Exhibit 22B-Avoyelles Parish Port-Cultural Resource Study

Contract Publication Series 13-171

A CULTURAL RESOURCE SURVEY OF 200 ACRES FOR THE PROPOSED PORT OF AVOYELLES DEVELOPMENT IN AVOYELLES PARISH, LOUISIANA

by
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Prepared for

CLEDA
Central Louisiana Economic Development Alliance

Prepared by

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ABSTRACT

Cultural Resource Analysts, Inc., personnel completed a records review and cultural resource survey of an 80.9 ha (200.0 acres) parcel for the proposed Port of Avoyelles development in Avoyelles Parish, Louisiana. This work was conducted at the request of Rick Ranson of the Central Louisiana Economic Development Alliance (CLEDA). The records review for the project was conducted on May 6, 2013. Fieldwork for this project was conducted between May 9 and 16, 2013. This tract is located on the west side of Louisiana State Highway 105 approximately 2.3 km (1.4 mi) south of downtown Simmesport, Louisiana.

The records review consisted of a search of online files maintained by the Louisiana Office of Cultural Development Division of Archaeology to identify any cultural resources or cultural resource investigations documented in the area. The records review indicated that no previous surveys and no cultural resources have been documented in the current project area or within a 1.6 km (1.0 mi) radius of the project area.

Field investigation consisted of an intensive pedestrian survey supplemented with screened shovel tests, and limited deep testing. Approximately the eastern 40 percent of the project area was within .8 km (.5 mi) of the Atchafalaya River, and therefore had a high probability of containing cultural material. In these areas, shovel testing was conducted at a 30.0 m (98.4 ft) interval, and in the remainder of the project area, further west of the river, shovel tests were excavated at a 50.0 m (164.0 ft) interval. A total of 648 shovel tests were excavated on 65 transects. Deep testing of five backhoe trenches was conducted in areas with the potential for buried archaeological materials. Two new archaeological sites (16AV149 and 16AV150) and one isolated find (X16AVA) were identified within the project area during the current investigation.

Both of the newly recorded sites are historic artifact scatters that lack contextual integrity. No structures are depicted in the vicinity of either site on the historic maps that were consulted, but analysis of the recovered artifacts suggests that both sites represent the remains of residences dating to the late nineteenth or early twentieth century. The two sites and the isolated find do not have the potential to yield any significant archaeological data, and as a result are not recommended for additional archaeological work. Based on the findings of the records review and the cultural resource survey, no archaeological sites or historic properties listed in, or recommended eligible for listing in, the National Register of Historic Places will be affected by the proposed construction activities, and cultural resource clearance is recommended.

ACKNOWLEDGMENTS

Cultural Resource Analysts, Inc. would like to thank Mr. Rick Ranson of Central Louisiana Economic Development Alliance for selecting us to conduct this study. Mr. Tommy Maddie addressed inquiries and served as the crew's information contact during fieldwork, and his assistance is greatly appreciated. Mr. Adam Lemoine of Cottonport, Louisiana, served as the backhoe operator during the deep testing portion of the project. Cheraki Williams at the Louisiana Division of Archaeology provided assistance with the issuance of site numbers and catalog numbers for the sites visited during the project.

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Chapter 1. Introduction

Cultural Resource Analysts, Inc. (CRA), personnel completed a file search on May 6, 2013, and fieldwork between May 9 and May 16, 2013, of an 80.9 ha (200.0 acres) parcel for the proposed Port of Avoyelles development in Avoyelles Parish, Louisiana (Figure 1.1). The file search and cultural resource survey were conducted at the request of Rick Ranson, Vice President of Central Louisiana Economic Development Alliance (CLEDA). The proposed project area consisted of approximately 80.9 ha (200.0 acres) along the west side of Louisiana State Highway 105 (LA 105), roughly 420 m (1,378 ft) west of the Atchafalaya River. This location is roughly 2.5 km (1.6 mi) south of the town of Simmesport, Louisiana (Figure 1.2).

The archaeological file search, using online files maintained by the Louisiana Office of Cultural Development Division of Archaeology/State Historic Preservation Office (SHPO), was conducted by Benjamin J. Bilgri. Fieldwork for the project was supervised by Benjamin J. Bilgri, and the field crew consisted of Jeremy Mangum, Adam Boe, and Charlie Burton. The fieldwork was conducted in approximately 270 person hours.

Purpose of Study

This study was conducted to comply with SHPO requirements in anticipation of federal involvement, although no lead federal agency was yet identified at the time this report was prepared. SHPO requirements specify that an archaeological survey must be completed prior to development of the parcel. All work associated with this investigation was conducted pursuant to standards set forth by SHPO, to comply with the National Historic Preservation Act (NHPA) as amended (36 CFR Part 800). *Louisiana's Comprehensive Archaeological Plan* (LCAP) was referred to for guidance during this investigation (Smith et al. 1983).

The purpose of this assessment was to locate, describe, evaluate, and to make appropriate recommendations for the future treatment of any historic or prehistoric archaeological properties that may be affected by proposed construction activities. All associated field notes, records, and site photographs will be curated with the SHPO in Baton Rouge, Louisiana.

Figure 1.1. Map showing the location of Avoyelles Parish in the state of Louisiana.

Project Description

The current survey is necessary to complete the compliance process for the proposed Port of Avoyelles complex to prepare the location for development. The proposed project is located roughly 2.5 km (1.6 mi) south of Simmesport, Louisiana, on the west bank of the Atchafalaya River near the southeast corner of Avoyelles Parish. The project area encompassed 80.9 ha (200.0 acres) and consisted of an irregular polygon. The eastern project area boundary was the western edge of LA 105; the northern boundary was arbitrary and was located approximately 40 m (131 ft) south of Bush Lane; the southern boundary was arbitrary and was located approximately 1.19 km (.74 mi)

south of Bush Lane; and the western boundary was arbitrary and was approximately .76 km (.47 mi) west of LA 105 (Figure 1.2). Located in Section 24 of T1S, R6E, the project area is depicted on the Simmesport, Louisiana, 7.5-minute United States Geological Survey (USGS) topographic quadrangle (USGS 1998).

The project area consisted entirely of cultivated agricultural fields with excellent surface visibility. Several intermittent tributaries of Wilson Bayou and Brushy Bayou run roughly north–south through the project area; although following several days after a heavy rainfall, these were dry during the field investigation and were typically distinguishable only as very shallow swales in the agricultural fields. The project area was considered to have varying levels of site probability based on distance to perennial water sources (see Figure 4.1).

Summary of Findings

The records review conducted using data available from the SHPO indicated that no previous archaeological surveys have been conducted within 1.6 km (1.0 mi) of the project area. No previously recorded archaeological sites or documented historic standing structures are located within the same radius.

Field investigation consisted of an intensive pedestrian survey supplemented with screened shovel tests excavated at 30.0 m (98.4 ft) and 50.0 m (164.0 ft) intervals, and limited deep testing. A total of 648 shovel tests were excavated on 65 transects, and deep testing consisted of the excavation of five backhoe trenches to sample a portion of the areas with the greatest potential for buried archaeological materials. The fieldwork resulted in the documentation of two new archaeological sites (16AV149 and 16AV150) and one isolated find. Both sites are historic artifact scatters that lack contextual integrity. No structures are depicted in the vicinity of either site on the historic maps that were consulted, but analysis of the recovered artifacts suggests that both sites represent the remains of residences dating to the late nineteenth or early twentieth century. The two sites and the isolated find do not have the potential to yield any significant archaeological data, and as a result are not recommended for additional archaeological work.

Based on the findings of the records review and the cultural resource survey, no archaeological sites or historic properties listed in, or recommended eligible for listing in, the National Register of Historic Places (NRHP) will be affected by the proposed construction activities. CRA recommends no further work, and cultural resource clearance for the proposed project area is recommended.

Report Organization

This report is organized into seven numbered chapters. Chapter 1 provides an overview of the project and summarizes the results of the archaeological investigation. Chapter 2 is an overview of the environmental setting of the project area. The records review of the project area and a cultural history overview are detailed in Chapter 3. Chapter 4 contains the methodological approach of the archaeological investigation. Chapter 5 discusses the artifacts recovered during the current project. The results of the cultural resource survey are presented in Chapter 6, and CRA's conclusions and recommendations regarding future work in the project area are presented in Chapter 7.

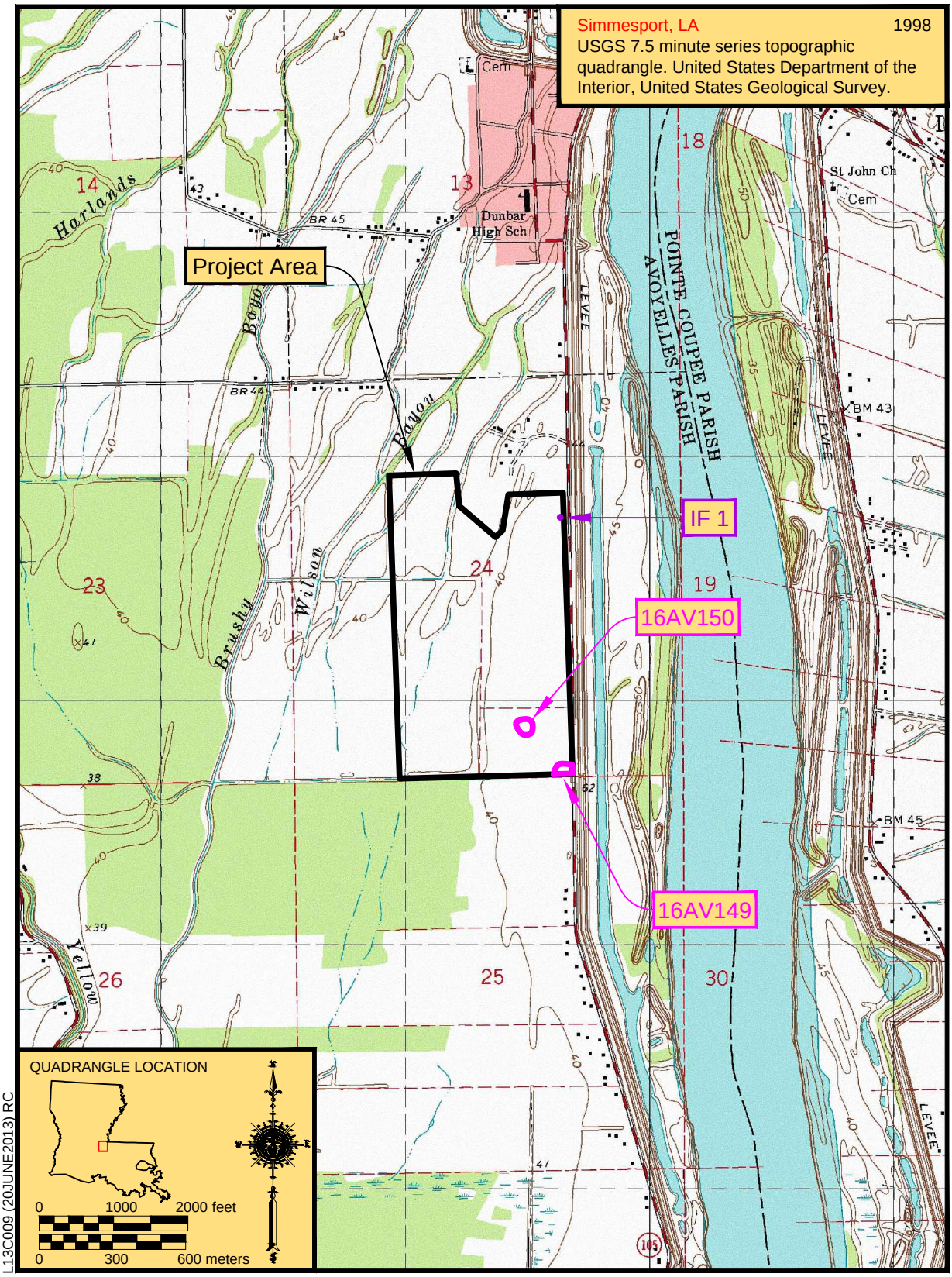

Figure 1.2. Topographic map showing the locations of the project area and cultural resources within the project area.

Chapter 2. Environmental Setting

This chapter of the report provides a description of the modern environment and considers those aspects of the physical environment that may have influenced the location and methods for finding archaeological sites. The discussion of the modern environment specifically provides information regarding the physiography, geomorphology, soils, vegetation, and climate.

Physiography

The project area is located in Avoyelles Parish in east central Louisiana. Avoyelles Parish covers an area of 220,149 ha (544,000 acres), with 8,130 ha (20,090 acres) of that consisting of water sources, including various lakes, bayous, and rivers (Martin 1986). The project area's elevation is 12–13 m (38–43 ft) above mean sea level (AMSL), sloping very gently downward from east to west. The Atchafalaya River is situated roughly 420 m (1,378 ft) east of the project area, and the Old River Control Structure at the junction of the Red, Mississippi, and Atchafalaya Rivers is approximately 10 km (6 mi) to the northeast.

The survey area is situated within the Southern Backswamps of the Mississippi Alluvial Plain "ecoregion," a term used by Daigle et al. (2006) to refer to geographic areas similar in environmental characteristics, vegetation, soils, and biotic and abiotic resources. The Mississippi Alluvial Plain extends south along the course of the Mississippi River from southern Illinois to the Gulf of Mexico, and is comprised of a flat alluvial plain with major elements of relief provided by swales, river terraces, and constructed and natural levees. The Southern Backswamps within this ecoregion are generally level, low-lying, and poorly-drained, and vegetated in bottomland hardwood forests or utilized for agriculture. Within Avoyelles Parish, typical crops in these areas include soybeans, corn, sugarcane, and cotton (Daigle et al. 2006; Martin 1986). The project area itself was entirely covered by soybean fields that had been recently planted at the time of the survey.

Soils

According to the Soil Survey of Avoyelles Parish, Louisiana, the project area is mapped as containing soils from four different series that are oriented as roughly northeast–southwest trending parallel bands. From west to east, the soils that appear in the project area include Coushatta silt loam, Coushatta silty clay loam, Moreland clay, Commerce silt loam, and Convent very fine sandy loam (Martin 1986).

The northern and western portions of the project area contain Coushatta silt loam or Coushatta silty clay loam of 0–3 percent slope, occupying 55 percent of the project's total area. These soils are nearly level, generally well-drained, and have slow runoff. Coushatta soils typically form on gently sloping natural levees along rivers that carry sediments originating in Permian red beds. A typical Coushatta pedon consists of an Ap horizon of reddish brown (5YR 4/4) silt loam or silty clay loam from 0 to 20 cm (0 to 8 in), a B21 horizon of reddish brown (5YR 4/4) silt loam or silty clay loam from 20 to 38 cm (8 to 15 in), a B22 horizon of reddish brown (5YR 4/4) silty clay from 38 to 69 cm (15 to 27 in), a C1 horizon of reddish brown (5YR 4/4) silt loam or silty clay loam from 69 to 97 cm (27 to 38 in), and a C2 horizon of reddish brown (5YR 5/4) loamy very fine sand from 97 to 112 cm (38 to 44 in) (National Cooperative Soil Survey 1999).

Moreland clay of 0–1 percent slope is present in portions of the central and southern project area, occupying 18 percent of the project's ground area. Moreland clay is a level, somewhat poorly drained soil with slow runoff that forms in low-elevation locations on natural river levees. A typical Moreland clay pedon is comprised of an Ap horizon of dark reddish brown (5YR 3/2) clay from 0 to 15 cm (0 to 6 in), an A1 horizon of dark reddish

brown (5YR 3/3) clay from 15 to 33 cm (6 to 13 in), a B21 horizon of dark reddish brown (5YR 3/4) clay from 33 to 61 cm (13 to 24 in), a B22 horizon of dark reddish brown (5YR 3/4) clay from 61 to 107 cm (24 to 42 in), and a B3 horizon of reddish brown (5YR 4/4) clay from 107 to 152 cm (42 to 60 in) (Martin 1986).

Commerce silt loam of 0–1 percent slope is found in much of the eastern portion of the project area immediately adjacent to LA 105, and occupies 25 percent of the survey's total land area. Similar to Moreland clay, Commerce silt loam is a somewhat poorly drained, nearly level soil that forms on natural levees of the Atchafalaya River. Commerce silt loam typically presents a pedon of an Ap1 horizon of dark grayish brown (10YR 4/2) silt loam from 0 to 15 cm (0 to 6 in), an Ap2 horizon of dark grayish brown (10YR 4/2) silt loam from 15 to 30 cm (6 to 12 in), a B2 horizon of dark grayish brown (10YR 4/2) silt loam from 30 to 56 cm (12 to 22 in), a B3 horizon of dark grayish brown (10YR 4/2) silt loam from 56 to 81 cm (22 to 32 in), and a C1 horizon of grayish brown (10YR 5/2) silt loam from 81 to 130 cm (32 to 51 in) (Martin 1986).

Finally, in the extreme southeastern corner of the project area, a small portion of Convent very fine sandy loam of 0–1 percent slope is present, covering just two percent of the project's land area. Convent series soils are somewhat poorly drained, nearly level soils that form on the highest portions of the Atchafalaya River's natural levees. A typical pedon of Convent very fine sandy loam presents an Ap1 horizon of dark brown (10YR 4/3) very fine sandy loam from 0 to 13 cm (0 to 5 in), an Ap2 horizon of dark brown (10YR 4/3) very fine sandy loam from 13 to 25 cm (5 to 10 in), a C1 horizon of dark grayish brown (10YR 4/2) very fine sandy loam from 25 to 51 cm (10 to 20 in), a C2 horizon of grayish brown (10YR 5/2) very fine sandy loam from 51 to 89 cm (20 to 35 in), and a C3 horizon of grayish brown (10YR 5/2) very fine sandy loam from 89 to 152 cm (35 to 60 in) (Martin 1986).

The profiles of all shovel tests excavated during the survey closely corresponded with one of the above profiles, the pedon seen in each test was generally consistent with the test's position relative to the mapped soil locations in the Soil Survey of Avoyelles Parish, Louisiana. The Ap horizons and at least one B horizon were encountered in virtually all shovel tests, while the deeper B horizons and C horizons were typically not present in shovel tests due to their depth.

Vegetation

The Southern Backswamps ecoregion is located within the Mississippi Alluvial Plain of the central United States. Historically, this region was naturally vegetated with bottomland deciduous forest, but the majority of the woodlands were later cleared for farmland. Modern land utilization in this region is almost exclusively devoted to agriculture (Daigle et al. 2006). At the time of the survey, the entire project area was covered with agricultural fields that had been recently plowed and planted with soybeans.

Modern Climate

Avoyelles Parish has a humid, subtropical climate. There is little fluctuation in climate throughout the parish, and it is characterized by relatively long and hot summers, short and mild winters, and abundant rainfall. Temperatures average 27 degrees C (81 degrees F) in the summer months and 10 degrees C (50 degrees F) in the winter months, with daytime highs averaging around 33 degrees C (92 degrees F) in the summer and daily lows averaging around 4 degrees C (39 degrees F) in the winter. Temperatures sometimes exceed 38 degrees C (100 degrees F), such as in August of 1962 when a temperature of 40 degrees C (104 degrees F) was recorded in Bunkie. The warm summer pattern typically persists from late April or early May through October. Between November and March temperatures have been known to drop below freezing; however, cold fronts are often short lived and temperatures rarely stay at or below freezing throughout the day (Martin 1986).

The climate in Avoyelles Parish is heavily affected by warm, moist air traveling north from the Gulf of Mexico and meeting cooler air moving south from the continent. This movement of air masses contributes to a relatively high level of precipitation. Martin (1986) indicates that precipitation occurs one out of every five days throughout the year. Annual average rainfall in the parish totals 155.7 cm (61.3 in). Snow has been known to fall in small quantities in January and February.

Description of the Project Area

The project area is an irregular polygon oriented north–south on the west side of LA 105, measuring 1,300 m (4,265 ft) in length at its longest point and 730 m (2,395 ft) in width at its widest point, and covering 80.9 ha (200.0 acres) (Figures 1.2 and 1.3). Located within Section 24 of T1S, R6E, the project area is depicted on the Simmesport, Louisiana, 7.5-minute USGS topographic quadrangle (USGS 1998). Elevations in the project area vary by roughly 1.5 m (5.0 ft), from approximately 12 m (38 ft) AMSL in the project area's southwestern corner to 13 m (43 ft) AMSL at the eastern edge of the survey area near LA 105. The most visibly prominent topographic features within the project area are artificial drainage ditches at the borders of individual fields.

As briefly discussed above, the entire project area is covered in cultivated agricultural fields that had been recently planted with soybeans at the time of the survey (Figure 2.1). A number of wide shallow swales marking the location of intermittent tributaries of Wilson Bayou and Brushy Bayou run generally north-south through the agricultural fields in the western half of the project area. Several artificial drainage ditches oriented north–south or east–west are also present, dividing the project area into individual agricultural fields. The drainage ditches and shallow swales were dry for the majority of the project, but did experience flooding for several days after a heavy rain due to their low elevation and generally poor runoff. Although the tributaries are intermittent and topographically subtle, they represent long-term landscape features visible on topographic maps as early as 1955.

Figure 2.1. Project area overview, view south.

The project area is situated on the west side of LA 105 approximately 40 m (131 ft) south of Bush Lane, and extends approximately 1,189 m (3,902 ft) south of Bush Lane. An unnamed dirt road bisects the project area from east to west approximately 390 m (1,280 ft) south of Bush Lane. A square concrete pad measuring 15-x-15 m (49-x-49 ft) is located just to the west of the point where this dirt road intersects Highway 105. No structures are mapped at this location on any of the maps discussed below in the Chapter 3, and the concrete pad appears to be primarily utilized as a parking area for farm equipment. Indeed, multiple pieces of agricultural equipment were observed parked on the pad and in its immediate vicinity at the time of the survey.

The entire project area covers nearly level ground with excellent visibility, all of which was suitable for shovel testing. Based upon observed shovel test and trench profiles and visible surface conditions, the project area has been subjected to disturbance from plowing to a depth of 15–30 cm (6–12 in). Below the plowzone, the natural soil profiles are intact and are consistent with those typical of the Coushatta, Moreland, Commerce, and Convent soil series described above. The weather during the survey was generally clear and sunny.

Chapter 3. Previous Research and Cultural Overview

On May 6, 2013, a search of online files maintained by the Louisiana Office of Cultural Development Division of Archaeology (SHPO) was conducted to: 1) determine if the project area had been previously surveyed for archaeological resources; 2) identify any previously recorded archaeological sites that were situated within the project area; 3) provide information concerning what archaeological resources could be expected within the project area; and 4) provide a context for interpreting any cultural resources identified within the project area. The examination of SHPO data consisted of a review of professional survey reports and records of archaeological sites for an area encompassing a 1.6 km (1.0 mi) radius of the project area. The review of professional survey reports and archaeological site data in the area can provide basic information on the types of archaeological resources that are likely to occur within a project area and the landforms that are most likely to contain these resources. In addition to the examination of site data, a review of available historic maps was conducted to identify any mapped historic structures in the vicinity of the project area and aid in locating potential historic sites. The results of the records review are discussed below.

Previously Documented Surveys

The SHPO maintains an online database containing professional survey reports and archaeological site data for the entire state of Louisiana. Examination of this data indicated that no prior surveys are documented within a 1.6 km (1.0 mi) radius of the project area.

Previously Recorded Sites

A search of the available SHPO records indicated that no previously recorded archaeological sites are present within a 1.6 km (1.0 mi) radius of the project area.

Map Data

In addition to the file search, a review of available maps was conducted to help identify any historic structures that may be located within the project area. These maps provide information on the dynamics of the cultural landscape in response to political and social changes, as well as technological innovations associated with agricultural industries. The following USGS and United States Army Corps of Engineers (USACE) maps were reviewed:

1955 Odenburg, Louisiana, 15-minute series topographic quadrangle map (USACE);

1969 Simmesport, Louisiana, 7.5-minute series topographic quadrangle map (USGS);

1970 Odenburg, Louisiana, 15-minute series topographic quadrangle map (USACE);

1998 Simmesport, Louisiana, 7.5-minute series topographic quadrangle map (USGS);

The map review suggests that one structure was present in the extreme northeast corner of the project area in 1955 but was no longer present in 1969. Similarly, a second structure existed just outside the project area's northwest corner in 1955, but was also no longer extant by 1969. No structural remains or any artifacts associated with these two structures were visible during the current survey. No other structures were present in, or immediately adjacent to, the project area within the time period covered by the available maps, and no standing structures were present in the project area at the time of the current survey. All mapped structures on these maps other than the two depicted in 1955 are well outside the project area and if associated structural elements should exist, they will not be impacted by the proposed construction activities. The results of the map review for each map are presented below.

1955 USACE

This map depicts one standing structure on the west side of LA 105 just inside the project area's northeast corner, and another structure just outside the project area's northwest corner. A further group of four structures is depicted along an unpaved road roughly 220 m (722 ft) north of the survey area's northern boundary (Figure 3.1) (USACE 1955). These latter four structures and all other structures on the map are depicted well outside the project area and they will not be impacted by the proposed construction activity.

1969 USGS

On the 1969 map, both the structure along LA 105 just inside the project area's northeast corner and the structure depicted just outside the project area's northwest corner are no longer present. Only two structures are depicted along the unpaved road approximately 220 m (722 ft) north of the survey area's northern boundary on the 1969 quadrangle (USGS 1969). All structures depicted on the 1969 map are well outside the project area and they will not be impacted by the proposed construction activity.

1970 USACE

The 1970 quadrangle depicts the two structures along the unpaved road 220 m (722 ft) north of the project area as having been joined by a third structure. Like the previous map, no structures are depicted within the project area itself, and all other structures depicted on the 1970 map are well outside the project area and they will not be impacted by the proposed construction activity (USACE 1970).

1998 USGS

The unpaved road 220 m (722 ft) north of the project area is still present on the 1998 map, and seven structures are depicted near the road. No structures are depicted within the project area itself, and all structures depicted on the 1998 map are well outside the project area and they will not be impacted by the proposed construction activity (USGS 1998). By the time of the current survey in 2013, the land immediately to the north of the project area had been developed into a housing complex containing 49 trailer homes.

Survey Predictions

In recent decades, many scholars have labored to develop predictive models to aid in the management and protection of cultural resources (e.g., Anderson et al. 1988, 1999; Anderson and Smith 2003; Campbell and Weed 1986; Hillman 1980; Johnson 1984a, 1984b; Johnson et al. 1986; Phillips and Willingham 1990; Servello 1983; Thomas et al. 1982; and Willingham and Phillips 1987). The factors that tend to be most commonly associated with prehistoric settlement are a close proximity to water and level ground. Historical draws to regions would have been the same as prehistoric, although through time there would have been increasing concern for suitability of land to certain prevailing industries, such as timber production or agriculture. Considering the soils data, information gleaned from historic maps, and the lack of recorded archaeological sites surrounding the project area, certain predictions are possible regarding the presence of cultural resources within the project area.

