has been only moderately impacted. Within this area, the solum of the original topsoil is relatively intact. Adjacent to the dredged slip, it has suffered some disturbance by plowing and loading prior to burial. This plow zone only occurs between the dredged slip and a point just west of Test Unit 1 which exposed a portion of a well-preserved brick house foundation. The thinness of the plow zone indicates that it was apparently associated with gardening rather then sugar cane farming. Adjacent to Bayou Sale, the abundance of dispersed, sand-size brick and charcoal grains within the upper 12 cm of that topsoil suggests the presence of either a farmyard or frequently hoed or plowed gardens. Beneath the

well-preserved brick foundations exposed by Test Unit 1 (see Figures 27, 28, 29 and 30) and east of those foundations, no evidence for a plow zone could be seen.

On the eastern natural levee, Allolayer 2 consists of the well-preserved brick foundations and sediments associated with the use and later decay of the structures associated with it. The sediments appear to represent both fill placed adjacent to and within the structures and sediment which accumulated within the foundations after the buildings had been razed or removed from their foundations. Additional work will be needed to clarify the precise history and origin of these sediments in relation to the brick foundations that they enclose. Regardless, the deposits of Allolayer 2 appear to be remarkably intact despite (or probably because of) the covering of shell that constitutes Allolayer 4. Unfortunately, bank erosion is very effectively destroying Allolayer 2 and the historic archeological deposits it contains.

Within the filled channel of Bayou Sale, Allolayer 2 consists of cinders, dirt, and trash dumped into the old channel of Bayou Sale. The thickness and geometry of these deposits are clearly indicative of artificial channel fill. The presence of buried wagon parts about 1.4 m below the top of Allolayer 2 and at water level within the slip indicate that a significant thickness of historic deposits fill the short segment of the former channel of Bayou Sale adjacent to the Intracoastal Canal. The cultural materials associated with this fill indicate that it accumulated during historic times and was later covered by spoil.

Allolayer 3 consists of sediments which accumulated because of historic earthmoving and dredging activities. The interbedded nature of the sands and fine grained sediments within the channel of Bayou Sale indicate that they represent the deposits of hydraulic dredging. Because they overlie a layer of water rolled shell which represents a transgressive beach eroding in from the Intracoastal Canal, these sediments are clearly of recent deposition. Similarly, the mixture of historic and modern artifacts within the rest of Allolayer 3 indicates that it is of modern origin. The earthmoving activities which deposited the materials of Allolayer 3 cut into the original surface of the natural levee as evidenced by the truncated solum of the original topsoil. As a result, any historic or prehistoric archeological deposits on the surface of this natural levee have probably been destroyed.

Allolayer 4 consists of at least two layers of shell paving. These layers represent successive parking and loading areas that were built adjacent to the Intracoastal Canal. Although specific dates were not determined, examination of Soil Conservation Service aerial photography suggests that they only date back to the 1950s.

### *Conclusions*

An examination of the sediments exposed within the cutbanks of the Intracoastal Canal at Site 16SMY132 revealed the presence of four allolayers. The lowest of these, Allolayer 1, consists of the natural levee deposits of the Teche Delta Complex. Within the banks exposing the eastern natural levee of Bayou Sale, a well-developed, relatively intact topsoil had developed within these sediments. The thin, discontinuous deposits of Allolayer 2 which consist of silt

loam containing intact brick foundations and historic archeological deposits lies upon Allolayer 1. In turn, both are covered by the modern shell paving of Allolayer 4. To the west, Allolayer 2 is absent, and a thin bed of modern spoil lies between the natural levee deposits and the shell paving. The eroding banks of the Intracoastal Canal west of Bayou Sale expose the modern spoil of Allolayer 3 lying directly upon the natural levee deposits of Allolayer 1. The surface of the natural levee had been cut away by earth moving operations, and any archeological deposits associated with it have been destroyed. Adjacent to the Intracoastal Canal, modern spoil and historic fill occupy the former channel of Bayou Sale.

# CHAPTER 3

# PREVIOUS RESEARCH

The various files at the Division of Archaeology, Louisiana Department of Culture, Recreation and Tourism in Baton Rouge were examined for previously recorded sites in the areas of the North Bend Site and the Todd Levee Survey Area. Additionally the records and library there were examined for archeological surveys and projects that had been done previously in the immediate and surrounding area of St. Mary Parish.

The nearest recorded site to the North Bend Site is Site 16SMY66 which is located in the opposite bank of the Intracoastal Waterway between Bayou Sale and Louisiana Highway 317. It is reported as consisting of wave washed shell deposits, primarily *Rangia* and some oyster. No *in situ* deposits were noted and it was believed to have been of undetermined historic origin (State Site Files; Rivet 1977). With the information now known about the North Bend Site that is outlined in several of the succeeding sections of this report, the material on the south bank of the Intracoastal Waterway is certainly related to the North Bend Site (16SMY132). Examination of Figures 23 and 24, indicates that those remains are part of the southern extent of the North Bend Plantation complex. The North Bend Cemetery that is located approximately 350 meters south of the waterway, although not investigated in this study, was probably also a part of the plantation complex.

Site 16SMY42 (Bayou Bartholomew) is located on the south bank of the Intracoastal Waterway approximately seven miles west of the North Bend Site (State Site Files; Gagliano, et al. 1975). Other than these and the sites discussed in the previous chapter there are few recorded sites in the Bayou Sale environs. It is therefore necessary to look at the Bayou Teche area for recorded sites.

Early archeological work in the coastal Louisiana area was initiated by William McIntire in the early 1950s and was incorporated into his *Prehistoric Indian Settlements of the Changing Mississippi River Delta* (McIntire 1958). In the early 1960s, Sherwood M. Gagliano and some of his associates carried out archeological and other related research in the coastal areas and salt domes of south Louisiana resulting in several publications (Gagliano 1963, 1964; 1967). Working more to the north of the present study area, Jon Gibson began, in the late 1960s, to carry out various archeological investigations in the Vermillion and Teche systems as well as the Atchafalaya Basin. His two decades of work in those areas is summarized in his *Archaeological Survey of the Mid-Teche Ridge* (Gibson 1990:21-24).

Broader and more recent studies of the Gulf Coastal areas include an *Overview, Inventory and Assessment of Cultural Resources in the Louisiana Coastal Zone* by Goodwin et al. (1991);

Gagliano, Weinstein and Burden's (1975) *Archaeological Investigations Along the Gulf Coastal Waterway*; and Neuman's *Archaeological Assessment of Coastal Louisiana* (1977). Bayou Teche has also been the subject of numerous investigations. Notable of these are Gibson's (1976) *Archaeological Survey of Bayou Teche, Vermillion River and Freshwater Bayou, South Central Louisiana*, and Neuman's (N.D.) *Archival Study for Archaeological Remains in the Lower Bayou Teche Watershed.*

Other archeological studies have been carried out in the south central part of Louisiana. These provide important information on the archeological sequence of that area, site distributions and models of settlement for those areas. Several have dealt with the Atchafalaya Basin. These include Neuman and Servello's (1976) *Atchafalaya Basin Archaeological Survey*; Gibson's (1978) *Archaeological Survey of the Lower Atchafalaya Region in Terrebonne and St. Mary Parishes*; his later *Archaeology and Ethnology on the Edges of the Atchafalaya Basin including Avoyelles, St. Landry, Iberia, St. Martin, St. Mary and Iberville Parishes* (Gibson 1980); and Goodwin's *Cultural Resource Survey of the Wax Lake Outlet Control Wier* (1986).

Numerous archeological surveys have been carried out in St. Mary Parish. A chronological listing of these (through 1988) has been presented by Heartfield, Price and Green, Inc. (1988:7-9 and Division of Archaeology Files). Several of these have a direct bearing on the North Bend Site and the Todd Levee Survey Area work. An archeological survey for the Louisiana Highway 317 Intracoastal Canal bridge at North Bend or Bayou Sale resulted in the record of Site 16SMY66 (mentioned above), and indicated no *in situ* cultural deposits (Rivet 1977). A subsequent archeological survey of the Intracoastal Waterway recorded the North Bend Site and Site 16SMY42 to the west of the North Bend Site, as indicated above (Gagliano, et al. 1975).

Several of the surveys are instructive for determining the predictability of archeological sites in the Todd Area Levee Survey Area. A portion of a 1978 pipeline survey by New World Research transected Bayou Sale and its natural levees approximately two miles northeast of the Todd Levee Survey Area. At the time of the survey, this transect (designated Locality 1) was located in cultivated fields which were thoroughly examined. No prehistoric sites were located, although a scatter of nineteenth century historic materials was noted. Other segments of this survey included the backswamps between Bayou Sale and Bayou Teche, the natural levee of Bayou Teche south of Calumet, and the backswamp from the edge of the natural levee of the Teche east and south to the Intracoastal Waterway. Notably, no sites were reported for those areas (Atschul 1979:27, 29; Figure 2).

In 1988, a survey was conducted in the area between Bayou Sale and Yellow Bayou just north of the New World Research Locality 1. An examination of the 1000 ft (305 m) transect was supplemented by shovel testing at 30 to 50 m intervals along the right-of-way. No cultural materials were recovered (Heartfield, Price and Greene, Inc. 1988:25-27, Figure 2).

A small tract was surveyed on Yellow Bayou in the Bayou Sale and Teche backswamp north of the Todd Levee Survey Area and west of the New World Research Locality 1. This

was done by Goodwin and Associates, Inc., in 1990. No prehistoric sites were located in the Yellow Bayou area at that time (Goodwin 1990).

Most of the studies that have been mentioned above are useful for the prediction and understanding of prehistoric occupations, but several have important information for a discussion of the historic occupations and settlement of the area. Gibson's (1982) survey of the East and West Atchafalaya Protection Levee from Moreauville to Morgan City, Louisiana, recorded several historic sites dating to the eighteenth and nineteenth centuries. The Teche study of Goodwin et al. (1988) reported the extensive historical research that was done on the Civil War Battle of Bisland.

A more recent study of that area, following up on their 1988 report, Goodwin et al.'s (1991) *History and Archaeological Investigations of Ft. Bisland and Lower Bayou Teche, St. Mary Parish* provides comprehensive historical documentation for nineteenth century occupations along portions of Bayou Teche. These include the Antebellum period, the Civil War period, and the late part of the nineteenth century and the early part of the present century. Portions of this study provide important comparative information with which to compare the North Bend Site archeological remains and historical documentation.

# CHAPTER 4

# A BRIEF HISTORY OF ST. MARY PARISH AND LAND OWNERSHIP IN THE STUDY AREA

## EARLY EXPLORATION AND SETTLEMENT OF ST. MARY PARISH

European explorers, lured by prospects of gold, began exploring the southeast United States within decades after Columbus' arrival in the New World. Early exploration efforts, however, ignored southeast Louisiana. The Spaniard Cabeza de Vaca, a member of the ill-fated Panfilo de Narvaez expedition, sailed along the coast of southwest Louisiana in 1527 on his way to Texas, but did not travel into the interior. In 1541, Hernando de Soto became the first European interloper into what is now Louisiana, but he also did not travel through southwest Louisiana. In 1682, the Frenchman Robert Cavalier Sieur de la Salle explored the Mississippi River Louisiana and named Louisiana for the French King, but also failed to explore southwest Louisiana. The French established settlements along the Mississippi River during the early eighteenth century to maintain their claim to Louisiana, but hostile Indians curbed early exploration and settlement into southwest Louisiana. Gradually, a few trappers moved into the area to take advantage of the abundance of both small mammals and wild cattle on the nearby Opelousas prairie (Louisiana Work Projects Administration 1941:37-43).

St. Mary Parish is located along the Gulf coast in southwestern Louisiana. During both the French and Spanish occupation of Louisiana, the area that now includes St. Mary Parish was referred to as the "Attakapas" region or district, named after the Indians who lived in southwestern Louisiana. Much of the land of St. Mary Parish is inundated regularly as either cypress swamp or marsh; however, a wide strip of land along Bayou Teche, now paralleled by U.S. Highway 90, is arable, fertile land. Thus, the early exploration and settlement of St. Mary Parish was generally along Bayou Teche, which runs into the Atchafalaya River in the southeastern portion of the parish (Perrin 1891:1-14).

In 1762, when France ceded Louisiana to Spain, about 400 people lived in the Attakapas region. Spain, recognizing the agricultural potential of the region, encouraged settlement in the area. In return for Spanish land grants in the region, settlers were required to build and maintain levees and to clear land. Responding to the encouragement to settle, Spanish, English and French immigrants moved into the region. In addition, Acadian refugees, fleeing political and religious persecution from the British in Canada, settled in the Attakapas district. The first Acadians settled near Fausse Point in 1765, but the original settlers dispersed throughout the

Attakapas and Opelousas regions. Many settled along Bayou Teche (Brasseaux 1987:73-89; Broussard 1977:11; Perrin 1891:14-18).

## ORGANIZATION OF ST. MARY PARISH

After four decades of rule, Spain ceded Louisiana back to France. In 1803, the United States acquired the Louisiana Territory from France. After the Louisiana Purchase, Attakapas County was established and in 1811 was divided into St. Mary and St. Martin Parishes (present-day St. Mary, St. Martin, St. Landry, Lafayette, Vermilion, and Iberia Parishes). In the following five decades, St. Mary Parish was further divided into Lafayette, Vermillion, and Iberia Parishes. In 1812, the State of Louisiana was admitted to the Union, and the following year the St. Mary Parish boundaries were further delineated in legislation (Broussard 1977:10; Perrin 1891:217-218).

Early travellers and settlers in southwestern Louisiana relied primarily on rivers and ba In 1819, the steamboat *James Lawrence* traveled regularly between New Orleans and Ne eria, through the communities of Centerville and Franklin. By 1850, the steamer *Old Times* made the trip twice a month. Before the Civil War, the New Orleans, Opelousas, and Great Western Railroad built tracks between Algiers and Brashier City (Morgan City) and began regular rail service, shortening the trip from New Orleans to Bayou Teche (Broussard 1977:14, 27, 40).

## FRANKLIN

The town of Franklin was established about 1800 by Pennsylvanian Guinea Lewis, who named the community for Benjamin Franklin. Most of the original settlers were from the eastern United States and were of British descent (Louisiana Work Projects Administration 1941:395-96). When the parish was organized in 1811, Franklin was chosen as parish seat and served as a port of entry for trade and traffic on Bayou Teche (De Grummond 1949:52-53; Perrin 1891:220-221). In 1819, James Leander Cathcart travelled through southwestern Louisiana for Secretary of War John C. Calhoun in order to survey the availability of live oak timber for the construction of naval vessels. In his journal, he noted the town of Franklin had 15 or 20 houses and the neighboring area had 15 to 20 plantations (Prichard et al. 1945:31).

During the next two decades, Franklin grew substantially as settlers moved in and purchased land. In 1838, a visitor to Franklin described it as a "beautiful village" with a population of 800. The community included "a Church, Court House, Public School, Female Seminary, two Hotels, two Banks, two Printing Offices, Post Office, an extensive ice house, and good McAdamized streets" (Prichard 1941:40). By 1891, Franklin had a white school, a colored school, a Catholic school, several churches, three hotels, two livery stables, and a newspaper (Perrin 1891:220-221).

## CENTERVILLE

Centerville, a small community located on Bayou Teche near the head of Bayou Salé, is the nearest community to Bayou Salé. A visitor to St. Mary Parish in 1838 noted that it had a post office, stores, and served as the port for Bayou Salé (Prichard 1941:41). In 1853, Centerville had a population of 200 and boasted several stores, a sawmill, an icehouse, and several inns (De Grummond 1949:51).

In describing the Centerville area, the Louisiana Work Projects Administration's *Louisiana: A Guide to the State* states that the land along Bayou Salé was on one of three arable ridges in the parish. "Willow trees, Cherokee roses, honeysuckle, and tall grasses grow along the curving road [along Bayou Salé], with canefields lying on each side" (1941:305).

## ECONOMIC BASE

Agriculture served as the primary economic base for St. Mary Parish since its permanent settlement in the mid-seventeenth century. During the early nineteenth century, cotton became an important cash crop throughout the South. Between 1820 and 1920, cotton growing penetrated both the Attakapas and Opelousas regions in Louisiana, but sugar cane became the dominant crop in the Bayou Salé area. By 1824, St. Mary Parish had 1515 acres planted in sugar cane. Some indigo was grown in the area, but by 1835 sugar was the dominant crop in the parish (Cowdrey 1983:72-73; De Grummond 1949:20-22). Because sugar cane required intensive labor, most planters had slaves to work in the fields. In 1813, there were 29 persons in the Bayou Salé area who were subject to taxation; sixteen of those owned slaves, although the average number of slaves owned was under six (Sanders 1962:1:92).

As the white population and number of acres under cultivation increased, so did the slave population. In 1840, the parish had a population of nearly 9,000, including 2366 whites, 6,286 slaves, and 298 free blacks. By 1850, St. Mary Parish's white population had increased to 3745, nearly 3,000 of which were foreign born (Broussard 1977:10-11). Slaves in St. Mary Parish were not limited to agricultural work. Several slaves worked as coopers, carpenters, blacksmiths, brickmasons, shopkeepers, and bartenders. These trades also supplied employment for free blacks as well (De Grummond 1949:27-28).

According to Joseph Karl Menn, in his book, *The Large Slaveholders of Louisiana*, St. Mary Parish had about 13,000 slaves in 1860. Of those, about 9,500 belonged to 90 large slaveholders who owned 50 or more slaves each. St. Mary Parish was an important sugar producing parish and led the state in sugar cane production eight of the years between 1850 and 1860. David Berwick, one of the large slaveholders, owned 128 slaves, 180 acres of improved land, and 900 acres of unimproved land in 1860 (Broussard 1977:26; Menn 1964:380-389).

Late nineteenth century agricultural writer Daniel Dennett stated that sugar cane was still the principal crop in the 1890s, although cotton, rice, corn, sweet potatoes, indigo, and tobacco were also cultivated. In 1891, St. Mary Parish planters owned 30,000 acres of sugar cane,

3,500 acres of rice, 18,000 acres of corn, 200 acres of oats, and 5,000 acres of pasture. This acreage represented less than one-tenth of the total acreage of the parish, the remaining being swamp, woods, or salt marsh. The fertile crop land produced 18,000 barrels of molasses and 100,000 barrels of sugar in 1889 (Perrin 1891:207-210). In the 1970s, St. Mary Parish planters still grew sugar cane, but industrial expansion altered the economic base as carbon black plants, oil exploration, and salt mining became an important part of the economy (Broussard 1977:167).

## ST. MARY PARISH AND THE CIVIL WAR

The Presidential election of 1860 served as a turning point in American history. St. Mary Parish, like most of Louisiana, voted for Southern Democrat John Breckinridge. Abraham Lincoln's election spurred secession efforts in the South, and within two months St. Mary Parish sent immediate secession delegates to a state secession convention. In the ensuing Civil War, several skirmishes took place in southwestern Louisiana. Federal troops led by General Nathaniel Banks invaded the Attakapas region in 1863. Union and Confederate troops fought in several locations in the Opelousas and Attakapas regions in 1863, including places near Franklin and Centerville along Bayou Teche. Union forces began retreating from the area in January of 1864 (Caskey 1938:Maps 1, 2, 3; Davis 1968:110; Edmonds 1979:viii-36).

## LAND OWNERSHIP IN THE TODD LEVEE SURVEY AREA

After the Louisiana Purchase, the United States Government required residents to show evidence of land ownership in order to help organize the territory (the claim period ended in 1825). Prior to any survey work or land sales, the government needed to understand what land was available. According to the American State Papers, early claimants on Bayou Salé included Thomas Berwick, Dominique Prévost, John Johnson, Francis Hackett, Nicholas Robineau, and Peter O'Reiley (Conrad 1990:1-5; Sanders 1962:1:60-73). Instituting the United States Rectangular Survey on pre-existing land divisions dictated by rivers and swamps proved to be a challenge. In St. Mary Parish, evidence of the original land grants is easily discernable as the irregular sections; the regular mile-square sections were surveyed by the Federal government (Conrad 1990:1-5).

The first Federal survey of Township 16 South, Range 10 East, was done by William Johnson in 1829. In 1841 and 1842, A. L. Fields, Deputy Surveyor, surveyed Townships 15 and 16 South, Range 10 East, according to the regulations established by the United States Rectangular Survey (Surveyor General's Office). By placing this survey structure on sparsely settled areas, the U. S. Government facilitated land purchase and promoted settlement, even though much of the Bayou Teche and Bayou Salé area had already been settled. Bayou Salé planter John B. Verdine apparently questioned the survey, so Fields resurveyed that claim in 1844, subsequently increasing Verdine's land claim.

The La Tourrette map of 1845 showed plantations on Bayou Salé owned by the Garrott, Johnson, and Kemper families, but several other holdings were established at that time and not

shown. On a copy of the original United States township survey map dated 1846, Section 29 was still public land at that time (Surveyor General's Office). William Garrett purchased 155 acres of Section 29 along Bayou Salé on December 30, 1846, for $1.25 per acre (Abstract Book for St. Mary Parish). According to John La Tourrette's 1845 map of Louisiana, Garrett owned land on both sides of Bayou Salé.

The Garrett family were early settlers in Southwest Louisiana. William Garrett's father, Joshua Garrett, moved to southwest Louisiana in the 1770s and fought in the Opelousas Militia in 1777. William Garrett married a woman of French descent in 1802 and had five children (Sanders 1983:36-40). According to St. Mary Parish marriage records, a William Garrett married Parthene A. Vinson in 1839, cementing the relationship between the Garrett and Vinson families. It is unclear whether it was Joshua Garrett's son, William Garrett, or a grandson who married Parthene Vinson in 1839 (Sanders 1962:2:14).

Census records indicate that both William Garrett and his sister Catherine Garrett registered cattle brands in the Attakapas District between 1798 and 1865. Although the Garretts must have had cattle in the Attakapas District, it was probably on a separate tract of land as records do not indicate that there was any cattle ranching along Bayou Salé, and the Garretts owned several parcels in the parish (Sanders 1962:1:14).

On a copy of the original United States township survey map dated 1846, Section 30 was public land (Surveyor General's Office). In 1850, the State of Louisiana selected Section 30 as swamp land to be acquired from the Federal Government, but only the east 1/2 of the section was approved for acquisition and sale (St. Mary Parish Federal Abstract Book 12:97). The west 1/2 of Section 30 was claimed by Stokeley Vinson on June 7, 1854 (St. Mary Parish State Abstract Book:51). Stokeley Vinson was a large St. Mary Parish planter, owning 64 slaves, 212 acres of improved land, and 1,440 acres of unimproved land in 1860 (Menn 1964:388-89).

Section 70, adjacent to Section 29, was claimed by John G. Garrett when Louisiana was purchased by the United States (St. Mary Parish Federal Abstract Book 12:100). According to a copy of the original United States township survey maps dated 1846, John G. Garrett owned Section 70 at the time of the survey (Surveyor General's Office).

During the 1850s, the three sections in Township 15 South mentioned above (Sections 29, 30 and 70) were combined with other adjacent parcels into one large landholding owned by David Berwick and William Garrett, probably due to the intermarriage of the Berwicks, Garretts, and Vinsons. David Berwick's marriage to Louisa Garrett in 1835 and William Garrett's marriage to Parthene A. Vinson in 1839, further fused the Berwick, Garrett, and Vinson families (Sanders 1962:2:11, 14).

Thomas Berwick, a surveyor, moved to the Attakapas region in 1779 as a religious exile and helped establish New Iberia. Shortly thereafter, several additional pro-Spanish Anglo settlers sought religious exile and land grants in the Attakapas region. Berwick purchased land throughout the region for speculation, although he apparently maintained a plantation and slaves.

Thomas Berwick's son, Joseph Berwick, became a large sugar cane planter and owned 133 slaves in 1840. His son, David Berwick, owned three plantations on Bayou Salé, both above and below his wife's family, the Garretts (Foret 1986:2-12; Conrad 1985:42-44).

As a large sugar cane planter, David Berwick owned a sugar mill and his experiments at the mill and on his plantations were recorded in the Franklin newspaper. According to Champomier's assessment of the sugar crop, Berwick had both horse-powered and steam-powered mills, and by 1860 owned 126 slaves. In 1863 and 1865, David Berwick pledged allegiance to the United States even though he had a son in the Confederate Army. David Berwick died in 1874 at age 66 (Foret 1986:2-12).

Berwick and Garrett formed a partnership to manage the large sugar plantation and jointly owned slaves and land. In 1860, Berwick and Johnson dissolved their partnership and divided all property equitably, including slaves (St. Mary Parish Conveyance Book N:925-931).

In 1919, David Berwick's son, Oscar Dudley Berwick, sold Garrett Plantation to Joseph Junca, Sr., and Mrs. Maggie Junca (St. Mary Parish Conveyance Book 3W:42). The Juncas were unable to pay the mortgage on the property, and in 1921, Investors Mortgage Company foreclosed their mortgage. R. B. Bishop purchased the property at a Sheriff's sale that same year, but within the next fifteen years the Federal Land Bank acquired the property (St. Mary Parish Conveyance Book 5F:612).

In 1936, Nicholas G. Huth, Reuben B. Laws, and Clarence C. Aycock purchased Garrett Plantation from the Federal Land Bank of New Orleans. At that time, Garrett Plantation straddled Bayou Salé and the property to the north of Garrett plantation was owned by Maryland Plantation. The property to the south, Johnson Plantation, was owned by O. D. Berwick. On the east and west, Garrett Plantation was flanked by swamp and salt marsh (St. Mary Parish Conveyance Book 5F:612). Laws, Huth, and Aycock sold the property to Earl G. Luke in 1950 (St. Mary Parish Conveyance Book 7M:144). Luke sold the Garrett Plantation in 1967 to Garrett Plantation Incorporated, the contemporary owners of the property (St. Mary Parish Conveyance Book 14Z:96, 14W:613).

## LAND OWNERSHIP IN THE NORTH BEND SITE AREA

Dominique Prévost established his claim to Sections 60 (T15S, R10E) and Sections 1, 2, 3 and 4 (T16S, R10E) shortly after the United States acquired Louisiana (St. Mary Parish Federal Abstract Book 12:97, 102; Sanders 1962:1:60). On a copy of the original United States township survey maps dated 1846, Dominique Prévost's name still showed up on several properties along Bayou Salé, including Section 60 (T15S, R10E) Sections 1 and 2 (T16S, R10E) (Surveyor General's Office).

Dominique Prévost was the first land owner along Bayou Salé. Prévost, a French merchant, moved to the Attakapas area before 1801, and purchased land on Bayou Teche in St. Martinville. The Spanish government granted Dominique Prévost land on Bayou Salé shortly

before Louisiana was reacquired by the French. Prévost served as a Justice of the Peace for Attakapas County from 1804-1807, and gained recognition from Governor W. C. C. Claiborne for his integrity. Prévost died in 1814 at age 63; his succession does not mention the property on Bayou Salé (Pourciau 1989:108-111; Sanders 1983:37).

In 1811, Henry Johnson and Nathan Kemper purchased the Dominique Prévost land on Bayou Salé. In 1831, the two divided the 3,385 acres of land, with Johnson taking the upper two sections and Kemper taking the lower two sections. In subsequent years, Henry Johnson had a distinguished career as both United States Senator and Governor of Louisiana (Kemper 1981:20-21).

James Kemper, great-grandson of Nathan Kemper, wrote of reminiscences about the sugar industry on his family's property on Bayou Salé. He described in detail the sugar refining process about 1881, just before he left to go to college. According to Kemper, sugar industry supplies such as coal, lime, sulphur, and hoops for barrels were floated down the Ohio, Mississippi, Red, and Atchafalaya Rivers to Bayou Teche. His father was supplied by a commission merchant in New Orleans who handled the sugar and molasses shipments in payment for his annual debt (Kemper 1980:77).

Kemper's father's sugar plant had a Niles three roller mill. Each roller was four feet long and twenty-eight inches in diameter and made thirty-six revolutions per minute. The mill could grind six tons of cane per hour and was run around the clock in sugar season, about seventy days. According to Kemper, labor was scarce, although many black employees lived and worked on the plantation. At one point, laborers were brought in from Minnesota, but Kemper believed that they were not as good at hauling cane as the local black employees (Kemper 1981:112-113).

Several chimneys were used in the Kemper sugar mill. It is not clear which chimney remains standing, but Kemper mentions several in describing the process used in the 1880s. Sugar cane was hauled to the mill, fed into the roller mill, and pressed twice to extract the juice. The residual fiber, called bagasse, was "carried out to a huge brick chimney where, with the aid of many cords of wood, it was burned up to get it out of the way." The chemicals sulphur and lime were used to bleach the juice and to coagulate foreign matter. Fumes from the sulphur process were also eliminated through yet another chimney. The Kemper mill boiled the raw juice in six kettles, and excessive heat was drafted out a smoke stack. "In old time, these were brick chimneys because bricks were made on the plantation and lime and cement were both cheap, having come down the river in barges. Steel stacks were not readily available on plantations; in fact, in those days, steel suitable for stacks had not been invented." As the juice boiled down in open kettles, it was skimmed and moved from kettle to kettle. Skilled workers were required to control the sugar refining process; in particular, it was important to take the sugar off of the heat at the correct time. The boiling sugar was moved into a cooling room to granulate and to have the molasses drained off. Kemper gave the following anecdote about this part of the process. "Rats like molasses, and sometimes a rat would drown in a molasses tank and, inadvertently, be dipped into the barrel. I would console myself with the realization that

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Savante M. Swenson (Waddill N.D.). In early 1910, the J. M. Burguieres Company, Limited, purchased the North Bend Sugar Company including land, "sugar-house and its machinery, carts, mules, implements" and other accouterments. The deed further defined the acquisition to include: "sugar house, refineries, storehouses, warehouses, tanks, cabins, overseers' houses, plantation residences, barns, stables, store-buildings, chains, machinery, boilers, engines, apparatus, tools, fixtures, sugar in wagons, molasses, corn, hay, forage, coal, fuel, railroad tracks, engines, cars, rolling stock, cars, carts, wagons, mules, horses, cattle, [and] swine." At the same time, the company also purchased adjacent Lone Magnolia Sugar Plantation, owned by Savante M. Swenson, who had apparently acquired that property from Emile Prévost in 1886. (St. Mary Parish Conveyance Book ZZ:846).

St. Mary Parish Courthouse records include a 1924 plat map of the J. M. Burguieres Company on Bayou Salé (Figure 11). Called the North Bend Unit of the company, it encompassed most of Sections 1, 2, 3, and 4. The Burguieres Company still owns those sections, but leases them to Cabot Corporation.

# CHAPTER 5

# THE TODD LEVEE SURVEY AREA

The Todd Levee Survey Area is located about 1.3 km west of Bayou Sale, and approximately 3 km north of the North Bend Site (see Figure 1). The proposed construction area surrounds the western portions of the agricultural fields of the Todd Plantation as shown on Figures 1, 12 and 13. The structures associated with the Todd Plantation proper are situated on either side of State Highway 317 along the western side of Bayou Sale. The following sections of this chapter outline the expectations of the survey, the proposed methodology and its necessary modifications, the results of the survey and recommendations for future work.

## EXPECTATIONS

On the basis of the examination of the Todd Survey Area, and the geormorphological, archeological, and historical background research the following were considered to be the prehistoric and historic possibilities and potential for the survey area.

1. The area of the survey may contain surfaces old enough for occupations from the Middle Archaic Period through protohistoric occupations. The earlier prehistoric occupations would probably be on buried surfaces well below that of the present one. Later occupations would perhaps be located closer to Bayou Sale on the higher ground of the natural levee.

2. Historic European occupations could be present, dating to the late eighteenth century, although it is expected that any structures, or location of former structures, would be much higher on the natural levee formation and near Bayou Sale. It is expected that they would be in the vicinity of the present-day plantation structures, well east of the survey area.

3. Given the surface conditions of the survey tract, and the nearness of any surfaces that could be shovel tested to the inundated backswamp, it was not expected that the survey would locate any archeological sites. The exception would be the location of sites that might be evident from previous dredging of canals and ditches in the area that would have brought up prehistoric materials from older buried surfaces.

## METHODOLOGY

As outlined in the scope of work, the archeological survey was to have been conducted in the following manner. All areas that could be traversed by pedestrian survey were to be covered with a lane spacing of 20 m. Shovel tests were to be excavated at 25 m intervals in a offset manner, with the shovel tests approximately 30 x 30 cm in the horizontal plane and

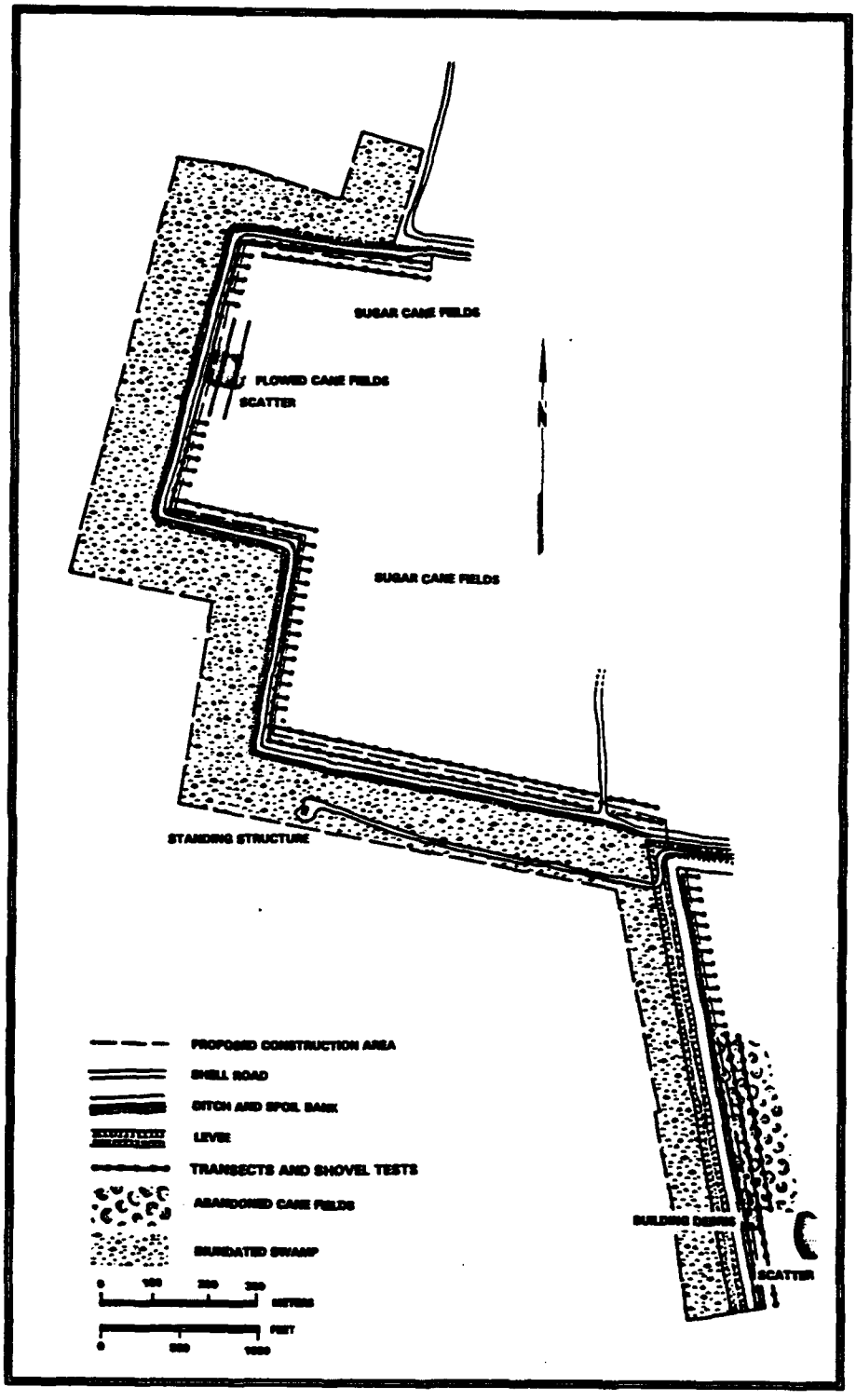


**Figure 12.** Plan of the Todd Levee Survey Area. The several survey conditions are noted, and the pattern of the transects and shovel tests are also shown.

**Figure 13.** Aerial photograph of the Todd Levee Survey Area. The Todd Plantation complex is right of center on the west side of Bayou Sale. Abandoned and overgrown cane fields can be see on the west of the survey area. Photograph is dated October 1, 1930. North is at the top. Photograph courtesy of U.S. Army Corps of Engineers, New Orleans District.

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excavated to sterile soil. The high moisture content and high clay content of the excavated soils was expected to preclude screening through 1/4 in wire mesh. Where that was the case, the soil was to be broken up with a trowel, or manually, and examined for cultural materials.

A preliminary examination of the Todd Area Levee right-of-way was conducted on July 14, 1991. It was determined that all but a small portion of the proposed levee right-of-way was located in undrained backswamp areas (see Figures 1 and 12). At the time of that cursory survey those areas were inundated. The only portion of the right-of-way which appeared to be

amenable to standard pedestrian survey was a narrow strip along the inside of the proposed levee area. Most of that area is currently drained and utilized for growing sugar cane. A small portion was drained, but had been abandoned for cane production and had reverted to forest.

A section of levee was present along the southeastern portion of the survey area (Figure 14), and the remainder of the area was surrounded by a drainage ditch and adjacent spoil dirt (Figure 15). An examination of topographic maps and aerial photographs indicates that the levying and ditching around the cultivated portions of the area was probably done sometime between 1954 and 1956. A raised shell road ran through a portion of the work area (Figure 12); it was probably constructed sometime after 1954 also, since it does not appear on the 1954 North Bend Quadrangle or aerial photographs taken prior to that time.

After the examination of the proposed survey area, and the determination that most of it was inundated, and after consultation with Michael Stout (New Orleans District), it was decided to modify the location and manner of the survey. The pedestrian traverse lines were moved inland so that they would be located inside the existing levee and ditch that was along the inside of the proposed survey area. This placed the transects along the edge of, and within the sugar cane fields and other environments that were located on the inland side of the proposed right-of-way. Figure 12 shows the placement of the transect lines and the shovel test locations within the inland portion of the survey area.

## CONDITIONS WITHIN THE SURVEY AREA

Within the area that was to be covered by these transects several different survey conditions existed. The locations and extent of these are shown on Figure 12. In general they consisted of the following:

1. Grass and other vegetation covered areas between the surrounding ditch and the mature sugar cane (Figure 16).

2. Mature sugar cane fields.

3. Recently plowed fields that had been rained on enough so that surface visibility was excellent.

4. One area of old sugar cane fields that had been abandoned and had a 30 to 40 year growth of trees.

Each area presented its own problems and possibilities, and the transects and testing program were appropriately modified for each area. In the areas between the surrounding ditch and the sugar cane, transects were done between the ditch and the cane with a spacing of 25 m between shovel tests. Where the rows of sugar cane ran parallel to the transect lines, transect lines and shovel tests were done within the cane following the cane rows. Where the cane rows were perpendicular to the transect along the edge of the cane, cane rows were walked into for

**Figure 14**. Existing levee along a portion of the proposed construction area. The inundated swamp is to the right and the vegetation covered ditch is on the left.

**Figure 15**. View of a portion of one of the drainage ditches surrounding the inland side of the survey area. The overgrown spoil bank is on the left and the sugar cane fields are to the right.

**Figure 16**. Typical survey transect area showing the mature sugar cane, the field edge and the surrounding vegetation covered ditch.

**Figure 17**. View of inundated swamp typical of most areas of the proposed survey area.

**Figure 18.** View of an old flooded borrow area in the northern part of the proposed construction area.

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a distance of 20 m and a shovel test was done at that location. This was done in such a way that an offset shovel test pattern was maintained. Materials excavated from the shovel tests were manually broken up and examined carefully for cultural materials. In general, the surface visibility within the cane rows was excellent (estimated 40 to 60 percent without vegetation) allowing for accurate surface examination for artifactual materials in addition to the shovel tests.

In the areas covered by grassy vegetation, generally between the cane and the surrounding ditch, transects and shovel tests were done in a standard manner at 25 m intervals. In the portion of the survey area that was a wooded, abandoned cane field it was possible to do the standard transects, spaced at 20 m intervals with shovel tests at 25 m intervals in an alternate pattern. The area of the survey that had been recently plowed was covered by transects at 20 m intervals, but no shovel tests were done in this area since there was 100 percent ground visibility.

The remainder of the right-of-way was examined for areas of surface that were exposed above the water, and shovel tests were placed in any above water areas in accordance with the above. Where exposed and amenable to examination, spoil banks and ditch banks along existing ditches within the right-of-way were examined for historic and prehistoric materials that may have been previously dredged from subsurface deposits or exposed in cuts. Photographs of representative areas of the right-of-way were taken to illustrate the survey conditions at the time

of the survey (see Figures 14, 15, 16, 17 and 18).

## RESULTS OF THE SURVEY

No prehistoric cultural remains were located in the shovel tests, in areas of exposed ground, in ditch cuts or on spoil banks. Two light scatters of brick fragments, *Rangia* and oyster shells were noted and are shown on Figure 12. Both were in close proximity to field roads (which had shell and brick incorporated in them) and are believed to be the result of scatter from road paving.

The remains of one apparently demolished structure was located in the southeast portion of the survey area (Figure 12). These remains were heavily overgrown. The materials appeared to be of relatively recent origin, including corrugated tin and corrugated plastic roofing. No foundations could be discerned, and it was uncertain whether this material was in place or dumped there from another location. Neither the 1930 nor 1940 aerial photographs show a structure at this location. The probability is that the materials noted are the result of dumping debris from a structure that was demolished elsewhere on the plantation complex.

One standing structure was situated near the southwest corner of the levee and borrow area (Figures 12 and 19). It was located just off of a raised shell road bed and near the center of a large open area that had been paved with shell. The structure is similar to several of the tenant structures that are at the Todd Plantation complex along the Highway 317 and Bayou Sale to the east of the survey area. An examination of 1930 and 1940 aerial photographs of the Todd Levee Survey Area do not show this structure, nor do they show the shell road along which this structure was located. As indicated above, this shell road was apparently constructed sometime after 1954. It is, therefore, believed that both the placement of the structure at that location and the construction of the road took place after that time.

The standing structure was probably moved to its present location from the Todd Plantation complex on Bayou Sale to serve as a hunting camp or other such facility. A comparison of the photograph of the structure located in the survey area (Figure 19) with a photograph of one of the tenant structures located at the Todd Plantation (Figure 20) clearly shows the similarities between the two. The remaining tenant structures at the Todd Plantation are located along the east side of, and perpendicular to, Highway 317. Interestingly, the map and photographic information that is available suggests that these tenant structures were only relatively recently moved onto or constructed at the Todd Plantation.

The 1930 aerial photograph of this area (Figure 13) shows four structures on the east side of Highway 317, only one of which might be structurally similar to the one on the survey tract and the ones presently at Todd Plantation. Additional structures are shown on the 1941 Quadrangle for the area, and the 1945 aerial photograph shows at least seven buildings along the east side of the Plantation site that have a configuration that would match the one on the survey tract and the ones on the plantation today. The evidence therefore suggests that the tenant houses at the Todd Plantation were brought in or constructed sometime after 1930, but

**Figure 19.** The standing structure located in the western part of the survey area in an expanse of shell paving. View is to the south. Compare this structure to the one in Figure 20.

**Figure 20.** Abandoned tenant structure located on the east side of Highway 317 at the Todd Plantation.

certainly before 1945.

It is interesting to speculate that they may have been moved there from the North Bend Plantation since there were probably as many as ten tenant structures at that location which were in the right-of-way of the Intracoastal Waterway construction. However, neither the 1930 aerial photographs nor the Engineer construction plans provide sufficient detail to verify this point. A Corps of Engineers construction plan dated April 12, 1930, (a portion of which is reproduced in the next chapter in Figure 24), shows several of the tenant structures at the North Bend Plantation. Scaled from that drawing, those structures have an overall plan dimension of 35 by 22 feet. If the unshaded portion of the structures in the drawings represent a porch, then the building size is 28 by 22 feet. Measurements of the structure at the Todd Plantation were 38.5 by 14 feet. The larger front room of the structure was 28 by 14 feet, and the remaining kitchen area at the rear was 10.5 by 14 feet. While the 28 foot dimension of each of the structures is interesting, the disparity between the 22 and 14 foot widths probably indicates that they are not the same structures.

## SUMMARY AND RECOMMENDATIONS

The pedestrian survey and shovel testing program in the Todd Levee Survey Area failed to locate any prehistoric archeological materials. This includes those that would have been located in the surficial deposits of the area, as well as any that had been brought up from deeper deposits by dredging and ditching activities. Since most of the area was located in backswamp, from areas that may have been reclaimed from backswamp, or the very back edge of the natural levee deposits, no prehistoric materials are to be expected in the upper levels. The geomorphological study indicates that there is the possibility of buried surfaces which may have prehistoric materials. None were noted as having been brought up by previous excavations, but the coverage of the spoil banks was obscured to a large extent by dense vegetation and ground cover.

The two light scatters of bricks and shells that were noted during the survey are attributed to field road construction and scatter by farm machinery. The one standing structure that is in the survey area, from all indications, is a recent introduction to the area, having been moved there from perhaps elsewhere on the plantation. The concentration of building debris is thought to be materials placed in that location from a building that was torn down elsewhere on the plantation.

Based on the results of the archeological survey and the background information that is available, it is not expected that the proposed levee construction in the Todd Levee Area will have any detrimental effect on any historic or prehistoric cultural resources. Since the presence of deeply buried prehistoric material was not adequately assessed within the scope of the work, it is recommended that, perhaps during, but certainly after the construction, that the newly exposed surfaces and spoil deposits be carefully examined for prehistoric materials.

# CHAPTER 6

# EXCAVATIONS AT THE NORTH BEND SITE

The purpose of this chapter is to present a description of the North Bend Site (16SMY132) and detail the test excavations and other work that was carried out at the site in conjunction with this project. The aerial photographic and map coverage is reviewed to reconstruct the plantation complex as it was in 1930, and to describe the changes to the complex that have taken place since that time. The field methods used are presented as well as the results of the testing program. The artifacts are summarized and discussed in terms of the context of the plantation occupation.

## SITE DESCRIPTION

The North Bend Site is located on the north bank of the Intracoastal Waterway in St. Mary Parish, Louisiana. It is situated on either side of Bayou Sale at the junction of that watercourse with the Intracoastal Waterway (see Figures 1 and 21). It is now clear from the archival, historical and archeological research that the archeological remains at this site are the vestiges of what was the North Bend Plantation complex, and date primarily to the latter half of the nineteenth and the first part of the twentieth century. From the examination of the aerial photography (Figures 23, 25 and 26), it is also evident that Site 16SMY66 located on the south bank of the Intracoastal Waterway between Bayou Sale and Highway 317 was also part of the North Bend Plantation complex. The maximum extent of the area of the former plantation which contained buildings and other structures is outlined on Figure 1.

Prior to the initiation of the fieldwork at the North Bend Site, in conjunction with the preliminary survey of the Todd Levee Survey Area, a careful examination of the site and its immediate surroundings was carried out. All portions of the bankline and the upper surface of the site were traversed. The results of that examination, and, in particular, the eroding bank along the Intracoastal Canal and a dredged portion of Bayou Sale indicated the following:

That portion of the site lying to the west of Bayou Sale and north of the Intracoastal Waterway, or the original extent of the site as reported in the State site form and the Corps of Engineers Scope of Services, consists of lenses of *Rangia* shells and soils containing historic artifacts overlying culturally sterile natural levee deposits. Most of the inclusive artifacts noted appeared to be of late nineteenth century or even more recent origin, particularly the upper stratum which contains large amounts of carbon black from the nearby Cabot carbon production plant. The lower stratum contained older materials, but may derive mostly from redeposition in this century. Near the point where the cut bank of the canal intersects the dredged portion

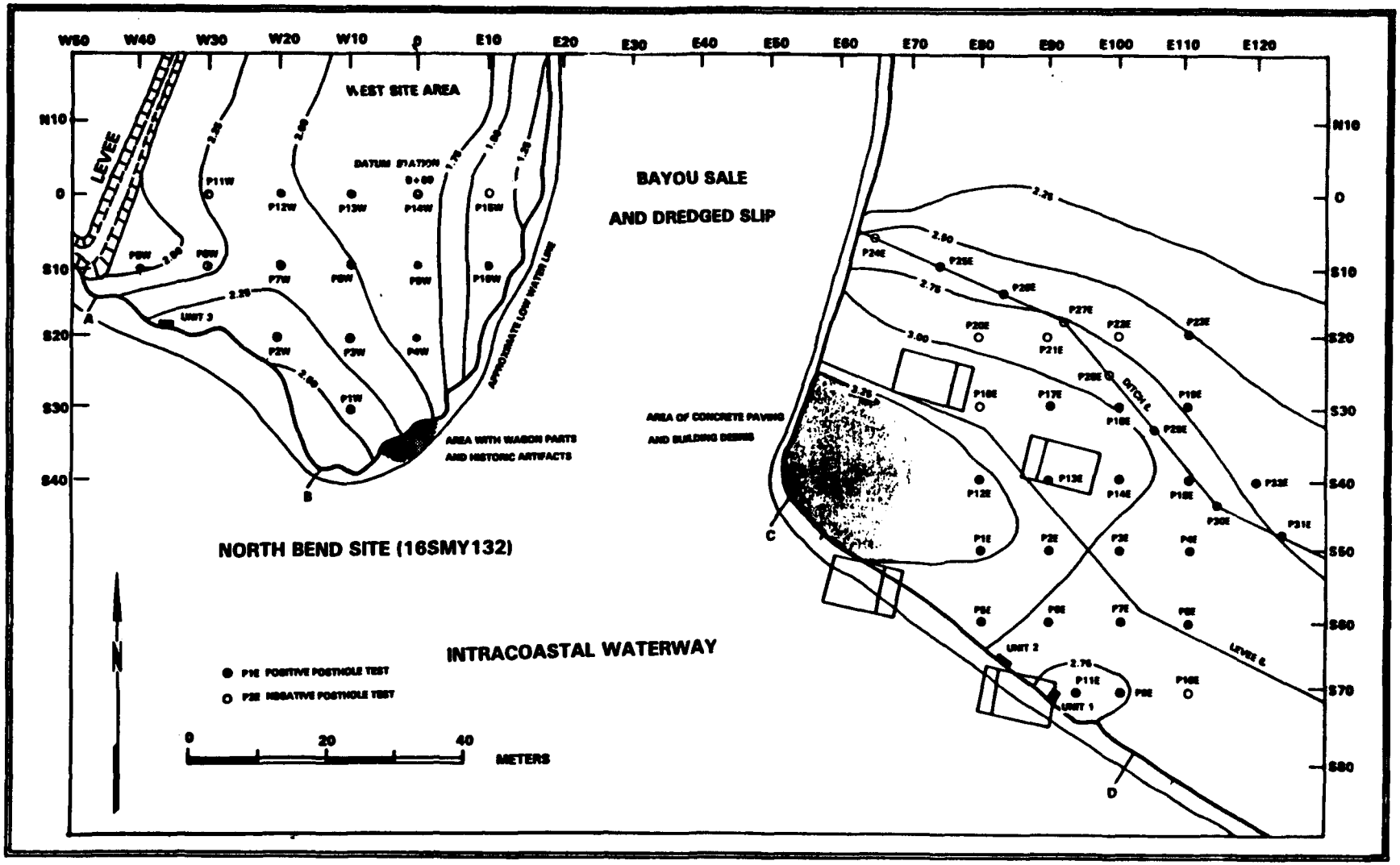


**Figure 21.** Plan of the North Bend Site showing the location of the test units and posthole tests. The northernmost tenant structures shown in Figure 24 are also plotted in their approximate locations.

**Figure 22.** Wagon wheels and other historic artifacts on the west shoreline of Bayou Sale. View is to the south.

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of Bayou Sale there are historic artifacts eroding from the bank at the water level and below the water surface. These artifacts consist of iron wagon wheels, other industrial metals and artifacts (Figure 22), and are resting on what was the original slope of the west bank of Bayou Sale.

In addition to the part of the site that is on the west side of Bayou Sale, the site extends along the bank of the Intracoastal Canal east of Bayou Sale for approximately 75 m. Two shell lenses and intervening soil layers were present above the natural levee deposits in that area. The shell lens directly above the natural levee surface and the A Horizon of the natural levee contained quantities of historic artifacts, dating possibly as early as the 1830s or 1840s. The upper shell layer and earth fill were clearly much more recent in origin.

Approximately 40 m east of Bayou Sale the profile of a brick floor or foundation was exposed in the bankline. It was below the lower lens of shell and situated on the A Horizon or topsoil of the natural levee surface. Historic ceramics, glass and other materials from the late nineteenth and early twentieth centuries were eroding from the same shell lens and underlying levee surface for several meters to the east and west of the brick floor. It was assumed at that time that the upper lens of shell was of more recent origin, or at least more recent deposition, and may have derived from the construction of the Intracoastal Waterway or subsequent dredging.

Subsequent to this examination, and the fieldwork, various maps and aerial photographic information became available which made it possible to reconstruct, to a large degree, the North Bend Plantation as it was around 1930. The history of the plantation and some of the structures and production of that facility have been previously described in Chapter 4. Of particular importance to the early twentieth century reconstruction is the 1930 aerial photograph of the area taken prior to the construction of the Intracoastal Waterway. A portion of that photograph, centering on the complex of buildings, is shown in Figure 23, and illustrates the North Bend Plantation complex as it was at that time. The approximate extent of the North Bend Plantation, excluding the agricultural fields, is shown by the dashed lines on Figure 1.

Plantation structures were situated on both sides of Bayou Sale. A shell-paved road followed the course of the bank on the west side of the bayou. To the west of this road was the main plantation house structure and several associated outbuildings. This part of the complex was surrounded by agricultural fields on the north, west and south. On the same side of the bayou, south of the main house complex, there was a row of five structures paralleling the bayou and situated between the shell road and the bayou bank. The North Bend Cemetery (shown on Figure 1, and which appears as a wooded patch in the aerials) was and is located on the west side of Bayou Sale approximately 225 m south of this row of houses, adjacent to the west side of the shell road.

On the east side of the bayou, the brick chimney and other buildings for the cane refinery are shown located almost directly east of the plantation house. North and just east of the stack and mill there are a number of structures shown that were probably related to the refining operation. Three structures were located directly east of the brick stack and separated from that structure by a shell road. South of the mill was a large structure situated in what appears to be a shell paved area, and south of that are 15 tenant houses arranged in two parallel rows extending to the south. About 150 m east of the complex of structures is a north-south line of the Southern Pacific Railroad. The field between the area where the structures are located and the railroad tracks appears to be in cultivation (and apparently remained in cultivation through at least 1955).