While the proposed development itself does not incorporate any permanent water sources, the Atchafalaya River is located approximately 420 m (1,378 ft) east of the project area. The entire project area is covered with flat or nearly flat 0–3 percent slopes. The closest recorded archaeological site to the project area is located on the west bank of Yellow Bayou at the junction of Louisiana State Highways 1 and 1183, roughly 4.0 km (2.5 mi) to the northwest. The paucity of sites closer to the project area is likely due to the fact that no cultural resource surveys have previously been conducted in these areas, and is not necessarily a reflection of the region's archaeological potential. It was therefore considered possible that archaeological materials could be present in the project area, especially in those portions of the survey area in close proximity to the Atchafalaya River. Accordingly, those portions of the project area

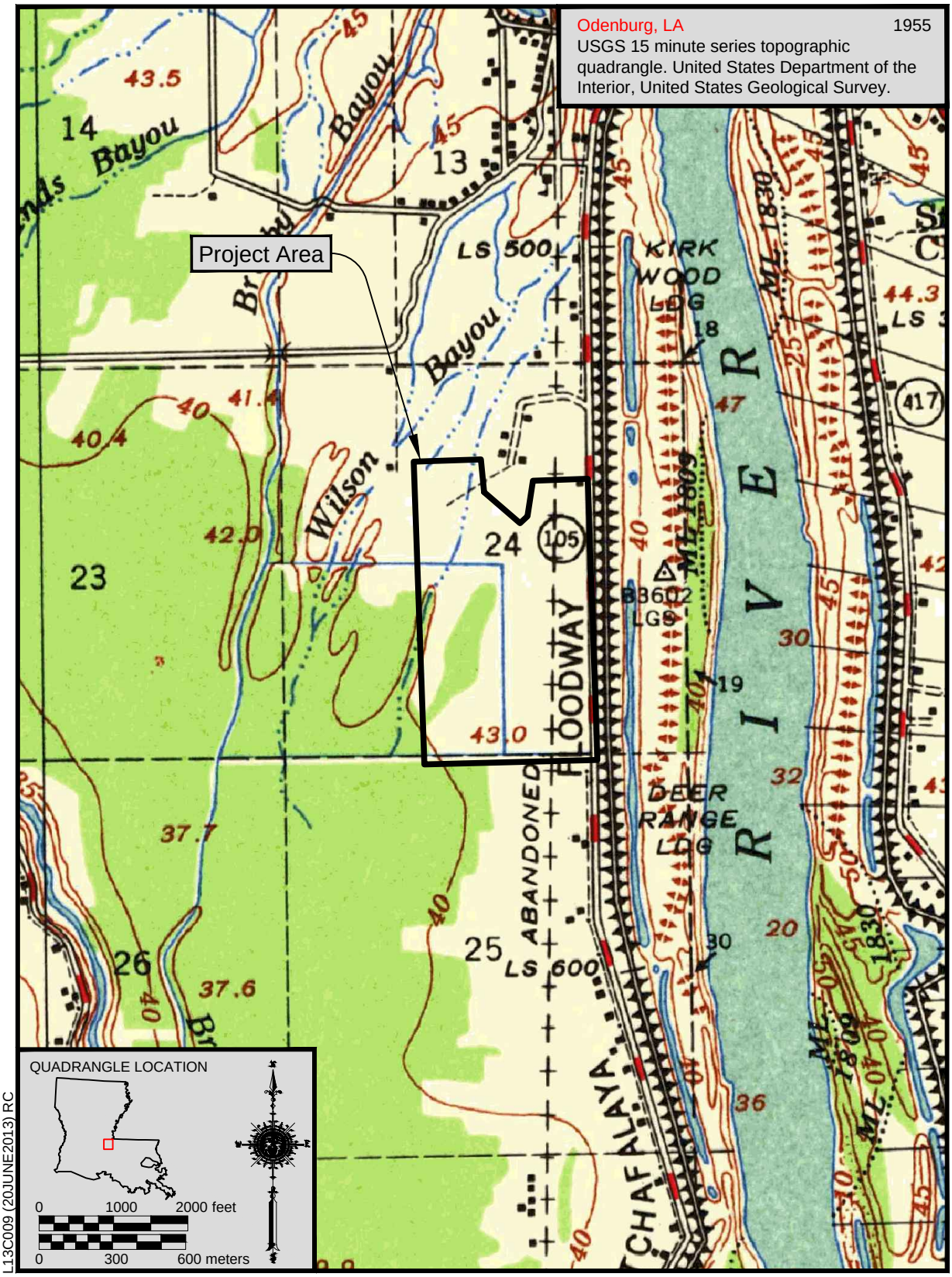

Figure 3.1. Project location depicted on the 1955 Odenburg, Louisiana, 15-minute series topographic quadrangle map.

Within .8 km (.5 mi) of the Atchafalaya River were shovel tested at a high probability interval of 30 m (98 ft). Portions of the project area further from the river were shovel tested at a low probability interval of 50 m (164 ft).

Cultural Overview

This section provides a cultural and historical overview of the project area. This information is drawn from a number of local and regional studies that are believed to be applicable to the cultural history of central Louisiana. This section incorporates data from nearby military installations, in particular Fort Polk roughly 130 km (81 mi) to the west of the project area, due to the extensive number of archaeological studies that have been conducted there.

Paleoindian (11,500–8000 B.C.)

The Paleoindian period represents the earliest manifestation of humans in the New World and is separated into a tripartite set of temporal sequences based on technological innovations presumed to correspond with cultural change. The Early Paleoindian period is presently described as the period from 11,500–9500 B.C., the Middle Paleoindian period is thought to have lasted from 9500–8800 B.C., and Late Paleoindian period is believed to have lasted from 8800 to 8000 B.C.

Early Paleoindian

The Early Paleoindian period is based on a relatively few recently discovered sites that are thought to predate the well-known Clovis culture that is a hallmark of the Paleoindian period. The most notable of these sites in North America are Meadowcroft Rockshelter in Pennsylvania, Cactus Hill in Virginia, and the Topper site in South Carolina (Goodyear 2006; Meltzer 2009). The existence of a pre-Clovis Early Paleoindian culture is still somewhat controversial but is gaining acceptance in the archaeological community (see Meltzer 2009). The earliest date that is broadly accepted for this period is approximately 11,500 B.C. though some researchers refute the evidence for a pre-Clovis occupation altogether, favoring the Clovis-first hypothesis for colonization of the New World. Pre-Clovis components have been reported from a number of sites that have not seen peer review and have not been widely accepted by the archaeological community, and some of these boast dates that are earlier than most researchers accept as valid (Meltzer 2009). By definition, the pre-Clovis Early Paleoindian period ended with the introduction of the Clovis projectile point at approximately 9500 B.C.

To date, no pre-Clovis sites have been identified in Louisiana (Anderson and Smith 2003:350). Given the scant evidence of later Paleoindian sub-periods and the generally meager evidence of Paleoindian habitation in the state in general, Early Paleoindian components would likely be difficult to find (Rees 2010). As a result of the relatively recent acceptance of a pre-Clovis Early Paleoindian colonization of North America and the low number of sites dating to this period, little is presently known about the social organization, diet, and other cultural characteristics of these populations.

Middle Paleoindian

The Middle Paleoindian period is represented by distinctive lanceolate fluted points including the well-known Clovis type. Paleoindian sites dating to this period in Louisiana are rare, amounting to just a few across the entire state. As a result of the poor representation of this period little is known of the dates for Clovis in Louisiana and much of the information regarding chronology and culture comes from other parts of the Southeast. The accepted date range for Clovis in the Southeast generally falls into the range from 9500 to 8800 B.C. (Rees 2010).

The Middle Paleoindian period has been traditionally characterized as consisting of small, extremely mobile groups that utilized a specialized lithic tool kit designed primarily for hunting, butchering, and hide-working activities (Maggard and Stackelbeck 2008). What is known of the settlement, mobility and diet of these groups suggests that they subsisted largely through hunting big-game

species, supplemented by the acquisition and consumption of seasonally available plant resources (Anderson and Sassaman 1996). The emphasis on big game hunting in these models has recently been criticized by Kornfeld (2007), who notes that during the development of Paleoindian subsistence models Pleistocene megafauna "kill sites" were most often used to identify Clovis components, and therefore other site types were underrepresented during model-building and the importance of other dietary resources may be underestimated. Whether these Paleoindian groups were big game specialists or had a more generalized diet has become a topic of debate among researchers in recent years, and very little subsistence data has been secured from Middle Paleoindian sites in Louisiana to contribute to subsistence modeling.

The distribution of identified Middle Paleoindian occupations in North America has shown that major river valleys like the Mississippi, Ohio, Tennessee, and Cumberland, as well as parts of the Atlantic coastal plain into Florida, appear to have been favorable locations for Clovis populations (Anderson and Smith 2003). In Louisiana, Paleoindian occupations along the major river valleys are likely inaccessible due to massive accumulations of sediment, and many may have been destroyed through erosive alluvial processes. For example, along the Atchafalaya River, as much as 40 m (131 ft) of sediment may overlie components dating back to only 3500 B.C. (Smith et al. 1986, cited in Rees 2010:41).

Among the most impressive Middle Paleoindian sites known in Louisiana is the John Pearce site (16CD56) along the Tertiary Uplands of northwest Louisiana, in Caddo Parish. Webb et al. (1971) reported three Clovis points along with several other lanceolate points from excavations at the site. It was unclear to the researchers whether the Clovis points were contemporaneously deposited with Pelican, Meserve (or possibly Dalton or San Patrice), and other lanceolate points usually associated with the Late Paleoindian period or if the Clovis points predated them (Webb et al. 1971, cited in Rees 2010). The co-occurrence of Clovis with Late Paleoindian lanceolate points has also been reported at other sites in Louisiana (see Rees 2010:49) and elsewhere, including San Patrice points at the Big Eddy site in southwest Missouri where they have been interpreted as having been deposited coevally during a single component (Lopinot et al. 1998). These data suggest the possibility that Clovis and other Middle Paleoindian points may have been introduced later in some areas, or that their use may have persisted into the Late Paleoindian period.

Peason Ridge is a lithic quarry located in west-central Louisiana at Fort Polk, and has produced lanceolate points from an apparently undisturbed Middle Paleoindian occupation that has been intensively studied. Among other information that this site has provided, it has shown that well-preserved Clovis sites exist in upland locations in Louisiana (Rees 2010). Since this site is a quarry locale, we would expect that it would be more easily identified archaeologically than more ephemeral site types with fewer artifacts, but we should fully expect that other, well-preserved Middle Paleoindian sites exist in northwest and central Louisiana that have escaped detection thus far.

Other, less intensively studied Middle Paleoindian sites have been identified throughout the state. According to research by Gagliano and Gregory (1965), the distribution of Clovis points shows the greatest representation along the Tertiary Uplands of northwest Louisiana. Like most areas of the Southeast, Clovis and other large lanceolate points in Louisiana have primarily been found in surface contexts. The distributions of these points may provide coarse-grained information on the distributions of Clovis culture (Rees 2010), although greater surface visibility along eroded uplands may favor their detection in these areas, as has been suggested elsewhere (Perkinson 1971).

Late Paleoindian

The Late Paleoindian period is thought to represent a period of decreased residential mobility and population increase, based on an increasing regional diversity in projectile point

types, decreased use of exotic lithic materials, and an increased number of identified sites. This sub-period coincides temporally with the Younger Dryas, a period of dramatically colder temperatures and increased aridity. Projectile point types that represent the Late Paleoindian period in Louisiana include the Pelican type and several varieties of the San Patrice types, which are thought to temporally precede the Angostura, Folsom, Meserve midland, Plainview, Quad, and Scottsbluff types later in this sub-period (Rees 2010). These types display varied stylistic qualities, and in some cases occur in fairly restricted spatial distributions suggesting increased regionalization or isolation of cultural groups as population levels increased and group mobility decreased (Anderson and Smith 2003:353).

Research into the Late Paleoindian period in Louisiana has included Peason Ridge, which contains a number of Paleoindian and Early Archaic components. The availability of high quality lithic material, such as Eagle Hill chert, is among the factors that may have made this location attractive for Middle and Late Paleoindian habitation. Eagle Hill is also one of the highest points in the immediate region, possibly making it a valued lookout point. It is also at a convenient location between the Sabine, Calcasieu, and Red Rivers, providing an adequate rendezvous point for peoples from each drainage area. Based on the extensive use of Eagle Hill during the Paleoindian and Early Archaic periods, Anderson and Smith (2003:363–364) have suggested that this area may represent an aggregation locus utilized by bands occupying the nearby drainages for critical social and biological functions (sensu Anderson and Hanson 1988).

The transition from lanceolate points during the early part of the Late Paleoindian period to side-notched forms by the end of this sub-period may relate to technological shifts such as the introduction of the atlatl (Jennings 2008). The shift in hafting technology, from basally-thinned to side-notched, along with inferred changes in patterns of settlement and mobility have suggested to some researchers a greater cultural continuity with the Early Archaic period than with the preceding Paleoindian sub-periods (Anderson and Smith 2003).

Archaic (8000–1250 B.C.)

The Archaic period represents an era of human adaptation to the warmer conditions brought on at the onset of the Holocene epoch in North America. This period is sub-divided into the Early Archaic (8000–6000 B.C.), Middle Archaic (6000–2000 B.C.) and Late Archaic (2000–1200 B.C.). These sub-periods are defined by changes in hafted bifaces and other non-perishable technology, which are believed to relate to changes in resource exploitation, ultimately corresponding with transitions in settlement and mobility strategies and social organization.

Early Archaic

The Early Archaic period spans from the end of the Younger Dryas to the beginning of the Hypsithermal episode, which was a warming climatic trend in the Middle Holocene. Projectile point styles associated with this period in the greater Southeast follow a sequence from side-notched to corner-notched and finally bifurcated forms during the end of the Early Archaic period. In central Louisiana, San Patrice, vars. Keithville, Dixon and Leaf River and Big Sandy points represent the side-notched tradition. Corner-notched varieties include the Palmer and Kirk types, which are found throughout the Southeast, as well as Angostura and Scottsbluff points found on the Great Plains. Bifurcated points, which are found during the terminal Early Archaic period in the South Appalachian area, have not been reported from sites in Louisiana. These forms show a decreasing frequency gradient away from the mountains of North Carolina, where they were first identified (Claggett and Cable 1982:434), and seem to have a much narrower distribution than the side- and corner-notched types discussed above. The Middle Archaic Kisatchie Phase, identified by Sinner points, may have its origin in the terminal Early Archaic period in Louisiana (Anderson and

Smith 2003) although the use of this phase in central Louisiana is tenuous.

Middle Archaic

The Middle Archaic period is believed to represent human adaptation to the Hypsithermal episode. A warmer and dryer climate resulted in decreased water levels, which is believed to have led to increased habitation near permanent bodies of water. This period marks the beginnings of earthen architecture in northeast Louisiana, which is the earliest known monumental architecture in North America. Research conducted at Watson Brake and other Middle Archaic mound complexes in northeast Louisiana have provided a baseline for identifying and understanding Middle Archaic components elsewhere, although these patterns have not been well established in central Louisiana. Mound construction during this period may generally be regarded as signaling greater population densities and increased sedentism, and there appears to have been increased interaction among Middle Archaic groups compared with earlier periods. Increased competition and warfare among groups was likely a response to more restricted access to resources as a result of population increase (Anderson and Smith 2003).

Sinner hafted bifaces represent a poorly-defined Kisatchie phase, which has been proposed for the terminal Early Archaic and early Middle Archaic periods (approximately 7500–6600 B.C.) at Fort Polk in western Louisiana (Thomas et al. 1997). Evans type hafted bifaces are the primary diagnostic of this period and date from around 2500 B.C. into the Late Archaic period. Central Louisiana is at the southern extent of their distribution, which spans from the Catahoula Lake area of central Louisiana northward into south-central Arkansas. Several single component sites dating to the Middle Archaic have been identified at Fort Polk in west-central Louisiana, yielding hafted bifaces characteristic of Evans or Sinner point types. Evans points are medium to large corner-notched points that exhibit a characteristic additional deep notch on the mid or lower edge that distinguishes them from other point types in the region (Webb 2000; Anderson and Smith 2003). Webb (2000) describes Sinner points as typically have two or more notches on the edges of the body and being smaller and more poorly made than Evans points (Webb 2000). Other points found in the area that are thought to date to the Middle Archaic include the Bulverde and Yarbrough types. Bulverde points typically have a more western distribution than the Evans point type, though they have been found in context with one another (Anderson and Smith 2003).

Late Archaic

The Late Archaic is believed to mark a period of increased regional population densities as environmental conditions began to display more modern characteristics. In northeast Louisiana, large-scale mound construction, long distance trade, and warfare increased during this period. The well-known Poverty Point site in northeast Louisiana represents a pinnacle of earthwork construction during the Archaic period, between 1730 and 1250 B.C. (Gibson 2010).

Sites dating to the Late Archaic period in central Louisiana are situated on terrace margins and rises overlooking tributaries. Based on the increased occurrence of plant-processing artifacts on sites dating to this period, such as sandstone manos and metates, it is inferred that there was an increase in plant processing, although it was still probably not extensive (Anderson and Smith 2003). The Birds Creek and Leander Phases have been identified at Fort Polk in west-central Louisiana. The Leander phase is identified by the presence of Motley, Epps, Delhi, and Calcasieu point types, and is strongly associated with the Poverty Point Culture. The Birds Creek phase is identified by the presence of Epps and Ensor point types, both of which are common at Fort Polk (Anderson and Smith 2003). Additionally, baked clay objects have been found on both Birds Creek and Leander phase sites and are indistinguishable from baked clay objects found at the Poverty Point site (Anderson and Smith 2003). Fiber-tempered pottery also made its appearance

during this time period and has been found on sites throughout Louisiana.

Woodland (1250 B.C.–A.D. 900)

Like the preceding periods, the Woodland period is divided into Early (1250 B.C.–A.D. 1), Middle (A.D. 1–400) and Late (A.D. 400–900) sub-periods in the Southeast. The beginning of the Woodland period is arbitrarily set at the widespread adoption of ceramic vessels. In addition to changes to projectile point morphology, the shifts in material culture that archaeologists use to denote Woodland sub-periods include stylistic changes to pottery. Other innovations that are thought to have affected subsistence practices during the Woodland period include broad implementation of the bow and arrow, and the adoption of horticulture (Anderson and Smith 2003).

Early Woodland/Tchefuncte

The Early Woodland period, referred to in the lower Mississippi Alluvial Valley as the Tchula period began at approximately 1250 B.C. The best known Early Woodland culture in Louisiana is Tchefuncte, which is believed to have existed between 800 B.C.–A.D. 1 (Hays and Weinstein 2010). During the first several centuries of the Early Woodland period, fluctuating climatic conditions resulted in cooler temperatures, and two short-term cold events are likely to have had a pronounced effect on native populations in the region. The widespread adoption of pottery manufacture signals the onset of the Early Woodland period, and the end of the Poverty Point culture in Louisiana also corresponds to this sub-period.

Although information pertaining to Early Woodland settlement is limited, based on the presence of well-defined structures, large subterranean storage pits, and dense occupational middens at some sites, Early Woodland groups are believed to have experienced increased sedentism with some groups inhabiting specific settlement locations year-round. Though this may be true at some locations, Anderson and Mainfort (2002) indicate that sites in the Central Mississippi Valley are typically small, having a few structures and probably no more than 50–60 people. With group mobility still a prominent characteristic of many indigenous groups, social organization appears to have been based on unranked or minimally ranked lineages and clans (Anderson and Mainfort 2002:45).

The Early Woodland period in the Southeast saw the cultivation of native plant species like goosefoot, sumpweed, sunflower, knotweed, squash/gourd, and maygrass, though the level of dependence upon such crops is unknown. The use of cultigens during this period likely varied regionally (Anderson and Mainfort 2002).

Tchefuncte culture appears to have been centered in eastern Louisiana and along the Gulf Coast, where small groups occupied sedentary and autonomous hamlets along slow-moving streams (Hays and Weinstein 2010). In central Louisiana, very few Tchefuncte period sites have been identified. Among the most prominent assemblages found near west-central Louisiana is a collection of eight sherds from a site along Peason Ridge at Fort Polk, illustrating the scarcity of this cultural material in the region (Anderson and Smith 2003). A few possible Tchefuncte sites have also been reported from Lake Rodemacher approximately 100 km (62 mi) northwest of the project area (House 1972) and in a cluster around southern Natchitoches Parish and northern Rapides Parish (Gregory and Curry 1978). The latter have been assigned to a Lena phase and have produced Lake Borgne Incised and Orleans Punctate pottery with Pontchartrain hafted bifaces and tubular clay pipes (Gregory and Curry 1978).

Middle Woodland/Marksville and Troyville

Throughout much of the Eastern Woodlands during the Middle Woodland period, Hopewell Culture thrived and culminated in the construction of massive earthen ceremonial centers and the implementation of an extensive trade network throughout much of the South Atlantic Slope and the Southeast. The Middle Woodland

period in Louisiana is associated with the Marksville culture, which existed from approximately A.D. 1 to 400 (McGimsey 2010), and the Troyville culture, which existed from approximately A.D. 300 to 900 (Lee 2010).

Marksville culture has traditionally been viewed as a regional variation of the Hopewell culture due to the presence of large earthen mounds, an elaborate mortuary complex, and intricately designed ceramics with similar iconographic themes to the Hopewell at the earliest Marksville sites discovered and studied. Although contemporaneous with Hopewell, many of the defining traits of this culture are not universally present at Marksville sites in Louisiana and most sites are relatively small. For example, the evidence of widespread, long-distance trade is not found on Marksville sites, or is at least not as extensive as on Hopewell sites. Relatively few examples of non-local materials, such as galena or copper, have been found in burial contexts at Marksville sites, although abundant extra-local chert seems to have been acquired through trade. The archaeological patterns found among Marksville sites and cemeteries also do not indicate that a hierarchical social organization was imbedded in the culture, but rather that it was largely egalitarian (McGimsey 2010).

Troyville culture is usually associated with the Baytown period (A.D. 400–700) (Lee 2010). Although it has been described as a period of cultural decline between the earlier Marksville and later Coles Creek cultures, the Baytown period is presently thought to represent a time that increased regional differentiation set the stage for the later, more complex societies (Lee 2010). Cultural continuities with earlier cultures include some evidence of long-distance trade and mound construction for public ceremonies and interment, while innovations during this period likely include the introduction of the bow and arrow, sometime around A.D. 600–700. Like the preceding Marksville culture, there does not appear to be a great deal of status differentiation among individuals at Troyville sites (Lee 2010).

Subsistence patterns compiled using data from Middle Woodland sites in Louisiana indicate that there is little change from the patterns of the preceding Tchefuncte culture. An emphasis on gathering and hunting of locally available flora and fauna is inferred from the dietary remains at these sites, and there is little indication that Marksville or Troyville populations participated in the cultivation of domesticated seed plants used by Hopewell populations during this period (Lee 2010, McGimsey 2010).

Marksville sites are identified by the presence of incised and zoned rocker-stamped Marksville ceramics (McGimsey 2010), while the later Baytown/Troyville ceramics are recognized by Baytown Plain and newly-introduced bi-chrome and polychrome painted ceramics (Lee 2010). Hafted bifaces are not generally considered diagnostic for the Middle Woodland period due to the long temporal range of points found in contexts dating to this period.

Marksville sites at Fort Polk in west-central Louisiana have been assigned to the Whiskey Chitto phase (Campbell et al. 1987). These sites are typically identified by the presence of Marksville stamped and Marksville incised pottery types, exhibiting rim forms and motifs like those of the Marksville in the Lower Mississippi Valley. Grog temper appears to be predominant in these specimens, though there are hints of bone and/or sandy paste in some. Dooley Branch, Ellis, Gary, Kent, the Williams cluster and similar points occur at Whiskey Chitto sites, though as mentioned before they are not diagnostic of this specific time period due to their temporal range (Anderson and Smith 2003). There are no complex ceremonial centers dating to this period known to exist in the vicinity of the project area, although several Marksville sites have been recorded to the east and southeast of Alexandria in Rapides Parish to the west of the project area (Wessel et al. 1993). Marksville ceramics were also present at the Coral Snake Mound along the Sabine River to the west, Bellevue Mound in northwest Louisiana, and the Fredericks site near Natchitoches (Anderson

and Smith 2003). Other cultures that potentially influenced developments in northwest Louisiana during the Middle Woodland include the Mossy Grove culture from eastern Texas and the Fourche Maline in northwest Louisiana and beyond.

No phases for Troyville culture have been identified in central Louisiana or at Fort Polk, and these components seem to be rare in general. The rarity of Mulberry Creek Cord Marked ceramics, which is the primary defining type for this period in the region, has been noted throughout western Louisiana (Anderson and Smith 2003). Several sites dating to the Baytown period have been recorded to the north of the project area near Catahoula Lake and in the Black River and Little River watersheds (Wessel et al. 1993).

Late Woodland/Coles Creek

The Late Woodland sub-period (circa A.D. 400–900) experienced a slight fluctuation in climate, with temperatures mildly dropping between circa A.D. 400 and 800, but warming again to a point beneficial for agriculture in the East (Anderson and Smith 2003). At this time, a continuation of the Troyville culture is believed to have occurred along the Red River, with the emergence of the Coles Creek culture at approximately A.D. 700 (Roe and Schilling 2010).

The Coles Creek period is believed to represent an important shift toward hierarchical social organization from the egalitarian order of earlier periods. This is reflected in the changing role of earthen architecture from primarily serving a mortuary function to providing a platform for structures and ceremonies for community functions or possibly related to a chiefly elite. Although formalization of a mound and plaza ceremonial center appears to have occurred at Coles Creek sites, the differentiation of hierarchical groups is difficult to see through mortuary and other archaeological remains (Roe and Schilling 2010).

Like the preceding Marksville and Troyville cultures, Coles Creek populations seem to have relied primarily upon local wild plants and animals for subsistence, although domesticated versions of native grasses including maygrass, chenopod, and knotweed were identified at some Coles Creek sites. Since other sites from which subsistence data have been obtained lack evidence of domesticated cultigens, the use of cultigens is believed not to have been widespread. At the end of the Coles Creek period, the use of starchy seeds seems to have increased with maize playing a minor role (Roe and Schilling 2010).

A variety of Late Woodland ceramics comprise Coles Creek assemblages, consisting primarily of grog-tempered or grog-and-sand-tempered Chevalier Stamped, Coles Creek Incised, Evansville Punctated, French Fork Incised, Mazique Incised, and Pontchartrain Check Stamped ceramics. Use of the bow and arrow flourished during the Late Woodland period, which is reflected in the abundance of small arrow point types dating to this period. Alba, Catahoula, Hayes, Friley, Scallorn, and possibly Colbert points are associated with the Coles Creek and Caddo cultures (Anderson and Smith 2003).

Truncated pyramidal mounds have been recorded at numerous Coles Creek sites in the region, but not in the vicinity of the project area. To the north of the project area, near Catahoula Lake and Jonesville, numerous Coles Creek sites have been recorded (Wessel et al. 1993). Presently at Fort Polk, there is little evidence of long-term habitation by Coles Creek or affiliated peoples. Based on the limited amount of ceramics found at Coles Creek sites and the small size of sites, it is suggested that the sites resulted from short-term activities (Anderson and Smith 2003).