In addition to the information that is available on the tenant structures from the 1930 aerial photograph, there is a U.S. Army Corps of Engineers drawing dated April 12, 1930, and revised to July 9, 1930. A portion of this drawing is reproduced in Figure 24. It shows the right-of-way for the waterway, the cut for the canal, and the 15 tenant structures. Scaled from

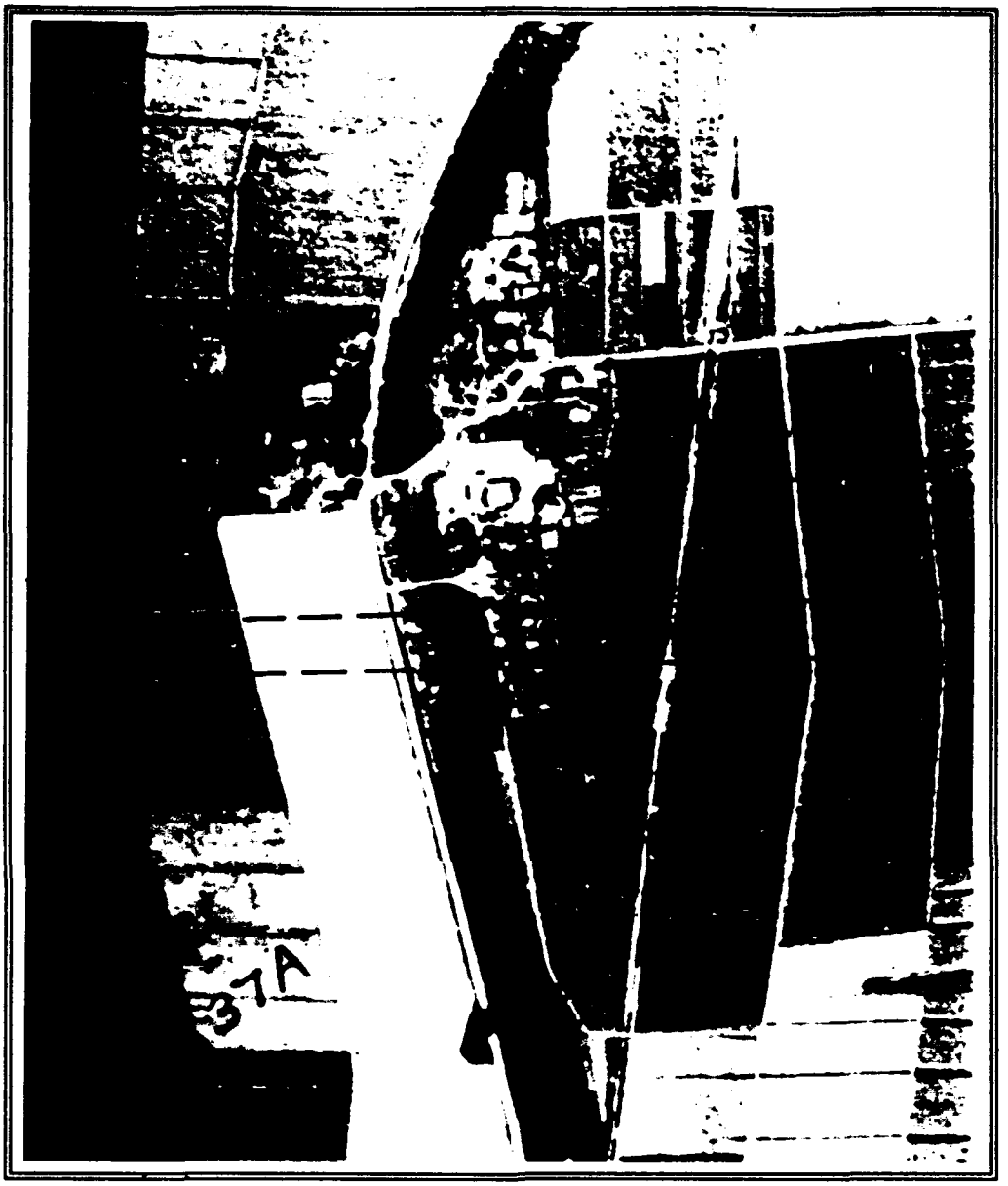

**Figure 23**. A portion of the 1930 aerial photograph of the North Bend Plantation. The dashed lines show the approximate location of the Intracoastal Waterway. This photograph and the ones in Figures 25 and 26 have been printed to the same scale. Courtesy of the U.S Army Corps of Engineers, New Orleans District.

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that drawing, the buildings were 35 by 22 ft (10.7 by 6.7 m) overall. Porch areas included in those dimensions, and facing the avenue between the two rows of buildings were 8 by 22 feet. The interior living area was approximately 27 by 22 ft (6.7 by 2.4 m). East of the tenant

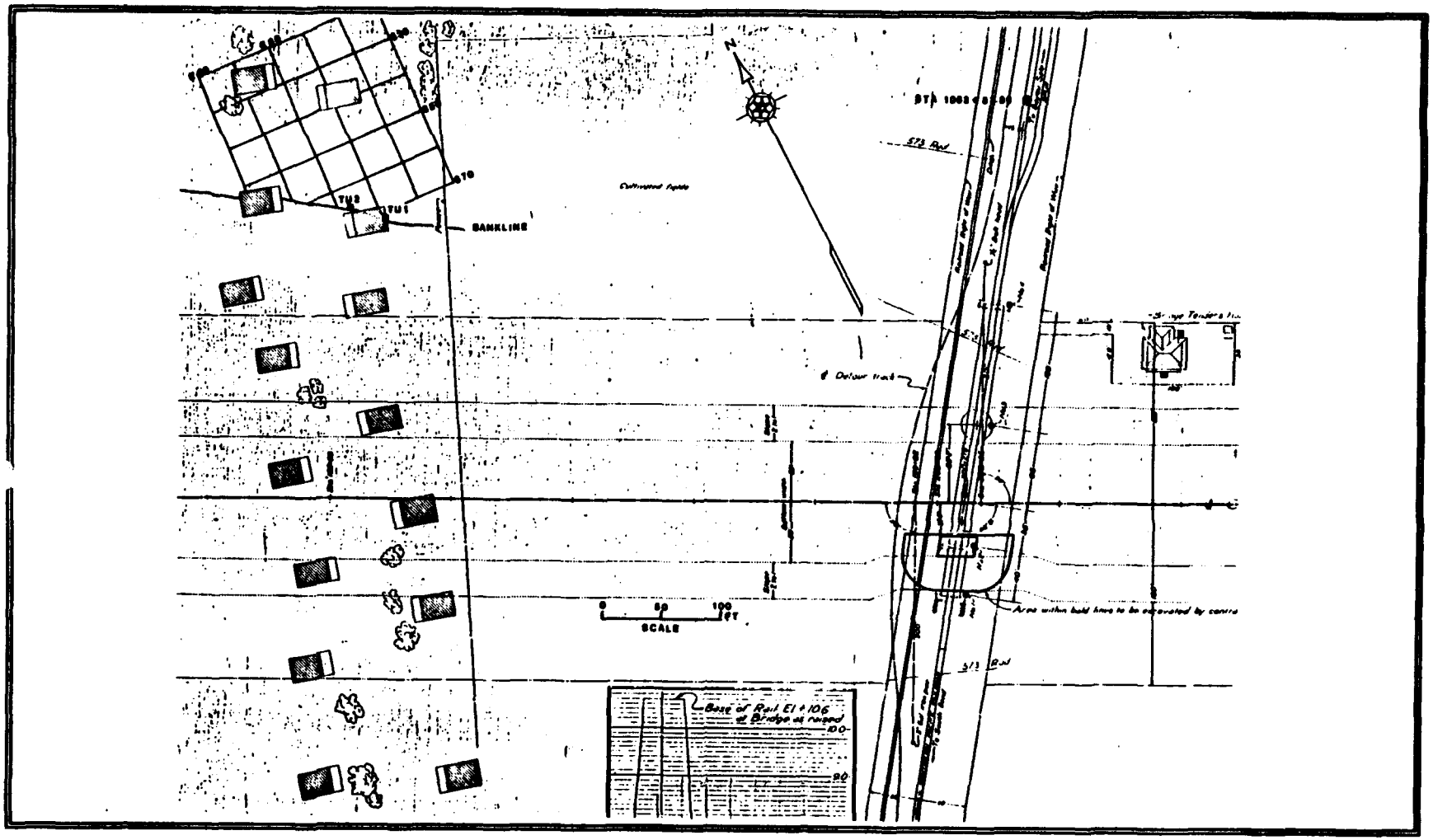


**Figure 24.** 1930 engineering drawing showing the Intracoastal Waterway right-of-way, the Southern Pacific railroad tracks and the 15 tenant houses on the east side of Bayou Sale. The location of the benchmark at Sta.1032+57.89, part of the grid system and the location of Excavation Units 1 and 2 have been added to the drawing. Courtesy of the U.S. Army Corps of Engineers, New Orleans District.

structures is a fence line bordering a cultivated field which extends eastward to the railroad right-of-way.

A portion of the 1991 grid system, the location of Excavation Units 1 and 2, and the Corps of Engineers benchmark at STA.1032+57.89 have been superimposed on that drawing. The bronze benchmark is located near the center of the abandoned railroad embankment. Its location was approximated on this map by measuring in the field its distance from the railroad bridge pier on the north bank of the canal, and scaling this distance on the 1930 drawing. Excavation Unit 1, which exposed part of Structure 1, was located 167.7 m (550 ft) from that benchmark at an azimuth of 283.5° (76.5° west of magnetic north). Scaled onto the 1930 drawing, it lies just within the eastern end of the second structure of the eastern row of houses. Excavation Unit 2 was located just north of, and near the western end of that building.

Figure 25 is an aerial photograph of the North Bend Plantation taken in 1945, well after the construction of the Intracoastal Waterway. The shell road on the west bank of Bayou Sale is still evident, although bisected by the waterway. The main house compound is intact and the area to the south of that (including the west part of the project area) still appears to be a cultivated field. One or two of the structures on the road south of the main house still remain on the south side of the waterway. The northernmost ones were within the right-of-way of the waterway and were probably removed prior to, or destroyed, by the waterway construction. The vegetated area paralleling the south side of the Intracoastal Waterway covers the spoil dirt from the construction of the waterway. The chimney and foundations of the mill appear, as do the buildings to the north of that structure. The large building to the south of the mill is still standing, but notably absent in the area south of that structure are any of the tenant houses which formally stood there.

However, nine or ten structures of similar size are shown located in a field to the north and east of the old mill. They are, most probably, the tenant houses that were moved to a new location prior to the construction of the waterway. Additionally, there is a railroad draw bridge that had been built in conjunction with the waterway construction to span the Intracoastal Waterway. Also evident in this photograph are the slips that were dredged into the east side of Bayou Sale on both the north and south sides of the waterway.

Figure 26 is an aerial of the area taken in 1955. It shows the Cabot carbon plant on the west side of the bayou in the approximate location of the main house complex. The shell road is still present extending to the north bank of the waterway. On the east side of the bayou similar buildings are shown as are on the 1945 photo. The portion of the site at the intersection of the east side of Bayou Sale and the north bank of the Intracoastal Waterway appears to have been paved with shell. The structures on the west side of Bayou Sale and south of the waterway that were present on the 1945 photo are not apparent on the 1955 aerial.

On the basis of the preliminary ground survey of the North Bend Site, the historical documentation, and the subsequent archeological work that is described in later sections of this chapter, the following statements may be made. The shell deposits and cultural materials at the

**Figure 25**. 1945 aerial photograph of the North Bend Plantation. Courtesy of the U.S. Army Corps of Engineers, New Orleans District.

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North Bend Site are the result of historic occupations dating from the nineteenth century, and later. The historic structures and artifacts are a result of occupation of the North Bend Plantation and sugar refining activities of that plantation. Any prehistoric materials that may have been present at the site (as originally reported) are probably due to use of aboriginal shell midden materials for paving and surfacing in the area of the plantation structures.

**Figure 26.** 1955 aerial photograph of the North Bend Plantation. Courtesy of the U.S. Army Corps of Engineers, New Orleans District.

## FIELD METHODS

The bronze Corps of Engineers benchmark that was at Station 1041+50.52 = 0+00 C.S. (see Figure 21) was used as a datum point for establishing a grid system over both the east and west portions of the project area within the North Bend Site. That benchmark had an elevation

of 6.21 feet NGVD. That was converted to meters (1.89 meters NGVD) and was subsequently used for computing the plane table elevations across the site. A regular 10 m grid was established across both portions of the site. That grid system was oriented magnetic north-south and east-west and was tied into the Army Corps of Engineer's baseline at Station 0+00. This grid system was the guide for locating the excavation units, and the grid of postholes that were excavated over portions of both parts of the site.

Once the grid was established and a plan of the site within the proposed work area had been made, work proceeded with a detailed examination of the bankline. The profiles of the bankline of both portions of the site were drawn to scale. Shovel and trowel cleaning of portions of the profile was done when necessary for clarification of profile details. A surface collection was made of the artifactual materials that had eroded from the bankline of the site and were present along the beach zone of the waterway edge.

Post hole tests (in lieu of shovels tests because of the necessary depth) were initially done at ten-meter intervals along the regular grid to determine the extent of the site within the project area, depth of the cultural deposits, stratigraphy, cultural association, and possible activity variation across the site. Fifteen were excavated on the west portion of the site, and 11 were done on the east portion of the site. At the request of the Corps of Engineers Contracting Office'r Representative, additional 21 posthole tests were excavated in the eastern portion of the project area. Several were done at the grid intersections to extend the coverage of the site area. Another series of these tests were dug along the axis of the planned drainage ditch that was to parallel the land side of the proposed levee on the east side of Bayou Sale (Figure 21).

The postholes were excavated by hand, and all soil removed was screened through a 1/4-in screen, and bagged by posthole test. The posthole tests on the east side of Bayou Sale were numbered sequentially from 1-E to 32-E; the ones on the west side of the bayou were numbered 1-W to 15-W. The locations of all of the posthole tests are shown on Figure 21. Appendix 2 presents the depths and descriptions of the stratigraphy as well as the artifacts that were recovered from each of the post hole tests. Efforts were made to carry all of the post hole tests down to and within the upper part of the original natural surface, or to sterile levee material.

Based on the examination of the bankline and its profile, the location for three one by two m test units was determined. These were all situated on the edge of the bank line so that the natural stratigraphy of the units was visible and could be followed during the excavations. One unit was located west of Bayou Sale and the other two were east of the bayou (see Figure 21). Careful clearing and profiling of the bank was done where the units were to be placed to insure that the natural stratigraphy was clearly defined and could be followed during the excavations. All three units were excavated by natural or cultural stratigraphic levels.

Testing of the North Bend Site was carried out using standard excavation procedures, following the natural stratigraphy within the units. Materials from most levels were water screened using nested 1/4- and 1/8-in screens (the levels excepted are noted in the discussions of the appropriate units). All artifactual materials were saved and bagged according to unit and

level. All non-shell faunal materials were saved and a sample of the shell matrix for each level (excepting those noted later) were also saved. All profiles were mapped and the portion of the one structure encountered was excavated, mapped, recorded and photographed. Descriptions of the soil stratigraphy in the excavation units and the description of the bankline profile were made by the geomorphologist (see Chapter 2 and Appendix 1). Appropriate field records were kept for all levels excavated. All aspects of the testing program at the North Bend Site were directed toward determining whether the site conforms to the National Register criteria, and if it possesses sufficient integrity to support nomination.

## FIELDWORK AND EXCAVATIONS

The following sections describe the excavation work that was done on both the east and west portions of the project area at the North Bend Site. A description of each excavation unit is provided along with a summary tabulation of the artifacts that were recovered from each level that was excavated in each unit. More specific details of the artifacts from the bankline surface collections, the excavation units and the posthole tests are presented in Appendices 2 and 3. The stratigraphic data from the posthole tests is also given in Appendix 3.

### *EASTERN PORTION OF THE SITE*

This is the part of the site that lies east of Bayou Sale and was the location of the sugar cane mill, several associated buildings, and the tenant houses for the plantation. The construction area of the proposed project is immediately back from the north bank of the Intracoastal Waterway, and lies within the area that was the location for one or more of the tenant structures (see Figure 21). At the time of the fieldwork the part of the site that is north from the bank of the waterway was for the most part a mowed grass field. However, surface examination and posthole excavation, as well as the test units, indicated that this area had been a mostly paved surface consisting of *Rangia* and oyster shells. The western part of this area was heavily overgrown. Underlying this undergrowth was a large concrete slab that was part of a foundation for a dock structure that had been constructed on the east edge of the slip dredged into Bayou Sale. The bankline was being severely eroded by wave wash from tows on the waterway (see Figure 3).

Work that was done in this portion of the site included gridding and mapping, profiling of the bankline along the Intracoastal Waterway, the excavation of two one by two m test units, and the excavation of a series 32 of postholes at the intersections of the grid system, and along the alignment of the ditch that is to parallel the land side of the proposed levee. These various tests were done to determine the extent of the stratigraphy that was present in the north bank of the waterway and detailed in the two test units. Additionally they served to show the extent of the distribution of cultural materials associated with the occupation of the North Bend Plantation within this part of the project area. Specifically, the work defined those deposits that were most probably associated with the tenant structures in this area.

*East Bankline Stratigraphy*

Some 60 meters of the north bankline of the waterway on the eastern part of the site was profiled, beginning at the junction of this bankline and the east bankline of the slip that had been dredged into Bayou Sale, and extending eastward. The location and extent of this profile (C-D) is shown in Figure 21. Figure 27 shows the profile that was made and the stratigraphic zones that were recognized. Five stratigraphic zones are evident and the descriptions of those are presented here in order from the lowest to the uppermost level. They are correlated with the soil and geomorphological descriptions of two measured sections of this bankline that were done by Heinrich and presented in Chapter 2 and Appendix 1. One of Heinrich's measured sections was located immediately adjacent to the east edge of Test Unit 1 (Figures 21-E and 27), and the other was six meters east of the slip dredged into Bayou Sale (Figures 21-F and 27). On this bankline Heinrich defined three allolayers (numbered 1, 2 and 4), which are detailed in Chapter 2. Within those allolayers he recognized eight different zones for Section 1 and seven for Section 2 (Appendix 2).

In all subsequent sections of this chapter zone is used to refer to a natural or cultural stratigraphic unit. Level is used to denote a vertical unit of excavation within a test unit regardless of whether it corresponds to a natural stratigraphic unit (zone) or an arbitrary unit of excavation. In the work reported here, all excavation levels correspond to natural or cultural stratigraphic units.

***Zone 5.*** As shown on Figure 27, this zone consists of the culturally sterile, underlying natural levee soils of Bayou Sale. This zone includes Heinrich's Zones 7 and 8 of his allolayer 1 in Section 1 and Zones 6 and 7 in Section 2. The upper part of Zone 5 consists of dark grayish brown (10YR 4/2) silty clay and brown (10YR 5/3) silty clay loam. These grade downward into brown (10YR 5/3) silt loam and light brownish gray (2.5YR 6/2) silty clay. Zone 5 was present and continuous for the entire length of the mapped profile and beyond to the east. From the beach surface upward it varied in thickness between a maximum of 155 cm at the west end of the profile and 55 cm in the eastern portion of the profile.

***Zone 4.*** Directly overlying Zone 5, this zone consists of the original topsoil of the natural levee (A Horizon) and contains the majority of the artifactual and structural materials that relate to the tenant occupation in this area of the North Bend Plantation. Zone 4 is the uppermost part of Heinrich's allolayer 1 and includes his Zone 6 of Section 1 and Zone 5 of Section 2. It is composed of very dark gray (10YR 3/1) loam and very dark gray (10YR 3/1) silty clay loam. It includes artifactual materials and brick fragments. This is the zone on which Structure 1 was built, which is detailed below in the discussion of Unit 1. The artifacts and other occupational debris in and on this zone derive from the occupation of the tenant houses of the plantation that were in this area.

This zone varies in thickness from 10 to 40 cm. It is evident in the profile from about Meter 5 near the western end of the profile to the easternmost end of the profile. It is discontinuous where it has been eroded away in the two gullies east of Test Unit 1, and between

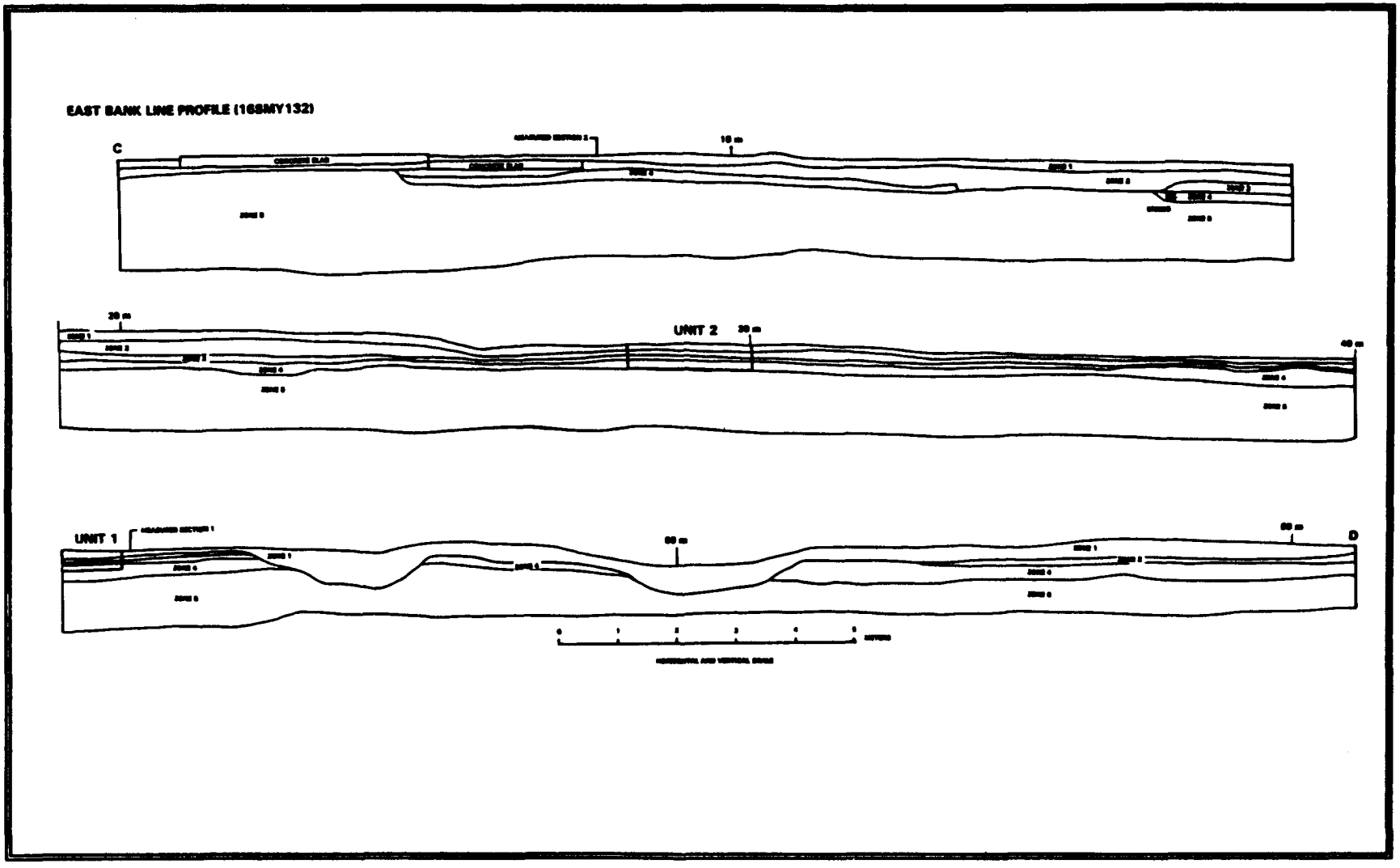


**Figure 27.** Stratigraphy of the bankline of the eastern part of the North Bend Site.

about Meter 13.5 and Meter 17 in the western portion of the profile. At Meter 17.25 there was a stack of three bricks within this zone and some brick fragments immediately to the west of that stack. The discontinuity between Meter 13.5 and Meter 17 and the stack of bricks correspond to the estimated location of a portion of the second tenant structure in the western row of those buildings (see Figure 21).

***Zone 3.*** This is a layer of shell paving that was spread over most of the site area, probably shortly after the removal and/or demolition of the tenant houses, but before the slip was dredged into Bayou Sale. It consists of *Rangia* shell in a very dark gray (10YR 3/1) silty clay matrix. It is present in the profile from about Meter 17 on the western part of the profile to Meter 43 at the western side of the first gully east of Test Unit 1. It varies in thickness between five and 15 cm, having the greatest thickness near its western extent. This zone corresponds to Heinrich's Zone 4 in Section 1, constituting the basal zone of allolayer 4, and is not present in his Section 2 near Bayou Sale.

***Zone 2A.*** Separating Zones 2 and 3 was a thin lens of dark gray (10YR 4/1) silty clay not shown on Figure 27. It was only recognized in the immediate vicinity of Test Unit 1 where it was excavated as Level 3 (see Figure 28). The thickness of this zone was one to two cm. Heinrich designated it Zone 3 in his Section 1 adjacent to Test Unit 1 and included it in his allolayer 4. It was not present in the other measured section. This zone is probably the lower part of Zone 2 (spoil dirt), distinguished by a variation in the soil type.

***Zone 2.*** This is a layer of nearly sterile spoil dirt that is present over most of the areas of the site that were tested. In the bankline it was continuous for most of the length of the profile, ending under the poured concrete slab at about Meter 5 near the west end of the profile. It was absent in the two gullies east of Unit 1 and the portion of the profile between the gullies. It consisted of brown (10YR 5/3) silty clay loam and brown (10YR 5/3) sandy silt loam. The thickness of this zone is relatively consistent, but has a variation in thickness between five and 40 cm. This zone is the equivalent of Heinrich's Zone 2 in Section 1, being the second zone in his allolayer 4, and Zones 3 and 4 in Section 2 where it constitutes allolayer 2. There it is brown (10YR 5/3) sandy silt loam and very dark grayish brown (10YR 3/2) sandy silt loam. This soil zone is interpreted as the spoil that was dredged from Bayou Sale to create the slip on the east side of that Bayou, and which was spread relatively evenly over the eastern part of the site.

***Zone 1.*** This zone was a tightly compacted layer of *Rangia* and oyster shells that had been placed over most portions of the eastern part of the site. Similar to the upper zone on the west part of the site, it was heavily permeated with carbon black. It was generally between five and 20 cm thick. It was present as the surficial layer the whole length of the mapped profile. Where this shell deposit filled two erosional gullies east of Test Unit 1 it reached maximum thicknesses of about 40 cm. This zone is Heinrich's Zone 1 in his Section 1, consisting of mixed *Rangia* and oyster shells, and Zones 1 and 2 in his Section 2 where the upper zone consists of oyster shells and the lower zone is made up of *Rangia* and oyster shells. In the western part of the bank profile his Zones 1 and 2 constitute the entire allolayer 4, while in the

area of Test Unit 1, his Zone 1 is only the upper part of his allolayer 4.

From the above stratigraphy it is clear that the original eastern natural levee of Bayou Sale and its former surface is preserved beneath later deposits in this portion of the site. Within and on the upper surface of Zone 4, or the original topsoil of the natural levee, are cultural deposits and constructions that may date from the third quarter of the nineteenth century (and perhaps earlier) to around 1930 or the time of the construction of the Intracoastal Waterway. Zone 3, a layer of shell, is believed to have been deposited shortly after the construction of the waterway. Zone 2, or spoil dirt, is from the dredging of the slip into Bayou Sale, and would have been in place sometime before 1945. Zone 1, the surficial layer of shell paving, was put down sometime between 1945 and 1955, since it appears on the 1955 aerial but not the one from 1945.

### *Surface Collection*

The surface collection of the beach along this portion of the site recovered large quantities of artifacts. These are listed in Table 1 and in Appendix 2. It is clear that with the exception of an earlier sherd of pearlware, the artifacts can be assigned to the latter part of the nineteenth century or the early part of this one. Some of the materials collected are certainly derived from flotsam and other debris from more recent activities on the waterway. Based on the location of the artifacts that were exposed in the profile of the bank and those that were recovered from the two excavation units, most of the artifacts on the beach line derived from the tenant occupations had, most probably, eroded from Zone 4.

### *Excavation Unit 1*

This unit was selected for excavation because of the clear stratigraphy in this area of the bankline and the presence of what appeared to be an *in situ* brick floor from some type of structure. This was a one by two m unit located at South 71/East 92 (NW Corner) and situated with the long axis of the unit perpendicular to the cut north bank of the Intracoastal Waterway. Its location is shown in Figures 21 and 27. The plan and profiles of this unit are shown in Figure 28.

There were five distinct natural or cultural zones within the unit as determined from the profile that was exposed in the cut bank. Excavation levels in the test unit corresponded to those zones. The zones indicated after each excavation level are the same as those shown on Figure 27 (excepting Excavation Level 3), discussed previously in the section on bankline stratigraphy. The profiles in Figure 28 show these zones, and they can be seen clearly in Figure 31. The following sections detail the excavated levels and their artifact and/or structural content.

***Excavation Level 1 (Zone 1 on Figures 27 and 28).*** This was the topmost level and varied in thickness from four to six cm. It consisted primarily of tightly packed *Rangia* and oyster shells with a black (10YR 2/1) loam matrix, and was completely permeated with carbon black from the nearby plant. Inclusions included some very recent artifactual materials. The

## TABLE 1

## BANKLINE SURFACE COLLECTIONS

| ARTIFACT CATEGORY | EAST BANKLINE | WEST BANKLINE | TOTALS |
|---|---|---|---|
| **CERAMICS** | | | |
| Pearlware | 1 | | 1 |
| Whiteware (annular) | 2 | | 2 |
| Whiteware (transfer printed) | 4 | 3 | 7 |
| Whiteware (blue shell edge) | 5 | 1 | 6 |
| Whiteware (banded) | 1 | | 1 |
| Whiteware (plain) | 28 | 14 | 42 |
| Flow Blue | 1 | | 1 |
| Spongeware | 1 | | 1 |
| Porcelain | 1 | 3 | 4 |
| Stoneware | 7 | 5 | 12 |
| **Total Ceramics** | **51** | **26** | **77** |
| **GLASS CONTAINERS** | | | |
| Dark green bottle glass | 34 | 17 | 51 |
| Aquamarine glass | 101 | 84 | 185 |
| Amethyst glass | 14 | 19 | 33 |
| Cobalt blue glass | 7 | 5 | 12 |
| Brown glass | 47 | 41 | 88 |
| Light green glass | 3 | | 3 |
| Milk glass | 1 | 1 | 2 |
| Clear glass | 57 | 59 | 116 |
| **Total Glass** | **264** | **226** | **490** |
| **HARDWARE** | | | |
| Nails and fragments | 65 | 18 | 83 |
| Wire spike nail | 1 | | 1 |
| Railroad spike | 1 | 3 | 4 |
| Iron bolt | | 1 | 1 |
| Iron eye bolt | | 1 | 1 |
| Iron U-bolt | 1 | 1 | 2 |
| Nuts | | 1 | 1 |
| Washers | | 10 | 10 |
| Iron wire | | 6 | 6 |
| Iron brace | | 1 | 1 |
| Iron strap hinges | | 2 | 2 |
| Screen door hinge | | 1 | 1 |
| Steamer trunk handle | | 1 | 1 |
| Iron drawer pulls | | 2 | 2 |
| Iron door pintle | 1 | | 1 |
| Iron rings | 2 | 2 | 4 |
| Iron chain | | 1 | 1 |

**TABLE 1, Continued**

| | | | |
|---|---|---|---|
| Indeterminate iron | 65 | 53 | 118 |
| **Total Hardware** | **136** | **104** | **240** |
| **TOOLS** | | | |
| Wrench | 1 | | 1 |
| **Total Tools** | **1** | | **1** |
| **HARNESS PARTS** | | | |
| Copper harness boss | 1 | | 1 |
| **Total Harness Parts** | **1** | | **1** |
| **CLOTHING ITEMS** | | | |
| Buttons | 1 | | 1 |
| Brass shoe heel tap | 1 | | 1 |
| **Total Clothing Items** | **2** | | **2** |
| **SMOKING ITEMS** | | | |
| Stoneware pipe stem | 1 | | 1 |
| **Total Smoking Items** | **1** | | **1** |
| **BUILDING AND MANUFACTURING DEBRIS** | | | |
| Bricks and fragments | 31 | 22 | 53 |
| Slate | 13 | 42 | 55 |
| Window glass | 2 | 5 | 7 |
| Coal | 4 | | 4 |
| Slag | 1 | 9 | 10 |
| **Total Bldg and Manuf Debris** | **51** | **78** | **129** |
| **KITCHEN** | | | |
| Cast iron stove eye lids | | 2 | 2 |
| **Total Stove Parts** | | **2** | **2** |
| **SUBSISTENCE** | | | |
| Animal bones | 17 | | 17 |
| **Total Subsistence Remains** | **17** | | **17** |
| **OTHER** | | | |
| White ceramic insulator | | 1 | 1 |
| Wheel bearing | | 1 | 1 |
| **Total Other** | | **2** | **2** |
| **TOTALS** | **520** | **442** | **962** |

bulk of the glass was twist-off top beer bottle glass. Two twist-off bottle caps were also recovered, as well as a dozen pieces of blue plastic. One piece of aquamarine glass and one indeterminate piece of iron were present. The brick fragments and gravel were part of the

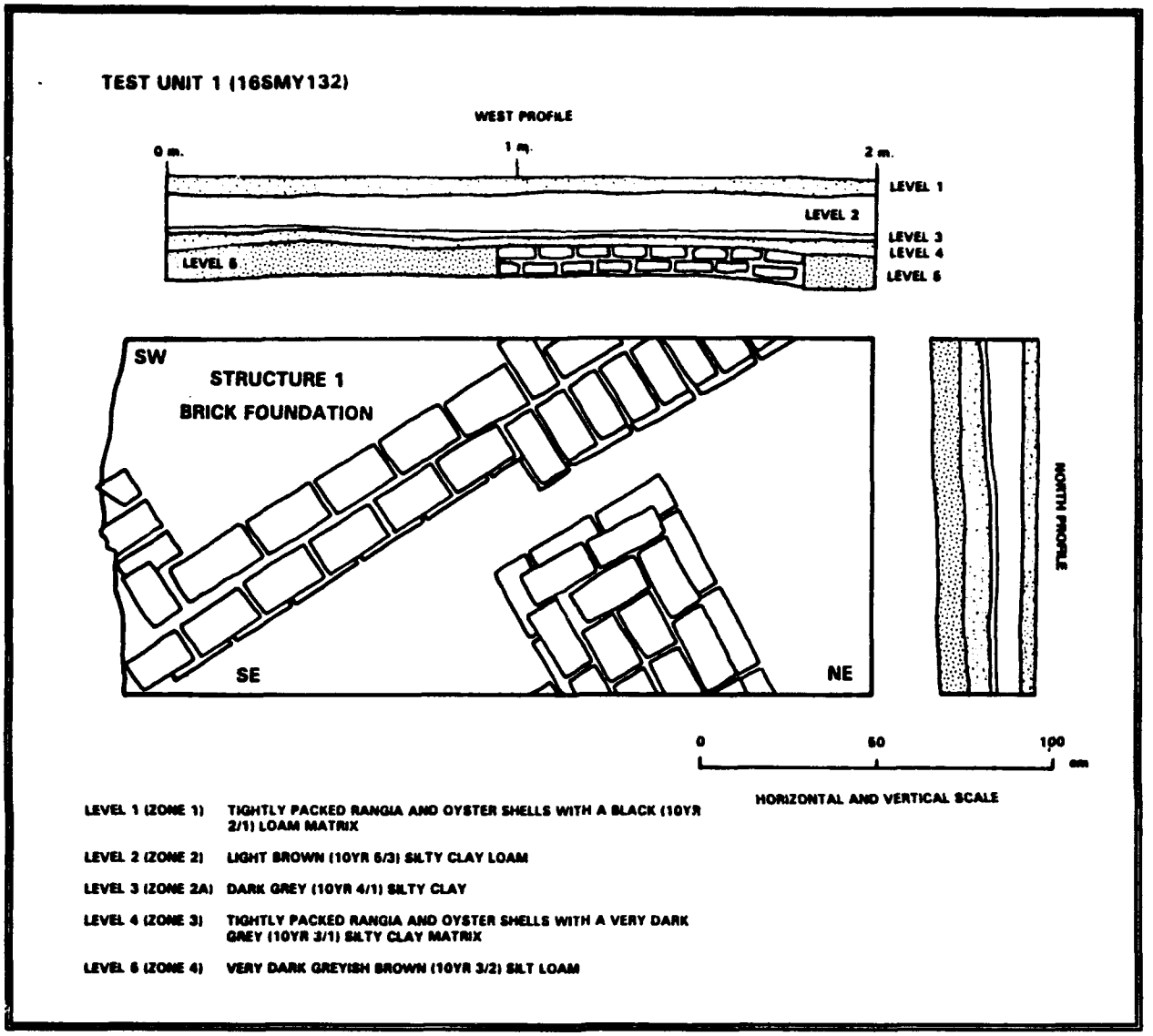


**Figure 28.** Plan of Unit 1 at the base of the excavations showing the brick foundations of Structure 1. The north and west profiles of the unit are shown.

surfacing materials. Based on the stratigraphy and the aerial photography this layer of shell was placed over this portion of the site as paving sometime between 1945 and 1955.

*Excavation Level 2 (Zone 2 on Figures 27 and 28).* This was a layer of brown (10YR 5/3) silty clay loam with a thickness of six to 12 cm. This zone was culturally sterile and consisted of spoil from dredging of the slip to the west, that was consequentially spread rather evenly over the area. No artifacts were recovered from this excavation level. The date of

**Figure 29**. Excavation Unit 1 at the base of Excavation Level 4. View is to the south. The upper course of bricks of the foundation of Structure 1 can be seen. The rubble fill and matrix between the brick foundations was excavated as Level 5.

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deposition of this zone was between 1930 and 1945, concurrent with the dredging of Bayou Sale.

***Excavation Level 3*** *(Zone 2A on Figure 28; not shown on Figure 27).* This level consisted of a thin layer (one to two cm) of dark grey (10YR 3/1) silty clay which separated Level 2 from the underlying shell of Level 4. It was either the first episode of spoil put over this area concurrent with the slip dredging, or an earlier cap spread over the underlying shell zone. Its horizontal extent was limited to Unit 1 and only a meter or two to the east and west of the unit.

**Figure 30.** Excavation Unit 1 after removal of Level 5 from between the brick foundations. View is to the south.

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The artifacts that were recovered from this zone include four whiteware sherds, two pieces of aquamarine glass, one piece of brown glass, three pieces of amethyst glass and a piece of dark green bottle glass. Two pieces of coal, one indeterminate nail fragment and a 12-gauge shotgun shell completed the artifact assemblage. None are particularly diagnostic, but are compatible with a date after 1930. Stratigraphically, their deposition at this location falls between 1930 and 1945.

***Excavation Level 4 (Zone 3 on Figures 27 and 28).*** Level 4 was a 2 to 4 cm thick layer consisting primarily of tightly packed *Rangia* shells with some oyster shells included within a very dark grey (10YR 3/1) silty clay matrix. Stratigraphically it was directly below Zone 2A

(Excavation Level 3). This level was removed as a unit and was found to be lying directly over the brick foundation and rubble fill within the foundation of Structure 1. The date of its placement is not precisely known, except that it was after Structure 1 had been razed or removed from its foundations, or sometime after 1930. The artifacts recovered from this level are from the lower portion of the level and are believed to have been derived from the occupation of the underlying structure and mixed with the shell during initial grading or leveling operations. Once Level 4 was removed, the top of the upper course of bricks of the structure foundation were exposed (Figure 29).

A total of 774 artifacts were recovered from this excavation level (Table 2). The majority can be attributed to building materials and domestic habitation. The building related materials included 605 brick fragments, 25 nails and fragments, and one piece of slate. Artifacts reflecting domestic activities consisted primarily ceramics and glass containers. The eight pieces of ceramics recovered included one piece of pearlware, four pieces of plain whiteware, and one sherd each of annular banded whiteware, spongeware, porcelain and stoneware. The glass containers included 76 pieces of clear glass, 17 pieces of aquamarine glass, 14 pieces of dark green bottle glass, four pieces of brown glass and one sherd each of amethyst glass, light green glass and clear pressed glass. Clothing related artifacts consisted of three four-hole buttons; one was iron and the other two were porcelain. Subsistence remains consisted of four animal bones representing pig and indeterminate large mammals. The seven pieces of slag that were recovered probably derived from household heating or cooking. Alternatively, they could have derived from the cane refinery or the nearby railroad. One rimfire cartridge, and six pieces of indeterminate iron completed the artifact assemblage from this level.

***Excavation Level 5 (Zone 4 on Figures 27 and 28)***: This level varied in thickness between eight and 10 cm. It extended from the top of the top course of bricks that were exposed at the base of Level 4 to the top of the original natural levee topsoil. The matrix of this level was a very dark grayish brown (10YR 3/2) silt loam containing large quantities of brick fragments and other historic artifacts. The recovery of artifactual materials terminated at the base of Excavation Level 4. In the area below the structure foundation, the remaining original topsoil of the natural levee was culturally sterile. Careful cleaning of this zone in the bankline profile beneath this unit failed to reveal any artifacts, and trowelling the upper surface of the remainder of Zone 4 failed to reveal any artifacts. It did not appear to have been previously plowed or otherwise disturbed, so it can be assumed that the brick foundation, which was placed directly on this surface, was the first cultural activity to take place here. After the excavation was terminated and the structure foundation photographed and mapped, the unit was backfilled to aid in the preservation of the remaining foundation, in the event that further excavations would be carried out on this structure during a data recovery operation.

During the excavation, Level 5 was subdivided by excavating the materials separately from the three areas that were partitioned by the brick foundations. The artifactual contents of those sections are combined for the entire level in Table 2. Appendix 3 details the artifacts from the three subdivisions of the level from which they were recovered.

## TABLE 2

## ARTIFACT SUMMARY FOR EXCAVATION UNITS 1 AND 2

### EXCAVATION LEVEL 1 (ZONE 1)

| ARTIFACT CATEGORY | UNIT 1 | UNIT 2 | TOTALS |
|---|---|---|---|
| **GLASS CONTAINERS** | | | |
| Aquamarine glass | 1 | | 1 |
| Brown glass | 37 | | 37 |
| Bottle caps (twist off) | 2 | | 2 |
| **Total Glass** | **40** | | **40** |
| **HARDWARE** | | | |
| Indeterminate iron | 3 | | 3 |
| **Total Hardware** | **3** | | **3** |
| **BUILDING AND MANUFACTURING DEBRIS** | | | |
| Brick fragments | 14 | | 14 |
| Gravel | 2 | | 2 |
| **Total Bldg and Manuf Debris** | **16** | | **16** |
| **OTHER** | | | |
| Plastic | 12 | | 12 |
| **Total Other** | **12** | | **12** |
| **TOTALS LEVEL 1** | **71** | **0** | **71** |

### EXCAVATION LEVEL 2 (ZONE 2)

| ARTIFACT CATEGORY | UNIT 1 | UNIT 2 | TOTALS |
|---|---|---|---|
| **CERAMICS** | | | |
| Whiteware (plain) | | 1 | 1 |
| **Total Ceramics** | **0** | **1** | **1** |
| **GLASS CONTAINERS** | | | |
| Dark green bottle glass | | 1 | 1 |
| Amethyst glass | | 2 | 2 |
| Clear glass | | 1 | 1 |
| **Total Glass** | **0** | **4** | **4** |
| **HARDWARE** | | | |
| Nails and fragments | | 7 | 7 |
| Indeterminate iron | | 2 | 2 |
| **Total Hardware** | **0** | **9** | **9** |

## TABLE 2, Continued

| | | | |
|---|---|---|---|
| **BUILDING AND MANUFACTURING DEBRIS** | | | |
| Brick fragments | | 7 | 7 |
| **Total Bldg and Manuf Debris** | **0** | **7** | **7** |
| **SUBSISTENCE** | | | |
| Animal bone | | 1 | 1 |
| **Total Subsistence Remains** | | **1** | **1** |
| **TOTALS LEVEL 2** | **0** | **22** | **22** |

## EXCAVATION LEVEL 3 (ZONE 2A IN UNIT 1 ONLY)[1]

| ARTIFACT CATEGORY | Unit 1 | TOTALS |
|---|---|---|
| **CERAMICS** | | |
| Whiteware (plain) | 4 | 4 |
| **Total Ceramics** | **4** | **4** |
| **GLASS CONTAINERS** | | |
| Dark green bottle glass | 1 | 1 |
| Aquamarine glass | 2 | 2 |
| Amethyst glass | 3 | 3 |
| Brown glass | 1 | 1 |
| **Total Glass** | **7** | **7** |
| **HARDWARE** | | |
| Nails and fragments | 1 | 1 |
| **Total Nails** | **1** | **1** |
| **BUILDING AND MANUFACTURING DEBRIS** | | |
| Coal | 2 | 2 |
| **Total Bldg and Manuf Debris** | **2** | **2** |
| **AMMUNITION** | | |
| Shotgun shell base | 1 | 1 |
| **Total Weaponry** | **1** | **1** |
| **TOTALS LEVEL 3** | **15** | **15** |

## TABLE 2, Continued

### EXCAVATION LEVEL 4 (ZONE 3 IN UNIT 1) AND EXCAVATION LEVEL 3 (ZONE 3 IN UNIT 2)[2]

| ARTIFACT CATEGORY | UNIT 1 | UNIT 2 | TOTALS |
|---|---|---|---|
| **CERAMICS** | | | |
| Pearlware | 1 | | 1 |
| Whiteware (annular banded) | | 3 | 3 |
| Whiteware (hand Painted) | | 2 | 2 |
| Whiteware (plain) | 4 | 37 | 41 |
| Spongeware | 1 | | 1 |
| Porcelain | 1 | 1 | 2 |
| Flow Blue | | 2 | 2 |
| Stoneware | 1 | 1 | 2 |
| **Total Ceramics** | **8** | **46** | **54** |
| **GLASS CONTAINERS** | | | |
| Dark green bottle glass | 14 | 22 | 36 |
| Aquamarine glass | 17 | 43 | 60 |
| Amethyst glass | 1 | 17 | 18 |
| Brown glass | 4 | 39 | 43 |
| Light green glass | 1 | 1 | 2 |
| Milk glass | | 3 | 3 |
| Clear pressed glass | 1 | | 1 |
| Clear glass | 76 | 73 | 149 |
| **Total Glass** | **114** | **198** | **312** |
| **HARDWARE** | | | |
| Nails and fragments | 25 | 51 | 76 |
| Staple | | 1 | 1 |
| Iron wire | | 9 | 9 |
| Indeterminate iron | 6 | 34 | 40 |
| **Total Hardware** | **31** | **95** | **126** |
| **CLOTHING ITEMS** | | | |
| Buttons | 3 | | 3 |
| **Total Clothing Items** | **3** | **0** | **3** |
| **BUILDING AND MANUFACTURING DEBRIS** | | | |
| Brick fragments | 605 | 185 | 790 |
| Slate | 1 | 4 | 5 |
| Coal | | 11 | 11 |
| Slag | 7 | 15 | 22 |
| Gravel | | 7 | 7 |
| *Rangia* shells | | 135 | 135 |
| **Total Bldg and Manuf Debris** | **613** | **357** | **970** |

TABLE 2, Continued

| | | | |
|---|---|---|---|
| **KITCHEN ITEMS** | | | |
| Cast iron stove parts | | 1 | 1 |
| **Total Kitchen Items** | **0** | **1** | **1** |
| **AMMUNITION** | | | |
| Rim fire cartridge | 1 | | 1 |
| Shotgun shell base | | 1 | 1 |
| **Total Weaponry Items** | **1** | **1** | **2** |
| **SUBSISTENCE ITEMS** | | | |
| Animal bones | 4 | 15 | 19 |
| **Total Subsistence Items** | **4** | **15** | **19** |
| **TOTALS LEVELS 4 AND 3** | **774** | **713** | **1487** |

## EXCAVATION LEVEL 5 (ZONE 4 IN UNIT 1) AND EXCAVATION LEVEL 4 (ZONE 4 IN UNIT 2)[3]

| ARTIFACT CATEGORY | UNIT 1 | UNIT 2 | TOTALS |
|---|---|---|---|
| **CERAMICS** | | | |
| Pearlware | 1 | | 1 |
| Pearlware (blue shell edge) | 1 | | 1 |
| Whiteware (transfer printed) | | 3 | 3 |
| Whiteware (blue shell edge) | | 1 | 1 |
| Whiteware (annular banded) | | 3 | 3 |
| Whiteware (plain) | 2 | 105 | 107 |
| Porcelain | 1 | 6 | 7 |
| Stoneware | | 5 | 5 |
| **Total Ceramics** | **5** | **123** | **128** |
| **GLASS CONTAINERS** | | | |
| Dark green bottle glass | 9 | 39 | 48 |
| Aquamarine glass | 21 | 91 | 112 |
| Amethyst glass | | 32 | 32 |
| Brown glass | 3 | 190 | 193 |
| Light green glass | | 11 | 11 |
| Milk glass | | 1 | 1 |
| Clear glass | 26 | 160 | 186 |
| **Total Glass** | **59** | **524** | **583** |
| **HARDWARE** | | | |
| Nails and fragments | 36 | 139 | 175 |
| Spike nail | 1 | | 1 |
| Railroad spike | 1 | 3 | 4 |
| Nuts | | 1 | 1 |
| Iron wire | | 1 | 1 |

## TABLE 2, Continued

| | | | |
|---|---|---|---|
| Iron handle | | 1 | 1 |
| Ceramic door knob fragment | | 1 | 1 |
| Cast iron pipe | | 1 | 1 |
| Indeterminate iron | 12 | 107 | 119 |
| **Total Hardware** | **50** | **254** | **304** |
| **HARNESS ITEMS** | | | |
| Brass harness rivet | 1 | | 1 |
| **Total Harness Items** | **1** | **0** | **1** |
| **CLOTHING ITEMS** | | | |
| Buttons | 5 | | 5 |
| Glass bead | 1 | | 1 |
| Bone needle case | 1 | | 1 |
| Brass straight pin | | 1 | 1 |
| Brass shoe eyelets | | 8 | 8 |
| **Total Clothing Items** | **7** | **9** | **16** |
| **SMOKING ITEMS** | | | |
| Stoneware pipe bowl | 1 | 1 | 2 |
| **Total Smoking Items** | **1** | **1** | **2** |
| **BUILDING AND MANUFACTURING DEBRIS** | | | |
| Brick fragments | | 465 | 465 |
| Mortar fragments | | 11 | 11 |
| Slate | | 20 | 20 |
| Window glass | | 1 | 1 |
| Coal | | 42 | 42 |
| Slag | 1 | 64 | 65 |
| Limestone | | 1 | 1 |
| Gravel | | 16 | 16 |
| *Rangia* shells | | 104 | 104 |
| **Total Bldg and Manuf Debris** | **1** | **724** | **725** |
| **KITCHEN ITEMS** | | | |
| Cast iron stove parts | | 3 | 3 |
| **Total Kitchen Items** | **0** | **3** | **3** |
| **AMMUNITION** | | | |
| Rim fire cartridge | | 1 | 1 |
| Center fire cartridge | | 1 | 1 |
| Shotgun shell bases | 1 | 2 | 3 |
| **Total Weaponry Items** | **1** | **4** | **5** |

**TABLE 2, Continued**

| | | | |
|---|---|---|---|
| **SUBSISTENCE ITEMS** | | | |
| Animal bones | 30 | 153 | 183 |
| Oyster shells | 2 | 28 | 30 |
| Total Subsistence Items | 32 | 181 | 213 |
| **TOTALS LEVELS 5 AND 4** | 157 | 1823 | 1980 |
| **GRAND TOTALS UNITS 1 AND 2** | 1017 | 2558 | 3575 |

1. Excavation Level 3 of Unit 1 is tabulated separately since the soil zone (Zone 2A) which was excavated as Level 3 was not present in Excavation Unit 2.

2. Excavation Level 4 of Unit 1 and Excavation Level 3 of Unit 2 are tabulated together since these two excavation levels were in the same stratigraphic zone (Zone 3).

3. Excavation Level 5 of Unit 1 and Excavation Level 4 of Unit 2 are tabulated together since these two excavation levels were in the same stratigraphic zone (Zone 4).

A total of 167 artifacts were recovered from the three sections of Excavation Level 5. Similar to the level above, they were dominated by building materials and artifacts derived from domestic habitation. The ceramic assemblage included two sherds of pearlware, two whiteware sherds and one sherd of porcelain. The 59 pieces of glass recovered included nine pieces of dark green bottle glass, 21 pieces of aquamarine glass, three pieces of brown glass and 26 of clear bottle glass. Clothing related items included five buttons, one wire-wound glass bead and a bone needle case. The one piece of slag was probably from heating or cooking with coal. Subsistence items included 40 animal bones and perhaps the two oyster shells that were recovered. Animals represented include cow and indeterminate bird, turtle and large and small mammals. One stoneware pipe bowl was present, as well as one shotgun shell base. One brass harness rivet was also recovered. Structural materials included 36 nails and fragments and, one spike nail in addition to the bricks and mortar of the foundation described below as Structure 1. Other artifacts recovered included one railroad spike and 12 pieces of indeterminate iron.

***Structure 1.*** The feature that was defined and labeled Structure 1 consists of two sections of an *in situ* soft mud brick foundation at the base of Excavation Unit 1 (Figures 28, 29, 30 and 31). The longer section of foundation which ran diagonally across the unit was generally oriented in a north-south direction. The southern part of this feature was one stretcher wide and was two courses high. Toward the northern part of the feature, it widened to two stretchers wide, but remained only two courses high. Separated from, and perpendicular to this foundation, was another brick foundation segment. It was also two courses in height. The lower course was two and one-half stretchers in width. The upper course was stepped back and was approximately two stretchers wide. The bricks in both foundation wall sections were similar

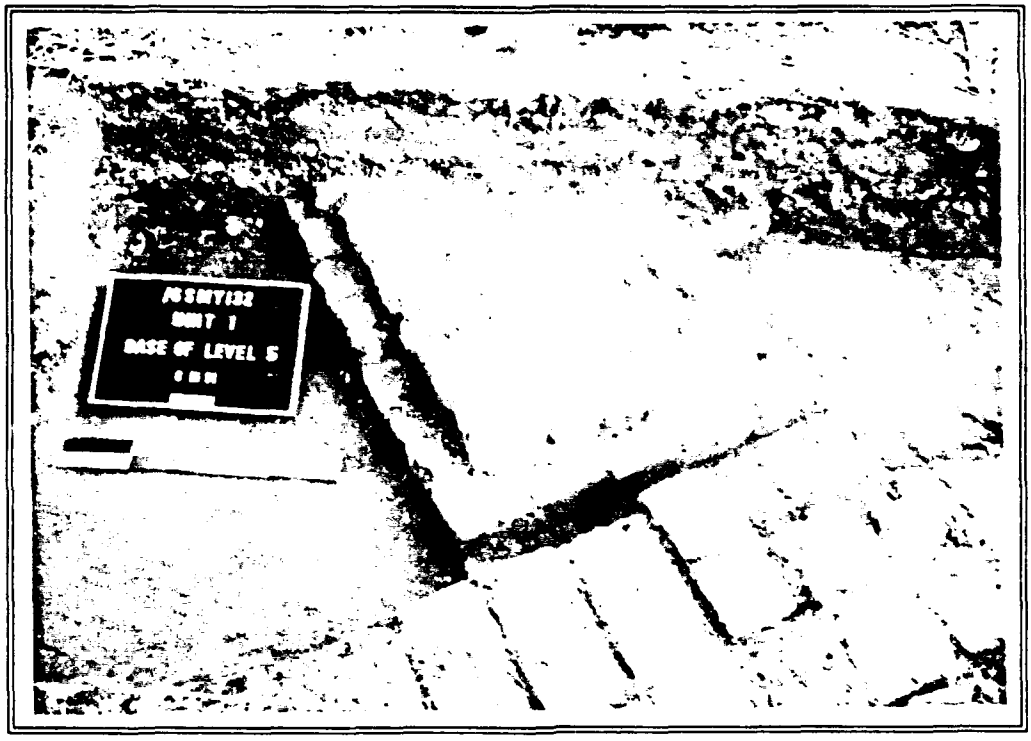

**Figure 31**. Excavation Unit 1. Detail of the brick foundation of Structure 1 and the east profile of the unit. View is to the east.

and were approximately 10 by 21 cm. They were similar to the bricks that were used to construct the foundations for holding the sugar mill machinery and the associated stack. Both courses were mortared together and some mortar remained on the top of the upper course, indicating that originally there was an additional course or courses above the ones that remained in this unit.

Given the archeological remains that were present at the base of this unit and the earlier discussion of the plan of the North Bend Plantation, this foundation is clearly the remains of one of the tenant structures of the North Bend Plantation that were located on the east side of Bayou Sale. It is most probably the second one from the north end of the eastern row of tenant structures (see Figures 21 and 24). If the plot of the tenant structures on Figure 21 and the placement of the test units on Figure 24 are accurate, then these foundations are near the eastern end of that building. The foundation continues and is apparently intact north of this unit since brick foundations were encountered at the same elevation in Posthole 11 just north of Unit 1 (see Appendix 2). However, an unknown amount of the southern and western portion of this structure has been previously destroyed by bank erosion.

*Excavation Unit 2*

Unit 2 was placed so that the long axis of the unit was parallel to the bank of the waterway to also take advantage of the exposed stratigraphy. The northwest corner of this unit was situated at South 65/East 83. The location for Unit 2 was selected because of the large numbers of historic artifacts that were present in the bank profile at this location and the similarity of the stratigraphy to that of Unit 1. With the exception of the soil zone (Zone 2A) excavated as Level 3 in Excavation Unit 1, all of the other natural stratigraphic zones that were present in Excavation Unit 1 were continuous in the bankline profile through Unit 2 (see Figures 27, 28, 32 and 33).

It was therefore possible to reasonably assume that the materials recovered from the several levels in both units resulted from similar and contemporary episodes of occupation and deposition. It was believed that the artifacts that were recovered from this unit, specifically those in Zones 3 and 4 (Excavation Levels 3 and 4) would reflect materials that were discarded or otherwise deposited outside of the confines of one of the tenant structures. Based on the plot of the tenant structures shown on Figures 21 and 24, the materials recovered from this unit are derived from midden outside of and just north of the second structure in the eastern row (Structure 1 in Unit 1). Details of the profiles of Excavation Unit 2 are shown in Figure 32 and can be seen clearly in Figure 33.