Late Prehistoric (A.D. 900–1700)

The end of the Late Woodland period, between A.D. 900 and 1100 marked the emergence of Caddo and Mississippian cultures across much of Louisiana (Anderson and Smith 2003). During the early part of this period, from A.D. 800–1300, a favorable climate for agriculture is thought to have

prevailed with temperatures approaching near those of the present. At approximately A.D. 1300 the Little Ice Age is thought to have reversed these favorable conditions (Anderson and Smith 2003).

Caddo

Although its origins are unsettled, Caddo culture is thought to have developed along the Red River and its tributaries in areas extending into northwest Louisiana at around A.D. 900 (Girard 2010). Along the lower Mississippi, Arkansas, and Red River valleys, the Coles Creek and affiliated peoples had previously been the primary cultural system. Webb saw the Caddo culture as a direct antecedent to the Coles Creek culture, having emerged in the Great Bend region of the Red River (Webb and McKinney 1975; Webb and Gregory 1986). Anderson and Smith (2003:392) believe that Caddo cultures emerged directly from the preceding Coles Creek culture along the middle course of the Red River, and within areas situated between the Red, Sabine, and Trinity Rivers. In contrast, Schambach (1982) has suggested that Caddo culture emerged in the Great Bend region from the Fourche Maline culture of southwest Arkansas.

Early Caddoan ceremonial centers have been found along the Red River, namely those at Mounds Plantation, Crenshaw, and Gahagan, though monumental construction at these sites is believed to have occurred after A.D. 1000 (Anderson and Smith 2003). During the initial expressions of Caddo culture, more extensive use of floodplains along the Red River occurred than preceding cultures, and large earthen mound complexes were constructed and apparently supported significant populations during ceremonial events. In addition to the mound complexes, these initial Caddoan settlements are assumed to have been similar to later ones with small villages on tributary streams or along lakes, or possibly scattered villages situated on floodplains (Anderson and Smith 2003). Mound centers contained residential areas for leaders that held political control over these outlying settlements. Burial data suggest that the Caddo culture was hierarchical, with finely constructed and decorated ceramics in the graves of apparent community leaders. Trade items recovered at Caddo sites have also indicated that these polities maintained contact with Mississippian chiefdoms in other areas of the southeast, including the Cahokia paramount chiefdom near St. Louis, Missouri (Girard 2010).

After approximately A.D. 1200, Caddo communities largely abandoned their ceremonial centers along the Red River and instead occupied upland areas and the banks of smaller tributary streams. Dispersed floodplain villages along these tributaries became the norm, replacing what were likely more compact villages along the Red River during the earlier Caddo period. This pattern of residence persisted into the early historic period and one such village was depicted on a map produced during the 1691–1692 Domingo Teran de los Rios expedition (Girard 2010). Jeffrey Girard has documented a dispersed floodplain village site in northwest Louisiana. The Willow Chute Bayou locality consists of a series of sites stretching along a 12 km (7 mi) long section of the bayou, most of which are small in size and light in density and seem to represent hamlets, although at least three mounds are also present (Girard 2010, 2012).

The Caddo culture is generally confined to northwest Louisiana extending only as far south as Natchitoches, and no major sites related to this culture are known within the vicinity of the project area. Several small sites identified at Fort Polk are thought to have Caddo affiliations. Archaeologically, the Caddo have been broken down into two major aspects (Gibson and Fulton), and are further divided into several subgroups (Alto/Alto-Gahagan, Haley, Bossier, Belcher, Glendora). Alto is the earliest focus, and the most commonly assigned Caddo focus at Fort Polk (Anderson and Smith 2003).

Mississippian and Plaquemine

The Mississippian period comprises the last 500 years of Southeastern prehistory, prior to European contact. The period is generally regarded to have begun in the southern Lower Mississippi Valley at A.D. 1200 and to have

lasted until the establishment of European settlements around A.D. 1700, whereas in the broader Southeast the Mississippian period is generally regarded as the period from A.D. 1000 to 1500 (Rees 2010). Plaquemine culture is a regionalized expression of Mississippian culture with sites occurring in southern and eastern areas of Louisiana that are differentiated from Mississippian sites by distinctive ceramic types (Rees 2010).

Mississippian subsistence patterns were of two varieties—riverine: the use of crop rotation in which plants, especially maize, were cultivated and supplemented by the collection of wild foods; and coastal: farming played a smaller role while hunting, gathering, and fishing were emphasized (Bense 1994). This dichotomy in subsistence also seems to have characterized Plaquemine groups, with inland communities relying on the use of cultivars and decreased dependence upon aquatic resources, in contrast to coastal communities, which were more reliant upon a subsistence economy based on marsh, backswamp and estuarine resources (Rees 2010).

The political organization of groups into chiefdoms stands as a defining characteristic of Mississippian culture, along with widespread trade, shared regional iconographic symbols, and the expansion of platform mound centers (Bense 1994). These traits also characterized Plaquemine culture, although many of the regional mound centers found in Louisiana are generally smaller than the immense centers that characterize the Mississippian sphere at sites such as Cahokia and Moundville (Rees 2010). Such large Mississippian regional centers also seem to be absent in Louisiana, and in general, Mississippian sites seem less well-represented than in neighboring states, suggesting that they may in fact be invasive cultural elements (Rees 2010).

Mississippian chiefdoms were either simple or complex in organization. Simple chiefdoms were typically comprised of several communities under the control of a single ruler. Complex chiefdoms consisted of several simple chiefdoms controlled by the ruling elite of a paramount center, having a paramount chief. The main themes in Mississippian society were ancestor worship, war, and fertility. Status differentiation was expressed through the acquisition of ritual items and the ritual use of space (i.e. mound construction), and these served as the major mechanisms for political control (Bense 1994).

Mississippian culture in the greater Southeast seems to have flourished at approximately A.D. 1200, and this was accompanied by increased warfare. The end of this period saw political turmoil and population relocations. Instability and violence encountered in some areas is thought to have resulted from environmental problems, possibly related to the changing climatic conditions known as the Little Ice Age, as well as political problems. Though mound building began to wane in some areas during this interval, it continued in others (Bense 1994).

No Mississippian or Plaquemine sites are known in the vicinity of the project area, although a few potential Plaquemine components have been identified at Fort Polk based on ceramic and point types exhibiting stylistic qualities consistent with those from Plaquemine sites. It is noted by Anderson and Smith (2003) that Plaquemine presence in this region was slight.

French Colonial (A.D. 1682–1763)

The beginning of the French Colonial Period in Louisiana is heralded by a journey by René Robert Cavelier, sieur de La Salle to the mouth of the Mississippi River and the Gulf of Mexico in 1682. A decade earlier in 1672 Joliet and Marquette had explored the headwaters of the Mississippi River from French Canada, documenting its course to the south toward the Gulf of Mexico (Wall 2002:19). La Salle, his lieutenant Henri de Tonti, and a party of Frenchmen and Native Americans followed the Mississippi River during a two month journey to chart the new route to the Gulf of Mexico. At the mouth of the Mississippi, La Salle and his men erected a

large cross, proclaiming possession of the country by France. After returning to France to report his claim, La Salle organized a second expedition to the Mississippi River with the intention of colonization, but instead overshot the mouth of the river and landed in what is now South Texas. The expedition ended in peril as La Salle's party became mutinous, murdering their leader, and eventually succumbing to starvation and exposure, and hostility first by native groups and ultimately by the Spanish (Wall 2002).

It would not be until a second voyage to the Basse Louisiane, or South Louisiana territory in 1699 that French presence would be sufficient to result in archaeologically-identifiable manifestations of material culture (Mann 2010). The expedition was led by Pierre Le Moyne d'Iberville, who was accompanied by his younger brother and lieutenant, Jean Baptiste Le Moyne, sieur de Bienville, along with 200 prospective colonists and two companies of royal marines. Iberville and Bienville sailed from La Rochelle, France to St. Domingue first and then to Mobile Bay where they erected a temporary encampment near present day Biloxi, Mississippi. Upon exploring the region, Iberville was informed by native groups of a great river to the west, convincing him that they were near the Mississippi River. A small party was assembled to scout the coast to the west, and they successfully located the mouth of the Mississippi on Mardi Gras day in 1699. The party navigated upriver as far as the present location of Pointe Coupee and spent several days at a large Houma village before returning to the temporary encampment near Mobile Bay (Wall 2002).

Before returning to France that same year, Iberville established the permanent settlement of Fort Maurepas to defend the mouth of the river, near present day Biloxi Bay, and left it under the command of Ensign de Sauvole. Shortly thereafter, while on a return journey into the Mississippi River, Bienville and a small contingency encountered a British ship south of present day New Orleans that was reconnoitering a site for settlement. Bienville informed the English ship's captain that they were in French territory and bluffed them, successfully convincing them that French reinforcements were available to combat the ship if it did not retreat. The site of this encounter is known as English Turn to this day, and this event is significant in that the British never returned to make a claim on Louisiana (Wall 2002).

The encounter with the English convinced Bienville of the need for a fort on the Mississippi River to properly defend the new French territory. Upon Iberville's return from France in 1700, Forte de Mississippi, later known as Fort de la Boulaye , was constructed about 80 km (50 mi) upriver from the head of passes, in what is now Plaquemines Parish. The site of the fort proved to flood frequently and it ultimately served primarily as a stopover and staging ground for the French during expeditions against native groups. In 1707 Iberville ordered the abandonment of Fort de Mississippi (Mann 2010).

The French settlement of Fort Louis de Louisiane, or La Mobile as it came to be known, was established on the Mobile River in 1702 and would serve as the headquarters for French activities in the area until 1711. The French also consolidated their claims on interior areas of their territory by establishing Fort Rosalie near present-day Natchez, Mississippi and Fort St. Jean Baptiste in Natchitoches in 1714 (Mann 2010; Wall 2002). Fort St. Jean Baptiste was established by Louis Juchereau de St. Denis at the site of the Natchitoches Caddo Indians to facilitate trade with the Caddo tribes of northwest Louisiana. Given the interior location of the newly established fort, St. Denis saw great potential for trade with the Spaniards of Mexico and appealed to the viceroy of Spain, despite Spanish and French laws forbidding trade with foreign nations. Upon realizing the position of the French fort, the Spanish soon after established four forts of their own to form the boundary between their territories. Ironically, St. Denis had managed to marry the daughter of a Spanish commandant, Don Diego Ramón and was assigned as a co-commander to establish these forts along with Ramón in 1716. This heralded a period of

clandestine trade between the French at Natchitoches and the Spanish, which proved profitable for St. Denis (Wall 2002).

New Orleans was founded in 1718 and was named the capital of Louisiana in 1721. The early years of occupation in New Orleans proved difficult for the colonists because of frequent flooding and a hurricane that destroyed two-thirds of the buildings in 1722 (Wall 2002).

Small farms were established in areas upriver and downriver from New Orleans by the 1730s. In central Louisiana, a set of large siltstone shoals along the Red River created an obstruction for navigation and Frenchmen travelling toward or away from Natchitoches had to portage the rapids. This area, which came to be known as Rapide by the French and eventually contributed to the name of Rapides Parish, remained a wilderness to Europeans during the French Colonial period (Wessel et al. 1993).

Spanish Rule (A.D. 1763–1800)

In 1763 France ceded all of the land of Louisiana west of the Mississippi River to Spanish rule as a result of the Peace of Paris accord, drafted at the close of the Seven Years' War. While news of the transfer caused an immediate reaction among the residents of Louisiana, it would have little effect on the lives of the inhabitants until the arrival of Governor Antonio de Ulloa to Balize at the mouth of the Mississippi River in 1767. As a result of the resentment over Spanish rule, and tempered by Spain's poorly funded and under-staffed attempt at governance, the residents of New Orleans rose in insurrection in October of 1768 and demanded that Ulloa depart Louisiana. Less than one year later, General Alejandro O'Reilly returned to New Orleans with a large contingent of soldiers to investigate the rebellion, and he named thirteen individuals as leaders of the insurrection and charged them with treason. Six of these individuals were convicted and put to death by a firing squad (Wall 2002).

Lands to the east of the Mississippi River had been ceded to England as a provision of the Treaty of Paris, and the British rapidly began to occupy their new territory. During Spanish rule the population in Louisiana increased more rapidly than it had under French rule, receiving immigrants from French Canada, the Caribbean, and Africa, in addition to Europe. The colonization of the southeastern United States by Europeans and others during the seventeenth and eighteenth centuries had a lasting effect on native tribes. Many groups occupying land in what would become Mississippi, Alabama and Tennessee moved into unoccupied areas of Louisiana to escape British and French intrusion. The Apalachee came from Florida to the banks of the Red River north of present-day Avoyelles Parish in 1763. Other groups including the Alabama, Pascagoula, Biloxi, Chacato, and some Choctaws moved into central Louisiana during this period (Wessel et al. 1993). The Koasati also moved into central Louisiana along the Red River in the late eighteenth century, a migration that was welcomed by the Spanish who hoped that the native group would from a buffer with the British to the east (Wall 2002).

Under Governor Ulloa's leadership, the Rapides post was established along the Red River to the north of present-day Avoyelles Parish, but European population in the area remained low. The European population of Rapide in 1770 consisted of 17 males and 16 females, as well as 12 male and 6 female slaves. Native Americans outnumbered Europeans, with four bands including 43 Apalachee, 22 Alabama, 17 Mobilians, and a number of Chacato. In 1788 the population of Rapide included 135 men, women, children and slaves (De Ville 1985, cited in Wessel et al. 1993).

Under Spanish rule, the economy of Rapide relied upon the raising of livestock and commercial crops including corn, indigo and tobacco. Some limited cotton production began after the invention of the cotton gin by Eli Whitney in 1793. The deer and bear skin trades for European markets formed an economic endeavor practiced by the native groups (Wessel et al. 1993).

Antebellum Era through the Twentieth Century (A.D. 1800–1999)

The Louisiana Territory was retroceded to France by Spain in 1800, and was then sold to the United States in 1803. Avoyelles Parish was established as one of the 19 Louisiana civil parishes in 1807 (Wall 2002). Central Louisiana was occupied at the time by native groups including Biloxi, Pascagoula, Apalachee, and Choctaw. The acquisition of Louisiana by the United States resulted in the immigration of numerous English-speaking settlers to the area (McGimsey 2001).

The number of plantations in the South increased during the 1820s as a result of innovations in cotton production and transport. The introduction of the steam engine on boats and cotton gins made the separation of seeds from the cotton fiber more efficient and allowed relatively cheap transport of the ginned cotton. In 1821, there were two steamboats that operated on the Red River between Natchitoches and New Orleans, and this number increased to five steamboats by the following year (Sibley 1822, cited in Wessel et al. 1993). The aforementioned shoals along the Red River near Alexandria continued to present a navigational obstacle, which was remedied through the use of a two-mile-long horse-drawn rail line freight was loaded on (Wessel et al. 1993).

In the Atchafalaya Basin sugarcane was the primary cash crop, although cotton was also grown on both small and large plantations. Labor-intensive plantation activities led to the development of a strongly stratified society (McGimsey 2001). As the number of slaves on plantations in Louisiana increased in the nineteenth century so did fear of the threat of a slave revolt, especially since a large number of slaves were brought from the island of St. Domingue where a successful revolt was carried out, forming the nation of Haiti. In 1811 a slave revolt did take place in Louisiana and a group of as many as 500 poorly armed individuals stormed New Orleans only to be defeated by residents and a detachment of U.S. troops. The fear of further insurrection continued to plague slaveholders in Louisiana, although none as large as the 1811 uprising would occur in the future (Wall 2002).

During the early antebellum years, sugarcane and cotton would continue to be the main staple crops. Alexandria, in Rapides Parish upstream of the project area, would during this period become a mercantile center, due to its position at the head of navigation along the Red River (Wessel et al. 1993).

In 1861 Louisiana seceded from the Union and joined the Confederate States of America. After the siege of New Orleans in 1862, the only Confederate strongholds remaining along the Mississippi River were at Vicksburg and Port Hudson. In an attempt to divide the Confederacy, Federal forces put their sights on the capture of Shreveport to stop the flow of supplies from Texas. In May 1863, a coordinated attack by a fleet of gunboats and Union forces successfully forced the retreat of Confederate troops from Fort De Russy south of Alexandria. The larger Union campaign to capture Shreveport was launched in the spring of 1864. Confederate troops had been able to remove most of their supplies from Fort De Russy prior to the earlier attack, and fought with greater resistance upon the return of Union forces (Wessel et al. 1993). The successful capture of Alexandria, along with Vermillionville and Opelousas to the south, put all of southwestern Louisiana under Federal control (Wall 2002).

Union forces proceeded toward Shreveport after marching north from Alexandria, but fell short of capturing the city due to a heated battle with Confederate troops near Mansfield that blunted the Union's advance up the Red River. During their subsequent retreat downriver, the Union gunboats were stranded at the shoals near Alexandria due to a low water level in the Red River. A Union engineer put the forces to work constructing a set of dams downriver from the falls that allowed the gunboats to safely pass over the shoals, but during their retreat through Alexandria the city was

burned. Although Confederate troops quickly reoccupied the area after Union forces left, the end of the war soon followed (Wessel et al. 1993).

The Civil War would lead to a restructuring of the agricultural production in Louisiana in the second half of the nineteenth century as farms struggled to meet higher labor costs after the emancipation of slaves. The plantations along the Red and Atchafalaya Rivers were particularly impoverished as the infrastructure for processing sugar and cotton had been largely demolished during the war. After Reconstruction, tenant farming and sharecropping became the primary forms of agricultural production in the state (Wessel et al. 1993).

With the development of the railroad system, many commercial steamboats were outcompeted, leading to a shift away from the river as the main avenue for commerce. While farming continued to be the primary economic activity in Avoyelles Parish for much of the twentieth century, lumbering boosted the central Louisiana economy. Sugarcane and cotton remained the most important crops, but corn, rice, potatoes, and oats were also produced on central Louisiana farms (Wessel et al. 1993).

Chapter 4. Methods

The entire project area was subjected to an intensive pedestrian survey supplemented by shovel testing in all areas. As discussed previously in Chapter 3, the project area was divided into high and low probability areas for containing archaeological materials based on proximity to perennial water sources. Shovel tests were excavated on a 30 m (98 ft) grid in those portions of the project area within .8 km (.5 mi) of the Atchafalaya River. In those areas further from the river, shovel tests were excavated on a 50 m (164 ft) grid. In total, 65 shovel test transects were oriented roughly east–west. Deep testing was also performed in areas along the eastern border of the project area where cultural deposits were the most likely to have been buried by alluvial sediments (Figure 4.1).

Shovel tests measured 30-x-30 cm (12-x-12 in) and were excavated to 50 cm (20 in) below surface or until sterile subsoil was encountered. All fill removed from the tests was screened through .64 cm (.25 in) mesh hardware cloth, or was trowel-sorted in instances where the soil was extremely clayey. Shovel tests were recorded using standardized shovel test recording forms, and the sidewalls and bottoms of shovel tests were examined for cultural material and features. A total of 648 shovel tests were excavated during the project. Along each transect, the ground surface was visually inspected for artifacts. In areas where transects were spaced at 50 m (164 ft) intervals, the area between transects was also walked and visually inspected. The entirety of the project area proved suitable for shovel testing and presented excellent surface visibility.

Deep testing was conducted by the mechanical excavation of trenches and the addition of adjacent exploratory excavation units. Trenches were typically excavated to a depth of approximately 1.0 to 1.5 m (3.3 to 5.0 ft) using a trackhoe with a 1.2 m (4.0 ft) bucket. Each trench was excavated so that one wall was smooth, and this wall was subsequently cleaned using a skim shovel and trowel and photographed. The profile wall was then inspected for buried strata and cultural features, and a detailed sketch of the exposed profile wall was prepared. Trench locations are presented on Figure 4.1.

Trench exploratory units were hand excavated adjacent to all of the trenches. Each unit measured 50 cm (20 in) on a side and was excavated along the portion of the trench where the profile had been recorded. The exploratory units were excavated in 10 cm (4 in) arbitrary levels within each natural soil layer. Each unit was excavated to sterile subsoil and recorded using standardized forms, and the profile walls were drawn to scale and photographed.

The delineation of each newly recorded cultural resource began with the assignment of a positive shovel test as the site datum with an arbitrary assignment of a grid coordinate of N1000 E1000. All other shovel tests excavated for site boundary delineation were also assigned coordinates in relation to the site datum. Surrounding each positive shovel test, delineation shovel tests were placed in cardinal directions until two negative shovel tests were excavated in each direction, or until a geographic or project area boundary was reached.

A sketch map was prepared for each site and included the locations of positive and negative shovel tests, the extent of surface artifacts, topographic and environmental information, and project area boundaries. A photograph of each site was taken to illustrate the conditions at the time of the survey.

The Field and Report Standards of the Louisiana Division of Archaeology indicate that sites should be delineated using shovel tests spaced at 10 m (33 ft) unless they are greater than 50 m (164 ft) across, at which point they may be delineated with shovel tests spaced at up to 20 m (66 ft). Both sites recorded during this project were greater than

50 m (164 ft) across and were delineated using shovel tests excavated on a 15 m (49 ft) grid to determine boundaries.

The locations of transects, trenches, site grid origins and datums, and site shape files were recorded using Universal Transverse Mercator (UTM) coordinates recorded with a MobileMapper 6 global positioning system (GPS) unit manufactured by Magellan. All UTM positions recorded by the GPS unit during the project were taken under sunny conditions, with typically three to five satellites being tracked. This unit is capable of greater than 3 m (10 ft) accuracy.

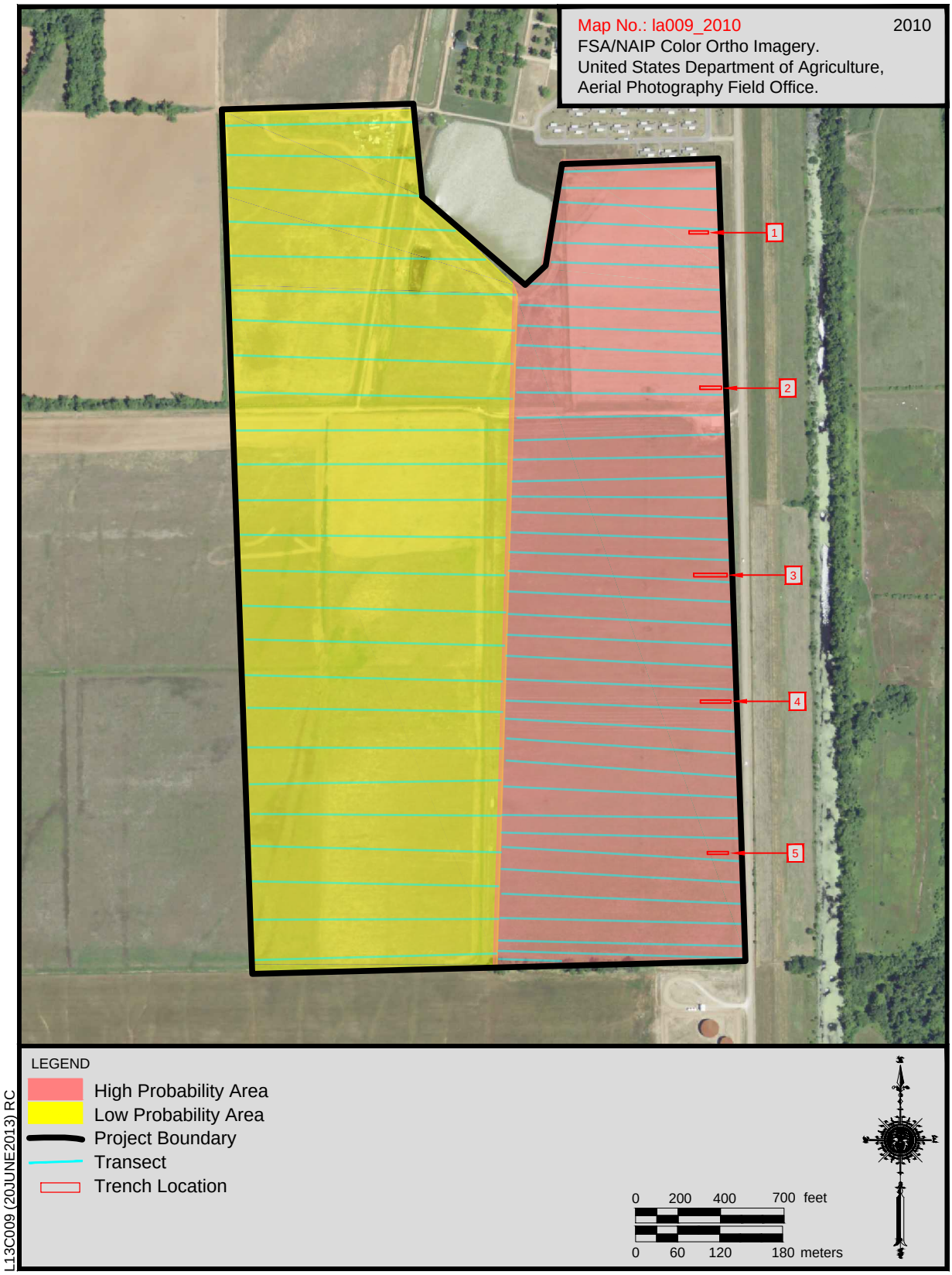

Figure 4.1. Project area aerial photo showing the location of transects, trenches, and high and low probability testing areas.

Chapter 5. Materials Recovered

Historic materials were recovered during the current survey from two sites (16AV149 and 16AV150) and one isolated find. No prehistoric artifacts were found in the project area. The assemblage is described below. In addition, an inventory of materials recovered from each site discussed by provenience is presented in the site description section of this report, Chapter 6. A summary of the historic artifacts recovered follows, as well as a discussion of the analysis methods. Information on the age of artifacts as described in the artifact analysis is derived from a variety of sources cited in the discussion. Beginning and end dates for some artifacts were approximated. A complete inventory of artifacts recovered in the project area can be found in Appendix A. Representative samples of each broad grouping of artifacts are also illustrated in Figure 5.1.

Methods

The historic assemblage includes artifacts classified and grouped according to a scheme originally developed by Stanley South (1977). South believed that his classification scheme would present patterns in historic site artifact assemblages that would provide cultural insights. Questions of historic site function, the cultural background of a site's occupants, and regional behavior patterns were topics to be addressed using this system.

South's system was widely accepted and adopted by historical archaeologists. However, some have criticized South's model on theoretical and organizational grounds (Orser 1988; Wesler 1984). One criticism is that the organization of artifacts is too simplistic. Swann (2002) observed that South's groups have the potential to be insufficiently detailed. She suggested the use of sub-groups to distinguish between, for example, candleholders used for religious purposes and those used for general lighting. Others, such as Sprague (1981), have criticized South's classification scheme for its limited usefulness on late-nineteenth- and early-twentieth-century sites, sites which include an array of material culture—such as automobile parts—not considered by South. Despite its shortcomings, most archaeologists recognize the usefulness of South's classification system to present data.