***Excavation Level 1 (Zone 1 in Figures 27 and 32).*** This level was comparable to Excavation Level 1 of Unit 1 which had been determined to be of recent origin. It consisted of a tightly packed *Rangia* and oyster shell paving with a black (10YR 2/1) loam matrix, heavily stained with carbon black. It was present in all parts of the unit, and was consistently about 12 cm in thickness. It was of the same material and composition as that of Excavation Level 1 in Excavation Unit 1, and since it was heavily permeated with carbon black, this level was removed as a unit and not further processed. The date of deposition of this zone is similar to that estimated for the same zone in Excavation Unit 1, or sometime between 1945 and 1955.

***Excavation Level 2 (Zone 2 in Figures 27 and 32).*** This level consisted of a brown (10YR 5/3) silty clay loam varying in thickness between eight and 15 cm. Like Excavation Level 1, it was continuous over all parts of the excavation unit. Twenty-two artifacts were recovered from this level but came from the very base of the level and are probably derived from the upper part of the shell layer (Zone 3, Excavation Level 3) that was directly below this excavation level. As with the same soil zone in Excavation Unit 1 (Zone 2, Excavation Level 2), it is interpreted as dredge spoil, and its deposition is similarly estimated to be after 1930, but before 1945.

There were 22 artifacts recovered from this level. They included one whiteware sherd, one piece of dark green bottle glass, two pieces of amethyst glass and one of clear glass. Structural materials and hardware were represented by seven nails and fragments, two pieces of indeterminate iron, and seven brick fragments. Additionally one small piece of calcified, but indeterminate, large mammal bone was recovered.

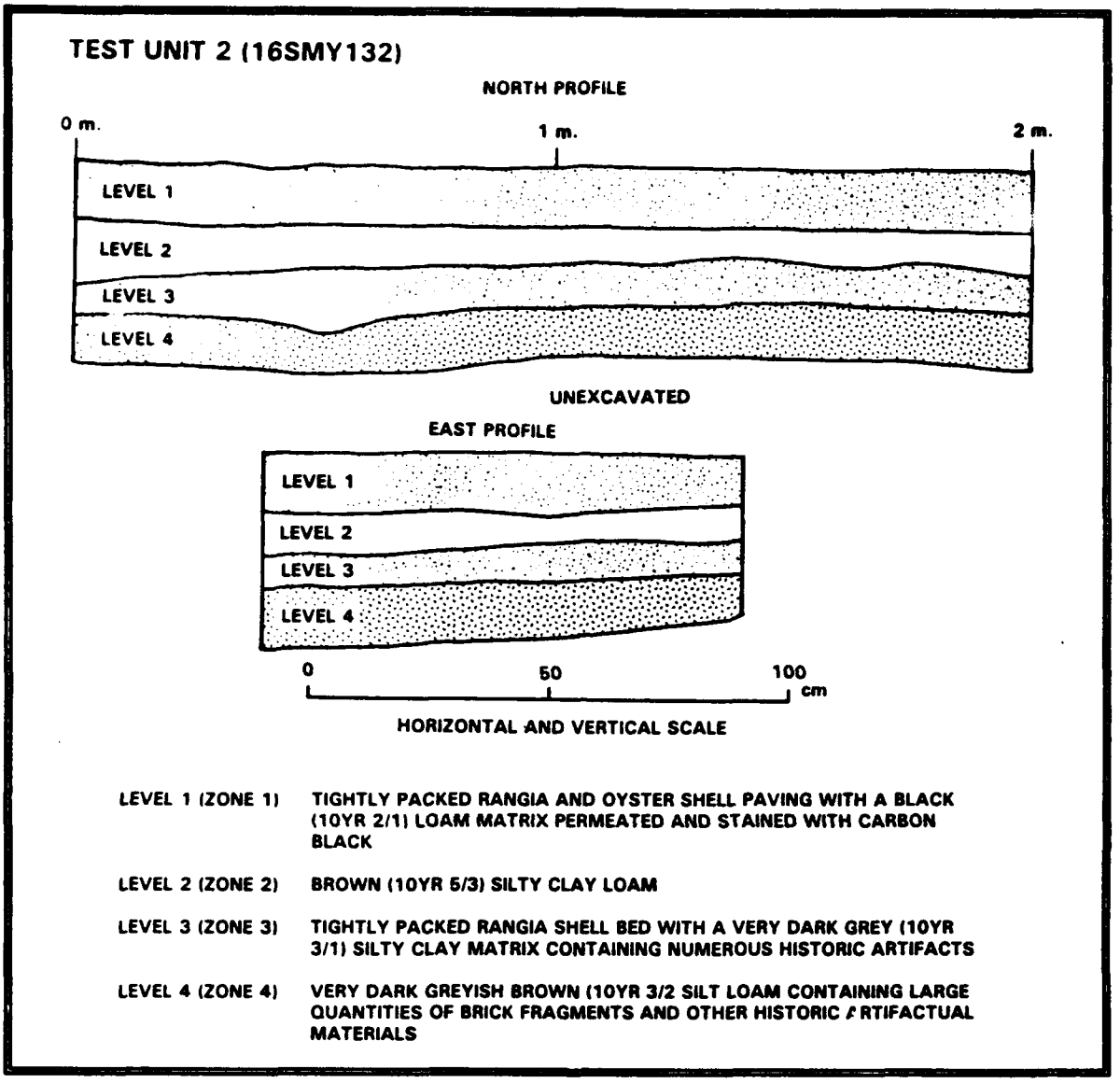


**Figure 32.** North and east profiles of Excavation Unit 2.

*Excavation Level 3 (Zone 3 in Figure 26).* This level consists of a tightly packed *Rangia* shell lens with a very dark grey (10YR 3/1) silty clay matrix. Stratigraphically, this level is the same as Zone 3 (Excavation Level 4) in Unit 1. Large numbers of historic artifacts were recovered from this level, and similarly to the ones recovered from this zone in Excavation Unit 1, they were associated with, or a result of, the occupation of a tenant structure. No structural foundations were encountered in this excavation unit, so it could be possible that this layer of shell, earth and artifacts was paving that was around, and contemporary with part of the occupation of the tenant houses.

However, since this zone is part of a continuous layer of shell that extends to Excavation Unit 1, and since it clearly overlies and postdates Structure 1 in that unit, a similar date of deposition (between 1930 and 1945) is assumed. Since the artifacts that were recovered from this level are contemporary with the ones from Excavation Level 4 (Zone 4) they are believed to have been derived from the lower level. As with the artifacts derived from the excavation of the same zone in Excavation Unit 1, their presence within this shell layer is probably the result of mixture from the lower zone during grading and clearing operations after the razing or removal of the tenant structures around the time of waterway construction.

The artifact assemblage that was recovered from this level consisted of 713 items (Table 2). They were dominated by artifacts derived from domestic activities and building related items. Ceramics included 42 whiteware sherds, one porcelain sherd, two flow blue sherds and one piece of stoneware. Glass containers were represented by 22 sherds of dark green bottle glass, 43 of aquamarine glass, 17 pieces of amethyst glass, 39 pieces brown glass, one of light green glass, three pieces of milk glass and 73 of clear glass. Kitchen and or heating items consisted of one cast iron stove part, 11 pieces of coal and 15 pieces of slag. One shotgun shell base was present, and subsistence remains consisted of 15 animal bones representing cow, pig, black bear and unidentified bird and small mammal remains. Hardware included 51 nails and fragments, one wire staple, nine pieces of iron wire, and 34 pieces of indeterminate iron. Structural materials consisted of 185 brick fragments, and four pieces of slate. The gravel and *Rangia* shells were probably paving materials.

***Excavation Level 4 (Zone 4 in Figures 27 and 32).*** This level consisted of a very dark grayish brown (10YR 3/2) silt loam containing large quantities of brick fragments and other historic artifactual materials. It is the original surficial topsoil of the natural levee of Bayou Sale with an admixture of historic artifacts and other materials resulting from tenant occupation in this area. The same zone was continuous throughout most of the length of the bankline profile that was mapped. This zone in Excavation Unit 2 (excavated as Level 4) is the same as Zone 4 in the vicinity of Excavation Unit 1 (see Figures 27 and 28). In Excavation Unit 2 this zone extended over the entire unit and had a thickness varying between eight and 12 cm. It rested directly on the lower, culturally sterile material of the natural levee.

The artifact assemblage that was recovered from this level is similar in composition to that of Level 3 (Zone 3) directly above, and consisted of 1,823 items (Table 2). They were once again dominated by artifacts derived from domestic activities and building related items. Ceramics included 112 whiteware sherds, six porcelain sherds, two flow blue sherds and five pieces of stoneware. Glass containers were represented by 39 sherds of dark green bottle glass, 91 of aquamarine glass, 32 pieces of amethyst glass, 190 pieces brown glass, 1 [illegible] green glass, one piece of milk glass and 160 of clear glass. Kitchen and or heating items consisted of three cast iron stove parts, 42 pieces of coal and 64 pieces of slag. Ammunition included two shotgun shell bases, one rimfire cartridge, and one centerfire cartridge. Clothing and sewing related artifacts included eight shoe eyelets and one brass straight pin. One fragment of a stoneware pipe bowl was present. Subsistence remains consisted of 153 animal bones and fragments representing cow, pig, white-tailed deer, drum fish, and unidentified bird, turtle and

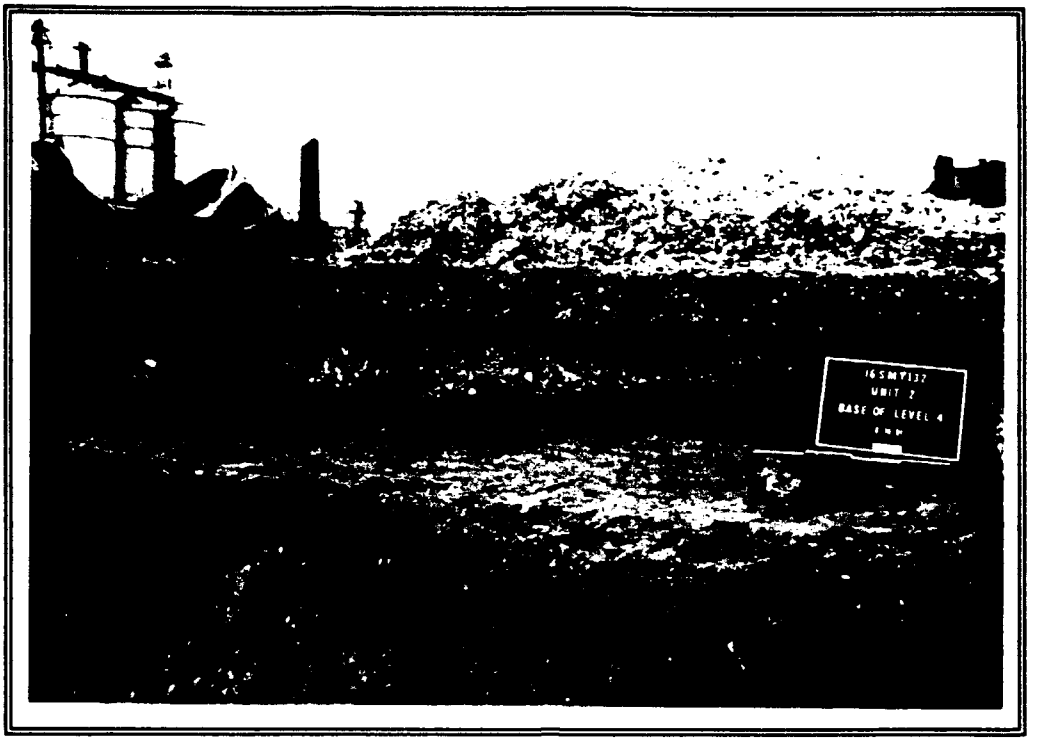

**Figure 33.** View to the northwest of the west and north profiles of Excavation Unit 2. The four natural strata are clearly seen.

small mammal remains. The oysters from the 28 shells recovered may have been eaten.

Hardware included 139 nails and fragments, one piece of iron wire, one nut, one piece of cast iron pipe, one iron handle and 107 pieces of indeterminate iron. Structural materials included 465 brick fragments, 11 pieces of mortar, 20 pieces of slate, one piece of window glass and one fragment of a ceramic door knob. The gravel, limestone and *Rangia* shells were probably paving materials.

### *Posthole Tests*

In addition to the work that is described in the above sections, a series of 32 postholes were excavated on a regular 10 meter grid and along the proposed ditch alignment to the north of the bankline. The purpose of these tests was to determine the extent of the stratigraphic levels and artifactual materials that were evident in the bank profile and the test units. The location of those tests are shown in Figure 21 and details of those tests are presented in Appendix 2. In general they show a continuation of a similar stratigraphy and artifact assemblage extending at least 50 meters north of the bank and to East 110 on the grid. The buried natural levee was reached in all of the tests except 11-E where additional brick foundations of Structure

1 were encountered. Zone 3, the natural levee topsoil, was reached in all cases, and many of the tests were extended into the underlying levee deposits.

The upper zone (Zone 1) in all of the posthole tests consisted of either a black silt loam, a sandy loam or a paving of *Rangia* shells. The thickness of this zone varied from two cm to 30 cm. In all areas it was thoroughly permeated with carbon black. Zone 2, which consisted of spoil dirt from dredging Bayou Sale, was present in all of the tests except 10-E. The thickness of this zone was usually on the order of 15 to 20 cm, but had a range of eight to 45 cm. The layer of shell that was recorded as Zone 3 in the bankline profile and in Test Unit 1 was not continuous across the site, but was confined to the area around Structure 1. It was encountered only in Posthole Tests 3-E, 5-E, 7-E, 9-E and 11-E. It was probably also present in the area of Test 6-E, but was not encountered because the test was terminated prior to that depth. The thickness of this zone in the tests ranged between five and 11 cm.

The primary artifact bearing zone that was encountered in the posthole tests was the topsoil of the natural levee. Twenty-five of the 32 tests produced historic artifacts from this zone and/or the overlying shell zone that was present in five of the tests in the vicinity of Structure 1. Domestic refuse and structural materials dominated the collection. The former included ceramics, glass and some indeterminate iron objects. Construction materials consisted primarily of brick fragments, and nails. Eighteen of the tests produced brick fragments, and six produced nails or fragments. Of the tests producing artifacts, six had only brick fragments. Overall the posthole tests show a pattern of artifacts and building debris scattered around and between the four northernmost tenant houses that were in this area (see Figure 21). The presence of a layer of spoil over most of the area, and an additional layer of shell paving over some of the same area has probably served to protect the archeological deposits that were within and around the tenant houses.

Notably, no other structural foundations were encountered, except in Posthole 11. It was adjacent to Excavation Unit 1 and probably revealed another part of the foundation of Structure 1. Posthole Test 13 was probably located near the south wall of the northeastern-most tenant house, but did not encounter any foundations. Oddly, Test 16, which was just east of the probable location of another structure failed to produce any artifactual materials (Figure 21).

### *WEST PORTION OF THE SITE*

The western part of the project area at the North Bend Site was bounded on the east by Bayou Sale, on the south by the Intracoastal Waterway, and on the west and north by a previously constructed levee. The site was in mowed grass at the time of the work. As with the eastern portion of the site, bank erosion along the west bank of Bayou Sale and the north bankline of the waterway was severe as can be seen in Figure 4. A scatter of metal wagon wheels and other industrial parts were exposed in the mud of the bankline of Bayou Sale (Figure 22). The work that was carried out on this portion of the site, in addition to the surface mapping, consisted of mapping the profile of the bankline, collecting the numerous artifacts that had eroded from the bank and were on the beach, excavating a one by two meter test unit, and

excavating a series of postmolds on a regular grid over portions of the site back from the bankline.

***Bankline Mapping and Stratigraphy***

Fifty meters of the bankline in this portion of the site were mapped, beginning at the intersection of Bayou Sale and the north bank of the Intracoastal Waterway and extending westward. The location and extent of this profile (A-B) is shown in Figure 21. Figure 34 shows the profile that was made, the locations of the three sections measured and described by Heinrich, and the stratigraphic zones that were recognized.

Five stratigraphic zones are evident and the descriptions are presented here in order from the lowest to the uppermost level. They are correlated with the soil and geomorphological descriptions given by Heinrich for the measured sections. His detailed descriptions of the three measured sections of this profile are presented in Chapter 2 and Appendix 1. The locations of these measured sections are shown on Figure 34. The West Levee Measured Section 1 was located approximately 25 m west of Excavation Unit 3 and Section 2 was located where Excavation Unit 3 was later excavated. The third measured section was at the point formed by the intersection of the north bank of the waterway and the west bankline of Bayou Sale. Heinrich defined three allolayers in this part of the site.

***Zone 5 (Figure 34).*** This is the lowest zone visible above the waterline of the Intracoastal Canal and Bayou Sale and is present the entire length of the profile. It consists of the sterile silts and clays of the natural levee along the west side of Bayou Sale. These were variously brown (10YR 5/3) silty clay, brown (10YR 5/3) sandy silt loam and very dark gray (10YR 3/1) and grayish brown (10YR 5/2) silt loams. Heinrich recognized this stratigraphic zone as Zone 4 in Measured Section 1, Zone 5 in Section 2, and Zones 5 and 6 in the easternmost section. In all three sections it constituted the upper part of allolayer 1.

At some time this portion of the site was graded, removing the original topsoil of the natural levee and an unspecified amount of the underlying natural levee. The only remaining topsoil or, A Horizon, was below Zone 4 on the sloping surface of the Bayou Sale bank at the eastern end of the profile. A shell road running north-south was put down on this leveled surface sometime prior to 1924 (see Figure 11). It is possible that the grading took place when the road was paved. The cross-section of this road shows clearly in the profile between Meter 9.5 and Meter 16.5.

***Zone 4 (Figure 34).*** This stratigraphic zone was present in the bankline profile from Meter 42 eastward to the end of the mapped section at the juncture with Bayou Sale. It consisted primarily of coal cinders, slag, and small brick fragments. The thickness of this deposit was 35 cm at the east end of the profile and reached a maximum of 60 cm at Meter 44 before tapering out at Meter 42. This is the same zone as Heinrich's Zone 4, the upper zone of allolayer 2, in his easternmost measured section (Chapter 2 and Appendix 1). It had been placed on the low slope of the west bank of Bayou Sale and rested on the original surface of the

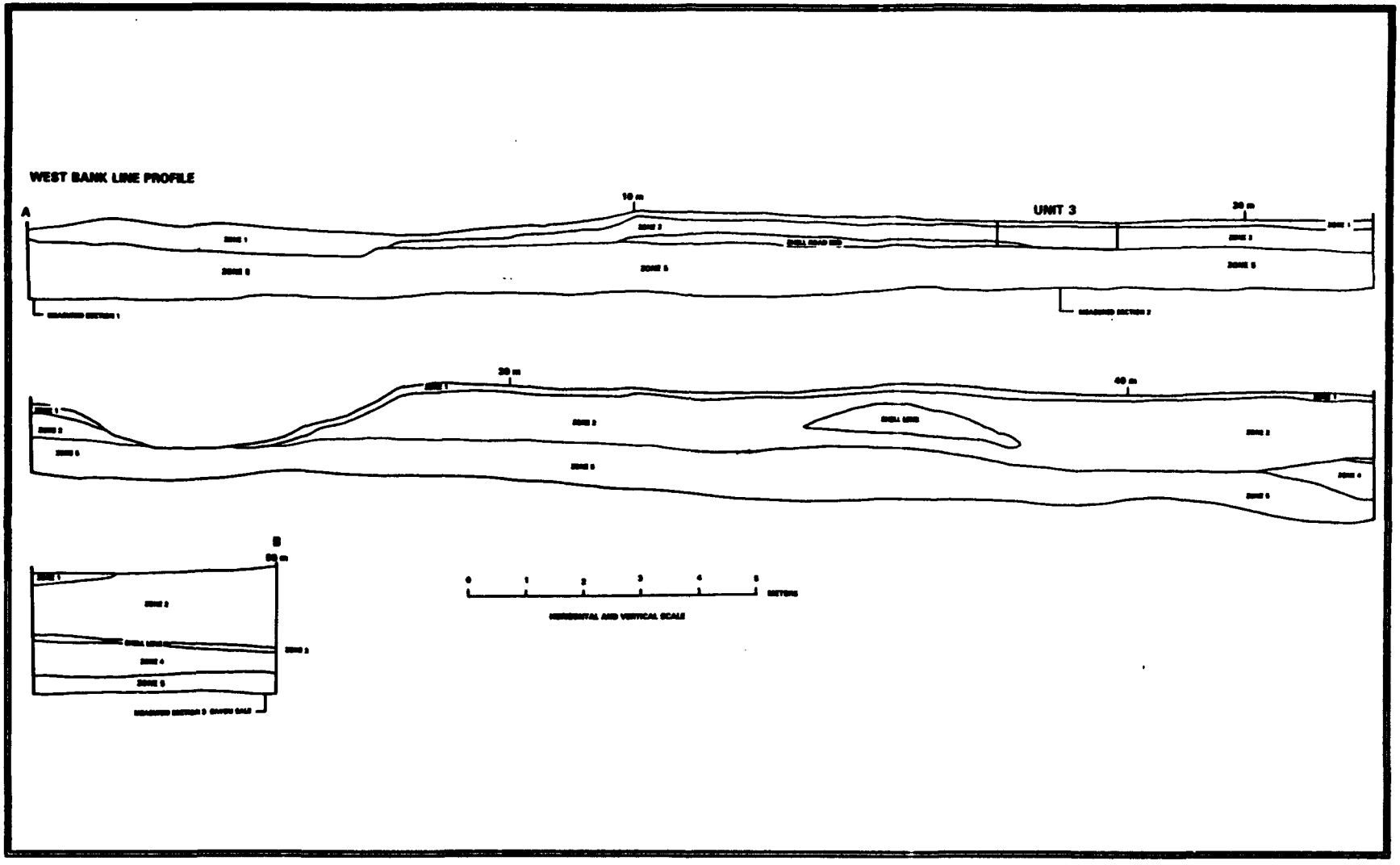


**Figure 34.** Profile of the bankline of the western portion of the North Bend Site.

bankline, the same surface on which the historic materials shown in Figure 22 are situated. The time of deposition of this zone is uncertain, but it is assumed that it was contemporary with the operation of the sugar refining operation at the North Bend Plantation.

***Zone 3 (Figure 34).*** This zone consists of a lens of *Rangia* shell separating Zone 2 from Zone 4 in the part of the bankline profile from Meter 43.5 to the eastern end of the profile. Its thickness ranged from about five to ten cm. In the profile it lay directly over, and covered all but the western 1.5 m of Zone 4 which consisted primarily of coal cinders and slag. Zone 4 corresponds to Zone 3 in Heinrich's easternmost measured section and is the lower zone in his allolayer 3 (Chapter 2 and Appendix 1). The shells appear to have been deliberately spread over the underlying zone in an effort to cover the slag and other debris. The time of deposition is uncertain, but it was probably contemporary with the operation of the sugar refining plant.

***Zone 2 (Figures 34 and 35).*** This is a layer of redeposited earth containing historic artifacts that had been spread over a large area of this portion of the site, including the shell road that paralleled the west bank of Bayou Sale. That feature is shown in the profile between Meter 10 and Excavation Unit 3. In the bankline profile, Zone 2 extended from about Meter 6 of the mapped portion to the extreme eastern end of the profile at the intersection of the waterway and Bayou Sale. It was discontinuous in a portion of the profile on either side of Meter 24.5 where there was an erosional gully cutting into the bankline. The thickness of this zone varied from 10 cm at about Meter 8 of the profile to a maximum thickness of 115 cm at the eastern end of the profile at Meter 50. It consisted of black (10YR 2/1) and dark brown (10YR 3/3) silt loam and sandy silt loam, brown (10YR 5/3) silty clay, grayish brown (10YR 5/2) loam, and light yellowish brown (10YR 6/4) sand and loamy sand. Within this layer of fill was an exposed lens of *Rangia* shells as shown on the profile between Meter 35 and Meter 38. The lens had a maximum thickness of 45 cm near its center and tapered off toward the east and west.

Zone 2 as shown in Figure 34 corresponds with Heinrich's Zones 2 and 3 in Measured Section 1, being the lower two zones of allolayer 3. In Measured Section 2 it corresponds with Heinrich's Zones 2, 3 and 4, which are the lower three zones within his allolayer 3 in that section. In the easternmost measured section Zone 2 corresponds with Heinrich's allolayer 3 in which he recognized three zones, the third, or lowest of which was a *Rangia* shell lens (Chapter 2 and Appendix 1).

The exact date of deposition of this zone is uncertain, although all indications are that it was done relatively recently. In general, it extends from about five meters west of the shell road shown in Figures 23 and 25 to the west edge of Bayou Sale. In the 1930 photograph (Figure 23) the west bankline of Bayou Sale appears to be cleared and relatively free of trees or other large vegetation. By the time the 1945 photograph (Figure 25) was taken the slip in the east side of Bayou Sale had been dredged, and the area in question appears to be heavily overgrown. In the 1955 photograph (Figure 26), taken after the carbon black plant had been constructed, most of the same area, excepting the southern part, appears to be relatively free of any large vegetation. Some of this zone may have consisted of spoil from the dredging of the slip. The other explanation is that it is earth that was placed over this area during construction

of the carbon black plant, perhaps consisting of materials graded from the location of the plant and the original location of the main plantation house complex. The fact that the shell road is still apparent in the 1955 photograph indicates that it was not covered with spoil until later, probably in conjunction with the previous levee work that was done immediately west of the project area.

Zone 2 contains most of the historic artifactual materials that are present on this portion of the site, except those that are lying on and within the original surface of the west bank slope of Bayou Sale. Test Unit 3 (discussed below) verified the presence of historic material in Zone 2. It is reasonably assumed that the artifacts (other than recent ones from canal activities) that were recovered from the beach along this bankline had eroded from Zone 2.

***Zone 1 (Figure 34).*** This is a layer of black (10YR 2/1) silt loam that caps the entire area of the western part of the site within the project area. This zone was missing only in the eastern three to four meters of the bankline profile, probably having been recently removed by grading or other activities. It was very heavily permeated with carbon black from the nearby plant. This soil zone was generally about eight to 15 cm in thickness, but reached a maximum thickness of 45 cm in the western five meters of the mapped profile. This zone was the same as Heinrich's Zone 1 in Measured Sections 1 and 2 (Chapter 2 and Appendix 1). In the two sections where he recognized this zone, it constituted the upper zone within his allolayer 3. It was not present in his easternmost section at the eastern end of the mapped profile. This zone has either formed or the carbon black has completely permeated to this depth since the construction of the plant in the early 1950s.

***Bankline Surface Collection***

During the course of the work at the site several collections were made along the shoreline; nearly continual wave action exposed new materials on a day-to-day basis. The materials that were collected are listed in Table 1. Similar to most of the other artifact collections from the site this assemblage is composed of a number of items derived from domestic activities and structural remains. There is also a large quantity of metal hardware, much of which may have been deposited as flotsam or resulted from recent waterway activities. There were 26 pieces of ceramics recovered. They were dominated by whitewares which include plain, transfer printed and shell-edge sherds, but also included examples of porcelain and stoneware. Two hundred and twenty-six pieces of glass containers made up the largest category of materials from the surface collection. Included were various ointment jars, pharmaceutical bottles, canning jars and beverage bottles. Glass types included dark green bottle glass, aquamarine glass, amethyst glass, cobalt blue, brown, light green milk and clear glass.

The 104 items of hardware from this collection are listed in the table. Many such as the nails and spikes, brace, hinges, trunk handle, and drawer pull may have been derived from plantation buildings and activities. The same can be said for the remainder of the hardware in the collection, although it is also quite possible that many are from more recent waterway deposition, and association with the plantation occupation is less certain. Building materials

included 2 . bricks and fragments, 42 pieces of slate and five pieces of window glass. Kitchen and cooking or heating items include two cast iron stove eye lids, and nine pieces of slag.

All of the artifacts can be assigned to the latter part of the nineteenth century, or the early part of this century and later. It was clear from the stratigraphy that any artifacts that had eroded from the bank eroded from Zone 2. The stratigraphy in this area and the information from Excavation Unit 3 indicate that the materials making up Zone 2, the matrix from which these artifacts derived, was redeposited. It is presumed that most, if not all of these materials, while they can be associated with the occupation of the North Bend Plantation, were probably removed from the area where the carbon plant is today, during its construction. As indicated in an earlier section, the plant now stands in the approximate location where the main plantation house and outbuildings once existed.

*Excavation Unit 3*

Unit 3 was located just to the east of the buried shell road bed that was exposed in the north bank of the Intracoastal Waterway on the western portion of the site. Its location is shown on Figures 21 and 34. The northwest corner of the unit was at South 18/West 37. That location was chosen to take advantage of the natural stratigraphy exposed in the bank, the ability to sample the artifactual remains that were in the zone between the topsoil and the natural levee materials below, and to test portions of the edge of the shell road to determine its age. The unit was excavated in two levels following the apparent natural stratigraphy. The unit was terminated at the top of the sterile natural levee soil. The stratigraphy of the bank where the unit was located can be seen in Figure 34, and the north profile of the unit after excavation is shown in Figure 35. The stratigraphic zones also show clearly in Figure 36.

*Level 1 (Zone 1 in Figures 34 and 35).* This level varied in thickness between 10 and 17 cm and consisted of a black (10YR 2/1) silt loam that was heavily permeated and stained by carbon black from the nearby plant. Because of its recent nature, and because of the presence of so much carbon black, this level was removed with shovel and trowel and not further processed. The artifacts that were recovered were those that were located during the excavation procedure. They are listed in Table 3, and included three porcelain cup fragments, eight pieces of brown beer bottle glass, one piece of green glass from a fruit jar and 10 pieces of clear glass from a fruit jar and a whiskey bottle. Hardware included seven wire nails, one cut nail, one iron trunk or box handle and three pieces of indeterminate iron. Also recovered were a 12-gauge shotgun shell base, and one brick fragment. Based on the stratigraphy all were of clearly recent origin.

*Level 2 (Zone 2 on Figures 34 and 35).* This level was excavated with shovel and trowels and was waterscreened through 1/4th and 1/8th mesh. This level varied between 28 and 35 cm in thickness and rested directly on the top of the remaining natural levee materials of Bayou Sale. It consisted of a mixture of dark brown (10YR 3/3) silt loam, brown (10YR 5/3) silty clay and grayish brown (10YR 5/2) mottled loam. Historic artifactual materials were dispersed throughout the level in moderate quantities.

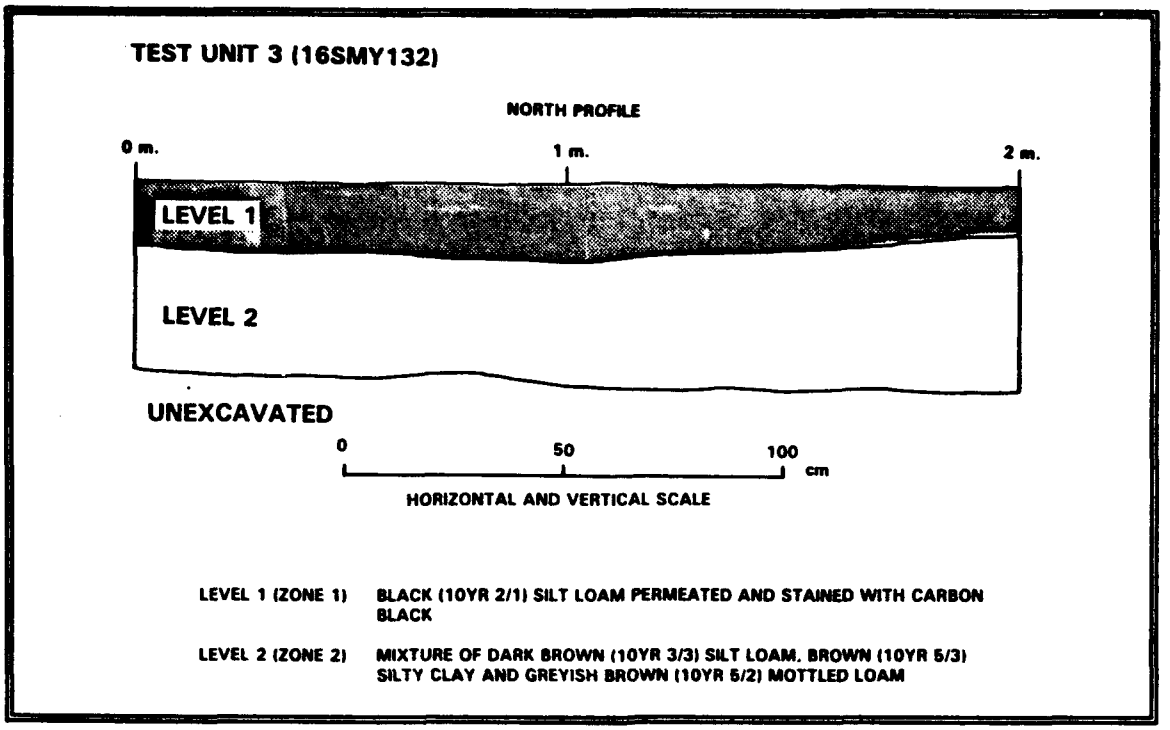


**Figure 35.** North profile of Excavation Unit 3.

The artifact assemblage that was recovered from this level consisted of 600 items not counting the gravel, *Rangia* shells and oyster shells that were from the roadbed (Table 2). Ceramics included only one whiteware sherd. Glass containers were represented by three sherds of aquamarine glass, three pieces of amethyst glass, 10 pieces of brown glass, and 52 pieces of clear glass. Hardware included 22 nails and fragments, two pieces of iron wire, one iron bolt, one brass rivet and 358 pieces of indeterminate iron. Structural materials included 96 brick fragments, one piece of mortar and six pieces of slate. There were also six pieces of coal and four pieces of slag. The gravel, crushed limestone oyster and *Rangia* shells were paving materials.

Some of the artifacts that were recovered from this level date from the late nineteenth and early part of the twentieth centuries. Represented are materials from domestic and manufacturing activities, and structural remains. From the excavation of this unit and other information that is discussed in other sections, none of the artifactual materials were *in situ*, all having been redeposited there from another location. The exception to this is the concentration of shell, pebbles, and crushed limestone which was from the edge of the roadway and which were clearly *in situ*. The excavation of this level and the test unit was discontinued at the base of this level at the top of the sterile natural levee materials.

**Figure 36**. Excavation Unit 3 at the base of the excavations. The heavily carbon black stained Level 1 is clear.

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*Posthole Tests*

A series of 15 posthole tests were excavated on a regular 10 m grid north from the bankline to examine the stratigraphy of the site in that area. The location of these tests are shown in Figure 21. The stratigraphic details of those tests and the artifacts recovered are presented in Appendix 2. An examination of the stratigraphy recorded in the posthole tests shows that the stratigraphy in other parts of this area was similar to that which has been described for the bank profile and Excavation Unit 3.

The surficial Zone 1, consisting of silt loam and carbon black, was present in all of the tests, as expected. The thickness of this zone varied between 11 and 38 cm. In the bankline and in Test Unit 3, Zone 2 consisted of spoil dirt that was put down over what remained of the natural levee surface. This zone was present in all of the tests excepting 12-W. The maximum thickness of this zone recorded in the posthole tests was 70 cm, and the least amount of spoil dirt encountered was 15 cm over the shell road bed at Posthole Test 5-W. However, the maximum thickness was often greater, since the base of this zone was not reached in five of the tests (1-W, 2-W, 3-W, 6-W, 9-W, and 11-W).

## TABLE 3

## ARTIFACT SUMMARY FOR EXCAVATION UNIT 3

### EXCAVATION LEVEL 1 (ZONE 1)

| ARTIFACT CATEGORY | UNIT 3 | TOTALS |
|---|---|---|
| **CERAMICS** | | |
| Porcelain | 3 | 3 |
| **Total Ceramics** | **3** | **3** |
| **GLASS CONTAINERS** | | |
| Brown glass | 8 | 8 |
| Light green glass | 1 | 1 |
| Clear glass | 10 | 10 |
| **Total Glass** | **19** | **19** |
| **HARDWARE** | | |
| Nails and fragments | 8 | 8 |
| Iron trunk or box handle | 1 | 1 |
| Indeterminate iron | 3 | 3 |
| **Total Hardware** | **12** | **12** |
| **BUILDING AND MANUFACTURING DEBRIS** | | |
| Bricks and fragments | 1 | 1 |
| **Total Bldg and Manuf Debris** | **1** | **1** |
| **AMMUNITION** | | |
| Shotgun shell | 1 | 1 |
| **Total Ammunition** | **1** | **1** |
| **TOTALS LEVEL 1** | **36** | **36** |

### EXCAVATION LEVEL 2

| ARTIFACT CATEGORY | UNIT 3 | TOTALS |
|---|---|---|
| **CERAMICS** | | |
| Whiteware (plain) | 1 | 1 |
| **Total Ceramics** | **1** | **1** |
| **GLASS CONTAINERS** | | |
| Aquamarine glass | 3 | 3 |
| Amethyst glass | 3 | 3 |
| Clear glass | 52 | 52 |
| **Total Glass** | **58** | **58** |

**TABLE 3, Continued**

| | | |
|---|---|---|
| **HARDWARE** | | |
| Nails and fragments | 22 | 22 |
| Iron bolt | 1 | 1 |
| Iron wire | 2 | 2 |
| Brass rivet | 1 | 1 |
| Pipe | 1 | 1 |
| Indeterminate iron | 358 | 358 |
| **Total Hardware** | **385** | **385** |
| **BUILDING AND MANUFACTURING DEBRIS** | | |
| Bricks and fragments | 96 | 96 |
| Mortar | 1 | 1 |
| Slate | 6 | 6 |
| Coal | 6 | 6 |
| Slag | 4 | 4 |
| Crushed limestone | 43 | 43 |
| Gravel (3.6 kg) | | |
| *Rangia* shells (24.1 kg) | | |
| Oyster shells (1.8 kg) | | |
| **Total Building Debris** | **156** | **156** |
| **TOTALS LEVEL 2** | **600** | **600** |
| **TOTALS LEVELS 1 AND 2** | **636** | **636** |

The remainder of the posthole tests, with the exception of 5-W which was terminated at the top of the shell road bed, reached either the original topsoil of the natural levee (A Horizon) or other natural levee deposits. The A Horizon was present in the two tests (10-W and 15-W) adjacent to the west bank of Bayou Sale and in a majority of the tests in the northernmost two rows (7-W, 8-W, 12-W, 13-W, and 14-W). Of the tests that reached the natural levee deposits only 4-W lacked the A-Horizon. Form the results of these tests and the information available from Test Unit 3 and the bankline profile, it appears that the removal of the topsoil from the natural levee was done from the bankline of the waterway northward from 10 to 20 meters.

Artifact densities in this area of the site are low. Only six of the posthole tests produced any artifactual material. Brick fragments were recovered from the A Horizon of the natural levee in Tests 4-W, 12-W and 13-W. A single blue annular whiteware sherd was recovered from the same zone in Test 10-W. A Dr. Tichenor's Antiseptic bottle came from Test 5-W immediately above the shell of the old roadbed. Brick fragments were recovered from the layer of spoil dirt (Zone 2) in Test 9-W. While the evidence is minimal, it suggests that where the original topsoil of the natural levee is still present there are a few inclusive historic artifacts. Brick fragments in Zone 2 (spoil) in Posthole Test 4 and Excavation Level 2 of Test Unit 3

further indicate that historic materials were mixed with spoil dirt and deposited over a large portion of this area.

Although artifactual remains are present in the original topsoil of the natural levee in this area where it still remains, it appears to be a very light scatter. Since the photographic documentation that has been previously discussed shows that there were no plantation structures located in this part of the project area, it is assumed that these materials. as well as the ones at the water level in Bayou Sale, were redeposited from other areas of the plantation complex. Artifactual materials in the layer of spoil dirt are definitely redeposited and out of context.

## DATING THE OCCUPATIONS

The structural information and the artifactual remains that were recovered from the North Bend Site are clearly from the occupation and remains of the North Bend Plantation complex. This is documented through the historical record (Chapter 4), the aerial photographic coverage from 1930 through the present, engineering drawings from 1930, and the archeological context that is now known, and as presented in this chapter. The information that is available suggests that occupation of the area may have begun early in the nineteenth century and continued until sometime in the 1950s.

The historical documentation shows that Dominique Prévost had claim to Sections 1 and 2 (T15S, R10E) shortly after 1803. The nearby town of Franklin was settled about 1800. In 1811, Henry Johnson and Nathan Kemper purchased the land that was owned by Prévost on Bayou Sale. They subsequently subdivided the property in 1831. Nathan Kemper's great-grandson, James Kemper, wrote a description of the sugar mill and refining process on Bayou Sale as it was about 1881. His account implies that by that time the plantation was a large and substantial concern. The town of Centerville located near the juncture of Bayou Sale and Bayou Teche was a well-established community by 1838. Land ownership of the North Bend Plantation was transferred to Savante M. Swenson sometime probably in the 1890s, and then again to the J. M. Burguieres Company in 1910.

While the historical record is sketchy with regard to the beginning of occupation at the North Bend Site, it is possible to suggest a beginning date during the early part of the 1830s and probably by the late 1830s. This is based primarily on the subdivision of the property in 1831 and the continued ownership of the property by the Kemper family until late in the nineteenth century. The presence of nearby Centerville in the late 1830s makes occupation along Bayou Sale during that decade a reasonable supposition.

The artifactual evidence may also suggest the possibility of occupation at the North Bend Plantation as early as the 1830s. The bulk of the artifacts can be clearly assigned to the last half of the nineteenth century and the first part of this century, however. Table 4 presents the date ranges or beginning dates manufacture of selected artifact categories that were recovered by the excavations and other fieldwork, and attributed to the occupation of the North Bend Plantation. The accepted end date for the manufacture of pearlware is 1830. Use of this type of ceramic

## TABLE 4

## DATE RANGES OF SELECTED ARTIFACT CATEGORIES FROM THE NORTH BEND SITE

| | | |
|---|---|---|
| **CERAMICS** | | |
| Pearlware | 1780-1830 | South 1977 |
| Pearlware (shell-edge) | 1780-1830 | South 1977 |
| Whiteware | 1820-1900+ | South 1977 |
| Whiteware (annular) | 1820-1890 | Ramsay 1947; South 1977 |
| Whiteware (transfer printed) | 1820+ | Goodwin 1991 |
| Flow blue | 1840+ | Goodwin 1991 |
| Spongeware | 1850-1920+ | Goodwin 1991 |
| **GLASS** | | |
| Amethyst glass | 1875-1920 | Jones and Sullivan 1985 |
| **CLOTHING ITEMS** | | |
| Porcelain Buttons | 1840+ | Hinks 1988; Goodwin 1991 |
| **SMOKING ITEMS** | | |
| Clay pipe | 1820-1900 | Noel Hume 1972:Figure 97-30 |
| **HARDWARE** | | |
| Square cut nails | 1815-1890 | Nelson 1968 |
| Wire Nails | 1890+ | Nelson 1968 |

at the plantation suggests occupation by the 1830s or perhaps slightly later. Several categories of artifacts had long ranges of production, but if the beginning of use of those types of artifacts at the North Bend Plantation is assumed to be within a decade of their earliest production, then the 1830s is an acceptable date for early occupations. Whitewares were being produced by the 1820s, flow blue appeared in the 1840s and sponge wares in the 1850s. Porcelain buttons were made after 1840. The clay pipe fragments that were recovered were of a type that would have been in use after 1820, and the presence of square cut nails would have been expected after 1815.

The documentation and much of the artifactual material clearly indicate an occupation and use of the North Bend Plantation throughout the latter half of the nineteenth century and well into the twentieth century. The ending date of use of many of the facilities on the planation complex are much easier to determine, particularly from the photographs. The main plantation house and its surrounding outbuildings stood and were presumably occupied through at least

1945 and perhaps until the early 1950s when the Cabot carbon plant was constructed. They were certainly demolished before or during that construction, and the construction probably removed any vestiges of their former presence. The foundations for some of the refining machinery and a portion of the stack still remain north of the project area. Many of the structures associated with the mill, as well as the tenant structures that had been moved to the east of the factory were still present in 1955, although they now no longer remain.

In particular regard to the project area, are the partial or complete foundations of the four tenant structures that may be within the project area. The time of their abandonment at that location is quite clear. They were present in 1930, but were removed from the project area to the east of the mill in the 1930s, just prior to or during the construction of the Intracoastal Waterway. The remaining foundations were subsequently sealed under a layer of dredge spoil prior to 1945.

## SUMMARY

The test excavations and other work at the North Bend Site show that the structural and artifactual remains can be associated with the occupation and use of the North Bend Plantation and sugar cane refining operation. The presence of a few ceramics and minimal historical documentation suggest that occupation may have begin during the second quarter of the nineteenth century. The bulk of the recovered materials can be assigned to occupations from the last half of the nineteenth century and later.

The western portion of the site within the project area, although producing artifactual materials contemporary with the plantation, appears, from several sources, to have been redeposited and completely out of context. On the eastern part of the site, excavations have demonstrated the presence of part of one intact foundation from what was one of the tenant houses, and other *in situ* deposits associated with that structure and others in that part of the project area. The documentation suggests that part of another, and possibly two other complete tenant house foundations may be preserved in the eastern part of the project area.

# CHAPTER 7

# SUMMARY AND RECOMMENDATIONS

A cultural resources survey of the Todd Levee Area was carried out and archeological testing was done to assess the National Register eligibility of the North Bend Site (16SMY132) in St. Mary Parish, Louisiana. In addition to the fieldwork that has been described in the preceding chapters, archival, historical, archeological and geomorphological background research was also done and has been presented. The background research indicated the presence of, and additional potential for archeological remains in the Bayou Sale area, although within the area of the Todd Levee Survey the expectation for prehistoric and historic sites was minimal. Historical documentation and other sources, particularly aerial photographic coverage, provide a good description and view of the North Bend Plantation. It is possible to compare what was probably at the plantation complex (in 1930) with the archeological potential that remains at the present time, and to interpret the archeological record as it was revealed in the work that was done at the North Bend Site. It was also possible to document the changes that have been effected to the plantation since the 1930s.

The pedestrian survey and shovel testing program of the Todd Levee project area failed to locate any prehistoric archeological materials. This includes those that would have been in or on the surficial deposits of the area, as well as any that had been brought up previously from deeper deposits by canal and ditch digging activities in the area. Since most of the project area was located in backswamp, areas that may have been reclaimed from backswamp, or the very back edge of the exposed natural levee deposits, no prehistoric materials were expected in the upper levels, nor were they found. The geomorphological study indicates that there is the possibility of buried surfaces which may have prehistoric materials. None were noted as having been brought up by previous excavations, but the coverage of the spoil banks was obscured to a large extent by dense vegetation and ground cover.

The two light scatters of bricks fragments and shells noted during the survey are attributed to the use of these materials in field road construction and subsequent scatter by farm machinery. The one standing structure in the survey area, from all indications, is a recent introduction to the area, having been moved there from perhaps elsewhere on the Todd Plantation. One concentration of building materials located within the survey area is believed to be debris placed in that location from a building that was torn down elsewhere on the plantation.

Based on the results of the archeological survey and the background information that is available, it is not expected that the proposed levee construction in the Todd Levee Survey Area will have any detrimental effect on any historic or prehistoric cultural resources. Since the

presence of deeply buried prehistoric material was not adequately assessed within the scope of the work, it is recommended that, perhaps during, but certainly after the construction, that the newly exposed surfaces and levee fill be carefully examined for prehistoric materials.

The North Bend Site, and most particularly that portion within the project area, was carefully examined. Those sections of the site that were in the right-of-way of the proposed levee work were variously examined by means of bankline profiling, test excavation units and posthole tests. The posthole tests were excavated on a systematic 10 meter grid over portions of the site north from the bankline of the Intracoastal Waterway, but within the areas of proposed construction. Additional posthole tests were excavated along the alignment of the ditch that is to be excavated on the land side of the proposed levee in the part of the project area east of Bayou Sale. The north bankline profiles of the Intracoastal Waterway east and west from Bayou Sale were examined carefully, cleaned as necessary and mapped. Two test excavation units were done adjacent to the waterway bankline on the portion of the site within the project area east of Bayou Sale, and one was excavated adjacent to the waterway bankline west of Bayou Sale.

The results of that work showed that nearly all of the deposits on the west side of Bayou Sale containing historic materials relating to the time of the North Bend Plantation were either redeposited or were very badly disturbed. The documentation, mainly in the form of aerial photographs, indicates that through at least 1945 the part of the site west of Bayou Sale and within the limits of the proposed construction, was an agricultural field west of the shell road that paralleled Bayou Sale. East of the road the bankline of the bayou was covered with vegetation. Based on the 1930 aerial photograph, no plantation structures were located in this part of the site. The present-day absence of the A Horizon of the natural levee, or a buried plowzone in most of this area, as evidenced by the bankline profiles and the excavations, indicates the nature and degree of the disturbance and redeposition that has taken place in this part of the site.

It appears that this plow zone and upper part of the natural levee (even if it had contained cultural materials) was apparently removed at some time after 1945. A subsequent fill containing late nineteenth and twentieth century artifacts was then deposited over the cleared area. Although it cannot be demonstrated on the basis of the available evidence, it can be suggested that this grading and redeposition were done as part of the construction activities during the construction of the carbon black plant immediately north of the area in question. Additionally, it is assumed that the late nineteenth and early twentieth century artifactual materials that were redeposited in this area were removed from the site of the original plantation house and outbuildings, which were located approximately where the carbon black plant stands today.

The portion of the site within the project area on the east side of Bayou Sale, portions of which have been heavily disturbed, presents a somewhat different picture. The bankline, in particular, has eroded much more severely than that on the western part of the site. However, part of one brick foundation of a plantation tenant structure was documented by the testing, and

the photographic and map documentation indicate the potential for at least two others. All of the tenant structures had been removed either prior to or during the construction of the Intracoastal Waterway. The excavation of the waterway and subsequent erosion of its north bank has removed all structural evidence for the tenant structures, except the one documented by the excavations and the two north of that one based on the documentation. The test excavation units and the posthole tests indicate that intact midden, artifactual materials and other debris from the occupation of the northern part of the tenant area are *in situ* in portions of the project area east of Bayou Sale as detailed in the preceding chapter. The cultural zone and foundation remains are buried beneath layers successive layers of spoil and shell paving which have probably helped to preserve them.

North of and outside the project area, above ground structural remains of the sugar c. refinery are still present. The photographic documentation indicates that there would be a potential for subsurface remains of other structures associated with the refining plant. The foundations for the cane refining machinery and the remainder of the chimney, now maintained by the Cabot Carbon Corporation, are relatively well-preserved. The brick chimney stack was in a relatively good state of preservation at the time of the field work in 1991, but during Hurricane Andrew, in August of 1992, the upper part of the remaining stack was blown down. This structure and any foundation remains from the associated structures that appear on the 1930 and 1945 aerials are well north of the project area and planned construction. Besides those of the refinery structure, there are no other standing structures remaining from the North Bend Plantation.

Louisiana's *Comprehensive Archaeological Plan* recognizes the need for the study of nineteenth and early twentieth century sugar plantations in the Bayou Teche area (Smith et al. 1983:66). Taking that into consideration, as well as the qualities of significance that have been defined by the National Register of Historic Places (36 CFR 60.4) it would be difficult to recommend that the North Bend Plantation complex as a whole would be eligible for the National Register. Clearly the plantation complex as a whole lacks the necessary criteria of integrity. The partially remaining chimney and foundations of the mill are potential sources of good information on that type of facility of the cane industry during Post-bellum times and the early twentieth century.

Within the construction area there is the potential for the excavation of two complete and one partial foundation of tenant structures and the recovery of concomitant artifactual materials. But given the nearly total absence now of certain parts the plantation complex, in particular the main residential structure and its associated outbuildings, there could not be any integrated study of the complex as a whole. While National Register eligibility cannot be suggested for the whole plantation complex, the partially intact foundations of one of the tenant house structures, and potentially two others, may be eligible because of the potential integrity of those foundations and the associated midden and artifactual materials. The research potential for the area in question would be limited, therefore, to a study of domestic tenant life. Despite this limited potential, research in this area would provide comparative materials on plantation tenant life in an area somewhat removed from the main Bayou Teche settlement.

The recommendation to be made, however, is that since there is at least one partially intact foundation of a tenant structure and the possibility for two others, as well as an intact zone of related artifactual material, that in the event that data recovery work is not warranted, that efforts be made to preserve what remains in place. It has been and is being recommended that the bankline between Stations 1037+00 and 1040+00 be rip-rapped or otherwise stabilized to protect these archeological remains and to preserve them intact as best as possible. It is further recommended that levee construction materials be placed directly on the present surface without any pre-construction grading which would disturb the underlying deposits. Careful monitoring of the excavation of the ditch on the land side of the levee should take place during its excavation, with provisions that any features or structural remains encountered be archeologically excavated and recorded.

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## APPENDIX 1

## DESCRIPTION OF MEASURED SECTIONS

Paul V. Heinrich

## EAST LEVEE SECTION 1

The East Levee Section 1 is located on the north bank of the Intracoastal Waterway where it cuts into the eastern natural levee of Bayou Sale immediately adjacent to Excavation Unit 1 exposing intact brick foundations (see Figure 27 for location).

**Allolayer 4**

| Zone | Depth Below Surface (cm) | Description of Zone |
|---|---|---|
| 1 | 0 - 7 | Grain-supported, unrolled, well-sorted, tightly parallel packed, *Rangia* and oyster shell bed with black (10YR 2/1) loam matrix, stained by carbon black, many fine roots, smooth abrupt boundary. |
| 2 | 7 - 14 | Brown (10YR 5/3) silty clay loam with black cutans, moist, weak fine crumb structure, nonsticky and slightly plastic, "cutans" of carbon black, wavy abrupt boundary. |
| **Allolayer 2** | | |
| 3 | 14 - 18 | Dark gray (10YR 4/1) silty clay, moist, weak fine crumb structure, slightly sticky and very plastic, thin discontinuous lens, wavy abrupt boundary. |
| 4. | 18 - 25 | Grain-supported, unrolled, well-sorted, tightly parallel packed, *Rangia* shell bed with very dark gray (10YR 3/1) silty clay matrix, smooth to wavy abrupt boundary, basal zone of allolayer 4. |
| **Allolayer 2** | | |
| 5. | 25 - 37 | Very dark grayish brown (10YR 3/2) silt loam, sand fraction consists of dispersed grains of brick and charcoal, massive, moist, nonsticky and slightly plastic, wavy abrupt boundary, buries intact brick foundation, allolayer 2. |

**Allolayer 1**

| | | |
|---|---|---|
| 6. | 37 - 50 | Very dark gray (10YR 3/1) silty clay loam, strong medium angular blocky structure, sticky and very plastic, gradual wavy boundary, A Horizon, uppermost zone of allolayer 1. |
| 7. | 50 - 85 | Dark grayish brown (10YR 4/2) silty clay with many yellowish brown (10YR 5/6) mottles, weak coarse angular blocky structure, sticky and very plastic, gradual and wavy boundary, many 6 to 7 cm diameter burrows filled with sediment from Zone 6, Bt Horizon. |
| 8. | 85 - 145 | Light brownish gray (2.5Y 6/2) silty clay loam with fine common dark yellowish brown (10YR 4/6) mottles, weak very coarse subangular blocky structure, sticky to very plastic, base covered, many 6 to 7 cm diameter burrows filled with sediment from Zone 6, Cg Horizon. |

## EAST LEVEE SECTION 2

The East Levee Section 2 is located on the north bank of the Intracoastal Waterway where it cuts into the eastern natural levee of Bayou Sale about 6 m east of the slip dredged into the bank of canal (see Figure 27 for location).

**Allolayer 4**

| Zone | Depth Below Surface (cm) | Description of Zone |
|---|---|---|
| 1 | 0 - 10 | Grain-supported, well-sorted, tightly parallel packed, crushed, oyster shell bed with black (10YR 2/1) silt loam matrix, stained by carbon black, wavy abrupt boundary. |
| 2 | 10 - 45 | Grain-supported, tightly parallel packed, intact, well-sorted, *Rangia* and crushed oyster shell bed with very dark gray (10YR 3/1) silt loam matrix, "cutans" of carbon black, wavy abrupt boundary, basal zone of allolayer 4. |

**Allolayer 2**

| | | |
|---|---|---|
| 3 | 45 - 55 | Brown (10YR 5/3) silt loam (sandy) with fine few dark yellowish brown (10YR 4/4) and yellowish brown (10YR 5/6) mottles, weak very fine to fine crumb (?), structure, nonsticky and nonplastic, wavy abrupt (knife-edge) boundary, spoil, upper |

| | | |
|---|---|---|
| | | zone of allolayer 2. |
| 4. | 55 - 62 | Very dark grayish brown (10YR 3/2) silt loam (sandy) with fine few very dark brown (10YR 2/2) mottles, massive, nonsticky and nonplastic, wavy abrupt boundary, spoil, lower zone of allolayer 3. |

**Allolayer 1**

| | | |
|---|---|---|
| 5. | 62 - 70 | Very dark gray (10YR 3/1) loam, weak medium subangular blocky, nonsticky and slightly plastic, sand to granule-size fragments of brick evenly dispersed, wavy abrupt to gradual boundary, Ap Horizon, upper zone of allolayer 1. |
| 6. | 70 - 125 | Brown (10YR 5/3) silty clay loam with fine to medium many dark yellowish brown (10YR 4/4-4/6) mottles, weak coarse subangular blocky structure, nonsticky and moderately plastic, wavy diffuse boundary, Bt Horizon. |
| 7. | 125-205 | Brown (10YR 5/3) silt loam with medium many yellowish brown (10YR 5/6) mottles, massive, nonsticky and nonplastic, C Horizon. |

## WEST LEVEE SECTION 1

The West Levee Section 1 is located on the north bank of the Intracoastal Waterway where it cuts into the western natural levee of Bayou Sale about 5 m west of the west edge of shell roadbed exposed in the canal bank (see Figure 34 for location).