Stewart-Abernathy (1986), Orser (1988), and Wagner and McCorvie (1992) have subsequently revised this classification scheme. In this report, artifacts were grouped into the following categories: architecture, arms, clothing, communication and education, domestic, faunal/floral, furnishings, maintenance and subsistence, personal, transportation, industrial, and unidentified. Not all of these groups were populated. The artifacts recovered during this project are summarized in Table 5.1.

Grouping artifacts into these specific categories makes it more efficient to associate artifact assemblages with historic activities or site types. One primary change associated with the refinement of these categories is reassigning artifacts associated with "Miscellaneous Activities" under South's (1977) original system. Considering the potential variety of historic dwellings and outbuildings within the project area, a refinement of the artifact groupings was considered important to perhaps observe whether the distribution of specific artifact groups would produce interpretable patterns related to activity areas or structure types. Each one of these groups and associated artifacts is discussed in turn.

Usually, an artifact has specific attributes that represent a technological change, an invention in the manufacturing process, or simple stylistic changes in decoration. These attribute changes usually have associated dates derived from historical and archaeological research. For example, bottles may have seams that indicate a specific manufacturing process patented in a certain year. The bottle

Table 5.1. Historic Artifacts Recovered According to Functional Group.

Sites	Architectural	Clothing	Domestic	Personal	Maintenance	Arms	Industrial	Total
16AV149	0	2	74	1	1	1	1	80
16AV150	1	0	54	0	0	0	0	55
Isolated Find 1	0	0	1	0	0	0	0	1
Total	1	2	129	1	1	1	1	136

then can be assigned a "beginning" date for the same year of the patent. New technology may eliminate the need for the same patent and the bottle would no longer be produced. The "ending" date will be the approximate time when the new technology took hold and the older manufacturing processes are no longer in use.

Specific styles in ceramic decorations are also known to have changed. Archaeological and archival researchers have defined time periods when specific ceramic decorations were manufactured and subsequently went out of favor (e.g., Lofstrom et al. 1982; Majewski and O'Brien 1987). South's (1977) mean ceramic dating technique uses this information. The dates presented here should not be considered absolute but are the best estimates of an artifact's age available at this time. A blank space in Appendix A indicates that the artifact could not be dated or, alternately, that the period of manufacture was so prolonged that the artifact was being manufactured before America was colonized. An open-ended terminal date was assigned for artifacts that may be acquired today. The rationale for presenting dates for the artifacts recovered is to allow a more precise estimate of the time span the site was occupied, rather than the mean occupation date of a site.

Materials Recovered by Functional Group

There were 136 historic artifacts recovered during the investigation. The following provides a descriptive discussion of the types and ages of artifacts recovered from throughout the survey area by functional group. Selected historic artifacts are presented in Figure 5.1.

Architecture Group

The architecture group is comprised of artifacts directly related to buildings, as well as those artifacts used to enhance the interior or exterior of buildings. These artifacts primarily consist of window glass, nails, and construction materials, such as brick, mortar, or slate. A single architecture group artifact was recovered during the current project and is discussed below (Table 5.2).

Table 5.2. Summary of Architecture Group Artifacts Recovered from the Project Area.

Sites	Construction Material	Total
16AV149	0	0
16AV150	1	1
Isolated Find 1	0	0
Total	1	1

Construction Materials

Construction materials refer to all elements of building construction. On this project, the building materials collected consisted of a single brick fragment.

Handmade or early machine-made bricks often have a glaze, resulting from the sand in the clay turning to glass in the kiln. The paste is usually more porous, and the shape of the early bricks is more irregular. The later machine-made bricks have a harder, more consistent paste and are uniform in shape. Machine-made bricks will often have marks in the clay related to the machine manufacturing process (Greene 1992; Gurcke 1987).

The paste of the recovered brick fragment was generally porous and non-vitrified, but the fragment was of insufficient size to confidently determine its method of manufacture. The fragment was not assigned a specific date.

Figure 5.1. Selected historic artifacts. Top row, from left to right: Embossed porcelain rim fragment; ironstone rim fragment; stoneware fragment with brown clay slipped and clear glazed exterior; ironstone fragment with brown transfer print decoration; and yellowware fragment. Center row, from left to right: Brown clay slipped stoneware handle fragment; green hand painted whiteware fragment; whiteware fragment with partial maker's mark; ironstone handle fragment; blue-green glass fragment with rough cup mold and vertical side mold seams (likely mouth-blown); blue-green glass fragment formed in slug plate mold with embossed lettering "PAI"; and amethyst glass bottle base fragment with cup mold seam. Bottom row, from left to right: Milk glass cosmetics jar fragment; milk glass canning jar lid liner fragment; non-vitrified red brick fragment; cylindrical porcelain electrical insulator; brass gauge faceplate; green glass marble; four-hole sew-through pressed ceramic Prosser button; and fired brass Union Metallic Cartridge Company New Club 12-gauge shotgun shell head.

Clothing Group

The clothing group includes buttons, clothing fasteners, footwear, and other clothing related items, such as belts and fabric. Two buttons were recovered during this project (Table 5.3).

Buttons

The two recovered buttons were white, four-hole, sew-through ceramic buttons. These types of buttons have been referred to in the collector's literature as porcelain buttons or china buttons (Albert and Adams 1951; Albert and Kent 1949; Luscomb 1992), but Sprague (2002) urges archaeologists to refer to them as Prosser buttons for clarity in referencing material characteristics and production processes.

Prosser buttons are often misidentified as glass (or more specifically, milk glass), but actually are manufactured out of fine clay powder that was pressed in molds and fired (Albert and Kent 1949:32; Sprague 2002). The manufacturing process, referred to as the Prosser process (in honor of Richard Prosser, who patented it), was developed in the 1830s and received an official patent in 1840 (Sprague 2002). The most common color for Prosser buttons was white, but black versions have also been recovered. Additionally hundreds of varieties or colorful "calico" and molded buttons were produced (Lamm et al. 1970).

Prosser buttons can be identified by the dimpled-like, or "orange-peel", texture on the back (Sprague 2002). There is a wide variability in the occurrence of this characteristic, but both buttons recovered during the current project clearly displayed the dimpled texture on their bases. Prosser buttons date from 1840 to 1920 (Luscomb 1992) and were considered highly fashionable between circa 1850 and 1920. Pre-1900 Prosser buttons are generally of a higher quality than the later varieties. Plain Prosser buttons often served utilitarian purposes, being used for undergarments, shirts, dresses, and infant and child clothing. The number of holes in a porcelain button is suggestive of the type of garment on which it was attached. Four-hole buttons were the major utilitarian button, being used on a variety of garments (i.e., dresses, shirts, and undergarments) and were available in many styles. White, dish type, four-hole Prosser buttons are probably the most common form identified in archaeological assemblages, followed by pantywaist, calicos, and piecrust (Sprague 2002). Both buttons found during the survey were of the dish type.

Domestic Group

A total of 129 Domestic Group artifacts were recovered from the project area. These artifacts consisted of ceramics (n = 78), container glass (n = 38), glass tableware (n = 7), and container closures (n = 6) (Table 5.4). Such artifacts could have a wide variety of functions within the domestic setting, including those related to cooking, serving, eating, decoration, or waste disposal.

Table 5.3. Summary of Clothing Group Artifacts Recovered from the Project Area.

Artifact Group, Class, Type	16AV149	16AV150	Isolated Find 1	Total
Clothing Group		0	0	
Buttons		0	0	
Sew-through	2	0	0	2
Total	2	0	0	2

Table 5.4. Summary of Domestic Group Artifacts Recovered from the Project Area.

Sites	Ceramics	Container Glass	Glass Tableware	Container Closures	Total
16AV149	50	17	1	6	74
16AV150	27	21	6	0	54
Isolated Find 1	1	0	0	0	1
Total	78	38	7	6	129

The ceramic inventory consisted of refined and utilitarian wares dating from the nineteenth century through the twentieth century. A full description of ceramic types recovered from the project area is listed below, followed by descriptions of other Domestic Group artifacts.

Ceramics

The ceramics recovered were grouped into five major ware types: whiteware (n = 44), stoneware (n = 12), porcelain (n = 10), ironstone (n = 10), and yellowware (n = 2) (Table 5.5). Ceramics within each of these ware groups were separated into decorative types that have temporal significance. Each of these ware groups is reviewed below, followed by discussions of associated decorative types.

Whiteware

As a ware type, whiteware includes all refined earthenware that possesses a relatively non-vitreous, white to grayish-white clay body. Undecorated areas on dishes exhibit a white finish under clear glaze. This glaze is usually a variant combination of feldspar, borax, sand, nitre, soda, and china clay (Wetherbee 1980:32). Small amounts of cobalt were added to some glazes, particularly during the period of transition from pearlware to whiteware and during early ironstone manufacture. Some areas of thick glaze on whiteware may, therefore, exhibit bluish or greenish-blue tinting. Weathered paste surfaces are often buff or off-white and vary considerably in color from freshly exposed paste (Majewski and O'Brien 1987).

Most whiteware produced before 1840 had some type of colored decoration. These decorations are often used to designate ware groups (i.e., edgeware, polychrome, and colored transfer print). Most of the decorative types are not, however, confined to whiteware. Therefore, decoration alone is not a particularly accurate temporal indicator or actual ware group designator (Price 1981).

The most frequently used name for undecorated whiteware is the generic "ironstone," which derives from "Ironstone China" patented by Charles Mason in 1813 (Mankowitz and Haggar 1957). For purposes of clarification, ironstone will not be used in this report when referring to whiteware. Ironstone is theoretically harder and denser than whiteware produced prior to circa 1840. Manufacturer variability is, however, considerable and precludes using paste as a definite ironstone identifier or as a temporal indicator. Consequently, without independent temporal control, whiteware that is not ironstone is difficult to identify, as is early vs. later ironstone. For this analysis, the primary determining factor in classification of a sherd as whiteware was the hardness and porosity of the ceramic paste. Decorative types observed on the whiteware sherds in the current assemblage are summarized and defined in the following discussions.

Plain

This whiteware type includes vessels which are undecorated. While some researchers, such as Lofstrom et al. (1982:10) and Wetherbee (1980) include molded designs with "plain" whiteware, we agree with Majewski and O'Brien (1987:153) that molded vessels should be grouped on their own. Plain whiteware vessels became very popular following the United States Civil War and continued in popularity throughout the late nineteenth and early twentieth centuries (Faulkner 2000).

Table 5.5. Summary of Ceramic Artifacts Recovered from the Project Area.

Sites	Ironstone	Porcelain: Hard Paste	Stoneware	Whiteware	Yellowware	Total
16AV149	4	7	9	28	2	50
16AV150	6	3	3	15	0	27
Isolated Find 1	0	0	0	1	0	1
Total	10	10	12	44	2	78

Bacteriological research emerged after the Civil War, and it was not long before it became widely known that there is a link between bacteria and disease (Duffy 1978:395). Since bacteria could not be seen with the naked eye, it was commonly thought that plain, undecorated wares were best suited for maintaining and serving clean, bacteria-free food. Hence, bacteriological research helped spur the rise in popularity of undecorated vessels, which resulted in increasing competition between whiteware and ironstone manufacturers.

Purity crusades also indirectly helped increase the popularity of plain, white vessels in the late nineteenth and early twentieth centuries as social reformers focused on cleaning up city streets, improving sanitation, and ridding cities of disease epidemics. Part of this crusade was the public promotion of purity at the dinner table. Unfortunately, many of these white public health reformers were also motivated by Social Darwinist ideas, and sanitation problems and disease epidemics were often blamed on African Americans and Eastern European immigrants who were stereotyped as being the harbingers of disease and social decay (Friedman 1970:123).

A total of 28 undecorated, or plain, whiteware sherds were recovered during the current survey. These sherds were dated from 1830 to the present (Majewski and O'Brien 1987:119). While plain sherds may have come from plain vessels, it should be noted that many of these sherds may be undecorated parts of decorated vessels.

Embossed/Molded Design

As transfer printing became popular on pearlware, molded designs were simplified. Molded designs were revived with the introduction of whiteware in the late 1830s, but they did not attain the elaborateness of previous forms. Specialized moldings for whiteware were common in the 1840s, when the ware had a more limited and generally more affluent market (Wetherbee 1980).

During the 1860s, embossing tended to become softer in relief than the angular and sculpted forms of the 1840s and 1850s (Wetherbee 1980). During the 1870s and 1880s, molded decorations occupied smaller areas on dishes, and elaboration was confined to handles and lids. British stylistic trends dominated the embossed and molded whiteware industry throughout most of the nineteenth century (Wetherbee 1980). Since a distinction between mold types was not made, the embossed/molded design whiteware sherds recovered during the current excavations were dated from 1860 to the present.

Eleven whiteware sherds containing molded designs were recovered from the project area. These included five sherds with very thin molded annular rings, one sherd with a scalloped rim and a molded decoration incorporating dots and lines, one fragment with a scalloped and molded rim, one sherd with geometric molded decoration, and three fragments with very shallow indeterminate molded decoration.

Transfer Print

By the late 1780s, transfer printing was being developed in the potteries of Staffordshire, England, as a fast and inexpensive method of mass producing decorated pearlware and whiteware. It was originally perfected circa 1756 for use on porcelains and was not used on earthenwares until Thomas Minton designed his blue willow pattern in 1780, which initiated a wider commercial use (Little 1969:15–17; Norman-Wilcox 1978). This process revolutionized the Staffordshire ceramic industry and allowed for the first time a set of tableware to be produced with design uniformity (Samford 1997:1).

When transfer printing, the required pattern is first engraved by hand on a copper plate, from which a tissue-paper print called a "pull" or "proof" is taken. Then, by pressing the tissue against a piece of undecorated ware, the design is deposited or transferred to the surface of the vessel. On early ceramic vessels these prints were added after the final glazing process had been completed. This was often referred to as bat printing, cold printing, or overglaze printing. These early designs were often found in black, red, brown, and purple.

Transfer prints applied underneath the glaze were first attempted circa 1780 (Samford 1997:2–3). Early underglaze prints were often blue, since cobalt was the only coloring agent that could withstand the heat of the firing process at this time (Samford 1997:21). As technology improved and glazes became clearer, other colors began to be used.

According to Hughes and Hughes (1968:150) and others, such as Godden (1964), blue was the dominant color of transfer-printed wares prior to the 1830s. With advances in ceramic technology, brown and black prints appeared after 1825, and by 1830, green, red, pink, mulberry, and light blue were also being produced (Bemrose 1952:23; Little 1969:13–22; Wetherbee 1980:15). By the late 1840s, a technique for transferring more than one primary color to a vessel was perfected (Godden 1964; Samford 1997:22). Green transfer-printed wares were generally no longer produced after 1859 (Samford 1997:20).

Early patterns include the willow pattern and other Chinese design motifs. Although some Chinese-style motifs were still being used, the use of classical and romantic scenic themes became popular in the early nineteenth century. These patterns included country scenes, floral motifs, and travel scenes. Patterns depicting American buildings and scenery were popular after 1812 (Snyder 2000:5). The patterns on these sherds were suggestive of prints of the early nineteenth century (Price 1979:19). Since whiteware was not generally available to the consumer market until 1830, this date was used as the beginning date of manufacture for the transfer-printed whiteware recovered, while the maximum date was based on the color.

Transfer prints produced in the late nineteenth through the early twentieth centuries were of a poor quality. For the most part, these can be identified by uneven patterning and overlapping seams in the transfer pattern. These late transfer prints were often reproductions of earlier transfer printed designs and were found in many different colors. Some of the patterns began to be litho-printed by machine instead of being engraved by hand, as had been conducted in the past. This allowed for mass production (Neale 2005:17).

Only four transfer printed whiteware sherds were recovered from the project area. All four pieces were from the bases of their respective vessels, and the transfer printed design on each was a portion of the vessel's maker's mark. If the majority of a vessel's maker's mark can be recovered, its manufacturing date can often be determined with a high degree of accuracy, as the dates during which a particular manufacturer was active are often more constrained than the period during which a basic ceramic type was available. The largest sherd incorporated a fragment of lettering reading "…NLEY…[E]NGLAN[D]". Unfortunately, all four of the transfer printed sherds recovered during this project retained too small a portion of their maker's marks to determine their manufacturer. The transfer printing on two of these sherds is executed in a greenish-blue color that dates these fragments to the mid- to late nineteenth century (Samford 1997:20). One of the remaining fragments may have black transfer printing and the final sherd may be printed in brown, but in both cases the portion of visible decoration is exceptionally small, and no confident date could be assigned to the final two sherds.

Hand Painted

Hand-painted decorations began to appear on whiteware vessels immediately after their introduction in the first quarter of the nineteenth century. In the early nineteenth century, blue was the most frequently used color. Only colors capable of withstanding the heat of the glost firing could be applied. Greaser and Greaser (1967) reported that children were utilized by some Staffordshire potteries to hand paint ceramics.

Pink, green, yellow, and red were commonly used from approximately 1830 through the mid-nineteenth century. The most common decorative motif on hand-painted ceramics was some type of floral design (Majewski and O'Brien 1987:157). There are

several varieties of hand-painted floral decoration, including fine line, broad line, or a combination of the two. Floral decorations were applied in many different ways. These designs were applied either freehand using brushes, by stencil, or by the turn of the twentieth century, by filling in printed outlines (Majewski and O'Brien 1987:157).

Another popular motif was borderline hand painting, or banding, usually surrounding the rim of the vessel. These borderlines were often found on the rims of hand-painted floral-decorated vessels as well. Without the complete vessel, it is impossible to determine if the banding or borderline sherds date to the nineteenth century or represent ceramics that became popular in the early twentieth century (Majewski and O'Brien 1987:160).

The term polychrome refers to the use of more than one color in hand painting, whereas the term monochrome is used to refer to the use of only one color. Majewski and O'Brien (1987) suggest that the peak popularity period for hand-painted whiteware vessels was 1840–1860; however, some were produced as early as 1830. Price (1979:31) suggested a circa 1830–1860 time frame for hand-painted whiteware ceramics recovered in Missouri, while Garrow and Wheaton (1986) utilized an 1830–1875 manufacturing range. For this study, the date range of Lange and Carlson (1985)—who suggested a date range of 1830–1870 for hand-painted wares such as whiteware, ironstone, and porcelain—is used.

A single monochrome sherd was recovered during the current survey: a body fragment with a green handpainted decoration incorporating an annular line and what may be a portion of a leaf from a floral design. A date for this fragment could not be confidently determined.

Stoneware

Stoneware served as the "daily use" pottery of America, particularly rural America, after its introduction during the last decade of the eighteenth century. By 1850, this ware generally replaced coarse redware as the primary utilitarian ware used in American households. Stoneware is a semi-vitreous ware manufactured of a naturally fine, but dense, clay. The pottery was fired longer and to a higher temperature than earthenwares; a kiln temperature of at least 1,200 to 1,250 degrees Celsius had to be obtained (Cameron 1986:319; Dodd 1964:274–275). As a result, stoneware generally exhibits a hard body and a very homogeneous texture. The paste may vary from gray to brown, depending on the clay source, and length and intensity of the firing.

Because this ware is fired at such high temperatures, its body is nonporous and well suited to liquid storage. Stoneware, as mentioned, was not typically manufactured as a refined ware (such as its cousin, ironstone, or eighteenth-century refined white salt-glazed stoneware), and hence it was, for the most part, utilized for utilitarian activities associated with jars, churns, crocks, tubs, jugs, mugs, pans, and pots. These vessels were typically glazed, with salt glazing and slip glazing most common.

Although refined salt glazing was practiced in England during the eighteenth century, by 1780, the production of English salt-glazed tableware had been virtually supplanted by the manufacture of cream colored earthenwares (Lewis 1950:29). The salt-glazing technique continued to be utilized for utilitarian vessels, however, and was eventually introduced to the United States in the early-nineteenth century. Salt glazing was accomplished by introducing sodium chloride into the kiln during the firing process, at which point the salt quickly volatilized. The vapor reacted with the clay to form a sodium aluminum silicate glaze (see Billington 1962:210; Dodd 1964:239). The surface of the glaze is typically pitted, having what is commonly known as an "orange peel" effect.

Stoneware may also be coated with a colored slip (a suspension of fine clay and pigment). The Albany slip—named after the rich brown clay found near Albany, New York—first appeared in the 1820s. Initially, it was mainly used for the interior of stoneware vessels. However, by the 1850s, it was also

used as an exterior glaze. Bristol glaze, an opaque white slip, was introduced late in the nineteenth century. When used in combination with Albany slip, Bristol-glazed stoneware vessels have a general date range of 1880–1925 (Ketchum 1983:19; Raycraft and Raycraft 1990:5).

A third glaze often used on stoneware is the alkaline glaze. Like the Albany slip, it was developed in the 1820s. The basic alkaline glaze is made up of wood ash, clay, and sand. Other additions may be slaked lime, ground glass, iron foundry cinders, or salt. These additions affected the color and texture of the glaze. Colors vary from olive to brown to a gray-green or yellowish hue, depending on adjustments in proportion of ingredients (Ketchum 1991:9). Although not as prevalent, alkaline glazing has been used in combination with salt glazing. This causes the stoneware vessel to exhibit the colors of alkaline glazing with the pitted texture of a salt glaze.

Twelve sherds make up the stoneware assemblage from the project area. Exterior treatments include eight slipped examples, two sherds with a salt glaze, one undecorated fragment, and one sherd that is partially slipped and partially clear glazed. Interior decorations generally correlate well with exterior treatments. There are eight slipped interior, three Albany slipped interior, and one salt glazed interior sherds.

Based on the stoneware literature, the slipped, clear glazed, and salt glazed varieties of stoneware recovered during the current project can be dated to between 1800 and 1925. The Albany slipped examples date between 1830 and 1925 (Ketchum 1983; Raycraft and Raycraft 1990).

Ironstone

Ironstone is a white or gray-bodied, refined stoneware with a clear glaze. It is often indistinguishable from whiteware, but ironstone differs from whiteware in that the body is more vitreous and dense. In addition, a bluish tinge or a pale blue-gray cast often covers the body. In some cases, a fine crackle can be seen in the glaze; however, this condition is not as common as it is in whiteware (Denker and Denker 1982:138).

Confusion in the classification of white-bodied wares is further compounded by the use of the term as a ware type or trade name in advertising of the nineteenth century. Both ironstones and whitewares were marketed with names such as “Patent Stone China,” “Pearl Stone China,” “White English Stone,” Royal Ironstone,” “Imperial Ironstone,” “Genuine Ironstone,” “White Granite,” and “Granite Ware” (Cameron 1986:170; Gates and Ormerod 1982:8). These names do not imply that true ironstone was being manufactured. Some investigators avoid the distinctions entirely by including ironstones as a variety of whiteware. Others, such as Wetherbee (1980) refer to all nineteenth-century white-bodied earthenwares as ironstone. For this analysis, the primary determining factor in classification of a sherd as ironstone was the hardness and porosity of the ceramic paste. Sherds with a hard vitreous paste were classified as ironstone.

Charles James Mason is usually credited with the introduction of ironstone (referred to as Mason’s Ironstone China) in 1813 (Dodd 1964:176). Others, including the Turners and Josiah Spode, produced similar wares as early as 1800 (Godden 1964). As a competitive response to the highly popular oriental porcelain, British potters initiated this early phase of ironstone production. The ironstone of this early phase bears a faint blue-gray tint and oriental motifs, much like Chinese porcelain. A second phase of ironstone began after 1850 in response to the popularity of hard paste porcelains produced in France. This variety of ironstone had a harder paste and reflected the gray-white color of French porcelains.

While some ironstones continued to use oriental design motifs after 1850, the general trend was toward undecorated or molded ironstones (Collard 1967:125–130; Lofstrom et al. 1982:10). Ironstone continued to be produced in England, and, after 1870, it was also manufactured by numerous American companies. For many years, classic

ironstone—the heavy, often undecorated ware—had been frequently advertised as being affordable and suitable for "country trade" (Majewski and O'Brien 1987:121). By the late 1800s, these thick, heavy ironstones began losing popularity and were often equated with lower socioeconomic status (Collard 1967:13). At the same time, ironstone manufacturers began shifting to thinner, lighter weight ironstones. As a result, this type of ironstone became popular tableware in American homes during most of the twentieth century (Majewski and O'Brien 1987:124–125). In spite of the shift toward thinner and lighter ironstones, heavy ironstone remained on the market and continues to be popular in hotel/restaurant service (hence, this heavy, twentieth-century ironstone is sometimes called "hotelware"); however, its production for home use all but ceased by the second decade of the twentieth century (Lehner 1980:11).

There were 10 ceramic sherds classified as ironstone in the current collection. Seven were noted as having a plain surface, two exhibited molded design patterns, and one was decorated with brown transfer print. The transfer printed sherd is a fragment of a thick, flat-topped vessel and includes a portion of a deep footring. The plain sherds in this collection likely post-date 1830, while those with molded designs date after 1900 (Majewski and O'Brien 1987:124).

Porcelain

Porcelain is the name given to high-temperature fired, translucent ware. This ware type was first developed by the Chinese. Chinese, or hard paste, porcelain was introduced to Europe by Portuguese sailors that had traveled to China during the sixteenth century. The formula for true, or feldspathic, porcelain was not discovered in Europe until 1708 and not marketed until 1713 (Boger 1971:266). The production of true porcelain was limited to three factories in England, all other products were softer porcelains made with glass, bone ash, or soapstone. Porcelain made with bone ash, often called "bone china," became the preferred product after 1800, since the paste was harder and the ware was cheaper to produce with bone than with glass or soapstone (Mankowitz and Haggar 1957:179). Among the more affluent households in Europe and North America, porcelain was common tableware used during the eighteenth and nineteenth centuries (Fay 1986:69). Porcelain production in America was not successful until 1826, and the number of porcelain factories in the United States remained small throughout the nineteenth century.

In the laboratory, bone china can be differentiated from hard paste porcelain by placing it under ultraviolet light. Bone china fluoresces blue-white, whereas hard paste porcelain fluoresces magenta (Majewski and O'Brien 1987:128). Like pearlware, few undecorated porcelain vessels were manufactured from the eighteenth through the nineteenth century, or in the previous centuries. However, plain porcelain was manufactured in quantity in the twentieth century.

Ten fragments of hard-paste variety porcelain were identified in the current artifact assemblage. Four of the sherds are undecorated, three incorporate indeterminate molded decorative elements, two fragments are decorated with heavily eroded overglaze decals, and one sherd displays hand painted green monochrome underglaze decoration. The decoration motif on this latter fragment is unclear, but the letters "MIGN" are visible. The undecorated porcelain sherds are thought to date to after 1800, while the remaining fragments likely date from roughly the mid-nineteenth to early twentieth centuries.

Yellowware

Ramsay (1939:148) states that yellowware represents the transition from "pottery" to earthenware. The paste is finer than the coarse earthenwares but coarser than whiteware and ironstone. Prior to the glost firing, the paste is a buff or cream color; however, the addition of an alkaline glaze creates a deep yellow upon firing. Yellowware was most commonly a utilitarian ware produced for chamber pots, slop jars, urinals, mugs, pitchers, mixing

bowls, cuspidors, pie plates, food molds, and canning jars. Nevertheless, since yellowware is a transitional ware, it was occasionally used for more refined wares, such as cups, saucers, plates, and bowls.