**Allolayer 3**

| Zone | Depth Below Surface (cm) | Description of Zone |
|---|---|---|
| 1 | 0 - 12 | Black (10YR 2/1) silt loam, weak medium subangular blocky structure, nonsticky and nonplastic, stained by carbon black from adjacent plant, gradual wavy boundary. |
| 2 | 12 - 20 | Dark brown (10YR 4/3) silt loam with streaks of black, massive, nonsticky and nonplastic, "cutans" of carbon black and scattered broken *Rangia* shells present, gradual wavy boundary, spoil. |
| 3. | 20 - 37 | Dark brown (10YR 4/3) silt loam with large few dark gray |

| | | |
|---|---|---|
| | | (10YR 4/1) mottles, massive, nonsticky and nonplastic, common pebble to sand-size brick fragments, wavy to smooth abrupt (knife-edge) boundary, spoil, basal zone of allolayer 3. |

**Allolayer 1**

| | | |
|---|---|---|
| 4. | 37 - 62 | Brown (10YR 5/3) silty clay with fine few dark yellowish brown (10YR 5/3) mottles, moderate subangular blocky structure, nonsticky and moderately plastic, wavy gradual boundary, upper zone of allolayer 1, truncated Bt Horizon. |
| 5. | 62 - 130 | Grayish brown (2.5Y 6/2) silty clay loam with fine few dark yellowish brown (10YR 5/3) mottles, weak subangular blocky to massive, nonsticky and moderately plastic, base covered. |

## WEST LEVEE SECTION 2

The West Levee Section 2 is located on the north bank of the Intracoastal Waterway where it cuts into the western natural levee of Bayou Sale adjacent to the eastern end of shell roadbed exposed in the canal bank (see Figure 34 for location).

**Allolayer 3**

| Zone | Depth below Surface (cm) | Description of Zone |
|---|---|---|
| 1 | 0 - 8 | Black (10YR 2/1) silt loam (clayey), weak fine crumb structure, nonsticky and slightly plastic, heavily stained by carbon black from adjacent plant, wavy gradual boundary. |
| 2 | 8 - 40 | Dark brown (10YR 3/3) silt loam (sandy) with streaks of black, weak fine crumb (?) structure to massive, nonsticky and nonplastic, smooth abrupt boundary. |
| 3. | 40 - 55 | Brown (10YR 5/3) silty clay, massive, nonsticky and moderately plastic, wavy abrupt boundary. |
| 4. | 55 - 62 | Grayish brown (10YR 5/2) loam with fine few dark yellowish brown (10YR 5/6) mottles, massive, nonsticky and slightly plastic, abundant dispersed sand and granule-size fragments of brick and charcoal, wavy abrupt boundary, basal zone of allolayer 3. |

**Allolayer 1**

| | | |
|---|---|---|
| 5. | 62 - 130 | Brown (10YR 5/3) silt loam (sandy) with fine few dark yellowish brown (10YR 5/6) mottles, massive, nonsticky and nonplastic, base covered, upper zone of allolayer 1, truncated C Horizon. |

## BAYOU SALE CHANNEL SECTION

The Bayou Sale Channel Section is located on the north bank of the Intracoastal Waterway at the tip of an erosional point that forms the west bank of slip dredged into the canal bank (see Figure 34 for location).

**Allolayer 3**

| Zone | Depth Below Surface (cm) | Description of Zone |
|---|---|---|
| 1 | 0 - 105 | Light yellowish brown (10YR 6/4) sand and loamy sand interbedded and interlaminated with dark gray (10YR 4/1) silt loam and silty clay, individual beds often are disrupted by soft sediment deformation structures, wavy to smooth abrupt (knife-edge) boundary, spoil. |
| 2 | 05 - 115 | Black (10YR 2/1) silt loam, massive, nonsticky and slightly plastic, wavy to smooth abrupt boundary. |
| 3 | 15 - 122 | Grain-supported, well-sorted, tightly packed, imbricated, water-rolled, fragmented, *Rangia* shell bed with gray (10YR 5/1) silty clay loam (?) matrix, wavy abrupt (knife-edge) boundary, beach lag from erosion of canal bank, basal zone of allolayer 3. |

**Allolayer 2**

| | | |
|---|---|---|
| 4 | 122 - 160 | Very dark gray (10YR 3/1) silt loam to sandy loam, massive, nonsticky and nonplastic, contains sand-size cinders, contains thick bed of pebble and granule-size cinders to west, wavy abrupt (knife-edge) boundary, upper zone of allolayer 2. |
| 5. | 160 - 172 | Black (10YR 2/1) silt loam, massive, nonsticky and nonplastic, rare fine root molds, abundant sand-size grains of brick, abrupt (knife-edge) boundary. |

| | | |
|---|---|---|
| 6. | 172 - 200 | Very dark gray (10YR 3/1) silt loam, nonsticky and nonplastic, abundant fine root molds lined with dark yellowish brown (10YR 5/6) cutans, wavy abrupt boundary. |
| 7. | 200 - 240 | Grayish brown (10YR 5/2) silt loam, nonsticky and nonplastic, abundant fine root molds, on opposite side of "point" this zone contains the metal fittings of a wagon exposed at and just below water level, base submerged. |

## APPENDIX 2

## NORTH BEND SITE POSTHOLE TEST RECORD

**Posthole 1 E**

Location: S50/E80

Stratigraphy:

| | | |
|---|---|---|
| Zone 1 | 0-11 cm | Black silt loam heavily stained with carbon black |
| Zone 2 | 11-45 cm | Brown silt loam (spoil) |
| Zone 3 | 45-73 cm | Dark brown silty clay (natural levee topsoil) with artifacts |

Artifacts recovered from Zone 3:

| | |
|---|---|
| 1 | White porcelain sherd |
| 1 | Whiteware sherd |
| 10 | Pieces of clear glass (1 pressed glass rim, 1 with an indeterminate molded design, 1 pharmaceutical bottle neck) |
| 10 | Nails and fragments (4 determinate square cut) |
| 8 | Pieces of aqua glass (one with ...**TAST**...<br>...**PREP**...<br>....**DIC**...) |
| 1 | 12 gauge shotgun shell base |
| 1 | Porcelain shirt stud |
| 3 | Brick fragments |
| 4 | *Rangia* shells and fragments |
| 1 | Animal bone |

**Posthole 2 E**

Location: S50/E90

Stratigraphy:

| | | |
|---|---|---|
| Zone 1 | 0-20 cm | Black silt loam and some *Rangia* shells heavily stained with carbon black |
| Zone 2 | 20-40 cm | Brown silt loam (spoil) |
| Zone 3 | 40-46 cm | Dark brown loam (natural levee topsoil) with *Rangia* shells and artifacts |
| Zone 4 | 46-58 cm | Brown silty clay (natural levee) |

Artifacts recovered from Zone 3:

| | |
|---|---|
| 1 | Piece of brown bottle glass |
| 1 | Piece of clear glass |
| 1 | Brick fragment |
| 1 | Snail shell |
| 4 | *Rangia* shells and fragments |

**Posthole 3 E**

Location: S50/E100

Stratigraphy:

| | | |
|---|---|---|
| Zone 1 | 0-15 cm | *Rangia* shell permeated with large quantities of carbon black |
| Zone 2 | 15-28 cm | Light brown silt loam (spoil) |
| Zone 3 | 28-38 cm | Brown silt loam and some *Rangia* shell |
| Zone 4 | 38-52 cm | Dark brown silty clay (natural levee topsoil) with artifacts |
| Zone 5 | 52-60 cm | Yellow brown clay (natural levee) |

Artifacts recovered from Zones 3 and 4:

| | |
|---|---|
| 1 | Piece of clear glass |
| 6 | Brick fragments |
| 2 | *Rangia* shells |

**Posthole 4 E**

Location: S50/E110

Stratigraphy:

| | | |
|---|---|---|
| Zone 1 | 0-18 cm | Silt loam heavily stained with carbon black |
| Zone 2 | 18-36 cm | Light brown silt loam (spoil) |
| Zone 3 | 36-66 cm | Dark brown silty clay (natural levee topsoil) with artifacts |
| Zone 4 | 66 + cm | Yellow brown clay (natural levee) |

Artifacts recovered from Zone 3:

| | |
|---|---|
| 3 | Whiteware sherds |
| 1 | Porcelain sherd |
| 31 | Pieces of clear glass (1 faceted bottle fragment, 1 thin drinking glass rim, 1 molded "salt shaker" with **RIVERS 2 26** on base) |

**Posthole 5 E**

Location: S60/E80

Stratigraphy:

| | | |
|---|---|---|
| Zone 1 | 0-04 cm | Silt loam heavily stained with carbon black |
| Zone 2 | 4-13 cm | Light brown silt loam (spoil) |
| Zone 3 | 13-18 cm | *Rangia* shell and artifacts |
| Zone 4 | 18-21 cm | Dark brown silty clay (natural levee topsoil) with artifacts |

Artifacts recovered from Zones 3 and 4:

| | |
|---|---|
| 2 | Whiteware sherds |
| 6 | Pieces of dark green bottle glass |
| 1 | Milk glass jar with a screw top |
| 2 | Square head nails |
| 1 | Piece of indeterminate iron |
| 17 | Brick fragments |

1 Piece of slag
1 Oyster shell
22 *Rangia* shells and fragments

**Posthole 6 E**

Location: S60/E90

Stratigraphy:

| | | |
|---|---|---|
| Zone 1 | 0-20 cm | Silt loam heavily stained with carbon black |
| Zone 2 | 20-38 cm | Light brown silt loam (spoil) |
| Zone 3 | 38-50 cm | Dark brown silt loam (natural levee topsoil) with artifacts (excavation stopped at this level because of a large iron object covering the base of the posthole and extending outward in all directions) |

Artifacts recovered from Zone 3:

2 Whiteware sherds
12 Dark green bottle glass fragments
1 Piece of aqua glass
1 Piece of clear glass
2 Pieces of indeterminate iron
4 Brick fragments
1 Pebble
2 *Rangia* shells

**Posthole 7 E**

Location: S60/E100

Stratigraphy:

| | | |
|---|---|---|
| Zone 1 | 0-10 cm | Silt loam heavily stained with carbon black |
| Zone 2 | 10-25 cm | Light brown silt loam (spoil) with some *Rangia* shells |
| Zone 3 | 25-36 cm | *Rangia* shells |
| Zone 4 | 36-56 cm | Dark brown silt loam (natural levee topsoil) with artifacts, *Rangia* and oyster shells |

Artifacts recovered from Zone 4:

1 Piece of aquamarine glass
4 Brick fragments
1 Piece of slate
1 Oyster shell
1 *Rangia* shell
1 Animal bone (ham bone slice)

**Posthole 8 E**

Location: S60/E110

Stratigraphy:

| | | |
|---|---|---|
| Zone 1 | 0-15 cm | Silt loam heavily stained with carbon black |
| Zone 2 | 15-36 cm | Light brown silt loam with some *Rangia* shells |

| | | |
|---|---|---|
| Zone 3 | 36-60 cm | Dark brown silt loam (natural levee topsoil) with artifacts |
| Zone 4 | 60 + cm | Yellow brown silty clay (natural levee) |

Artifacts recovered from Zones 2 and 3:

- 1 Whiteware sherd
- 1 Porcelain sherd
- 1 Piece of brown bottle glass
- 1 Piece of indeterminate iron
- 4 Brick fragments
- 2 Oyster shells
- 3 *Rangia* shells and fragments

**Posthole 9 E**

Location: S70/E100

Stratigraphy:

| | | |
|---|---|---|
| Zone 1 | 0-12 cm | Silt loam heavily stained with carbon black |
| Zone 2 | 12-20 cm | Light brown silt loam with large quantities of *Rangia* shell (spoil and paving) |
| Zone 3 | 20-26 cm | *Rangia* shells (paving) |
| Zone 4 | 26-50 cm | Dark brown silty clay (natural levee topsoil) with artifacts |
| Zone 5 | 50 + cm | Yellow brown silty clay (natural levee) |

Artifacts recovered from Zone 3:

- 3 Whiteware sherds
- 2 Pieces of amethyst glass
- 3 Nail fragments
- 1 Piece of indeterminate iron
- 7 Brick fragments
- 6 Oyster and *Rangia* shell fragments
- 2 Animal bones

**Posthole 10 E**

Location: S70/E110

Stratigraphy:

| | | |
|---|---|---|
| Zone 1 | 0-02 cm | *Rangia* shells (paving) |
| Zone 2 | 2-30 cm | Dark brown silt loam (natural levee topsoil) |
| Zone 3 | 45 + cm | Dark brown silty clay (natural levee) |

Artifacts recovered: None

**Posthole 11 E**

Location: S70/E95

Stratigraphy:

| | | |
|---|---|---|
| Zone 1 | 0-05 cm | *Rangia* shells (paving) permeated with carbon black |
| Zone 2 | 17-27 cm | Brown silt loam (spoil) |

| | | |
|---|---|---|
| Zone 3 | 27-32 cm | *Rangia* shells with artifacts (posthole terminated at the base of this level because of brick foundation) |

Artifacts recovered from Zone 3:

1 Whiteware sherd
1 Stoneware sherd (grey glazed)
5 Pieces of aquamarine glass (1 neck ring)
2 Pieces of clear glass (1 bottle neck and shoulder)
2 Pieces of indeterminate iron
1 Brick fragment
1 White porcelain button with 4 holes
1 Animal tooth

**Posthole 12 E**

Location: S40/E80

Stratigraphy:

| | | |
|---|---|---|
| Zone 1 | 0-15 cm | *Rangia* shells (paving) permeated with large of carbon black |
| Zone 2 | 15-44 cm | Brown silt loam (spoil) |
| Zone 3 | 44-54+cm | Dark brown silty clay (natural levee topsoil) with brick fragments |

Artifacts recovered from Zone 3:

Brick fragments (not saved)

**Posthole 13 E**

Location: S40/E90

Stratigraphy:

| | | |
|---|---|---|
| Zone 1 | 0-20 cm | *Rangia* shells (paving) permeated with carbon black |
| Zone 2 | 20-30 cm | Brown silt loam (spoil) |
| Zone 3 | 30-50 cm | Dark Brown silty loam (topsoil of natural levee) with artifacts |
| Zone 4 | 50 + cm | Dark brown silty clay (natural levee) |

Artifacts recovered from Zone 3:

2 Nail fragments (1 determinate square cut)
7 Brick fragments

**Posthole 14 E**

Location: S40/E100

Stratigraphy:

| | | |
|---|---|---|
| Zone 1 | 0-20 cm | Silt loam heavily stained with carbon black |
| Zone 2 | 20-40 cm | Brown silt loam (spoil) |
| Zone 3 | 40-55+cm | Dark brown silty loam (natural levee topsoil) with bricks fragments and mortar |

Artifacts recovered from Zone 3:

Brick fragments and mortar (not saved)

**Posthole 15 E**

Location: S40/E110

Stratigraphy:

| | | |
|---|---|---|
| Zone 1 | 0-15 cm | Silt loam heavily stained with carbon black |
| Zone 2 | 15-53 cm | Brown silt loam (spoil) |
| Zone 3 | 53-60+cm | Dark Brown silty loam (natural levee topsoil) with brick fragments and artifacts |

Artifacts recovered from Zone 3:

3 Nails (square cut)
Brick fragments (not saved)

**Posthole 16 E**

Location: S30/E80

Stratigraphy:

| | | |
|---|---|---|
| Zone 1 | 0-15 cm | Silt loam heavily stained with carbon black |
| Zone 2 | 15-32 cm | Brown silt loam (spoil) |
| Zone 3 | 32-56 cm | Dark Brown silty loam (natural levee topsoil) |

Artifacts recovered: None

**Posthole 17 E**

Location: S30/E90

Stratigraphy:

| | | |
|---|---|---|
| Zone 1 | 0-18 cm | *Rangia* shells (paving) permeated with carbon black |
| Zone 2 | 18-30 cm | Brown silt loam (spoil) |
| Zone 3 | 30-48 cm | Dark brown silt loam (natural levee topsoil) with some artifacts |
| Zone 4 | 48 + cm | Dark brown silty clay (natural levee) |

Artifacts recovered from Zone 3:

1 Nail (square cut)
2 Brick fragments
1 Animal bone

**Posthole 18 E**

Location: S30/E100

Stratigraphy:

| | | |
|---|---|---|
| Zone 1 | 0-12 cm | Silt loam heavily stained with carbon black |
| Zone 2 | 12-30 cm | Brown silt loam (spoil) |
| Zone 3 | 30-46 cm | Dark brown silty loam (natural levee topsoil) with brick fragments, *Rangia* shells and artifacts |

Artifacts recovered from Zone 3:

4 Pieces of clear glass
1 Piece of dark green bottle glass
5 Nails and fragments (2 determinate square cut, 2 wire nails)

**Posthole 19 E**
Location: S30/E110
Stratigraphy:

| | | |
|---|---|---|
| Zone 1 | 0-15 cm | Silt loam heavily stained with carbon black |
| Zone 2 | 15-42 cm | Brown silt loam (spoil) |
| Zone 3 | 42-56+cm | Dark brown silty loam (natural levee topsoil) with brick fragments and *Rangia* shells |

Artifacts recovered from Zone 3:
Brick fragments (not saved)

**Posthole 20 E**
Location: S20/E80
Stratigraphy:

| | | |
|---|---|---|
| Zone 1 | 0-16 cm | Silt loam heavily stained with carbon black and some gravel (paving) |
| Zone 2 | 16-40 cm | Brown silt loam (spoil) |
| Zone 3 | 40-48+cm | Dark brown silt loam (natural levee topsoil) with small fragments of *Rangia* shells |

Artifacts recovered: None

**Posthole 21 E**
Location: S20/E90
Stratigraphy:

| | | |
|---|---|---|
| Zone 1 | 0-22 cm | Silt loam heavily stained with carbon black |
| Zone 2 | 22-45 cm | Brown silt loam (spoil) |
| Zone 3 | 45-55 cm | Dark brown silt loam (natural levee topsoil) with some shell, gravel and an artifact |
| Zone 4 | 55 + cm | Dark brown silty clay (natural levee) |

Artifact recovered from Zone 3:
1 Wire nail

**Posthole 22 E**
Location: S20/E100
Stratigraphy:

| | | |
|---|---|---|
| Zone 1 | 0-16 cm | Silt loam heavily stained with carbon black |
| Zone 2 | 16-40 cm | Brown silt loam (spoil) |
| Zone 3 | 40-48+cm | Dark brown silt loam (natural levee topsoil) with small fragments of *Rangia* shells |

Artifacts recovered: None

**Posthole 23 E**
Location: S20/E110
Stratigraphy:

| | | |
|---|---|---|
| Zone 1 | 0-23 cm | Silt loam heavily stained with carbon black |

| | | |
|---|---|---|
| Zone 2 | 23-53 cm | Brown silt loam (spoil) |
| Zone 3 | 53-64+cm | Dark brown silt loam (natural levee topsoil) with small brick fragments |

Artifacts recovered from Zone 3:
Brick fragments (not saved)

**Posthole 24 E**
Location: S5/E65
Stratigraphy:

| | | |
|---|---|---|
| Zone 1 | 0-25 cm | Sandy loam heavily stained with carbon black |
| Zone 2 | 25-45 cm | Dark brown silt loam (natural levee topsoil) with *Rangia* shells and small brick fragments |
| Zone 3 | 45 + cm | Dark brown silty clay (natural levee) |

Artifacts recovered from Zone 3:
Brick fragments (not saved)

**Posthole 25 E**
Location: S10/E74
Stratigraphy:

| | | |
|---|---|---|
| Zone 1 | 0-10 cm | Silt loam heavily stained with carbon black |
| Zone 2 | 10-30 cm | Brown silt loam (spoil) |
| Zone 3 | 30-45 cm | Dark brown silt loam (natural levee topsoil) with *Rangia* shells, gravel and a brick fragment |
| Zone 4 | 45 + cm | Dark brown silty clay (natural levee) |

Artifact recovered from Zone 3:
1 Brick fragment

**Posthole 26 E**
Location: S14/E83
Stratigraphy:

| | | |
|---|---|---|
| Zone 1 | 0-10 cm | Silt loam heavily stained with carbon black |
| Zone 2 | 10-24 cm | Brown silt loam (spoil) |
| Zone 3 | 24-38 cm | Dark brown silty clay (spoil) |
| Zone 4 | 38-60 cm | Dark brown silt loam (natural levee topsoil) with *Rangia* shells and brick fragments |

Artifacts recovered from Zone 4:
4 Brick fragments

**Posthole 27 E**
Location: S18/E92
Stratigraphy:

| | | |
|---|---|---|
| Zone 1 | 0-10 cm | Silt loam heavily stained with carbon black |
| Zone 2 | 10-43 cm | Brown silt loam (spoil) |
| Zone 3 | 43-58 cm | Dark brown silt loam (natural levee topsoil) |

| | | |
|---|---|---|
| Zone 4 | 58 + cm | Dark brown silty clay (natural levee) |

Artifacts recovered: None

**Posthole 28 E**

Location: S25/E98

Stratigraphy:

| | | |
|---|---|---|
| Zone 1 | 0-17 cm | Silt loam heavily stained with carbon black |
| Zone 2 | 17-62 cm | Brown silt loam (spoil) |
| Zone 3 | 62-68 cm | Dark brown silt loam (natural levee topsoil) |

Artifacts recovered: None

**Posthole 29 E**

Location: S23/E105

Stratigraphy:

| | | |
|---|---|---|
| Zone 1 | 0-19 cm | Black soil with carbon black |
| Zone 2 | 19-42 cm | Brown silt loam (spoil) |
| Zone 3 | 42-60 cm | Dark brown silt loam (natural levee topsoil) with small brick fragments |
| Zone 4 | 60 + cm | Dark brown silty clay (natural levee) |

Artifacts recovered from Zone 3:

Brick fragments (not saved)

**Posthole 30 E**

Location: S43/E123

Stratigraphy:

| | | |
|---|---|---|
| Zone 1 | 0-30 cm | Silt loam heavily stained with carbon black and brown silt loam (spoil) mixed |
| Zone 2 | 30-60 cm | Dark brown silt loam (natural levee topsoil) with artifacts |

Artifacts recovered from Zone 2:

| | |
|---|---|
| 1 | Blue shell edge whiteware sherd |
| 1 | Piece of dark green bottle glass |
| 2 | Pieces of indeterminate iron |
| 1 | Piece of slag |

**Posthole 31 E**

Location: S40/E120

Stratigraphy:

| | | |
|---|---|---|
| Zone 1 | 0-25 cm | Silt loam heavily stained with carbon black and brown silt loam (spoil) mixed |
| Zone 2 | 25-55 cm | Dark brown silt loam (natural levee topsoil) with an artifact |
| Zone 3 | 55 + cm | Dark brown silty clay (natural levee) |

Artifact recovered from Zone 2:

| | |
|---|---|
| 1 | Piece of brown bottle glass |

**Posthole 32 E**
Location:
Stratigraphy:

| | | |
|---|---|---|
| Zone 1 | 0-16 cm | Silt loam heavily stained with carbon black |
| Zone 2 | 16-55 cm | Brown silt loam (spoil) |
| Zone 3 | 55-60+cm | Dark brown silt loam (natural levee topsoil) with *Rangia* shells |

Artifact recovered from Zone 1:
1 Iron valve knob and stem

**Posthole 1 W**
Location: S30/W10
Stratigraphy:

| | | |
|---|---|---|
| Zone 1 | 0-15 cm | Silt loam heavily stained with carbon black |
| Zone 2 | 15-65 cm | Brown silt loam (spoil) |

Artifacts recovered: None

**Posthole 2 W**
Location: S20/W20
Stratigraphy:

| | | |
|---|---|---|
| Zone 1 | 0-20 cm | Silt loam heavily stained with carbon black |
| Zone 2 | 20-68 cm | Brown silt loam (spoil) |

Artifacts recovered: None

**Posthole 3 W**
Location: S20/W10
Stratigraphy:

| | | |
|---|---|---|
| Zone 1 | 0-12 cm | Silt loam heavily stained with carbon black |
| Zone 2 | 12-82 cm | Brown silt loam (spoil) |

Artifacts recovered: None

**Posthole 4 W**
Location: S20/W0
Stratigraphy:

| | | |
|---|---|---|
| Zone 1 | 0-14 cm | Silt loam heavily stained with carbon black |
| Zone 2 | 14-55 cm | Brown silt loam (spoil) |
| Zone 3 | 55-75 cm | Yellow brown silt loam (natural levee) |

Artifact recovered from Zone 3:
1 Brick fragment

**Posthole 5 W**
Location: S10/W40
Stratigraphy:

| | | |
|---|---|---|
| Zone 1 | 0-11 cm | Silt loam heavily stained with carbon black |

| | | |
|---|---|---|
| Zone 2 | 11-26 cm | Brown silt loam (spoil) |
| Zone 3 | 26 + cm | *Rangia* shell (buried shell road bed which extends to cut bank along Intracoastal Waterway; see profile in Figure 33) |

Artifact recovered from top of Zone 3:
1 Dr. Tichenor's Antiseptic bottle (complete)

**Posthole 6 W**
Location: S10/W30
Stratigraphy:

| | | |
|---|---|---|
| Zone 1 | 0-20 cm | Silt loam heavily stained with carbon black |
| Zone 2 | 20-60 cm | Brown silt loam (spoil) |

Artifacts recovered: None

**Posthole 7 W**
Location: S10/W20
Stratigraphy:

| | | |
|---|---|---|
| Zone 1 | 0-30 cm | Silt loam heavily stained with carbon black |
| Zone 2 | 30-65 cm | Brown silt loam (spoil) |
| Zone 3 | 65-75 cm | Brown silty clay (natural levee topsoil) |

Artifacts recovered: None

**Posthole 8 W**
Location: S10/W10
Stratigraphy:

| | | |
|---|---|---|
| Zone 1 | 0-11 cm | Silt loam heavily stained with carbon black |
| Zone 2 | 11-75 cm | Brown silt loam (spoil) |
| Zone 3 | 75-82 cm | Brown silty clay (natural levee topsoil) |

Artifacts recovered: None

**Posthole 9 W**
Location: S10/W0
Stratigraphy:

| | | |
|---|---|---|
| Zone 1 | 0-23 cm | Silt loam heavily stained with carbon black |
| Zone 2 | 23-68 cm | Brown silt loam (spoil) |
| Zone 3 | 68-84 cm | Light brown silt loam (spoil) |

Artifacts recovered from Zone 2:
3 Brick fragments

**Posthole 10 W**
Location: S10/E10
Stratigraphy:

| | | |
|---|---|---|
| Zone 1 | 0-15 cm | Silt loam heavily stained with carbon black |
| Zone 2 | 15-76 cm | Brown silt loam (spoil) |

| | | |
|---|---|---|
| Zone 3 | 76-90 cm | Brown silty clay grading into yellow brown silt loam (natural levee topsoil grading into lighter subsoil; water level reached at 80 cm) |

Artifact recovered from the upper part of Zone 3:
1 Blue annular whiteware sherd

**Posthole 11 W**
Location: S0/W30
Stratigraphy:

| | | |
|---|---|---|
| Zone 1 | 0-20 cm | Silt loam heavily stained with carbon black |
| Zone 2 | 20-90 cm | Brown silt loam (spoil) |

Artifacts recovered: None

**Posthole 12 W**
Location: S0/W20
Stratigraphy:

| | | |
|---|---|---|
| Zone 1 | 0-38 cm | Silt loam heavily stained with carbon black |
| Zone 2 | 38-68 cm | Brown silty clay (natural levee topsoil) with small brick fragments |

Artifacts recovered from Zone 2:
Brick fragments (not saved)

**Posthole 13 W**
Location: S0/W10
Stratigraphy:

| | | |
|---|---|---|
| Zone 1 | 0-27 cm | Silt loam heavily stained with carbon black |
| Zone 2 | 27-66 cm | Brown silt loam (spoil) |
| Zone 3 | 66-78 cm | Brown silty clay (natural levee topsoil) with small brick fragments |

Artifacts recovered from Zone 3:
Brick fragments (not saved)

**Posthole 14 W**
Location: S0/W0
Stratigraphy:

| | | |
|---|---|---|
| Zone 1 | 0-22 cm | Silt loam heavily stained with carbon black |
| Zone 2 | 22-50 cm | Brown silt loam (spoil) |
| Zone 3 | 50-68 cm | Brown silty clay (natural levee topsoil) |

Artifacts recovered: None

**Posthole 15 W**
Location: S0/E10
Stratigraphy:

| | | |
|---|---|---|
| Zone 1 | 0-18 cm | Silt loam heavily stained with carbon black |

| | | |
|---|---|---|
| Zone 2 | 18-37 cm | Brown silt loam (spoil) |
| Zone 3 | 37-44 cm | Brown silty clay (natural levee topsoil) |

Artifacts recovered: None

## APPENDIX 3

## CATALOGUE OF ARTIFACTS RECOVERED FROM SURFACE COLLECTIONS AND TEST EXCAVATIONS AT THE NORTH BEND SITE

### East Bank Surface Collection

| | |
|---|---|
| 1 | Pearlware sherd |
| 39 | Whiteware sherds (1 banded blue and red, 5 blue shell edge, 2 blue transfer printed, 1 brown transfer printed, 1 blue annular, 1 blue, green and white annular) |
| 1 | Flow blue sherd |
| 1 | Spongeware sherd |
| 1 | Porcelain sherd |
| 7 | Stoneware sherds (2 brown glazed, 1 grey exterior and red interior, 2 grey exterior and interior, 1 black exterior and interior, 1 cream exterior and red interior) |
| 34 | Pieces of dark green bottle glass (1 with ..CH.. on the side) |
| 22 | Pieces of aqua glass (1 rectangular basal fragment, 1 neck fragment) |
| 14 | Pieces of amethyst glass (1 pharmaceutical bottle neck, 1 with ..DURANC.., 1 neck rim, 1 basal fragment) |
| 47 | Pieces of brown glass (1 rectangular base with ..FE on side) |
| 3 | Pieces of light green glass (1 pharmaceutical bottle fragment with TRA.., 1 string ring) |
| 7 | Pieces of cobalt blue glass (1 base with a 3.5 in diameter) |
| 79 | Pieces of aqua glass (most from two bottles, 1 with BUDWEISE[R] U S PATENT NO. 6..76, 1 with LEA & PER[RINS]) |
| 1 | Piece of milk glass |
| 57 | Pieces of clear glass (1 round base with N B on either side of the pontil mark, 1 base 1.5 in in diameter, 1 whiskey bottle neck, 1 pharmaceutical bottle neck, 1 complete Dr. Tichenor's bottle) |
| 2 | Pieces of window pane glass |
| 65 | Nails and fragments (15 determinate square cut, 3 wire nails) |
| 1 | Wire spike |
| 1 | Railroad spike |
| 1 | Iron U-bolt |
| 1 | Iron door pintle |
| 2 | Iron rings (2 in diameter, 2.5 in diameter) |
| 1 | 7/8 in open end wrench |
| 65 | Pieces of indeterminate iron |
| 1 | Copper harness boss |
| 1 | Stoneware pipe stem |
| 1 | Brass shoe heel tap |

| | |
|---|---|
| 1 | 4 hole porcelain button (5/8 in diameter) |
| 4 | Pieces of coal |
| 1 | Piece of slag |
| 31 | Bricks and fragments |
| 13 | Pieces of slate |
| 17 | Animal bones |

**Excavation Unit 1, Level 1**

| | |
|---|---|
| 1 | Half-brick |
| 13 | Brick fragments |
| 2 | Pieces of gravel |
| 3 | Pieces of indeterminate iron |
| 37 | Pieces of brown bottle glass (twist off cap beer bottle) |
| 2 | Twist off bottle caps |
| 1 | Piece of aqua glass |
| 12 | Pieces of blue plastic |

**Excavation Unit 1, Level 2**

No associated artifacts

**Excavation Unit 1, Level 3**

| | |
|---|---|
| 4 | Whiteware sherds (one with an indeterminate maker's mark) |
| 2 | Pieces of aqua glass |
| 1 | Piece of brown glass |
| 3 | Pieces of amethyst glass |
| 1 | Piece of dark green glass |
| 2 | Pieces of coal |
| 1 | Indeterminate nail |
| 1 | 12-Gauge shotgun shell base (legible stamping read ...NION No. 12) |

**Excavation Unit 1, Level 4**

| | |
|---|---|
| 1 | Pearlware sherd |
| 4 | Whiteware sherds |
| 1 | Porcelain sherd |
| 1 | Red and blue spongeware sherd |
| 1 | Stoneware sherd (yellow glaze on the interior and blue and white annular decoration on the exterior) |
| 4 | Pieces of brown bottle glass (1 with indeterminate molded design) |
| 17 | Pieces of aqua glass |
| 76 | Pieces of clear glass (1 square pharmaceutical bottle neck and shoulder, 3 |

| | |
|---|---|
| | square bottle bases [1 with ...**ANS**, 1 with **McC**], 2 sides of square bottles [1 with ...**LAY & C**..., 1 with ...**R.FIN**/...**ORLE**..]) |
| 1 | Light green bottle base (2 in diameter) |
| 14 | Pieces of dark green bottle glass (2 necks and one basal fragment) |
| 1 | Piece of clear pressed glass |
| 1 | Piece of amethyst glass |
| 3 | 4-hole buttons (1 iron, 1 small white porcelain, 1 medium porcelain) |
| 25 | Nails and fragments (5 determinate square cut) |
| 6 | Pieces of indeterminate iron |
| 1 | Rim fire cartridge (fired) |
| 605 | Brick fragments |
| 1 | Piece of slate |
| 7 | Pieces of slag |
| 4 | Animal bones (1 *sus scrofa*, 3 indeterminate large mammal bone fragments) |

**Excavation Unit 1, Level 5 (Northeast Portion of Unit)**

| | |
|---|---|
| 1 | Blue shell-edge pearlware |
| 1 | White porcelain sherd |
| 2 | Dark green bottle glass fragments |
| 11 | Pieces of aquamarine glass |
| 1 | Piece of brown glass |
| 15 | Pieces of clear glass |
| 19 | Nails (2 determinate square cut) |
| 2 | Oyster shell and fragment |
| 10 | Animal bones (1 *sus scrofa*, 1 indeterminate turtle, 8 indeterminate large mammal) |

**Excavation Unit 1, Level 5 (Southeast Corner of Unit)**

| | |
|---|---|
| 1 | Pearlware sherd |
| 2 | Whiteware sherds |
| 7 | Dark green bottle glass fragments (1 corner from an octagonal bottle) |
| 1 | Piece of brown glass |
| 11 | Pieces of clear glass (2 pieces from a stemmed glass base) |
| 10 | Pieces of aquamarine glass (1 bottle base, 1 in in diameter) |
| 12 | Nails and fragments (3 determinate square cut) |
| 1 | Square headed spike |
| 12 | Pieces of indeterminate iron |
| 1 | Railroad spike |
| 5 | 4-hole buttons (1 small mother of pearl, 1 medium black porcelain, 1 medium white porcelain, 1 small white porcelain, 1 opalescent porcelain. |
| 1 | Light blue wire wound glass bead half |
| 1 | Bone needle case |

| | |
|---|---|
| 1 | Brass harness rivet |
| 1 | 16 gauge shotgun shell base |
| 1 | Stoneware pipe bowl fragment |
| 1 | Piece of slag |
| 30 | Animal bones (1 *bos taurus*, 4 indeterminate bird bone fragments, 1 indeterminate turtle shell fragment, 2 indeterminate small mammal bone fragments, 22 indeterminate large mammal bone fragments) |

**Excavation Unit 1, Level 5 (Southwest Portion of Unit)**

| | |
|---|---|
| 1 | Piece of brown glass |
| 5 | Nails and fragments (2 determinate square cut) |

**Excavation Unit 2, Level 1**

No associated artifacts

**Excavation Unit 2, Level 1**

| | |
|---|---|
| 1 | Whiteware sherd |
| 1 | Piece of dark green bottle glass |
| 2 | Pieces of amethyst glass |
| 1 | Piece of clear glass |
| 7 | Nails and fragments (3 determinate square cut) |
| 2 | Pieces of indeterminate iron |
| 7 | Brick fragments |
| 1 | Animal bone (calcified indeterminate large mammal bone fragment) |

**Excavation Unit 2, Level 3**

| | |
|---|---|
| 37 | Whiteware sherds (4 rims from plates and cups; 1 sherd with an indeterminate coat of arms maker's mark) |
| 1 | Porcelain sherd |
| 2 | Annular banded whiteware sherds (blue, white and black) |
| 2 | Flow blue sherds |
| 2 | Handpainted sherds (blue and white floral design) |
| 1 | Banded annular ware sherd (blue, white and brown) |
| 1 | Stoneware sherd (cream glaze on interior and exterior) |
| 22 | Pieces of dark green bottle glass (1 heavy basal portion with a heavy kickup) |
| 39 | Pieces of dark brown glass (1 basal fragments, 4 pieces with an indeterminate molded design) |
| 73 | Pieces of clear glass (4 had an indeterminate embossed design, 1 pharmaceutical bottle neck, 1 soda bottle neck, 2 fragments of a wine glass bowl and stem) |

| | |
|---|---|
| 43 | Pieces of aqua glass (2 indeterminate bottle rims, 1 corner of a rectangular pharmaceutical bottle) |
| 17 | Pieces of amethyst glass (1 with molded with [F]RANCE, 1 soda bottle base with a molded 8 in the center) |
| 3 | Pieces of milk glass (1 threaded jar rim, 1 indeterminate molded decorative pattern) |
| 1 | Piece of green Coca Cola bottle |
| 51 | Nails and fragments (10 determinate square cut, 1 wire nail) |
| 1 | Staple |
| 9 | Pieces of wire |
| 1 | Piece of a cast iron stove part |
| 34 | Pieces of indeterminate iron |
| 1 | 12 gauge shotgun shell base (WESTERN FIELD No. 12) |
| 185 | Brick fragments |
| 4 | Pieces of slate |
| 11 | Pieces of coal |
| 15 | Pieces of slag |
| 7 | Pebbles |
| 15 | Animal bones (1 *Bos taurus* femur section, 1 *Sus scrofus* femur section, 1 *Ursus americanus* canine, 1 indeterminate bird bone fragment, 2 indeterminate small mammal bone fragments, 10 indeterminate large mammal bone fragments) |
| 135 | *Rangia* shells and fragments |

**Excavation Unit 2, Level 4**

| | |
|---|---|
| 108 | Whiteware sherds (21 rims, 1 pitcher or sugar bowl base, 1 cup handle fragment, 3 with transfer print designs, 1 molded rim design, 2 with indeterminate English maker's marks) |
| 1 | Blue shell edge sherd (indeterminate as to pearlware or whiteware) |
| 6 | Porcelain sherds |
| 3 | Annular whiteware sherds (blue and black annular) |
| 5 | Stoneware sherds (1 annular dipped brown and yellow glaze - small bowl fragment, 1 blue and green annular dipped rim from a chamber pot, 1 cream glaze on exterior and brown with red spotted glaze on interior, 1 with brown glaze on both sides, 1 with yellow glaze on both sides, 1 grey glazed) |
| 39 | Pieces of dark green bottle glass (1 indeterminate applied string ring, 1 heavy kickup fragment, 1 thin kickup fragment) |
| 91 | Pieces of aquamarine glass (4 with indeterminate molded designs - one has cluster of arrows and may be part of an eagle flask, 1 round base with 1/2 in kickup and 4 in diameter, 1 piece was the side and corner of a Dr. Tichenor-like bottle, 1 pharmaceutical bottle neck) |
| 32 | Pieces of amethyst glass (1 molded bottle neck, 1 hexagonal wine glass stem fragment, 2 pressed or molded pieces) |

| | |
|---|---|
| 190 | Dark brown or amber bottle fragments (3 pieces of a heavy oval base 4 in by 1 3/4 in and a shallow kickup with circular indention in base - ...**CH**.. on side near base, 1 bottle neck with a rounded applied ring over mold-made neck - probably neck to above bottle base, 3 fragments of a thin oval bottle base without a kickup, 27 molded bottle fragments - elaborate but indeterminate design, 1 bottle corner - square bottle with angular corners, 1 bottle base 3 in diameter and a shallow kickup) |
| 160 | Pieces of clear glass (1 bottle base 3 in diameter, 1 pharmaceutical vial neck, 1 square pharmaceutical vial base, 1 square bottle base with a molded 3, 3 pieces with indeterminate impressed designs) |
| 1 | Piece of milk glass |
| 11 | Pieces of light green bottle glass |
| 139 | Nails and fragments (12 determinate square cut, 1 wire nail) |
| 3 | Railroad spikes |
| 1 | Chrome end nut |
| 1 | Piece of iron wire |
| 1 | Oval iron handle |
| 3 | Pieces of cast iron (probably stove parts) |
| 1 | Piece of cast iron pipe fragment |
| 107 | Pieces of indeterminate iron |
| 1 | Brown marbleized door knob fragment |
| 1 | Rim fire cartridge |
| 1 | Center fire cartridge |
| 2 | 12 gauge shotgun shell bases (1 with **U MG CO NEW CLUB No. 12**) |
| 1 | Piece of window pane glass |
| 1 | Brass straight pin |
| 8 | Brass shoe eyelets |
| 1 | Stoneware pipe bowl fragment |
| 465 | Brick fragments (one with ...**ED**) |
| 11 | Pieces of mortar |
| 42 | Pieces of coal |
| 64 | Pieces of slag |
| 1 | Piece of limestone |
| 16 | Small pebbles |
| 20 | Pieces of slate |
| 28 | Oyster shells and fragments |
| 104 | *Rangia* shells and fragments |
| 153 | Animal bones (10 *Bos taurus*, 4 *Sus scrofus*, 1 *Odocoileus virginianus*, 3 *Aplodinotus spp.*, 1 indeterminate bird bone fragment, 1 indeterminate turtle shell fragment, 3 indeterminate small mammal bone fragments, 130 indeterminate large mammal bone fragments) |

**West Bankline Surface Collection**

| | |
|---|---|
| 18 | Whiteware sherds (1 blue shell edge, 3 blue transfer printed, 1 with an indeterminate maker's mark) |
| 3 | Porcelain sherds |
| 5 | Stoneware sherds |
| 17 | Pieces of dark green bottle glass (1 base with a 2.5 in diameter with **3 B**, 2 string rings) |
| 41 | Pieces of brown glass (1 rectangular bottle base; 3 fragments impressed **100, P, STON...**; 2 others with indeterminate impressions) |
| 19 | Pieces of amethyst glass (1 with a molded design) |
| 84 | Pieces of aquamarine glass (1 with an indeterminate impressed design, 1 rectangular bottle base) |
| 5 | Pieces of cobalt blue glass |
| 59 | Pieces of clear glass (1 from a Ball jar, 1 screw top olive jar, 1 whiskey bottle neck, 4 basal fragments-1 with **WINE**) |
| 1 | Milk glass jar lid with **PAT. APRIL 10, 1900** |
| 5 | Pieces of window pane glass |
| 4 | Square cut nails |
| 14 | Wire nails and spikes |
| 3 | Railroad spikes |
| 1 | 1/2 in U-bolt |
| 1 | 1/2 in iron bolt 34 in long |
| 1 | 1/4 in eye bolt |
| 1 | 1/2 in square nut |
| 8 | Round washers |
| 2 | Square washers |
| 6 | Pieces of wire |
| 1 | Heavy angle brace |
| 2 | Strap hinges |
| 1 | Screendoor hinge |
| 2 | Iron rings |
| 1 | Piece of chain |
| 1 | Steamer trunk handle |
| 2 | Iron drawer pulls |
| 1 | Wheel bearing with ball bearings |
| 2 | Cast iron stove eye lids |
| 53 | Pieces of indeterminate iron |
| 22 | Bricks and fragments (1 with **STA[R]**, 1 with **STAR**, 1 with **Sharon J**) |
| 1 | White ceramic electrical insulator |
| 42 | Pieces of slate |
| 9 | Pieces of slag |

**Excavation Unit 3, Level 1**

| | |
|---|---|
| 3 | Porcelain cup fragments |
| 8 | Pieces of brown glass |
| 1 | Piece of green glass (fruit jar) |
| 10 | Pieces of clear glass (1 fruit jar rim, 1 whiskey bottle fragment) |
| 8 | Nails (7 wire nails, 1 square cut) |
| 1 | Iron trunk or box handle |
| 3 | Pieces of indeterminate iron |
| 1 | 12-gauge shotgun shell base |
| 1 | Brick fragment |

**Excavation Unit 3, Level 2**

| | |
|---|---|
| 1 | Whiteware sherd |
| 10 | Pieces of brown glass |
| 52 | Pieces of clear glass (1 threaded canning jar rim, 1 bottle base with **4/5 QUART** molded on exterior just above base, 1 rectangular bottle base, 1 complete ointment jar) |
| 3 | Pieces of aquamarine glass |
| 3 | Pieces of amethyst glass |
| 22 | Nails and fragments (1 determinate square cut, 6 wire nails) |
| 2 | Pieces of wire |
| 1 | Piece of 1/2 in pipe |
| 1 | Square head 1/2 in bolt 11.5 in long |
| 358 | Pieces of indeterminate iron |
| 1 | Brass rivet |
| 1 | 22-caliber shell |
| 96 | Brick fragments |
| 1 | Piece of mortar |
| 6 | Pieces of slate |
| 6 | Pieces of coal |
| 4 | Pieces of slag |
| 43 | Pieces of crushed limestone |
| | Pebbles (3.6 kg, 8.0 lbs) |
| | *Rangia* shells and fragments (24.1 kg, 53.0 lb) |
| | Oyster shells (1.8 kg, 4.0 lbs) |

# APPENDIX 4

# SCOPE OF SERVICES

**SCOPE OF SERVICES**
Archeological Testing of the
North Bend Site (16SMY132) and
Survey of the Todd Area Levee,
St. Mary Parish, Louisiana

**1. Introduction.** The archeological site testing and survey to be performed under this delivery order are in support of proposed improvements to the West Bayou Sale Levee, a feature of the Atchafalaya Basin, Levees West of Berwick project. In the vicinity of the North Bend Site (16SMY132), levee enlargement and foreshore protection are scheduled. Site impacts may result from the proposed foreshore protection which will involve bank grading and the placement of shell and rock on the bankline of the Gulf Intracoastal Waterway (GIWW). The North Bend Site was reported in 1975 by Weinstein and Burden during their survey of the GIWW. The site was only briefly examined and further testing is necessary to determine its extent and significance.

In the Todd Area, the proposed work consists of levee enlargement with material obtained from adjacent borrow areas. The cultural resources survey of the East and West Atchafalaya Basin Protection Levees conducted by Gibson in 1979-80 covered the levees adjacent to the Todd Area. The Todd Area was not surveyed during the Gibson study nor under any other cultural resources survey.

**2. Study Area.** The work consists of two distinct study areas as shown on the attached maps and described below:

a. site testing area - the reported location of the North Bend Site (16SMY132), approximately between baseline stations 0+00 and 2+62.69 on dwg. 1 of 6, File No. H-8-30911

b. survey area - proposed right-of-way for new levee, baseline stations 1153+00 to 1233+00 on map entitled Flood Protection in the Vicinity of Yellow Bayou and Todd Area, LA

**3. Background Information.** Weinstein and Burden described 16SMY132 as follows:

> A Rangia midden varying in thickness from 1 inch to 2 feet and running along the bank for about 200 feet. Two layers of shell - the uppermost is possibly attributable to the levee building. Lower lens is definitely prehistoric. Shell eroding out of midden and forming into piles along the shore.

The site was reported to be located on the north bank of the GIWW just west of its intersection with Bayou Sale. Artifacts recovered include a Tchefuncte-like sherd found in situ and a few other sherds and bone pieces found among the shell. Coastal Environments, Inc. concluded that the site was "important." They recommended that the site should be tested in order to disclose the site's cultural content and significance.

**4. General Nature of the Work.** The study will consist of historical research relative to the two study areas, intensive cultural resources survey of the Todd Area Levee right-of-way, archeological testing of the North Bend Site (16SMY132), and data analysis and report preparation.

**5. Study Requirements.** The study will be conducted utilizing current professional standards and guidelines including, but not limited to:

- the National Park Service's draft standards entitled, "How to Apply the National Register Criteria for Evaluation," dated June 1, 1982;
- the Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation as published in the Federal Register on September 29, 1983;
- Louisiana's Comprehensive Archeological Plan dated October 1, 1983;
- The Advisory Council on Historic Preservation's regulation 36 CFR Part 800 entitled, "Protection of Historic Properties."

The study will be conducted in four phases: Historical Research, Survey of the Todd Area Levee, Testing of North Bend Site, and Data Analysis and Report Preparation.

A. Phase 1: Historical Research. The study will begin with research of available literature and records necessary to establish the historic setting, predict the nature of the resource base in the project area, and refine the survey and testing methodology. This background research will include a literature review, review of the geomorphology, and research of historic maps and records. Historical research will include title searches and review of other written, cartographic and aerial photography records sufficient to reconstruct the historic uses of the two study areas

A brief, interim report will be prepared at the conclusion of this phase and submitted to the Contracting Officer's Representative (COR). The report will specifically include the following:

(1) a brief description of the study area's geomorphology, prehistory, and history as they relate to the location, identification, and evaluation of cultural resources;

(2) predictive statements of the geomorphological and archeological expectations based on the background research, and

(3) refinements in the survey and testing methodologies as necessitated by these predictions. A detailed discussion of the North Bend Site testing program will be provided.

The report shall be submitted within 3 weeks after delivery order award for review and approval. All review comments will be resolved or incorporated within 1 week after submittal.

B. Phase 2: Survey of the Todd Area Levee. Upon approval of the Phase 1 report by the COR, the Contractor shall initiate the fieldwork. Standard terrestrial survey as described below is the required procedure. The intensive pedestrian survey will utilize lane spacing of 20 meters and a shovel testing interval of 50 meters in an offset pattern. Shovel tests will be approximately 30x30 cm in the horizontal plane and approximately 25-50 cm deep, i.e. to sterile subsoil. The excavated soil will be screened through 1/4 inch wire mesh. This systematic procedure will be supplemented with judgmental shovel testing where the background research indicates high probability geomorphic features or historic sites.

All sites located in the survey corridors will be mapped, photographed, and briefly tested using shovel, auger, and limited controlled surface collection to determine depth of deposit, site boundaries, stratigraphy, condition, and cultural association. At a minimum, site maps will show site boundaries, locations of features and artifact scatters, locations of all subsurface testing units, and prominent natural and cultural features in the site area. All shovel/auger tests and excavation units will be immediately backfilled upon completion of archeological recordation.

For all sites discovered during the survey, the Contractor will file state site forms with the Louisiana State Archeologist and cite the resulting state-assigned site numbers in all draft and final reports. In addition, the Contractor will submit site update forms to the State Archeologist for all previously recorded sites. These forms will correct previously filed information where appropriate and summarize the results of the present investigation. All sites located within the project area will be recorded to scale on the appropriate 7.5 minute quadrangle and aerial mosaic project maps. The quadrangle maps will be utilized to illustrate the site forms. One copy of the aerial mosaic project maps, marked with the locations of all sites and historic structures in the project easement, and two unbound copies of each site and site update form will be submitted to the COR with the draft report.

All standing structures located in the survey area will be identified by function, dated and described in standard terminology of formal and/or vernacular architecture, as appropriate. Each structure predating 1945 or of potential National Register eligibility will be recorded on Louisiana state standing

structure forms accompanied by a minimum of three black and white photographs showing front, back and side views of the structure. The Contractor will determine whether subsurface features are present. If present, the structure and features will be treated as a site and documented accordingly. The Contractor shall assess the significance, i.e. the National Register eligibility, of all standing structures. Two copies of all standing structure forms will be submitted with the draft report.

C. Phase 3: Testing of North Bend Site. The reported location of site 16SMY132 will be intensively tested with bankline inspection, shovel and auger testing, and excavation of 1 x 2m test units. The specific methodology to be employed will be that contained in the approved Phase 1 report. Generally, however, the site testing will commence with the establishment of a grid over the site area tied to the Corps baseline. Next, the Contractor will perform bankline inspection and profile recordation to assess the elevation and linear extent of the site. Utilizing tightly spaced shovel and/or auger testing, the Contractor shall determine the site boundaries, depth of deposit, stratigraphy, cultural association, and possible activity areas. The results of these methods will be used to select the locations of test excavation units. These excavations will be designed to determine site integrity, stratigraphy, range and density of various artifact categories, and research potential of the site.

Excavation units will be limited to the minimum necessary to assess the site's National Register eligibility. Test units will be excavated in 10cm levels unless natural stratigraphic levels can be recognized. All profiles and features excavated will be mapped and photographed. Detailed site maps illustrating the horizontal extent of the site, the stratigraphy, the locations of all subsurface tests, the delineation of disturbed portions of the site, feature locations, and artifact densities will be prepared.

D. Phase 4: Data Analyses and Report Preparation. All data will be analyzed using currently acceptable scientific methodology. The Contractor shall catalog all artifacts, samples, specimens, photographs, drawings, etc., utilizing the format currently employed by the Louisiana State Archeologist. The catalog system will include site and provenience designations.

All cultural resources located by the survey will be evaluated against the National Register criteria contained in Title 36 CFR Part 60.4 to assess the potential eligibility for inclusion in the National Register. The Contractor will classify each site as either eligible for inclusion in the National Register, potentially eligible, or not eligible. The Contractor shall fully support his recommendations regarding site significance. For those sites considered worthy of additional testing, the Contractor will recommend a specific testing plan. The Contractor shall also recommend appropriate mitigation measures for all sites classified as eligible.

The North Bend Site (16SMY132) will be evaluated against the National Register criteria and within the framework of the site's historic setting to assess its eligibility for inclusion in the National Register. If the site is recommended as

eligible, the Contractor shall consult with the technical representative to review the project design and possible project effects.

The analyses will be fully documented. Methodologies and assumptions employed will be explained and justified. Inferential statements and conclusions will be supported by statistics where possible. Additional requirements for the draft report are contained in Section 6 of this Scope of Services.

**6. Reports:**

a. Phase 1 Report. Two copies of the report on the results of the Phase 1 investigations will be submitted to the COR within 3 weeks after work item award for review and approval. All review comments will be resolved or incorporated within 1 week after submittal. This report will present in detail the proposed field methodology.

b. Draft and Final Reports (Phase 1-3). Six copies of the draft report integrating all phases of this investigation will be submitted to the COR for review and comment within 16 weeks after delivery order award. Along with the draft reports, the Contractor shall submit:

(1) One copy of the aerial mosaic project maps, marked with the locations of all sites and standing structures in the project easement;
(2) two unbound copies of each site, site update, and standing structure form;
(3) three copies of the National Register Registration Forms for each site recommended as eligible for inclusion in the National Register. This documentation will contain all of the data required by NPS National Register Bulletin 16: Guidelines for Completing National Register of Historic Places Forms.

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

The COR will provide all review comments to the Contractor within 8 weeks after receipt of the draft reports (24 weeks after work item award). Upon receipt of the review comments on the draft report, the Contractor shall incorporate or resolve all comments and submit one preliminary copy of the final report to the COR within 4 weeks (28 weeks after work item award). Upon approval of the preliminary final report by the COR (within 1 week after submittal), the Contractor will submit 30 copies and one reproducible master copy of the final report to the COR within 32 weeks after work item award. The Contractor will also provide computer disk(s) of the text of the final report in Microsoft Word or ASCII format.

Included as an appendix to the Final Report will be a complete and accurate listing of cultural material and associated documentation recovered and/or generated. In order to preclude vandalism, the final report shall not contain specific locations of archeological sites. Site specific information, including one set of project maps accurately delineating site locations, site forms, black and white photographs and maps, shall be included in an appendix separate from the main report.

**7. Right-of-entry.** The New Orleans District has obtained right-of-entry for archeological investigations in the two study areas. However, the property owners have requested that we closely coordinate our activities with them. For the Todd Area survey, the contractor shall contact Mr. Joel Luke prior to entering upon the property. Mr. Luke can be reached at phone number (318) 836-9484. Prior to initiating fieldwork at the North Bend Site, the Contractor shall check in at the offices of the Cabot Carbon Company which are immediately adjacent to the site.