For the purposes of this study, yellowware is assumed to be American, although it is realized that the wares were generally of English inspiration, and some English yellowware was imported into this country. James Bennett, an English emigrant who left Cincinnati in 1839, is generally credited with the introduction of American yellowware to East Liverpool, Ohio in 1840 (Gates 1984:47; Stout 1923:16). Vodrey and Frost of Pittsburgh were the first to produce yellowware in the United States, perhaps as early as 1827 (Ramsay 1939:74). Yellowware, produced in molds, was very conducive to mass production, and other potters in Ohio, Vermont, and New Jersey opened factories in the 1840s. Ohio was one center of yellowware manufacture, and it is estimated that in 1850, half of all United States yellowware was manufactured in East Liverpool (Gates 1984:47). Yellowware is rarely marked, although William Bromley, who operated potteries in Cincinnati, Ohio, and Covington, Kentucky, during the mid-nineteenth century, included an elaborate molded mark on some of his finer Cincinnati pieces (Genheimer 1987).

One decorative treatment of yellowware, called Rockingham, is simply a mottled, brown-glazed yellowware. It is sometimes referred to as Bennington ware; however, it was manufactured throughout the eastern United States. A glaze of pure oxide of manganese produced a brown or purple brown tint, resulting in a mottled or streaked effect (Hughes and Hughes 1956:130). Originally, Rockingham ware referred to ornate porcelain manufactured between 1826 and 1842 at Swinton, Yorkshire, England, on the estate of the Marquis of Rockingham (Dodd 1964:232). Hence, the term is not actually paste specific; the characteristic glaze was applied to redwares, whitewares, porcelain, and yellowware.

Christopher Webber Fenton at Bennington, Vermont, introduced Rockingham wares to the United States around 1845. Yellowware potteries in East Liverpool and other parts of Ohio and the eastern United States quickly took up its production. Bennington designs were closely copied in Ohio, including round-handled pitchers, book flasks, picture frames, mugs, pie plates, and milk pans (Ramsay 1939:76–77). During the mid-nineteenth century, both Rockingham and yellowware were marketed as “Liverpool” ware and “Queensware” (Gates and Ormerod 1982:7).

Another prominent decorative treatment for yellowware includes the application of annular-slip bands, which were usually blue, white, or brown, as well as mocha techniques, such as cat’s eye, swirl/wormware, and dendritic. Slip decorating, variously termed dipped, annular, or banded, refers to a technique used to apply bands or stripes horizontally to hollow vessel forms, such as mugs, bowls, cups, and covered dishes (Majewski and O’Brien 1984:163). The bands or stripes applied to the particular vessel—unlike hand-painted, flat decorations—will have slight relief. Various colors can be found on slip-decorated wares. Over time, the bands became wide, and the colors changed from earthen browns, greens, yellows, blues, and black to bolder colors, such as bright blues, yellows, and white. Very narrow bands of white or black were often found on the later, brightly colored vessels. Slip-decorated vessels may be further enhanced with one or more of the following decorative types: rouletted or engine-turned decoration, hand-painted swirls, marbled motifs, and mocha designs.

Rouletted decoration is produced when a shaped instrument is pressed onto a still damp slipped vessel as it is turned on a potter’s wheel, thereby exposing the contrasting paste color beneath (Godden 1963:105). Hand-painted decorations were often used on annular wares as accents between bands. These designs were often swirled, resembling finger painting or black-and-white “cat’s eyes.” In addition to these hand-painted

motifs, zigzag and other abstract-shaped concentric lines were often applied between bands (Majewski and O'Brien 1984:163). Mocha decoration is produced when an acidic mixture (usually consisting of various combinations of tobacco juice, hops, urine, dry printer's black, turpentine, citric acid, and water) is dripped onto the colored slip, where it spreads into forms resembling trees, seaweed, and/or fronds (Majewski and O'Brien 1984:163).

Another popular type of yellowware is flint enameled. Flint enameled yellowware looks very similar to Rockingham yellowware; however, flint enameling also uses more expensive oxides, such as copper and cobalt, creating blue and green flowing lines often interspersed with the manganese brown used in Rockingham decorations (Leibowitz 2002:14). Flint enameling was introduced in 1849. This decorative type is produced by sprinkling metallic oxides onto a transparent-glazed vessel. The piece was then fired and the oxides melted and fused with the underglaze, creating one solid surface. The melted oxides flowed and spread over the surface, creating a glaze that looked similar to Rockingham decorations with blues and green added (Barrett 1958:19).

Only two yellowware sherds were recovered during the current project. They are both undecorated and have a light yellow refined paste. These are thought to have a date range of 1830 through 1925.

Container Glass

Bottle and other glass container typology is an important factor in classification. Although typology is not a precise science, the general shape of a bottle or glass container gives an indication of what the original contents were or the bottle's function. It is also important to note that although a bottle may be placed in a specific category, bottles were often reused and recycled for unrelated products. Specific categories of bottles, for instance, include: liquor/wine/beer bottles, soda/water bottles, medicine bottles, commercial bottles, household bottles, canning jars, nursing bottles, toiletry/perfume bottles, miscellaneous bottles, and miscellaneous jars.

Liquor/wine/beer bottles came in a wide variety of shapes and sizes holding from a few ounces to a gallon. Liquor bottles were one of the most diverse groups of bottles manufactured. These bottles ranged from small flasks to large jugs. Wine bottles were one of the least diverse groups of bottles, generally only found as round, heavy glass bottles. Beer bottles were typically found as round, heavy glass bottles also, but this group of bottles was generally smaller than the wine bottles previously mentioned. Soda and mineral water bottles also had to be made of relatively thick glass. This allowed for strength during shipping and handling as well as during the reuse of these bottles.

Medicine bottles are the most diverse group. The medicine bottle category contains early medicine bottles, patent and proprietary medicine bottles, druggist bottles, and prescription bottles. Many of these bottles exhibit embossing and maker's marks, indicating specific medicines of drug companies that allowed for specific dating.

Commercial bottles were also a diverse group with many different shapes and sizes. The commercial bottle category contained sauce bottles, condiment bottles, pickle and preserved food bottles, vegetable oil bottles, and milk bottles. When possible, these bottles were assigned specific dates, and a specific bottle type within this category was noted.

The household bottles category contained ink bottles, shoe polish bottles, toiletry bottles, and household cleaning product bottles. This category, although smaller than the others, contained a diverse group of bottles with a wide range of dates.

As the name implies, canning jars were used to preserve foods. The most distinctive attribute of canning jars was their closure type. Canning jars are a ubiquitous type of artifact in the nineteenth and early twentieth centuries and can be assigned specific dates of manufacture when maker's marks or other distinguishing characteristics are present.

Glass containers can come in a variety of colors. Colors include amber, amethyst, aqua, leaded or clear flint, green, light green, olive green, opaque white, clear or colorless, selenium, cobalt, blue-green, cornflower blue, and yellow/green glass. Jones and Sullivan (1985) observed that chemicals color glass, either as natural inclusions or additions by the manufacturer. Although glass color is a relatively obvious descriptive attribute of a historic bottle, it is of limited utility in dating or type casting a bottle.

Amber glass was created from the natural impurities in glass as well as from popular color additives, such as nickel, sulfur, and carbon. Amber glass, because of the many amber variations, dates throughout the nineteenth century; however, amber glass was not widely used until the mid-nineteenth century (Fike 1987:13; Lindsey 2008).

According to Lockhart (2006), amethyst glass began to be manufactured around 1870, when manganese was being added to the glass recipe. Although initially colorless, the glass will turn a distinctive purplish color when exposed to sunlight over time. It was previously thought that amethyst glass production ceased by 1914 due to a shortage of manganese from Germany during World War I; however, the change was actually a result of technological advancements in the glass industry, mainly the conversion to automatic bottle machines (Lockhart 2006:53).

Following World War I, the cost of selenium was lowered and it proved to be an inexpensive decolorant in glass production and ultimately displaced manganese as a decolorizer by 1920 (Lockhart 2006:53). Selenium glass exhibits a straw or amber tint in the thickest portions of the glass. This glass color was used in blown in mold (BIM) bottles, but typically those dating to the 1910s (Faulkner 2000; Lindsey 2008).

Aqua colored glass had many different variations. Aqua glass is a result of the iron impurities found in natural sand. Although sand was available in the eastern United States, some western-American glass factories were importing sand from Belgium. Because aqua glass is one of the most common glass colors in American made bottles, this glass color is not assigned a specific date of manufacture (Lindsey 2008). Light blue and cornflower blue are often grouped into the aqua glass category. These glass colors are also not typically assigned specific dates; however, cornflower blue glass was available as early as 1820 (Jones 2000:147).

Cobalt glass is produced with the addition of the coloring agent cobalt oxide to the glass batch (Lindsey 2008). The introduction of what Lindsey (2008) calls “true blue” glass began in 1840 with the production of soda, mineral water, and ink bottles.

Opaque white glass, also referred to generally as milk glass, was produced with the addition of tin or zinc oxide and phosphates to the glass recipe. Some more opalescent varieties of milk glass were even infused with arsenic. Opaque white glass was used for a variety of different bottle types and glass tableware, including most commonly cosmetic and toiletry bottles dating from 1870 to 1920. This glass type was noted as early as 1830 and continued to be used until circa 1960, when the process of making opaque white glass changed (Husfloen 1992:163; Lindsey 2008).

Green glass is found in more shades than any other glass color. These colors include, but are not limited to, light green, olive green, blue-green, and yellow-green. Green glass was produced by using the coloring agents iron, chromium, and copper. Many shades of green glass do not have diagnostic dates, since they have been used for many centuries in glass production and continue in popularity today. Emerald green or bright glass, however, was introduced in the mid-nineteenth century (Fike 1987:13; Lindsey 2008).

Clear or colorless glass was difficult to produce because it required the use of nearly perfect materials. With the public’s growing desire to see the contents of the bottles, clear glass came into demand and was popular beginning in the 1860s (Baugher-Perlin 1982:261). However, it should be noted that clear glass was available to a limited degree before this time. Clear-flint, or leaded, glass

was made with lead oxide. This glass color was available to the bottle industry as early as the early nineteenth century and was utilized until the end of the nineteenth century (Lindsey 2008; Pullin 1986:354–355).

The lip on a bottle can be informative. A lipping tool, patented in the United States in 1856, smoothes and shapes the glass rim into a more uniform edge than a hand-smoothed lip or "laid-on ring." Certain types or styles of lips were associated with specific contents; for example, medicines were often contained in bottles with prescription lips (Jones and Sullivan 1985). A "sheared," or unfinished, bottle lip typically dates before 1880.

Lipping tools were used throughout the middle and end of the nineteenth century until the advent of the fully automatic bottle machine (ABM) in 1903. It should be noted, however, that as automated bottle manufacture became available after the turn of the twentieth century (see below), tooled finishes continued to be produced—albeit in steadily decreasing numbers. That is, there is a lag time between tooled finishes and ABM finishes, and although ABM glass is given start date of 1903, most tooled-glass vessel shards will be given a terminal date around the 1920s due to this lag time, unless other diagnostic characteristics are observed enabling one to give it an earlier terminal date.

The approximate date of manufacture for bottles and bottle fragments recovered from the project area was established first by attempting to determine the manufacturing process associated with the bottle (i.e., creation of the base and lip of the container) and using any patent or company manufacturing marks or dates embossed on the bottle and comparing those to the published literature (Baugher-Perlin 1982, Jones and Sullivan 1985, and Toulouse 1971). The majority of the container glass recovered during the current project, however, was too fragmentary to identify its manufacturing method. For most of these artifacts, glass color was the only attribute that could be used for dating the fragments.

The manufacturing process can be roughly divided into four basic groups including free blown, blown-in-mold (BIM), semi-automatic, and automatic bottle machine (ABM) manufactured vessels (Baugher-Perlin 1982:262–265). Of the 38 fragments of container glass recovered during the current project, 4 were pieces of BIM glass and 9 fragments were ABM manufactured glass. An undiagnostic category was used for the remaining 25 fragments for which the manufacturing process was indeterminable (Table 5.6).

Blown in Mold (BIM)

Most molded bottles are constructed in pieces and have distinctive seams. The dip mold was used from the late seventeenth through the mid-nineteenth century (Baugher-Perlin 1982:262). It leaves no seams, unless glass adhered to the edges of the bottle mold as it was attached to the free blown shoulder and bottle neck. The key mold, on the other hand, was a type of two-piece mold that was used from approximately 1750 to 1880 (Jones and Sullivan 1985:27). Key mold seams cross the base and are concealed in the corners of a flat-sided body.

The turn paste mold was used from circa 1870 to the early twentieth century and does not contain seams because the glass is blown into a container that is spun. The glass conforms to the mold from the centrifugal force produced. Vessels formed from this process usually have faint horizontal lines from the spinning process.

Table 5.6. Summary of Container Glass Recovered from the Project Area.

Sites	BIM	ABM	Undiagnostic container fragment	Total
16AV149	2	2	13	17
16AV150	2	7	12	21
Total	4	9	25	38

The three-part mold has seams running around the shoulder of the vessel and partially up the neck of the vessel. This style of mold lost popularity around 1870. The blow back mold was another mold type, and this was used in the manufacture of jars such as the distinctive Mason jar, which was patented in 1858.

Post mold and cup mold bases were the most common bottle mold types during the last part of the nineteenth century. The post mold is a three part mold variation where the middle portion of the base is formed by a small separate plate, while the neck, shoulder, body, and the outside edges of the base are formed by two side mold plates (Jones and Sullivan 1985; Lindsey 2008). A number of post mold bottles exhibit a mold seam at the upper edge of the heel that appears identical to the seam created by the cup base mold. For this reason, post molds and cup base molds identified in the glass assemblage recovered during the current excavations were called cup/post bottom molds. The cup mold was a three-part mold where the third part was a base plate that molded the entire bottle base and lower heel of the bottle. The remaining portions of the bottle were formed by two other plates (Toulouse 1969). Both post molds and cup molds were utilized beginning circa 1850 (Lindsey 2008).

The term “finish” originated with the mouth-blown bottle manufacturing process where the last step in the completion of a finished bottle was to “finish the lip.” The finish is the top part of the neck of a bottle or jar made to fit the cork or other closure used to seal the vessel. The finish is often simply referred to as either the lip or rim. Glass factories in the late-nineteenth and early-twentieth centuries produced a wide variety of finishes for their containers (Jones and Sullivan 1985:78). These finish types included a laid-on ring, a rolled finish, a flared or flanged finish, an applied finish, and a tooled finish. The most commonly found finish types are the applied finish and the tooled finish. An applied finish was created when applied hot glass is added at the point where the blowpipe was removed. Once reheating or refiring the end of the neck was accomplished, a lipping tool was inserted into the neck of the bottle and rotated while squeezing the jaws to manipulate the applied hot glass and form the finish desired (Lindsey 2008).

Embossing on container glass vessels was made possible by engraving the mold, into which the glass was blown. Embossing generally consists of lettering, numbers, and/or designs that were intended to either attract the consumer or to establish ownership of the bottle, since bottles were often reused. This was first conducted in the mid-eighteenth century and continued into the twentieth century. The panel bottle came into popular existence around 1860, and the shape of this vessel was useful because the name of the commodity or the manufacturing company could be changed on the bottle form by substituting a different “slug-plate” into the mold. This process can be identified through the distinctive seams, since they follow the rectangular shape of the nameplate. The date of the manufacturer’s patent on the bottle and the name of the company, when present, can often be utilized to determine a date of manufacture for the container.

Pattern molding, a variation of the dip mold, was another form of body decoration on mold blown containers. Pattern molding consists of an inscribed pattern inside the surface of the mold being transferred to the glass surface while the bottle is being blown.

These molds often had diamonds or spiral rib patterns engraved on the surface. Pattern molding was used to produce bottles during the first half of the nineteenth century (Lindsey 2008). It was also possible for bottles to exhibit overglaze hand-painting similar to enameled machine-made bottles. This decorative type is rare and is usually not assigned a specific date.

Four BIM bottle glass fragments were recovered during the current project. Two shards are portions of panel bottles formed in a slug-plate mold. These are too small for useful details to be discerned on the embossed nameplates; one fragment contains a visible letter “S”, and the other incorporates the

letters “PAI”. The other two recovered BIM bottle glass shards include a fragment with very rough vertical mold seams indicating that it pre-dates machine manufacture, and a base fragment displaying a post mold seam. The BIM fragments collected from the project area all date to between 1840 and 1920.

Automatic Bottle Machine (ABM)

The Owens automatic bottle-making machine was patented in 1903 and creates suction scars and distinctive seams that run up the length of the bottle neck and onto the lip. This ABM mold provides a firm manufacturing date at the beginning of the twentieth century. Another automatic bottle machine, called the Individual Section, was also used in the commercial production of bottles. This machine was widely used starting in 1925 and, by 1940, became the most widely used bottle manufacturing device (Jones and Sullivan 1985:39). This bottle machine was more cost effective than the Owens machine, which was no longer used after 1955.

Valve marks are indicative of machine-made bottles formed by a press-and-blow type of machine. This mark was formed when the ejection valve rod pushed the partially expanded parison out of the blank mold. When the parison was placed in the second blow mold, the ejection mark was left behind. These marks are typically found on wide mouth ABM bottles, such as food bottles and jars, milk bottles, and canning jars. These marks are usually found on bottles and jars dating from the 1910s to circa 1950 but are most common on wide mouth bottles produced in the 1930s and 1940s (Lindsey 2008; Rock 1980:7).

Although a full discussion of color types was provided in the introductory section of this artifact group, it should be noted that a few of the glass colors identified were only manufactured for a short time in the ABM industry. Amethyst glass, for instance, was only utilized in the ABM industry until 1920, when it was superseded by selenium glass (Lockhart 2006). Selenium glass was only popular until around 1930, when the glass recipe was perfected and selenium was no longer added (Faulkner 2000). Opaque white and cobalt colored glass, although still found contemporarily, decreased in popularity circa 1960 (Jones and Sullivan 1985; Lindsey 2008).

Nine ABM manufactured glass fragments were recovered during the current survey. Colors included amethyst (n = 1), aqua (n = 2), blue-green (n = 2), colorless (n = 2), and opaque white (n = 2). These included one milk glass cosmetic jar fragment incorporating a cup mold seam and a partial maker’s mark on its base reading “CHICAG[O]”; one amethyst glass bottle base with an Owens scar; three rim shards with machine-made external screw threads; three lip or neck fragments with mold seams from a machine manufacturing process; and one base fragment with a portion of what is likely a valve mark. All of these artifacts display temporally diagnostic features dating them to the twentieth century.

Undiagnostic Container Glass

When no diagnostic features useful for temporal classification or the identification of a fragment’s manufacturing method were present, the color of the glass was noted, although there is some subjectivity inherent in color classification. Jones and Sullivan (1985) observed that chemicals color glass, either as natural inclusions or additions by the manufacturer. The concern for the current study was primarily to note the presence of datable glass in the small fragments recovered. Of the 25 recovered fragments of undiagnostic container glass, the variety of colors present include: amber (n = 2), amethyst (n = 9), aqua (n = 1), blue-green (n = 1), cobalt (n = 3), colorless (n = 5), light green (n = 1), olive green (n = 1), and opaque white (n = 2). Seven of the undiagnostic glass fragments incorporate mold seams, but do not include sufficient base or lip features to precisely determine their manufacturing method. One bottle neck fragment displays stretch marks, but the lack of any other diagnostic features does not allow a determination of whether this vessel was entirely free blown or partially blown in mold.

Glass Tableware

Press molding was first used (although on a very small scale) in England in the late seventeenth century to make small solid glass objects, such as watch faces and imitation precious stones (Buckley 1934). By the end of the eighteenth century, decanter stoppers and glass feet for objects were also being produced (Jones and Sullivan 1985). The production of complete hollowware glass objects did not become possible until there were innovations in press-molded techniques in the United States during the late 1820s (Watkins 1930). Mass production of press-molded glassware was well established by the 1830s (Watkins 1930).

Earlier press-molded glass objects were predominately made of colorless, lead glass (Jones and Sullivan 1985). William Leighton of the Hobbs-Brockunier Glass Works in Wheeling, West Virginia, invented lime glass. This type of glass looked like lead glass, had superior pressing attributes, and was much more inexpensive than lead glass (Revi 1964). Advancements in mold technology in the 1860s and 1870s led to the application of steam-powered mold operation. This, in turn, led to increased production and reduced costs (Revi 1964). Modern press molding is conducted entirely by machine (Jones and Sullivan 1985).

Press-molded table glass was made by dropping hot pieces of glass into a mold. A plunger was then forced into the mold, pressing the hot glass against it. The outer surface of the glass took on the form of the mold, while the inner surface of the glass was shaped by the plunger. The plunger was withdrawn and the glass object was removed from the mold. The surface of the glass was often fire polished to restore the brilliance of the glass surface that was disturbed by its contact with the mold (Jones and Sullivan 1985).

Press-molded glass may be recognized by several characteristics. Usually, the glass object must be open-topped in order for the plunger to be withdrawn from the mold. Narrow mouthed vessels were produced, but additional manipulation of the glass was necessary after the plunger was removed from the mold. Evidence of this manipulation should be present on the vessel (Jones and Sullivan 1985). There is no relationship between the exterior shape and design of a press-molded vessel to the interior shape and design because the plunger shapes the interior of the object, most often leaving behind a smooth surface. This differs from earlier glass vessel production techniques like blown glassware, where interior shape was related to the exterior shape and design (Jones and Sullivan 1985).

Another characteristic of press-molded containers was that mold seams were generally present. The seams were sharp and distinct, unless steps had been taken to deliberately remove them. The texture of the glass surface of press-molded glass was disturbed and often disguised by an all-over stipple design. The edges of the designs on press-molded glass had a predisposition toward rounded edges. The bases of press-molded objects were usually polished. The quality of the designs on press-molded glassware was precise and the design motifs were numerous (Jones and Sullivan 1985).

In contrast to press-molded glass, cut glass generally had a polished, smooth, glossy surface texture. The design edges were sharp and distinct. Cut glass designs consisted mostly of panels, flutes, and miters. The designs were often slightly uneven and asymmetrical. Mold seams were usually absent; they were polished off prior to cutting (Jones and Sullivan 1985). Contact-molded glass also differs from press-molded glass in that the exterior and interior of the vessel will portray parallel patterns. The interior of the vessel is also generally much more diffuse towards the base.

Pattern molding was also occasionally found on glass tableware vessels. This mold type was performed in the same way that it was performed on BIM glass. Free-blown glass tableware was the first type of glass tableware to be created and, therefore, cannot be assigned a specific period of manufacture.

Glass tableware was decorated in numerous ways, including applied color, acid etching, painting, engraving, wheel etching, iridescent, heat treating, gilting, and flashing. Glass tableware with applied color decoration is also referred to as enameled tableware. Enameling on tableware was produced much in the same way as in bottle manufacturing; however, enameled tableware appears much earlier. Vitreous colors were mixed with an adhesive, and after application to the glass surface, the vessel was reheated, fusing the color to the glass. Enameling was popular on glass tableware from the 1880s through the twentieth century (Jones 2000:150).

Wheels and abrasives were used to engrave glass tableware. Wheel engraving, also referred to as wheel etching, allowed for a greater variety of motifs to be cut and often accommodated thin glass. Engraving can be found on pieces of glass tableware dating prior to the early nineteenth century (Jones 2000:177). Acid etching was performed by coating a glass object with a hydrofluoric acid resistant compound. The glass was then placed in an acid bath. Once removed from the bath, the resist was removed, and the glass was polished, frosted, textured, or etched. This process was originally introduced in the eighteenth century (Jones 2000:182).

Iridescent glass tableware was introduced in the 1870s, although years would pass before this glass type was available commercially. It was produced by exposing hot glass to metallic chlorides, producing an iridescent color overlay. This decoration was used on pressed glass beginning in 1905 and was referred to as "carnival glass" (Jones 2000:151). Heat sensitive, or heat treated, glass tableware was introduced in the 1880s. This category of glass tableware contains a few different heat treatments. The first heat treatment involves glass batches containing ingredients that when heated, cooled, and reheated would change the color of the glass at its thickest points. Hobnails, often found in glass tableware, were the most popular result of this heat treatment. Cased or flashed glass was the other result of heat treatments. This treatment involved the layering of glasses using hot glass. This glass type usually refers to a thin layer of colored glass placed over a thicker layer of colorless glass (Jones 2000:148–149). Gilding was performed by applying a layer of gold leaf, gold paint, or gold dust to the glass surface. This treatment was then fired or unfired. Unfired gilding does not preserve well and was used for cheaply decorated wares circa 1890 (Jones 2000:150).

A total of seven pieces of glass tableware were recovered during the current project (Table 5.7). All are heavily fragmented and no complete or nearly complete vessels were encountered. Two press-molded amethyst glass fragments display a repeating geometric design. The remaining five artifacts do not contain sufficient diagnostic features to determine their manufacturing method, but include two amethyst, one blue-green, and two colorless glass fragments.

Container Closures

Six milk class canning jar lid liner fragments were recovered (Table 5.8). These were manufactured between 1869 and 1950. The disc seal was used as early as 1810 by Nicholas Appert (Berge 1980). John L. Mason used this type of closure on his patented fruit jar in 1858 (Berge 1980). Mason's closure was made of zinc and was held in place with an exterior screw cap ring. Unfortunately, the zinc often reacted with the contents of the jars, giving the contents an unpleasant metallic taste (Jones and Sullivan 1985).

Table 5.7. Summary of Glass Tableware Recovered from the Project Area.

Sites	Press Mold	Undiagnostic Fragment/Unidentified Mold	Total
16AV149	1	0	1
16AV150	1	5	6
Total	2	5	7

Table 5.8. Summary of Container Closures Recovered from the Project Area.

Sites	Home Canning Jar Lids	Total
16AV149	6	6
Total	6	6

Glass liners were then developed and added to the disc around 1869 by Lewis R. Boyd (Toulouse 1969, 1977). These liners prevented the zinc from reacting with the contents of the jar. To aid in opening, Boyd added a handle to the disc circa 1900 (Toulouse 1977). Both of these disc seal types were used until around 1950 (Jones and Sullivan 1985; Toulouse 1969, 1977). In 1865, the Kerr two piece seal was patented. This system utilized a metal disc seal held in place by an exterior screw cap with no center. This seal and cap type system is still in use today.

Personal Group

The personal group includes artifacts assumed to have belonged to individuals. This category of artifacts includes health and grooming items, jewelry and beads, coins, music and art items, toys and games, and other personal items. Tobacco products are also subsumed into this category. A single artifact related to toys and games was recovered during this project (Table 5.9). This artifact was a green glass marble 16.80 mm (.66 in) in diameter, containing an interior white swirl. The marble has been heavily pitted over its entire surface, and no temporally diagnostic features or evidence of the marble's manufacturing method remain visible.

Table 5.9. Summary of Personal Group Artifacts Recovered from the Project Area.

Sites	Toys and Games	Total
16AV149	1	1
Total	1	1

Maintenance and Subsistence Group

The maintenance and subsistence group contains artifacts related to general maintenance activities. These artifacts were grouped into classes containing non-food cans, non-food containers, electrical, farming and gardening, stable and barn activities, general hardware, general tools, and fuel-related items, such as coal. The only maintenance and subsistence group artifact recovered during this project is a cylindrical porcelain electrical insulator that incorporates a shaped base hollow and vertical interior channel for undetermined electrical components (Table 5.10). The original application for which this insulator was manufactured could not be determined.

Table 5.10. Summary of Maintenance and Subsistence Group Artifacts Recovered from the Project Area.

Sites	Electrical	Total
16AV149	1	1
Total	1	1

Arms Group

The arms group includes artifacts related to weapons or ammunition. These artifacts are grouped into classes containing gun parts, projectiles, and other artifacts related to arms, such as clay pigeons or BBs. One artifact was recovered from the projectile class of the arms group during the current project (Table 5.11).

Table 5.11. Summary of Arms Group Artifacts Recovered from the Project Area.

Sites	Projectiles	Total
16AV149	1	1
Total	1	1

The recovered artifact consists of a fired brass 12-gauge shotgun shell head. No portion of the shell wall remains attached to the artifact. The shell's headstamp is slightly corroded, but the legend "U.M.C. CO. No 12 NEW CLUB" remains visible. This headstamp design corresponds to the logo of the New Club line of 12-gauge shotgun shells produced by the Union Metallic Cartridge Company (UMC). Incorporated in 1867, UMC manufactured and sold loaded and unloaded

versions of brass and paper shotgun shells in a variety of gauges during the late nineteenth and early twentieth centuries. The New Club line of shells was introduced between 1891 and 1905, and UMC eventually merged with Remington Arms in 1911. The company ceased to operate independently in 1916 (Farrar 2013). The brass shotgun shell head recovered during the current survey was therefore produced between 1891 and 1916.

Industrial Group

The industrial group contains artifacts related to manufacturing, materials and resource processing, power generation, and other industries. These artifacts are grouped into classes containing objects related to ceramic manufacturing, steam engine/boiler operations, mills, brick kilns, and other activities.

One brass gauge faceplate from an undetermined steam engine or boiler was recovered during the current project (Table 5.12). The roughly circular gauge faceplate incorporates several screw holes and two mounting holes for pointers, one in the upper right portion of the dial and one in the lower center. Ferrous concretions near the two mounting holes mark the possible positions of pointers which have since corroded away. Unlabeled tick marks are inscribed in an arc above the mounting point of the lower pointer. The date "JAN 23 1900" is inscribed on the left edge of the front of the gauge cover. It is assumed that the gauge faceplate is from a boiler, steam engine, or other piece of industrial machinery due to the early date, but it is also possible that it is a component from a motorized vehicle.

Table 5.12. Summary of Industrial Group Artifacts Recovered from the Project Area.

Sites	Steam Engine/Boiler	Total
16AV149	1	1
Total	1	1

Discussion

A total of 136 historic artifacts were recovered from two sites (16AV149 and 16AV150) and one isolated find during the current investigation. The material collected is discussed in detail above, and a brief discussion is provided below by locus. A complete inventory can be found in Appendix A, and a full discussion of each location is provided in Chapter 6.

Site 16AV149 Summary

The materials recovered from Site 16AV149, and the observation of numerous very small brick fragments at the site location that were not collected, suggest that at least one structure was present at the location. The very high proportion of domestic artifacts collected during the current survey indicates that this structure was utilized as a residence. Dating of the recovered cultural material indicates that the site was occupied from the late nineteenth through early twentieth centuries.

This site yielded a total of 80 artifacts, with 93 percent (n = 74) of these being from the domestic group. Domestic group artifacts included ceramics (n = 50), container glass (n = 17), container closures (n = 6), and glass tableware (n = 1). Ceramics dominated the domestic group assemblage, including ironstone (n = 4), hard paste porcelain (n = 7), stoneware (n = 9), whiteware (n = 28), and yellowware (n = 2). The container glass assemblage included ABM fragments (n = 2), BIM fragments (n = 2), and undiagnostic fragments (n = 13). Recovered container closures included six milk glass canning jar lid liner fragments, and the single recovered fragment of glass tableware was a piece of press-molded amethyst glass. All domestic group artifacts from Site 16AV149 clearly dated the site to the late nineteenth through early twentieth centuries.

The remaining artifacts from the Site 16AV149 assemblage included two four-hole sew-through Prosser buttons in the clothing group, one brass gauge faceplate from the industrial group, one porcelain electrical

insulator from the maintenance and subsistence group, one glass marble from the personal group, and one fired brass 12-gauge shotgun shell head from the arms group. Several of these latter artifacts could not be assigned to a specific date range, but the Prosser buttons and shotgun shell head agreed very well with a late nineteenth to early twentieth century date for the site.

Site 16AV150 Summary

The cultural material recovered from Site 16AV150 suggests that at least one structure was also present at this location, with the very high proportion of domestic artifacts indicating that this structure was also utilized as a residence. Dating of the recovered artifacts indicates an occupation period for this site of the late nineteenth through early twentieth centuries, roughly contemporaneous with Site 16AV149.

Site 16AV150 yielded a total of 55 artifacts, of which 54 (98 percent) were classified as part of the domestic group. These domestic group artifacts were comprised of ceramics (n = 27), container glass (n = 21), and glass tableware (n = 6). Ceramic varieties represented included whiteware (n = 15), ironstone (n = 6), hard paste porcelain (n = 3), and stoneware (n = 3). The majority of the container glass assemblage was comprised of undiagnostic fragments (n = 12), but ABM fragments (n = 7) and BIM fragments (n = 2) were also represented. Of the glass tableware fragments, one piece was formed in a press mold, but the remaining five fragments had been manufactured in an unidentified mold or were otherwise undiagnostic. The only other artifact recovered from Site 16AV150 was a single non-vitrified brick fragment of indeterminate manufacturing method, classified as part of the architecture group. As a whole, the artifact assemblage recovered from Site 16AV150 very closely agrees with a late-nineteenth- to early-twentieth-century occupation date for the site.

X16AVA Summary

This isolated find consisted of a single piece of whiteware. Little can be inferred about the activities at the location based on this artifact.

Chapter 6. Results

The fieldwork portion of this project consisted of a combination of pedestrian survey, shovel testing, and limited deep testing. The entire project area was covered in open agricultural fields at the time of the survey. Planting of the fields with soybeans had taken place several days prior to the survey, but the plants had just begun to sprout during the project. As a result, surface visibility was exceptional (more than 90 percent) throughout the entire investigation.

This chapter is separated into two sections. The first section presents data on the cultural resources that were recorded as a result of the survey. The second section provides data regarding the depositional environment and the potential for buried cultural resources as determined by the deep testing program incorporated into this project.

Cultural Resources

Pedestrian survey and shovel testing resulted in the location and delineation of two sites (16AV149 and 16AV150) and one isolated find (X16AVA). The locations of the sites and isolated find are presented in Figure 1.2. The following section provides an overview of the investigations and findings at these cultural resources and the justification for our NRHP recommendations.

Site 16AV149

UTM Coordinates:
Datum: 15N, N3424721 E613626 (NAD 83)
Elevation: 13 m (43 ft) AMSL
Components: Historic
Specific Components: Late nineteenth through early twentieth century
Site Type: Residential
Size: 3,200 sq m (34,445 sq ft)
Distance/direction to nearest water: Atchafalaya River, 420 m (1,378 ft) to the east
Type and extent of previous disturbance: Heavy disturbance from cultivation
Topography: Backswamp
Vegetation: Soybeans (newly-planted at time of survey, normally variable)
Ground surface visibility: 91 to 100 percent
Slope Direction (Aspect): Virtually level
Recommended NRHP status: Not eligible; no further work

Site Description

Site 16AV149 is a newly recorded archaeological site as a result of this project, and was assigned the temporary field site number FS-1. The site is comprised of a surface and very limited subsurface concentration of historic artifacts in an open agricultural field on the west side of LA 105, immediately to the north of a chain link fence separating the field from a small area containing storage tanks (Figures 1.2 and 6.1). Located in the extreme southeastern corner of the project area, Site 16AV149 is approximately 230 m (755 ft) southeast of Site 16AV150. No historic structures are depicted at the site location on any of the topographic quadrangles examined during the records review (see Chapter 3).

The site area is relatively well drained, since it is immediately adjacent to a shallow ditch parallel to the west side of LA 105, and the site area was free of standing water despite recent heavy rain. Surface visibility was excellent at the time of the survey, estimated at 91 to 100 percent, consistent with the exceptional visibility in the project area as a whole. As such, the site was primarily delineated using surface visibility. Delineation shovel tests were also excavated at 15 m (49 ft) intervals from the single positive shovel test.

Site 16AV149 contained a moderately dense surface scatter of primarily domestic historic artifacts, accompanied by a very limited subsurface scatter of similar materials to a depth of 25 cm (10 in) bgs. A variety of historic ceramics, container glass, and miscellaneous other artifacts were recovered. Very small red brick fragments

Figure 6.1. Overview of Site 16AV149, facing south from datum.

were also present on the surface throughout the site area, but no fragments large enough for analysis were observed. No artifacts remained in situ, as plowing and other agricultural activities over the entire site area had disrupted any integrity the cultural deposits might have once had.

The recovered artifact assemblage is consistent with a domestic function. The presence of a large quantity of very small brick fragments suggests that the site represents the location of a structure, and is not simply a historic dump site. The probable late-nineteenth- to early-twentieth-century date for the assemblage is consistent with this interpretation, since such an occupation period predates the available quadrangle maps. If a structure was present at the site location, it was no longer extant by 1955 (see Figure 3.1) (USGS 1955). Given the site's location and probable occupation date, Site 16AV149 likely represents a residence. No intact surface or subsurface features or midden soils were encountered during investigations at the site, and plowing disturbance is extensive. This site is recommended not eligible for listing in the NRHP, and no further archaeological work is recommended.

Investigation Methods

The portion of the project area containing the site had been designated before the survey began as an area with a high probability to contain cultural materials. As discussed in Chapters 3 and 4, shovel tests were excavated on a 30 m (98 ft) grid in those portions of the project area within.8 km (.5 mi) of the Atchafalaya River. The center point of Site 16AV149 is located approximately.42 km (.26 mi) west of the Atchafalaya River. The site was first detected through visual observation.

Upon encountering a moderately dense surface scatter of cultural material over an area greater than 50 m (164 ft) in diameter, delineation shovel tests were excavated at 15 m (49 ft) intervals in cardinal directions from all positive shovel tests until two negative tests were encountered in each direction. Only a single shovel test yielded subsurface artifacts from Site 16AV149, and the site boundaries were defined by the extent of the surface artifact scatter to the north and west, by the edge of LA 105 to the east, and by the project area boundary near the chain link fence around the storage tanks to the south (Figure 6.2).

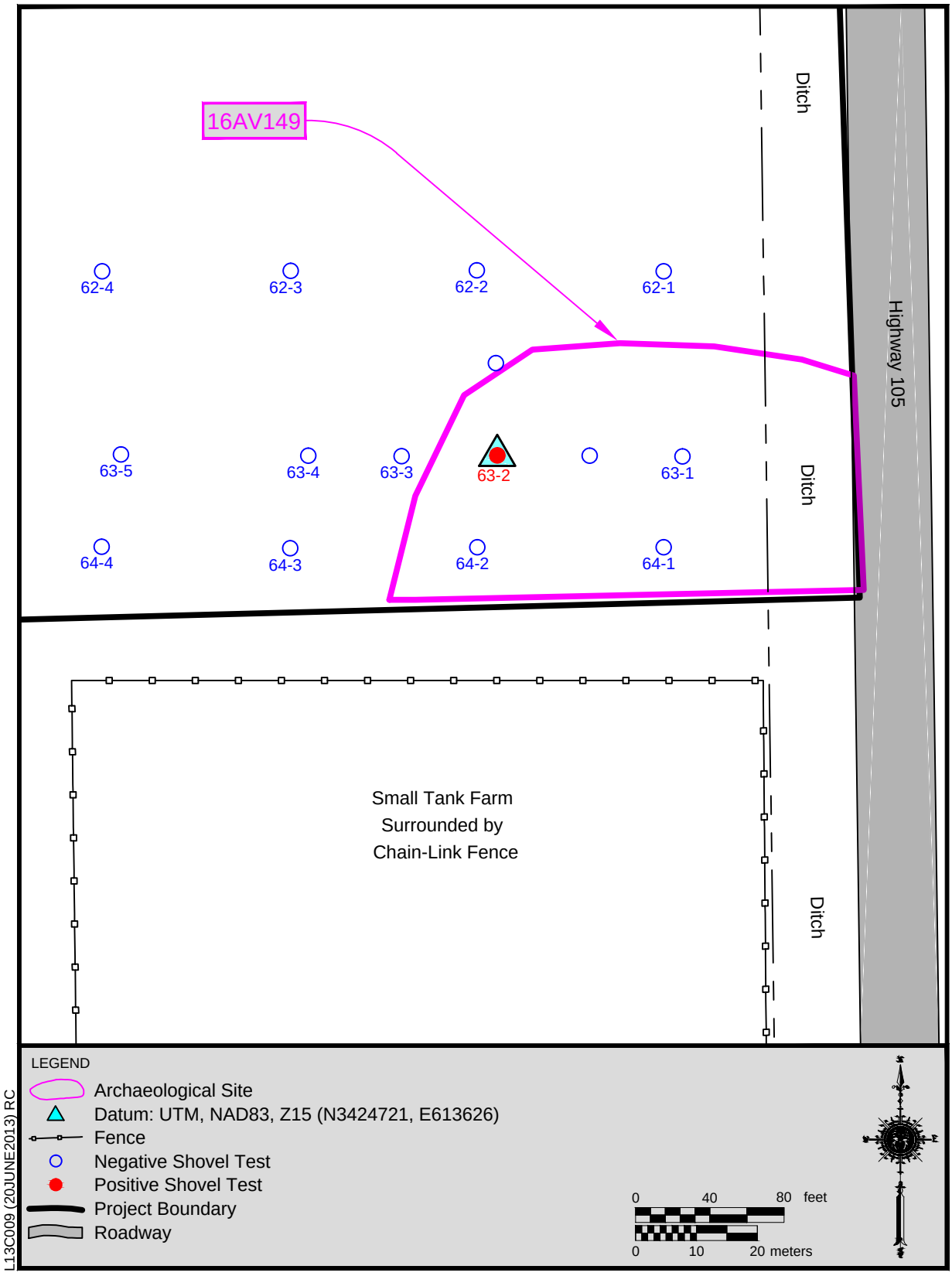

Figure 6.2. Schematic plan map of Site 16AV149 within the project area.

Only two artifacts were recovered from subsurface contexts in the single positive shovel test, so a general collection of diagnostic surface artifacts from within the site boundaries was also conducted to allow dating and characterization of the assemblage. The recovered artifacts are discussed in the Chapter 5.

The cultural deposits at Site 16AV149 have been severely disrupted by plowing and other agricultural activities. No artifacts remain in situ, and no intact surface or subsurface features or midden soils were encountered during investigations at the site. Locational data points collected at Site 16AV149 include the site datum (grid position N1000 E1000) and the site boundaries. The site shape is irregular, with geographical boundaries on the east and south and irregular boundaries defined by the surface artifact scatter to the north and west.

Depositional Context

Profiles observed at Site 16AV149 during the cultural survey were typical of those encountered in the southeast portion of the project area and mapped as Commerce silt loam (Martin 1986). The profile of the single positive shovel test from the site (Transect 63, Shovel Test 2) consisted of an Ap1 horizon of dark grayish brown (10YR 4/2) silt loam in the top 25 cm (10 in), overlying an Ap2 horizon of dark grayish brown (10YR 4/2) silty clay loam from 25 to 34 cm (10 to 13 in) bgs. This was in turn underlain by a B2 horizon of grayish brown (10YR 5/2) silty clay loam from 34 to 60 cm (13 to 24 in) bgs and a B3 horizon of dark gray (10 YR 4/1) silty clay loam from 60 to 75 cm (24 to 30 in) bgs.

Shovel tests excavated at Site 16AV149 did not extend below the dark gray or dark grayish brown B3 horizon, but in a typical Commerce series solum, the B3 horizon extends to a depth of 81 cm (32 in) bgs, and is in turn underlain by a C1 horizon of grayish brown (10YR 5/2) silt loam from 81 to 130 cm (32 to 51 in) bgs (Martin 1986).

The Commerce series soils found at Site 16AV149 were observed throughout the southeastern portion of the project area. No breaks within the soil horizon could be seen in exposed soil profiles. Shovel tests excavated at Site 16AV149 always encountered the Ap and B2 horizons, and sometimes extended into the B3 horizon. Subsurface artifacts were only recovered from the shallow Ap1 horizon in a single shovel test. Ap horizons were observed throughout the project area in all soil series, and represent the portions of the soil column subject to plowing or other agricultural activities. No artifacts were recovered from beneath the plowzone at Site 16AV149.

Artifacts

The Site 16AV149 assemblage recovered during the survey consists of 80 artifacts. The vast majority of these artifacts (93 percent) fall within the domestic group. All other groups that are represented, including clothing, industrial, maintenance and subsistence, personal, and arms, constituted the remaining 7 percent of the assemblage. Artifacts recovered from the field investigation are tabulated by provenience in Table 6.1. Numerous very small red brick fragments were also observed on the surface at the site location, but all were too small for analysis.

Table 6.1. 16AV149 Artifact Recovery by Provenience.

Provenience	Domestic	Clothing	Industrial	Maint. and Sub.	Personal	Arms	Total
STP TR 63, #2	2	0	0	0	0	0	2
GSC	72	2	1	1	1	1	78
Total	74	2	1	1	1	1	80

The terminus post quem (TPQ), or earliest dates, and terminus ante quem (TAQ), or latest dates associated with artifact types from 16AV149 are very consistent with a late-nineteenth- to early-twentieth-century occupation, consistent with depictions on historic maps of no structure being present at

the site location by 1955 and later (USGS 1955).

The available TPQ and TAQ dates are from domestic, clothing, and arms group artifacts. The former group includes whiteware, yellowware and ironstone, all of which went into production in 1830 and remain in production today (Faulkner 2000; Majewski and O'Brien 1987:119). Stoneware sherds recovered indicate a date between A.D. 1800 and 1925 (Greer 1999; Ketchum 1983). Additionally, two glass container fragments formed by an Automatic Bottle Machine (ABM) denote a date after A.D. 1903 (Jones and Sullivan 1985; Lindsey 2008). Seven recovered fragments of amethyst glass were manufactured between 1880 and 1914 (Lockhart 2006). Two four-hole sew-through Prosser pressed ceramic buttons in the clothing group were made between 1840 and 1910 (Sprague 2002). Finally, a fired brass 12-gauge shotgun shell head was produced between 1891 and 1916 (Farrar 2013).

Architectural group artifacts would provide some indication of the date structures were constructed, but no nails were recovered and only very small brick fragments unsuitable for historic analysis were observed on the surface. The presence of brick fragments suggests that a structure was once present at the site location and that the assemblage represents more than simply a historic dump site, but no diagnostic architectural artifacts were recovered. When considered as a complete assemblage, the domestic, clothing, and arms materials from Site 16AV149 indicate that habitation activities likely took place at the site in the late nineteenth and early twentieth centuries.

There is no clear spatial distribution of artifacts recovered from Site 16AV149 by functional group. Domestic group artifacts represent the vast majority of the cultural material recovered from the site during the survey, and were collected throughout the site in surface contexts. Too few artifacts from the clothing, industrial, maintenance and subsistence, personal, and arms groups were recovered to draw conclusions from their spatial distributions. Similarly, the spatial distribution of artifacts by TPQ/TAQ date range does not show any unambiguous indications as to the temporal changes, if any, that took place at the site.

The homogenous distribution of artifact types throughout Site 16AV149 is possibly a reflection of disturbance to the site from agricultural activities, but the large relative proportion of recovered domestic group artifacts clearly indicates that the structure represented by the assemblage was utilized as a residence.

Features

The profiles of all excavated shovel tests were examined for cultural features and other in situ historic deposits, but no such intact deposits were found. This absence is possibly the result of disturbance to the site caused by plowing and other agricultural activities.

Summary and National Register Evaluation

Site 16AV149 is a newly recorded archaeological site as a result of this survey, and represents the remains of a late-nineteenth- to early-twentieth-century residence. The site consists of a surface and very limited subsurface concentration of historic artifacts in an open agricultural field on the west side of LA 105. No historic structures are depicted at the site location on the available topographic quadrangles, but the earliest available map dates to 1955 (Figure 3.1), and it is likely that the structure at the site location was no longer extant by that time.

The agricultural field within which the site is situated had exceptional surface visibility at the time of the survey, and the site was originally located via surface observation. Delineation shovel tests were excavated at 15 m (49 ft) intervals in cardinal directions from the single positive shovel test until two negatives were encountered, but the boundary of Site 16AV149 was primarily defined by visual observation of the extent of the surface artifact scatter. Disturbance from plowing was extensive, and subsurface artifacts were

recovered from only one shovel test at a maximum depth of 25 cm (10 in) bgs. No features or other intact subsurface deposits were noted.

The functional group distribution of the recovered artifacts definitively indicates that the structure at Site 16AV149 was utilized as a residence. The age of the artifacts confirms a date from the late nineteenth through the early twentieth centuries for the residence. However, their homogeneity of distribution did not allow any meaningful analysis of spatial or temporal artifact distribution within the site.

Investigations at Site 16AV149 indicate that this resource contains very low density subsurface remains and has experienced considerable modern disturbance through plowing and other agricultural activities. No artifacts remain in situ, and the site has no remaining integrity. Based on its limited research potential, Site 16AV149 is recommended not eligible for listing in the NRHP. This site is unlikely to produce any significant data relative to local and regional research themes, and no further work is recommended.

Site 16AV150

UTM Coordinates:
Datum: 15N, N3424905 E613487 (NAD 83)
Elevation: 12 m (41 ft) AMSL
Components: Historic
Specific Components: Late nineteenth through early twentieth century
Site Type: Residential
Size: 4,225 sq m (45,478 sq ft)
Distance/direction to nearest water: Atchafalaya River, 620 m (2,034 ft) to the east
Type and extent of previous disturbance: Heavy disturbance from cultivation
Topography: Backswamp
Vegetation: Soybeans (newly-planted at time of survey, normally variable)
Ground surface visibility: 91 to 100 percent
Slope Direction (Aspect): Virtually level
Recommended NRHP status: Not eligible; no further work

Site Description

Site 16AV150 is a newly recorded archaeological site as a result of this project, and was assigned the temporary field site designation FS-2. The site is comprised of a surface and limited subsurface concentration of historic artifacts in an open agricultural field, approximately 170 m (558 ft) west of LA 105 (Figures 1.2 and 6.3). Located in the southeastern portion of the project area, Site 16AV150 is roughly 230 m (755 ft) northwest of Site 16AV149. No historic structures are depicted at the site location on any of the topographic quadrangles examined during the records review (see Chapter 3).

Figure 6.3. Overview of Site 16AV150, facing south from datum.

The site area is relatively well drained despite being virtually level, and was free of standing water despite recent heavy rain. Surface visibility was excellent at the time of the survey, estimated at 91 to 100 percent, consistent with the exceptional visibility in the project area as a whole. As such, the site was primarily delineated using surface visibility. Delineation shovel tests were also excavated at 15 m (49 ft) intervals from all positive shovel tests.

Site 16AV150 contained a moderately dense surface scatter of historic domestic artifacts, accompanied by a limited subsurface scatter of similar materials to a depth of 25 cm (10 in) bgs. A variety of historic ceramics and container glass was recovered. Very small red brick fragments were also present on the surface throughout the site area, but only one fragment large enough for analysis was observed and collected. No artifacts remained in situ, as plowing and other agricultural activities over the entire site area had disrupted any integrity the cultural deposits might have once had.

The recovered artifact assemblage is consistent with a domestic function. The presence of a large quantity of very small brick fragments suggests that the site represents the location of a structure, and is not simply a historic dump site. The probable late-nineteenth- to early-twentieth-century date for the assemblage is consistent with this interpretation, since such an occupation period predates the available quadrangle maps. If a structure was present at the site location, it was no longer extant by 1955 (see Figure 3.1) (USGS 1955). Given the site's location and probable occupation period, Site 16AV150 likely represents a residence. No intact surface or subsurface features or midden soils were encountered during investigations at the site, and plowing disturbance is extensive. This site is recommended not eligible for listing in the NRHP, and no further archaeological work is recommended.

Investigation Methods

The portion of the project area containing the site had been designated before the survey was conducted as an area with a high probability of containing cultural materials. As discussed in Chapters 3 and 4, shovel tests were excavated on a 30 m (98 ft) grid in those portions of the project area within .8 km (.5 mi) of the Atchafalaya River. The center point of Site 16AV150 is located approximately.62 km (.39 mi) west of the Atchafalaya River. The site was first detected through visual observation.

Upon encountering a moderately dense surface scatter of cultural material over an area greater than 50 m (164 ft) in diameter, delineation shovel tests were excavated at 15 m (49 ft) intervals in cardinal directions from all positive shovel tests until two negative tests were encountered in each direction. A total of six shovel tests yielded subsurface artifacts from Site 16AV150. The site boundaries were defined on all sides by the extent of the surface artifact scatter (Figure 6.4). Only 12 artifacts were recovered from subsurface contexts in the six positive shovel tests, so a general collection of diagnostic surface artifacts from within the site boundaries was also conducted to allow dating and characterization of the assemblage. The recovered artifacts are discussed in the Chapter 5.

The cultural deposits at Site 16AV150 have been severely disrupted by plowing and other agricultural activities. No artifacts remain in situ, and no intact surface or subsurface features or midden soils were encountered during investigations at the site. Locational data points collected at Site 16AV150 include the site datum (grid position N1000 E1000) and the site boundaries. The site shape is roughly circular, with the site boundaries being defined by the surface artifact scatter to the north, south, east and west.

Depositional Context

Profiles observed at Site 16AV150 during the cultural survey were typical of those encountered in the southern central portion of the project area and mapped as Moreland clay (Martin 1986). The profile of a representative positive shovel test from the site (Transect 57, Shovel Test 6) consisted of an Ap horizon of

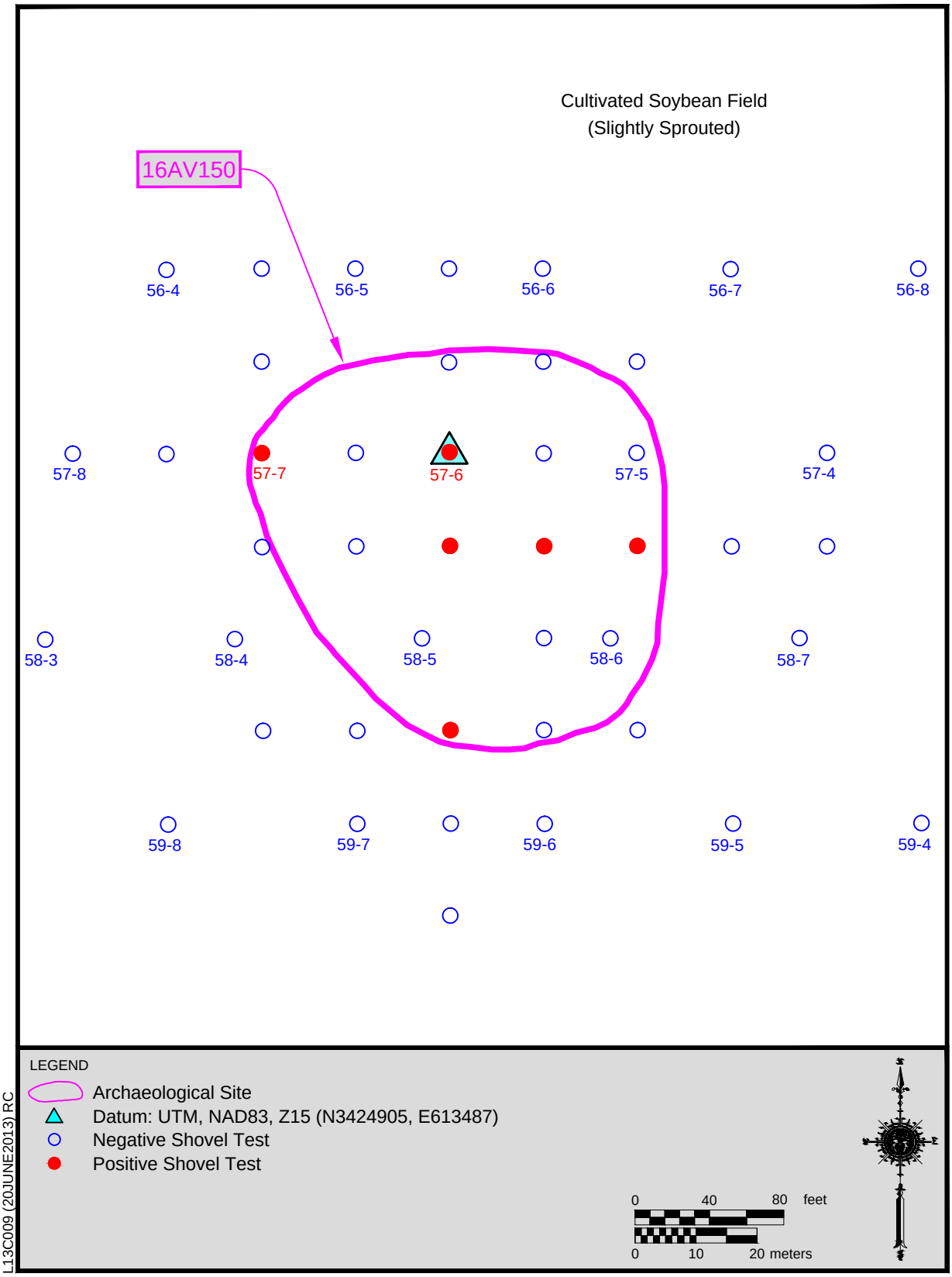

Figure 6.4. Schematic plan map of Site 16AV150 within the project area.

dark reddish brown (5YR 3/2) silty clay loam in the top 15 cm (6 in), overlying an A1 horizon of dark grayish brown (10YR 4/2) silty clay from 15 to 38 cm (6 to 15 in) bgs. This was in turn underlain by a B21 horizon of dark reddish brown (5YR 3/4) clay from 38 to 70 cm (15 to 28 in) bgs.

Shovel tests excavated at Site 16AV150 did not extend below the dark reddish brown B21 horizon, but in a typical Moreland series solum, the B21 horizon is underlain by a B22 horizon of dark reddish brown (5YR 3/4) clay from 61 to 107 cm (24 to 42 in) bgs, and a B3 horizon of reddish brown (5YR 4/4) clay from 107 to 152 cm (42 to 60 in) bgs (Martin 1986).

The Moreland series soils found at Site 16AV150 were observed with slight variations throughout the southern central portion of the project area. No breaks within the soil horizon could be seen in exposed soil profiles. Shovel tests excavated at Site 16AV150 all encountered the Ap and A1 horizons, and usually extended into the B21 horizon. Subsurface artifacts were only recovered from the shallow Ap horizon in six shovel tests. Ap horizons were observed throughout the project area in all soil series, and represent the portions of the soil column subject to plowing or other agricultural activities. No artifacts were recovered from beneath the plowzone at Site 16AV150.

Artifacts

The Site 16AV150 assemblage recovered during the survey consists of 55 artifacts. All but one of these artifacts (98 percent) fall within the domestic group; the final artifact is the only architectural group artifact recovered (a fragment of red brick). Artifacts recovered from the field investigation are tabulated by provenience in Table 6.2. Numerous, very small red brick fragments were observed on the surface at the site location, but only one fragment recovered from a shovel test was large enough for analysis.

The terminus post quem (TPQ), or earliest dates, and terminus ante quem (TAQ), or latest dates associated with artifact types from Site 16AV150 are very consistent with a late-nineteenth- to early-twentieth-century occupation, consistent with depictions on historic maps of no structure being present at the site location by 1955 and later (USGS 1955).

Table 6.2. 16AV150 Artifact Recovery by Provenience.

Provenience	Domestic	Architectural	Total
STP TR 57, #6	2	0	2
STP TR 57, #7	1	0	1
N955 E1000	1	1	2
N985 E1000	3	0	3
N985 E1015	3	0	3
N985 E1030	1	0	1
GSC	43	0	43
Total	54	1	55

The available TPQ and TAQ dates are exclusively from domestic artifacts. These include whiteware and ironstone, both of which went into production in 1830 and remain in production today (Faulkner 2000; Majewski and O'Brien 1987:119). Stoneware sherds recovered indicate a date between A.D. 1800 and 1925 (Greer 1999; Ketchum 1983). Additionally, seven glass container fragments formed by an Automatic Bottle Machine (ABM) denote a date after A.D. 1903 (Jones and Sullivan 1985; Lindsey 2008). Six recovered fragments of amethyst glass were manufactured between 1880 and 1914, while one additional fragment was manufactured between 1903 and 1914 (based on its being formed by an ABM) (Lockhart 2006).

Architectural group artifacts would provide some indication of the date structures were constructed, but no nails were recovered and only very small brick fragments unsuitable for historic analysis were observed on the surface. Although one larger brick fragment was later recovered from a shovel test and presented a generally non-vitrified appearance, insufficient diagnostic characteristics were present on this fragment to allow a definitive determination of its date of manufacture. The observed presence of brick fragments suggests that a structure was once present at the site location and that the assemblage represents more than simply a historic dump site, but no diagnostic

architectural artifacts were recovered. The domestic materials from Site 16AV150 indicate that habitation activities likely took place at the site in the late nineteenth and early twentieth centuries.

There is no clear spatial distribution of artifacts recovered from Site 16AV150 by functional group, primarily because the assemblage consisted almost entirely of domestic group artifacts. These artifacts were collected throughout the site in surface and subsurface contexts. The single recovered artifact from the architectural group does not allow conclusions to be drawn from its spatial location. Similarly, the spatial distribution of artifacts by TPQ/TAQ date range does not show any unambiguous indications as to the temporal changes, if any, that took place at the site.

The homogenous distribution of artifact types throughout Site 16AV150 is possibly a reflection of disturbance to the site from agricultural activities, but the very large relative proportion of recovered domestic group artifacts clearly indicates that the structure represented by the assemblage was utilized as a residence.

Features

The profiles of all excavated shovel tests were examined for cultural features and other in situ historic deposits, but no such intact deposits were found. This absence is possibly the result of disturbance to the site caused by plowing and other agricultural activities.

Summary and National Register Evaluation

Site 16AV150 is a newly recorded archaeological site as a result of this survey, and represents the remains of a late-nineteenth- to early-twentieth-century residence. The site consists of a surface and limited subsurface concentration of historic artifacts in an open agricultural field approximately 170 m (558 ft) west of LA 105. No historic structures are depicted at the site location on the available topographic quadrangles, but the earliest available map dates to 1955 (see Figure 3.1), and it is likely that the structure at the site location was no longer extant by that time.

The agricultural field within which the site is situated had exceptional surface visibility at the time of the survey, and the site was originally located via surface observation. Delineation shovel tests were excavated at 15 m (49 ft) intervals in cardinal directions from the six positive shovel tests until two negatives were encountered, but the boundary of Site 16AV150 was primarily defined by visual observation of the extent of the surface artifact scatter. Disturbance from plowing was extensive. Subsurface artifacts were recovered from six shovel tests at a maximum depth of 25 cm (10 in) bgs. No features or other intact subsurface deposits were noted.

The functional group distribution of the recovered artifacts definitively indicates that the structure at Site 16AV150 was utilized as a residence. The age of the artifacts confirms a date from the late nineteenth through the early twentieth century for the residence. However, their homogeneity of distribution did not allow any meaningful analysis of spatial or temporal artifact distribution within the site.

Investigations at Site 16AV150 indicate that this resource contains very low density subsurface remains and has experienced considerable modern disturbance through plowing and other agricultural activities. No artifacts remain in situ, and the site has no remaining integrity. Based on its limited research potential, Site 16AV150 is recommended not eligible for listing in the NRHP. This site is unlikely to produce any significant data relative to local and regional research themes, and no further work is recommended.

Isolated Find X16AVA

UTM Coordinates:
Datum: 15N, N3425749 E613634 (NAD 83)
Elevation: 13 m (42 ft) AMSL
Components: Historic
Specific Components: Nineteenth through twenty-first century
Topography: Backswamp

Vegetation: Soybeans (newly-planted at time of survey, normally variable)
Ground surface visibility: 91 to 100 percent
Slope Direction (Aspect): Level
Recommended NRHP status: Not eligible; no further work

Description

Isolated find X16AVA consists of a single fragment of undecorated whiteware, found at a depth of 15 cm (6 in) bgs in a shovel test in an open agricultural field approximately 35 m (115 ft) west of LA 105. Whiteware went into production in 1830 and remains in production today (Faulkner 2000; Majewski and O'Brien 1987). The fragment must therefore post-date 1830, but nothing further can be determined about its age, as the sherd has no temporally diagnostic decoration. Delineation shovel tests were excavated at intervals of 15 m (49 ft) in cardinal directions from the positive shovel test until two negatives were encountered in each direction. The excavation of seven shovel tests in this cruciform pattern failed to reveal any subsurface remains or to recover any additional artifacts. The excavation of the second test to the east of the original positive test was prevented due to the presence of a large push pile containing vegetation and other debris. This resource falls short of the minimum number of artifacts that constitute a site and is unlikely to provide any information regarding use of the area. This resource is recommended not eligible for listing in the NRHP, and no further archaeological work is recommended.

Deep Testing Results

This section presents the results of the deep testing program that was conducted as a part of the survey of the project area. A total of five trenches were mechanically excavated during this program. These were roughly evenly spaced every 220 m (722 ft) along the eastern border of the project area. The survey area is situated roughly 420 m (1,378 ft) to the west of the Atchafalaya River, and no rise in the ground surface near the eastern edge of the project area that could be interpreted as natural levee deposits was observed. The purpose of the deep testing program was to examine the deep sediments along the eastern edge of the project area, ascertain whether natural levee sediments are present, and assess the potential for buried cultural resources in these areas. Each of the excavated trenches received an adjacent exploratory 50-x-50 cm (20-x-20 in) test unit to test for buried archaeological deposits. The stratigraphic data and the results of the deep testing at each of the trenches are discussed individually below.

Trench 1

The first trench excavated during the deep testing program was positioned in the northeast corner of the project area (see Figure 4.1). This trench was aligned from west to east and was approximately 15.0 m (49.2 ft) in length, 1.5 m (4.9 ft) in width, and 1.1 m (3.6 ft) deep. A total of two soil strata were documented within the exposed profile.

Soil Stratum I consists of an Ap plowzone of dark grayish brown (10YR 4/2) silty clay loam from 0 to 15 cm (0 to 6 in) bgs. Stratum II is recorded as reddish brown (5YR 4/4) silty clay loam from 15 cm to the base of the trench at 114 cm (6 to 45 in). This profile is consistent with the Coushatta soils observed throughout the northern and western portions of the project area. Below the Ap horizon, Coushatta series soils display a sequence of B21, B22, and C1 horizons, all of which are reddish brown (5YR 4/4) silt loam, silty clay loam, or silty clay (refer to the Coushatta series description in the Soils section of Chapter 2). In Trench 1, the textural boundaries between the B21, B22, and C1 horizons were subtle to the point where they could not be reliably distinguished, and these Coushatta horizons are encompassed within Stratum II. The Coushatta C2 horizon of loamy very fine sand was not observed in Trench 1.

Trench Unit 1 was excavated along the northern trench wall. The unit was excavated to the local bottom of the trench in 12 arbitrary levels, ending at a depth of 114 cm (45 in) bgs. No artifacts or cultural features were encountered in Unit 1 or in Trench 1 as a whole. The north profile of Trench Unit 1 is depicted in Figure 6.5.

Figure 6.5. Trench Unit 1 north profile.

Trench 2

The second trench was excavated near the project area's eastern boundary to the south of Trench 1, approximately 40 m (131 ft) north of the unnamed dirt road bisecting the project area from east to west (see Figure 4.1). This trench was aligned from west to east and was roughly 7.8 m (25.6 ft) in length, 1.5 m (4.9 ft) in width, and 1.4 m (4.6 ft) deep at its deepest point. A total of three soil strata were documented within the exposed profile.

Soil Stratum I consists of an Ap1 plowzone of very dark grayish brown (10YR 3/2) silt loam from 0 to 25 cm (0 to 10 in) bgs. Stratum II is comprised of an Ap2 plowzone of dark yellowish brown (10YR 4/4) silty clay from 25 to 35 cm (10 to 14 in) bgs. Finally, Stratum III is recorded as reddish brown (5YR 4/4) silty clay from 35 cm to the local bottom of the trench at 120 cm (14 to 47 in) bgs. This profile is also generally consistent with the Coushatta soils observed throughout the northern and western portions of the project area. Similar to Trench 1, there was little to no textural distinction between the reddish brown (5YR 4/4) sub-Ap horizons in Trench 2, and it is believed that the Coushatta B21, B22, and C1 horizons are encompassed within Trench 2's mapped Stratum III. The Coushatta C2 horizon of loamy very fine sand was also not observed in Trench 2.

Trench Unit 2 was excavated along the northern trench wall. The unit was excavated to the local bottom of the trench in 12 arbitrary and natural levels, ending at a depth of 120 cm (47 in) bgs. No artifacts or cultural features were encountered in Unit 2 or in Trench 2 as a whole. The north profile of Trench Unit 2 is depicted in Figure 6.6.

Figure 6.6. Trench Unit 2 north profile.

Trench 3

The third trench was excavated near the project area's eastern boundary to the south of Trench 2, roughly 230 m (755 ft) south of the unnamed dirt road bisecting the project area from east to west (see Figure 4.1). This trench was aligned from west to east and was approximately 15.0 m (49.2 ft) in length, 1.8 m (5.9 ft) in width, and 1.1 m (3.6 ft) deep. A total of three soil strata were documented within the exposed profile.

Soil Stratum I is comprised of an Ap1 plowzone of dark grayish brown (10YR 4/2) silt loam from 0 to 23 cm (0 to 9 in) bgs. Stratum II consists of an Ap2 plowzone of grayish brown (10YR 5/2) silt loam from 23 to 38 cm (9 to 15 in) bgs. Finally, Stratum III is recorded as dark grayish brown (10YR 4/2) silty clay loam from 38 cm to the bottom of the trench at 112 cm (15 to 44 in) bgs. This profile is consistent with the Commerce soils observed in much of the eastern portion of the project area. Below the Ap1 and Ap2 horizons, Commerce series soils typically display B2 and B3 horizons, both of which are dark grayish brown (10YR 4/2) silt loam or silty clay loam (refer to the Commerce series description in the Soils section of Chapter 2). In Trench 3, the textural boundaries between the B2 and B3 horizons were subtle to the point where they could not be reliably distinguished, and these Commerce horizons are encompassed within Stratum III. The deep Commerce C1 horizon of grayish brown (10YR 5/2) silt loam was not observed in Trench 3.

Trench Unit 3 was excavated along the northern trench wall. The unit was excavated to the local bottom of the trench in 12 arbitrary and natural levels, ending at a depth of 112 cm (44 in) bgs. No artifacts or cultural features were encountered in Unit 3 or in Trench 3 as a whole. The north profile of Trench Unit 3 is depicted in Figure 6.7.

Figure 6.7. Trench Unit 3 north profile.

Trench 4

The fourth trench was excavated near the project area's eastern boundary to the south of Trench 3 (see Figure 4.1). This trench was aligned from west to east and was approximately 6.1 m (20.0 ft) in length, 2.4 m (7.9 ft) in width, and 1.2 m (3.9 ft) deep. A total of three soil strata were documented within the exposed profile.

Soil Stratum I is comprised of an Ap1 plowzone of light brownish gray (10YR 6/2) silt loam from 0 to 25 cm (0 to 10 in) bgs. Stratum II consists of an Ap2 plowzone of grayish brown (10YR 5/2) silty clay loam from 25 to 43 cm (10 to 17 in) bgs. Finally, Stratum III is recorded as dark grayish brown (10YR 4/2) silty clay from 43 cm to the bottom of the trench at 120 cm (17 to 47 in) bgs. This profile is also consistent with the Commerce soils observed in much of the eastern portion of the project area. Similar to Trench 3, there was little to no textural distinction between the dark grayish brown (10YR 4/2) B2 and B3 horizons in Trench 4, and it is believed that the Commerce B2 and B3 horizons are encompassed within the mapped Stratum III of Trench 4. The deep Commerce C1 horizon of grayish brown (10YR 5/2) silt loam was not observed in Trench 4.

Trench Unit 4 was excavated along the southern trench wall. The unit was excavated to the local bottom of the trench in 12 arbitrary and natural levels, ending at a depth of 120 cm (47 in) bgs. No artifacts or cultural features were encountered in Unit 4 or in Trench 4 as a whole. The south profile of Trench Unit 4 is depicted in Figure 6.8.

Figure 6.8. Trench Unit 4 south profile.

Trench 5

The fifth and final trench excavated during the deep testing program was positioned in the southeast corner of the project area, roughly 110 m (361 ft) north of Site 16AV149 (see Figure 4.1). This trench was aligned from west to east and was roughly 15.0 m (49.2 ft) in length, 1.7 m (5.6 ft) in width, and 1.3 m (4.3 ft) deep. A total of three soil strata were documented within the exposed profile.

Trench 5's profile is very similar to that of Trench 4. Soil Stratum I consists of an Ap1 plowzone of light brownish gray (10YR 6/2) silt loam from 0 to 23 cm (0 to 9 in) bgs. Stratum II is comprised of an Ap2 plowzone of grayish brown (10YR 5/2) silty clay loam from 23 to 43 cm (9 to 17 in) bgs. Finally, Stratum III is recorded as dark grayish brown (10YR 4/2) silty clay from 43 cm to the bottom of the trench at 128 cm (17 to 50 in) bgs. Like Trenches 3 and 4, this profile is consistent with the Commerce soils observed in the eastern portion of the project area. There was also no discernible textural distinction between the dark grayish brown (10YR 4/2) B2 and B3 horizons in Trench 5, and it is believed that the Commerce B2 and B3 horizons are encompassed within the mapped Stratum III of Trench 5. The deep Commerce C1 horizon of grayish brown (10YR 5/2) silt loam was also not observed in Trench 5.

Trench Unit 5 was excavated along the southern trench wall. The unit was excavated to the local bottom of the trench in 13 arbitrary and natural levels, ending at a depth of 128 cm (50 in) bgs. No artifacts or cultural features were encountered in Unit 5 or in Trench 5 as a whole. The south profile of Trench Unit 5 is depicted in Figure 6.9.

Figure 6.9. Trench Unit 5 south profile.

Summary and Conclusions

The deep testing program conducted as part of this survey did not reveal any deeply buried archaeological resources within the survey area. Trench profiles along the eastern border of the project area indicate that alluvial processes have not contributed significantly to soil development in this area. Exposed profiles were very consistent in the number of stratigraphic units that were recorded, and in their descriptions. The soils encountered in all trenches were consistent with the soil series observed in nearby shovel tests, and with the soils mapped in the portions of the project area where each trench was excavated.

The Ap horizons observed in the trench profiles are a constant throughout the project area, and were also encountered in virtually all shovel tests. These horizons vary somewhat in color and texture according to the prevalent soil series in a given area, but are generally light brownish gray to dark grayish brown in color. The homogenous presence of mechanically modified Ap horizons throughout the project area indicates that the entire survey area has historically been subject to plowing.

All historic artifacts recovered during the survey are associated with these shallow Ap plowzones. Artifacts from the late nineteenth and early twentieth centuries at Sites 16AV149 and 16AV150 were found at or very near the surface. Since Site 16AV149 in particular is almost the closest point within the project area to the Atchafalaya River, this demonstrates that overbank flooding episodes and natural levee formation processes have not significantly altered the stratigraphy of the project area.

The Ap horizons associated with historic materials were found at the surface in all portions of the project area, and no older buried A horizons were found in shovel tests or in the trenches excavated during the deep testing program. This low rate of sediment deposition suggests that prehistoric artifacts, if they exist within the project area, would occur in soil strata shallow enough to be reached via shovel testing. The results of the survey therefore indicate that no prehistoric cultural material is present within the project area. After trench excavation, trench unit excavation, and recordation were completed, the trenches were back-filled.

Chapter 7. Conclusions and Recommendations

CRA personnel completed a records review and cultural resource survey of an 80.9 ha (200.0 acre) parcel for the proposed Port of Avoyelles development in Avoyelles Parish, Louisiana. A full records review of online files maintained by the SHPO was conducted on May 6, 2013, and consisted of a review of professional survey reports and records of archaeological sites for an area encompassing a 1.6 km (1.0 mi) radius of the project area. The records review determined that no previous surveys and no cultural resources have been documented in the current project area or within a 1.6 km (1.0 mi) radius of the project area.

Fieldwork conducted for this project consisted of a combination of pedestrian survey, shovel testing, and limited deep testing and was conducted from May 9 through May 16, 2013. This project resulted in the identification of newly recorded Sites 16AV149 and 16AV150 and isolated find X16AVA.

All cultural resources recorded as a result of this project (Sites 16AV149 and 16AV150 and isolated find X16AVA) are recommended not eligible for listing in the NRHP, and cultural resource clearance is recommended for the project area. Note that a principal investigator or field archaeologist cannot grant clearance to a project. Although the decision to grant or withhold clearance is based, at least in part, on the recommendations made by the field investigator, clearance may be obtained only through an administrative decision made by the SHPO.

If any previously unrecorded archaeological materials are encountered during activities in the project area, the SHPO should be notified immediately. If human skeletal material is discovered, the construction activities should cease, local law enforcement and the SHPO should be notified immediately, and SHPO guidelines should be followed.

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APPENDIX A. MATERIALS RECOVERED

Table A-1. Materials Recovered.

Bag	Site	Unit #	Grid N	Grid E	Depth	Cat #	Group	Class Definition	Type Definition	Count	Combined Attributes	Burned	ID	Discard	Weight (g)	Diameter	Unit Mea	Vessel Part	Vessel Type	Function	MinDate	MaxDate	References	Comments
001	IF-1	STP TR 4, #8	0	0	15-15 cm bgs	1	D	Ceramics	Whiteware	1	Undecorated	N	N	N	1.28		mm	Body	Indeterminate	Other - Indet	1830		Majewski and O'Brien 1987:119; Smith 1983:119	
002	16AV150	STP TR 57, #6	0	0	0-10 cm bgs	2	D	Ceramics	Porcelain: hard paste	1	Decal	N	N	N	1.71		mm	Footring	Indeterminate	Other - Indet	1800		Faulkner 2000	Possible green decal decoration in extreme upper corner of fragment.
002	16AV150	STP TR 57, #6	0	0	0-10 cm bgs	3	D	Glass Tableware	Unidentified mold	1	Molded Amethyst Glass	N	N	N	5.45		mm	Body with base	Indeterminate	Other - Indet				Indeterminate molded ridged design on body. Base mold seam and possible partial side mold seam.
003	16AV150	STP TR 57, #7	0	0	3-3 cm bgs	4	D	Ceramics	Whiteware	1	Undecorated	N	N	N	1.69		mm	Rim	Indeterminate	Other - Indet	1830		Majewski and O'Brien 1987:119; Smith 1983:119	
004	16AV150	STP	955	1000	10-10 cm bgs	6	D	Ceramics	Whiteware	1	Undecorated	N	N	N	0.21		mm	Rim	Indeterminate	Other - Indet	1830		Majewski and O'Brien 1987:119; Smith 1983:119	
004	16AV150	STP	955	1000	10-10 cm bgs	5	A	Construction Material	Brick	1	Indeterminate brick: non-vitrified	N	N	N	5.99		mm							
005	16AV150	STP	985	1000	2-16 cm bgs	7	D	Ceramics	Whiteware	1	Undecorated	Y	N	N	2.9		mm	Base	Indeterminate	Other - Indet	1830		Majewski and O'Brien 1987:119; Smith 1983:119	Burned whiteware fragment.
005	16AV150	STP	985	1000	2-16 cm bgs	8	D	Container Glass	Undiagnostic container fragment	1	Fragment Clear glass	N	N	N	1.46		mm	Body	Indetermiate bottle/jar	Bottle - Jar				
005	16AV150	STP	985	1000	2-16 cm bgs	9	D	Container Glass	Undiagnostic container fragment	1	Fragment Blue-green glass	N	N	N	0.43		mm	Body	Indetermiate bottle/jar	Bottle - Jar				
006	16AV150	STP	985	1015	0-23 cm bgs	11	D	Container Glass	Undiagnostic container fragment	1	Fragment Clear glass	N	N	N	1.9		mm	Body	Indetermiate bottle/jar	Bottle - Jar				Body fragment, incorporating the corner of a rectangular or square bottle/jar and vertical mold seam
006	16AV150	STP	985	1015	0-23 cm bgs	12	D	Container Glass	Undiagnostic container fragment	1	Fragment Clear glass	N	N	N	0.59		mm	Body	Indetermiate bottle/jar	Bottle - Jar				
006	16AV150	STP	985	1015	0-23 cm bgs	10	D	Container Glass	Blown in Mold	1	Slug Plate Molded	N	N	N	1.76		mm	Body	Indetermiate bottle/jar	Bottle - Jar	1800	1920	Lindsey 2006; Miller & Sullivan 1984; Jones & Sullivan 1985	Blue-green body fragment formed in slug plate mold with embossed lettering "PAI". Post-ca. 1850.
007	16AV150	STP	985	1030	0-25 cm bgs	13	D	Glass Tableware	Press mold: unleaded	1	Molded Amethyst Glass	N	N	N	2.05		mm	Rim	Indeterminate	Other - Indet	1865		Jones 2000:165	Rim fragment with molded geometric design.
008	16AV150	GSC	0	0	- Surface	39	D	Ceramics	Whiteware	1	Undecorated	N	N	N	4.66		mm	Footring	Indeterminate	Other - Indet	1830		Majewski and O'Brien 1987:119; Smith 1983:119	Whiteware fragment with a portion of footring.

008	16AV150	GSC	0	0	- Surface	33	D	Ceramics	Whiteware	1	Undecorated	Y	N	N	4.65	mm	Footring	Indeterminate	Other - Indet	1830		Majewski and O'Brien 1987:119; Smith 1983:119	Burned whiteware fragment with a portion of footring.
008	16AV150	GSC	0	0	- Surface	34	D	Ceramics	Whiteware	3	Undecorated	N	N	N	13.33	mm	Body	Indeterminate	Other - Indet	1830		Majewski and O'Brien 1987:119; Smith 1983:119	Three undecorated whiteware body fragments.
008	16AV150	GSC	0	0	- Surface	47	D	Ceramics	Stoneware	1	Slip decorated exterior	N	N	N	7.84	mm	Handle	Indeterminate	Other - Indet	1780	1925	Greer 1999; Ketchum 1983	Fragment of stoneware handle (possibly handmade), with a brown clay slipped exterior.
008	16AV150	GSC	0	0	- Surface	35	D	Ceramics	Whiteware	2	Undecorated	N	N	N	4.95	mm	Rim	Indeterminate	Other - Indet	1830		Majewski and O'Brien 1987:119; Smith 1983:119	Two undecorated whiteware rim fragments.
008	16AV150	GSC	0	0	- Surface	36	D	Ceramics	Whiteware	1	Molded	N	N	N	3.69	mm	Rim	Indeterminate	Other - Indet	1830		Majewski and O'Brien 1987:119; Smith 1983:119	Whiteware fragment with scalloped rim and very shallow indeterminate molded edge decoration.
008	16AV150	GSC	0	0	- Surface	37	D	Ceramics	Whiteware	1	Molded	N	N	N	1.83	mm	Base	Indeterminate	Other - Indet	1830		Majewski and O'Brien 1987:119; Smith 1983:119	Whiteware base fragment with thin molded annular line.
008	16AV150	GSC	0	0	- Surface	38	D	Ceramics	Whiteware	1	Molded	N	N	N	5.77	mm	Footring with base	Indeterminate	Other - Indet	1830		Majewski and O'Brien 1987:119; Smith 1983:119	Whiteware base fragment with a portion of footring and two thin molded annular lines.
008	16AV150	GSC	0	0	- Surface	40	D	Ceramics	Whiteware	1	Handpainted Green monochrome	N	N	N	6.16	mm	Body	Indeterminate	Other - Indet	1830		Majewski and O'Brien 1987:119; Smith 1983:119	Whiteware body fragment with a portion of green handpainted design (leaf?) and green annular line.
008	16AV150	GSC	0	0	- Surface	41	D	Ceramics	Porcelain: hard paste	1	Molded / embossed border	N	N	N	3.38	mm	Rim	Indeterminate	Other - Indet	1800		Faulkner 2000	Porcelain rim fragment with embossed decoration of repeating radial lines.
008	16AV150	GSC	0	0	- Surface	42	D	Ceramics	Porcelain: hard paste	1	Decal	N	N	N	2.07	mm	Body	Indeterminate	Other - Indet	1800		Faulkner 2000	Includes floral decal that has been entirely worn away except for residue. Thin molded annular line.
008	16AV150	GSC	0	0	- Surface	43	D	Ceramics	Ironstone	3	Undecorated	N	N	N	8.23	mm	Body	Indeterminate	Other - Indet	1830		Majewski and O'Brien 1987:122	Three undecorated ironstone body fragments, including one of only partial thickness.
008	16AV150	GSC	0	0	- Surface	44	D	Ceramics	Ironstone	1	Molded / Embossed (late)	N	N	N	6.22	mm	Handle	Indeterminate	Other - Indet	1830		Majewski and O'Brien 1987:122	Handle fragment with mold line along center and molded repeating point decoration on either side.-00
008	16AV150	GSC	0	0	- Surface	46	D	Ceramics	Ironstone	1	Undecorated	N	N	N	69.84	mm	Other part	Indeterminate	Other - Indet	1830		Majewski and O'Brien 1987:122	Fragment of very thick, large ironstone vessel. Incorporates fragment of one circular foot.

008	16AV150	GSC	0	0	- Surface	27	D	Container Glass	Blown in Mold	1	Post bottom mold	N	N	N	6.45	mm	Base	Indetermiate bottle/jar	Bottle - Jar	1800	1920	Lindsey 2006; Miller & Sullivan 1984; Jones & Sullivan 1985	Fragment incorporates a post mold seam.
008	16AV150	GSC	0	0	- Surface	48	D	Ceramics	Stoneware	1	Slip decorated interior and exterior	N	N	N	15.56	mm	Footring	Indeterminate	Other - Indet	1780	1925	Greer 1999; Ketchum 1983	Incorporates a portion of footring. Blue slip on exterior, off white slip on interior and on base.
008	16AV150	GSC	0	0	- Surface	49	D	Ceramics	Stoneware	1	Multiple slipped exterior, Albany slipped and molded interior	N	N	N	50.5	mm	Body	Indeterminate	Other - Indet	1780	1925	Greer 1999; Ketchum 1983	Brown clay slip and clear glaze on exterior, Albany slip and molded annular ring on interior.
008	16AV150	GSC	0	0	- Surface	45	D	Ceramics	Ironstone	1	Molded and Brown Transfer printed surface	N	N	N	22.2	mm	Other part	Indeterminate	Other - Indet	1830		Majewski and O'Brien 1987:122	Flat vessel (possibly a pot rest). Includes footring, upper surface, and rim with molded design.
008	16AV150	GSC	0	0	- Surface	22	D	Container Glass	Automatic Bottle Machine	1	Blue-green glass with External Thread	N	N	N	3.58	mm	Rim	Miscellaneous jar	Bottle - Jar	1903		Jones & Sullivan 1985; Lindsey 2006	Jar lip fragment with a portion of external thread.
008	16AV150	GSC	0	0	- Surface	14	D	Container Glass	Undiagnostic container fragment	1	Clear glass fragment	N	N	N	1.75	mm	Body	Indetermiate bottle/jar	Bottle - Jar				
008	16AV150	GSC	0	0	- Surface	15	D	Glass Tableware	Undiagnostic fragment	2	Clear unleaded glass	N	N	N	13.79	mm	Body	Indeterminate	Other - Indet				
008	16AV150	GSC	0	0	- Surface	16	D	Container Glass	Automatic Bottle Machine	1	Clear glass fragment	N	N	N	3.75	mm	Lip	Miscellaneous jar	Bottle - Jar	1903		Jones & Sullivan 1985; Lindsey 2006	Jar lip fragment with seams from a two-stage machine manufacturing process.
008	16AV150	GSC	0	0	- Surface	17	D	Container Glass	Automatic Bottle Machine	1	Clear glass fragment with external thread	N	N	N	10.93	mm	Lip with neck	Miscellaneous bottle	Bottle - Jar	1903		Jones & Sullivan 1985; Lindsey 2006	Colorless glass bottle neck fragment with seams from a two-stage manufacturing process.
008	16AV150	GSC	0	0	- Surface	18	D	Container Glass	Undiagnostic container fragment	1	Cobalt glass	N	N	N	0.88	mm	Body	Indetermiate bottle/jar	Bottle - Jar				
008	16AV150	GSC	0	0	- Surface	19	D	Container Glass	Undiagnostic container fragment	1	Aqua glass	N	N	N	1.43	mm	Body	Indetermiate bottle/jar	Bottle - Jar				Fragment has indeterminate molded decoration incorporating curved lines. Likely cosmetic jar incorporating cup mold seam.
008	16AV150	GSC	0	0	- Surface	29	D	Container Glass	Undiagnostic container fragment	1	Opaque white glass	N	N	N	8.56	mm	Base	Toiletries/Perfume	Bottle - Jar				
008	16AV150	GSC	0	0	- Surface	21	D	Glass Tableware	Undiagnostic fragment	1	Blue-green glass	N	N	N	9.41	mm	Indeterminate part	Indeterminate	Other - Indet				Fragment incorporates a curved beveled edge of indeterminate location on the overall vessel.
008	16AV150	GSC	0	0	- Surface	32	D	Ceramics	Whiteware	1	Undecorated	Y	N	N	1.47	mm	Body	Indeterminate	Other - Indet	1830		Majewski and O'Brien 1987:119; Smith 1983:119	Possibly burned whiteware body fragment.
008	16AV150	GSC	0	0	- Surface	23	D	Container Glass	Automatic Bottle Machine	1	Amethyst glass with Owens mold scar	N	N	N	8.61	mm	Base	Indetermiate bottle/jar	Bottle - Jar	1903		Jones & Sullivan 1985; Lindsey 2006	Base fragment with Owens scar and indeterminate maker's mark: "513" in a horizontal diamond.

008	16AV150	GSC	0	0	- Surface	24	D	Glass Tableware	Unidentified mold	1	Molded Amethyst Glass	N	N	N	14.19	mm	Body	Indeterminate	Other - Indet			Curved fragment with two molded concentric lines.
008	16AV150	GSC	0	0	- Surface	25	D	Container Glass	Undiagnostic container fragment	2	Amethyst glass fragment	N	N	N	3.33	mm	Body	Indetermiate bottle/jar	Bottle - Jar			
008	16AV150	GSC	0	0	- Surface	26	D	Container Glass	Undiagnostic container fragment	1	Amethyst glass fragment	N	N	N	3.78	mm	Body	Indetermiate bottle/jar	Bottle - Jar			Fragment incorporates a vertical body seam.
008	16AV150	GSC	0	0	- Surface	28	D	Container Glass	Automatic Bottle Machine	1	Opaque white glass Cup bottom mold	N	N	N	12.89	mm	Body with base	Toiletries/Perfume	Bottle - Jar	1903	Jones & Sullivan 1985; Lindsey 2006	Likely cosmetic jar fragment incorporating cup mold seam. "CHICAG[O]" mark on base. No lip present.
008	16AV150	GSC	0	0	- Surface	30	D	Container Glass	Automatic Bottle Machine	1	Opaque white glass with external thread	N	N	N	5.42	mm	Lip	Toiletries/Perfume	Bottle - Jar	1903	Jones & Sullivan 1985; Lindsey 2006	Likely cosmetic jar lip fragment with machine-made external threads.
008	16AV150	GSC	0	0	- Surface	31	D	Container Glass	Undiagnostic container fragment	1	Opaque white glass	N	N	N	7.02	mm	Body	Indetermiate bottle/jar	Bottle - Jar			
008	16AV150	GSC	0	0	- Surface	20	D	Container Glass	Automatic Bottle Machine	1	Aqua glass with valve mark	N	N	N	12.56	mm	Base	Indetermiate bottle/jar	Bottle - Jar	1903	Jones & Sullivan 1985; Lindsey 2006	Bottle/jar base fragment with a portion of what is likely a valve mark. Very messy glass residue.
009	16AV149	STP TR 63, #2	0	0	0-25 cm bgs	50	D	Ceramics	Whiteware	1	Undecorated	N	N	N	3.19	mm	Body	Indeterminate	Other - Indet	1830	Majewski and O'Brien 1987:119; Smith 1983:119	
009	16AV149	STP TR 63, #2	0	0	0-25 cm bgs	51	D	Container Glass	Undiagnostic container fragment	1	Clear glass fragment	N	N	N	0.47	mm	Body	Indetermiate bottle/jar	Bottle - Jar			
010	16AV149	GSC	0	0	- Surface	54	D	Container Glass	Undiagnostic container fragment	1	Amber glass fragment	N	N	N	2.41	mm	Body	Indetermiate bottle/jar	Bottle - Jar			
010	16AV149	GSC	0	0	- Surface	92	D	Ceramics	Ironstone	1	Molded / Embossed (late)	N	N	N	43.25	mm	Rim	Indeterminate	Other - Indet	1830	Majewski and O'Brien 1987:122	Ironstone rim fragment with thin molded annular line on ventral surface.
010	16AV149	GSC	0	0	- Surface	52	D	Container Glass	Blown in Mold	1	Slug Plate Molded	N	N	N	1.87	mm	Body	Indetermiate bottle/jar	Bottle - Jar	1800	1920	Lindsey 2006; Miller & Sullivan 1984; Jones & Sullivan 1985	Colorless glass fragment from vessel formed in slug plate mold. Letter "S" is visible.
010	16AV149	GSC	0	0	- Surface	81	D	Ceramics	Whiteware	1	Undecorated	N	N	N	1.54	mm	Base	Indeterminate	Other - Indet	1830	Majewski and O'Brien 1987:119; Smith 1983:119	
010	16AV149	GSC	0	0	- Surface	82	D	Ceramics	Whiteware	1	Molded	N	N	N	1.65	mm	Body	Indeterminate	Other - Indet	1830	Majewski and O'Brien 1987:119; Smith 1983:119	Whiteware body fragment with a portion of very thin molded annular line.
010	16AV149	GSC	0	0	- Surface	83	D	Ceramics	Whiteware	1	Molded	N	N	N	6.24	mm	Footring with base	Indeterminate	Other - Indet	1830	Majewski and O'Brien 1987:119; Smith 1983:119	Base has molded decoration of two very thin molded concentric annular lines.

010	16AV149	GSC	0	0	- Surface	84	D	Ceramics	Whiteware	1	Molded	N	N	N	1.72	mm	Base	Indeterminate	Other - Indet	1830		Majewski and O'Brien 1987:119; Smith 1983:119	Base fragment has molded decoration of two very thin concentric annular lines.
010	16AV149	GSC	0	0	- Surface	85	D	Ceramics	Whiteware	1	Molded	N	N	N	2.47	mm	Rim	Indeterminate	Other - Indet	1830		Majewski and O'Brien 1987:119; Smith 1983:119	Whiteware rim fragment with scalloped molded edge.
010	16AV149	GSC	0	0	- Surface	86	D	Ceramics	Whiteware	1	Molded	N	N	N	2.88	mm	Rim	Indeterminate	Other - Indet	1830		Majewski and O'Brien 1987:119; Smith 1983:119	Whiteware rim fragment with scalloped rim and molded edge decoration incorporating dots and lines.
010	16AV149	GSC	0	0	- Surface	87	D	Ceramics	Whiteware	6	Undecorated	N	N	N	22.34	mm	Rim	Indeterminate	Other - Indet	1830		Majewski and O'Brien 1987:119; Smith 1983:119	Six undecorated whiteware rim fragments.
010	16AV149	GSC	0	0	- Surface	88	D	Ceramics	Whiteware	1	Transfer printed	N	N	N	7.79	mm	Base	Indeterminate	Other - Indet	1830		Majewski and O'Brien 1987:119; Smith 1983:119	Whiteware base fragment with a small portion of indeterminate transfer-print maker's mark.
010	16AV149	GSC	0	0	- Surface	89	D	Ceramics	Whiteware	1	Transfer printed	N	N	N	4.84	mm	Base	Indeterminate	Other - Indet	1830		Majewski and O'Brien 1987:119; Smith 1983:119	Whiteware base fragment with partial indeterminate transfer print maker's mark: "…NLEY…[E]NGLAN[D]"
010	16AV149	GSC	0	0	- Surface	79	D	Ceramics	Whiteware	1	Brown Transfer printed	N	N	N	3.98	mm	Base	Indeterminate	Other - Indet	1830		Majewski and O'Brien 1987:119; Smith 1983:119	Whiteware base fragment with a small portion of brown transfer print-possibly maker's mark.
010	16AV149	GSC	0	0	- Surface	91	D	Ceramics	Ironstone	1	Undecorated	N	N	N	43.12	mm	Rim	Indeterminate	Other - Indet	1830		Majewski and O'Brien 1987:122	
010	16AV149	GSC	0	0	- Surface	78	D	Ceramics	Whiteware	1	Black Transfer printed	N	N	N	2.62	mm	Base	Indeterminate	Other - Indet	1830		Majewski and O'Brien 1987:119; Smith 1983:119	Whiteware base fragment with a very small portion of black transfer print-possibly a maker's mark.
010	16AV149	GSC	0	0	- Surface	93	D	Ceramics	Stoneware	1	Slipped exterior and molded and slipped interior	N	N	N	11.19	mm	Rim	Indeterminate	Other - Indet	1780	1925	Greer 1999; Ketchum 1983	Stoneware fragment with molded rim and interior and exterior light gray clay slip.
010	16AV149	GSC	0	0	- Surface	94	D	Ceramics	Stoneware	1	Slipped exterior, salt glazed interior	N	N	N	3.52	mm	Body	Indeterminate	Other - Indet	1780	1925	Greer 1999; Ketchum 1983	
010	16AV149	GSC	0	0	- Surface	95	D	Ceramics	Stoneware	2	Salt glazed exterior and slipped interior	N	N	N	8.13	mm	Body	Indeterminate	Other - Indet	1780	1925	Greer 1999; Ketchum 1983	Two stoneware fragments, possibly from the same vessel. Wheel-turning marks on interior.

010	16AV149	GSC	0	0	- Surface	96	D	Ceramics	Stoneware	1	Slipped exterior	N	N	N	26.96		mm	Handle	Indeterminate	Other - Indet	1780	1925	Greer 1999; Ketchum 1983	Hand-formed stoneware handle with brown clay slip; interior side has a metallic chromatic sheen.
010	16AV149	GSC	0	0	- Surface	97	D	Ceramics	Stoneware	1	Unglazed exterior and slipped interior	N	N	N	17.68		mm	Body	Indeterminate	Other - Indet	1780	1925	Greer 1999; Ketchum 1983	Stoneware body fragment with gray paste, unglazed exterior, and dark gray clay slip on interior
010	16AV149	GSC	0	0	- Surface	98	D	Ceramics	Stoneware	2	Slipped exterior and Albany slipped interior	N	N	N	14.3		mm	Body	Indeterminate	Other - Indet	1780	1925	Greer 1999; Ketchum 1983	Two stoneware body fragments with off-white clay slip exteriors and Albany slipped interiors.
010	16AV149	GSC	0	0	- Surface	100	M	Electrical	Insulator: ceramic	1		N	N	N	56.29		mm				1892		Berge 1980:156	One cylindrical porcelain insulator with base hollow and interior channel for electrical components.
010	16AV149	GSC	0	0	- Surface	99	D	Ceramics	Stoneware	1	Slipped exterior and interior	N	N	N	10.17		mm	Body	Indeterminate	Other - Indet	1780	1925	Greer 1999; Ketchum 1983	Light gray clay exterior slip and brown clay interior slip. Wheel-turning marks on interior.
010	16AV149	GSC	0	0	- Surface	101	C	Buttons	Sew-through	2	Four holes, flat one-piece, plain Prosser	N	N	N	2.63		mm							Two four-hole dish-shaped plain white ceramic Prosser buttons.
010	16AV149	GSC	0	0	- Surface	102	P	Toys and Games	Marble	1	Glass	N	N	N	5.98	16.8	mm							Green glass marble with interior white swirl. Heavily pitted surface and flattened on one side.
010	16AV149	GSC	0	0	- Surface	103	R	Projectiles	Shot Gun Shell	1	12 gauge: brass base/paper wall	N	N	N	2.98		mm							Brass base of fired 12-gauge New Club shotgun shell from UMC Company. Manufactured from 1891 to 1916
010	16AV149	GSC	0	0	- Surface	90	D	Ceramics	Ironstone	2	Undecorated	N	N	N	16.02		mm	Body	Indeterminate	Other - Indet	1830		Majewski and O'Brien 1987:122	Two undecorated ironstone body fragments.
010	16AV149	GSC	0	0	- Surface	66	D	Container Closures	Home Canning Jars	6	Glass lid for top seal Mason	N	N	N	19.44		mm	Cover / Lid						Six milk glass canning jar lid fragments.
010	16AV149	GSC	0	0	- Surface	104	I	Steam Engine / Boiler		1		N	N	N	8.14		mm							Brass gauge cover from undetermined machinery. Inscribed date "JAN 23 1900".
010	16AV149	GSC	0	0	- Surface	55	D	Container Glass	Undiagnostic container fragment	1	Amber glass fragment	N	N	N	19.46		mm	Body with base	Indetermiate bottle/jar	Bottle - Jar				Amber glass fragment formed in a cup mold. Portion of lettering on base just visible: "…&…"
010	16AV149	GSC	0	0	- Surface	56	D	Container Glass	Undiagnostic container fragment	1	Olive green glass fragment	N	N	N	3.23		mm	Other part	Miscellaneous bottle	Bottle - Jar				Bottle neck fragment with stretch marks (free blown or blown in mold), before ca. 1915.
010	16AV149	GSC	0	0	- Surface	57	D	Container Glass	Undiagnostic container fragment	1	Light green glass fragment	N	N	N	2.19		mm	Body with base	Indetermiate bottle/jar	Bottle - Jar				Light green glass fragment incorporating a small portion of the heel of the bottle/jar; no seams.
010	16AV149	GSC	0	0	- Surface	58	D	Container Glass	Blown in Mold	1	Cup bottom mold	N	N	N	20.47		mm	Body with base	Indetermiate bottle/jar	Bottle - Jar	1800	1920	Lindsey 2006; Miller & Sullivan 1984; Jones & Sullivan 1985	Blue-green fragment w/ cup mold/vertical body mold seams. Seams are rough-mouth blown ca. pre-1910.

010	16AV149	GSC	0	0	- Surface	59	D	Container Glass	Automatic Bottle Machine	1	Blue-green glass fragment with external thread	N	N	N	6.22	mm	Rim	Miscellaneous jar	Bottle - Jar	1903		Jones & Sullivan 1985; Lindsey 2006	Rim fragment of jar with machine-made external threads.
010	16AV149	GSC	0	0	- Surface	60	D	Container Glass	Automatic Bottle Machine	1	Aqua glass fragment	N	N	N	2.34	mm	Rim	Miscellaneous jar	Bottle - Jar	1903		Jones & Sullivan 1985; Lindsey 2006	Fragment of jar rim with one machine-made ring, but very edge of rim not present.
010	16AV149	GSC	0	0	- Surface	61	D	Glass Tableware	Press mold: unleaded	1	Molded Amethyst Glass	N	N	N	6.57	mm	Body	Indeterminate	Other - Indet	1865		Jones 2000:165	Body fragment with molded geometric pattern.
010	16AV149	GSC	0	0	- Surface	62	D	Container Glass	Undiagnostic container fragment	1	Amethyst glass fragment	N	N	N	10.41	mm	Base	Indetermiate bottle/jar	Bottle - Jar				No mold seams.
010	16AV149	GSC	0	0	- Surface	63	D	Container Glass	Undiagnostic container fragment	3	Amethyst glass fragment	N	N	N	10.35	mm	Body	Indetermiate bottle/jar	Bottle - Jar				Three amethyst glass body fragments. One fragment incorporates a vertical side mold seam.
010	16AV149	GSC	0	0	- Surface	80	D	Ceramics	Whiteware	1	Undecorated	N	N	N	4.56	mm	Footring with base	Indeterminate	Other - Indet	1830		Majewski and O'Brien 1987:119; Smith 1983:119	Whiteware base fragment with a portion of footring.
010	16AV149	GSC	0	0	- Surface	65	D	Container Glass	Undiagnostic container fragment	1	Amethyst glass fragment	N	N	N	8.77	mm	Base	Indetermiate bottle/jar	Bottle - Jar				Base fragment of small bottle/jar. Formed in cup mold containing an imperfection in base.
010	16AV149	GSC	0	0	- Surface	53	D	Container Glass	Undiagnostic container fragment	2	Cobalt glass	N	N	N	3.09	mm	Body	Indetermiate bottle/jar	Bottle - Jar				
010	16AV149	GSC	0	0	- Surface	67	D	Ceramics	Yellowware	1	Undecorated	N	N	N	5.4	mm	Body	Indeterminate	Other - Indet	1830	1925	Raycraft and Raycraft 1992:7	
010	16AV149	GSC	0	0	- Surface	68	D	Ceramics	Yellowware	1	Undecorated	N	N	N	8.31	mm	Rim	Indeterminate	Other - Indet	1830	1925	Raycraft and Raycraft 1992:7	
010	16AV149	GSC	0	0	- Surface	69	D	Ceramics	Porcelain: hard paste	2	Undecorated	N	N	N	6.65	mm	Body	Indeterminate	Other - Indet	1800		Faulkner 2000	
010	16AV149	GSC	0	0	- Surface	70	D	Ceramics	Porcelain: hard paste	2	Molded / embossed border	N	N	N	3.05	mm	Body	Indeterminate	Other - Indet	1800		Faulkner 2000	Two hard paste porcelain body fragments with indeterminate molded decoration.
010	16AV149	GSC	0	0	- Surface	71	D	Ceramics	Porcelain: hard paste	1	Undecorated	N	N	N	1.41	mm	Rim	Indeterminate	Other - Indet	1800		Faulkner 2000	
010	16AV149	GSC	0	0	- Surface	72	D	Ceramics	Porcelain: hard paste	1	Undecorated	N	N	N	1.57	mm	Footring	Indeterminate	Other - Indet	1800		Faulkner 2000	
010	16AV149	GSC	0	0	- Surface	73	D	Ceramics	Porcelain: hard paste	1	Handpainted monochrome	N	N	N	1.49	mm	Body	Indeterminate	Other - Indet	1800		Faulkner 2000	Hard paste porcelain body fragment with handpainted green decoration. "MIGN…" visible on fragment.
010	16AV149	GSC	0	0	- Surface	74	D	Ceramics	Whiteware	7	Undecorated	N	N	N	27.86	mm	Body	Indeterminate	Other - Indet	1830		Majewski and O'Brien 1987:119; Smith 1983:119	Seven undecorated whiteware body fragments.
010	16AV149	GSC	0	0	- Surface	75	D	Ceramics	Whiteware	1	Molded	N	N	N	2.28	mm	Body	Indeterminate	Other - Indet	1830		Majewski and O'Brien 1987:119; Smith 1983:119	Geometric molded decoration on exterior.

010	16AV149	GSC	0	0	- Surface	76	D	Ceramics	Whiteware	1	Molded	N	N	N	2.99		mm	Handle	Indeterminate	Other - Indet	1830		Majewski and O'Brien 1987:119; Smith 1983:119	Whiteware handle fragment with indeterminate molded decoration.
010	16AV149	GSC	0	0	- Surface	77	D	Ceramics	Whiteware	1	Molded	N	N	N	3.06		mm	Other part	Indeterminate	Other - Indet	1830		Majewski and O'Brien 1987:119; Smith 1983:119	Whiteware fragment incorporating footring and portion of body with indeterminate molded decoration.
010	16AV149	GSC	0	0	- Surface	64	D	Container Glass	Undiagnostic container fragment	1	Amethyst glass fragment	N	N	N	6.95		mm	Other part	Indetermiate bottle/jar	Bottle - Jar				Shoulder of amethyst glass vessel. Incorporates horizontal mold seam and molded shoulder ridge.